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# **The Determinants and Outcomes of User Commitment to Mandatory Information System Change**

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# ABSTRACT

Thesis title: The determinants and outcomes of user commitment to mandatory information system change

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Winning the commitment and support of employees for organisational transformation is a major objective of the leaders of organisational change. However, the determinants and outcomes of employee commitment to organisational change (Herscovitch & Meyer, 2002) are still not yet fully understood, especially with regard to a mandatory information system change in a non-Western environment. In the context of Namibia, a developing country in Africa, the mixed-methods approach applied in the study led to the development of a model of the determinants and outcomes of user commitment to mandatory information system change. Following recent advances in the wider commitment literature, the present study proposed changes to the classical tripartite model of commitment: Normative commitment to change was accordingly changed to commitment propensity, an individual difference driving the development of affective user commitment. On the basis of Meyer and Herscovitch's (2001) general model of commitment, determinants of user commitment were selected from the commitment, change management and information system literature. Apart from commitment propensity, three areas were proposed to predict affective user commitment, namely information system change value (information quality and perceived usefulness), information system change involvement (communication, participation and training) and information system change climate (overall change fairness and information system change leadership). The outcomes of commitment were classified in the three wider categories of workplace behaviour: Task, citizenship and counterproductive work behaviour. Within these categories, mere compliance, compliance, cooperation, championing and counterproductive work behaviour towards an organisation and individuals were proposed. In the first phase of the study, focus group discussions were conducted with users ( $N= 31$ ) who had recently experienced a mandatory new information system. Building on the findings of the first phase of the study, the second and dominant phase comprised a cross-sectional survey study with users ( $N = 240$ ) from eight different Namibian organisations that had recently experienced a mandatory information system change. The findings of the study demonstrate the portability of the proposed bipartite user commitment construct to the Namibian context. A large part of the variance in affective user commitment can be explained by commitment propensity and information system change value. Affective and continuance user commitment and their two-way interactions also significantly predicted information system change-related behaviour in the study. Finally, the theoretical, methodological and practical contributions of the study are discussed.

# ABBREVIATIONS

---

<b>IS</b>	Information System
<b>ERP</b>	Enterprise Resource Planning
<b>C2C</b>	Commitment to Organisational Change
<b>ACC</b>	Affective Commitment to Organisational Change
<b>CCC</b>	Continuance Commitment to Organisational Change
<b>NCC</b>	Normative Commitment to Organisational Change
<b>ACC (IS)</b>	Affective User Commitment to Mandatory Information System Change
<b>CCC (IS)</b>	Continuance User Commitment to Mandatory Information System Change
<b>CP</b>	Commitment Propensity
<b>OC</b>	Organisational Commitment
<b>OCQ</b>	Organisational Commitment Questionnaire
<b>AOC</b>	Affective Organisational Commitment
<b>COC</b>	Continuance Organisational Commitment
<b>NOC</b>	Normative Organisational Commitment
<b>IQ</b>	Information Quality
<b>PU</b>	Perceived Usefulness
<b>PEU</b>	Perceived Ease of Use
<b>FC</b>	Facilitating Conditions
<b>CF</b>	Overall Change Fairness
<b>CL</b>	Change Leadership
<b>PLA</b>	Perceived Lack of Alternatives
<b>PHS</b>	Perceived High Sacrifice
<b>PST</b>	Perceived Skills Transferability
<b>POS</b>	Perceived Organisational Support
<b>TL</b>	Transformational Leadership
<b>OJ</b>	Organisational Justice
<b>POJ</b>	Perceived Overall Justice
<b>LMX</b>	Leader-Member Exchange
<b>OCB</b>	Organisational Citizenship Behaviour
<b>CWB</b>	Counterproductive Work Behaviour
<b>CWB (O)</b>	Counterproductive Work Behaviour towards the Organisation
<b>CWB (I)</b>	Counterproductive Work Behaviour towards Individuals
<b>EFA</b>	Exploratory Factor Analysis
<b>CFA</b>	Confirmatory Factor Analysis
<b>MSA</b>	Measures of Sampling Adequacy
<b>VIF</b>	Variable Inflation Factor
<b>SEM</b>	Structural Equations Modelling
<b>GFI</b>	Goodness-of-Fit Index
<b>CFI</b>	Comparative-Fit-Index
<b>RMSEA</b>	Root-Mean-Square Error of Approximation
<b>ECVI</b>	Expected Cross-Validation Index

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Note. Because some of the terms used in this thesis are lengthy and occur frequently, abbreviations are used. Readers are encouraged to familiarise themselves with these abbreviations. Alternatively, a copy of the abbreviations on a separate sheet could be made and used as a reference whilst reading the thesis.

# **CHAPTER 1: INTRODUCTION**

The increasingly competitive world (Lopez-Claros, Porter, Sala-i-Martin, & Schwab, 2007) is forcing organisations to become more adaptable to organisational change than ever before. The recent severe global recession (International Monetary Fund, 2009) has led to the failure of even successful organisations (Collins, 2009). The lesson is that organisations wishing to survive have no choice but to adapt to constant and significant change (Kondratuk, Hausdorf, Korabik, & Rosin, 2004). Apart from the ability to change on a macro-level, the leaders of organisations must also know how to win commitment to change from the affected people in their organisations. This thesis contributes to new knowledge on this issue by developing a new explanatory model of the determinants and outcomes of user commitment to mandatory information system change.

## **NATURE OF INFORMATION SYSTEM CHANGE**

Large-scale, transformational changes receive wide media attention (e.g., mergers and acquisitions, and organisational downsizing or rightsizing), yet most changes occur discretely and are of a transactional or evolutionary nature (Burke, 2002). The implementation of a new information system (IS), or enterprise resource planning (ERP) system, is an example of an important transactional organisational change aimed at reducing costs and increasing productivity. Even in the midst of an economic crisis, companies still continue to increase expenditure on new information systems (Petter, DeLone, & McLean, 2008).

In the field of information systems, ERP implementations have received much attention during the past few years. An ERP system is a comprehensive information system that integrates the complete range of business processes in order to present a holistic view of the business from a single platform (Al-Mashari, Al-Mudimigh, & Zairi, 2003). It allows the seamless integration of all major business functions, such as finance, human resources, marketing and operations, into a single database (Law & Ngai, 2007; Motwani, Subramanian, & Gopalakrishna, 2005). ERP systems also enable organisations to adopt streamlined, industry-wide best practice business processes (Amoako-Gyampah & Salam, 2004).

An ERP implementation represents a major financial investment in technology and user training but holds the promise of significant improvements in efficiency and business performance (Yardley, 2002). A successful ERP system can therefore be seen as an organisation's information backbone giving management an accurate and on-time overview of its resources and processes (Motwani et al., 2005). Since the potential benefits are attractive, many organisations are willing to undertake the difficult process of converting their old legacy systems to ERP systems (Abdinnour-Helm, Lengnick-Hall, & Lengnick-Hall, 2003).

ERP systems are, however, complex, and their implementation is difficult and expensive placing high demands on time and resources (Umble, Haft, & Umble, 2003). ERP implementations often require the re-alignment of business processes or system customisation to ensure organisational fit (Light, 2005; Soffer, Golany, & Dori, 2005). All users are affected by the restructuring, and, unlike a voluntary new information system implementation, an ERP system is a mandatory, imposed or forced information system change. The new system replaces the existing system completely, and users have no choice but to go along with the new system. In practice, this means that users have to abandon the old system and be willing to learn the processes of the new system. They must also be willing to accept role changes necessitated by the resultant business process restructuring. The only alternative for unwilling employees would be to leave the organisation. ERP implementation therefore directly affects all users, as they are the people who have to work on the system on a daily basis.

## **RESEARCH PROBLEM**

The study of change is a major topic in the organisational sciences (Bouckenooghe, 2010). Although the general literature on change management is extensive (Herold, Fedor, & Caldwell, 2007), most organisational changes fail to deliver the promised results (Beer, 2003; Pascale, Millemann, & Gioja, 1997).

Numerous studies have been conducted to identify information system success factors, yet information system and ERP implementation failure seems to mirror general organisational transformation failure. Information system change projects thus have high failure rates (Collerette, Legris, & Manghi, 2006), especially with regard to

ERP implementations (Robey, Ross, & Boudreau, 2002; Umble et al., 2003). Many ERP implementations have been criticised because of the time, cost and disruption caused by them, and also because of the limited benefits in some cases once the system becomes operational (King & Burgess, 2006). A high percentage of ERP implementation projects are not completed on time or within budget (Ehie & Madsen, 2005; Legris, Ingham, & Colletette, 2003). Some authors quote failure rates of as high as 70% (Bernroider, 2008; By, 2005) thus indicating that, despite more than 30 years of experience, the implementation of new information systems remains problematic (Brown, Chervany, & Reinicke, 2007).

Past information system research (DeLone & McLean, 1992) indicated that technical factors were only the necessary condition for information system success. DeLone and McLean devised a comprehensive model of information system success consisting of six factors: System quality, information quality, organisational impact, user satisfaction, individual impact and, finally, use by its users. Based on a literature review of 180 studies from 1992 to 2007, Petter et al. (2008) later revised the model to include system quality, information quality, service quality, use, user satisfaction and net benefits. Based on this model of information system success, user perceptions were found to be instrumental in explaining usage intentions, information system acceptance and actual information system use (Agarwal & Prasad, 1997; Amoako-Gyampah & Salam, 2004). The two major streams of research in this field concern the literature on user satisfaction and technology acceptance (Rai, Lang, & Welker, 2002; Sabherwal, Jeyaraj, & Chowa, 2006; Wixom & Todd, 2005).

The sufficient condition for information system success is therefore the appropriate use and support by its users (i.e. Use) (Mathieson, 1991; Yardley, 2002). These users, in turn, are human beings, and consequently employees, and their attitudes and behaviour, in particular, are crucial during ERP implementation. Technology is undoubtedly important, but organisations have often placed too much importance on it at the expense of people issues (Shum, Bove, & Auh, 2008). For example, many implementation failures are due to non-technical factors (Choi & Price, 2005; Martinsons & Chong, 1999) or because organisations fail to gain employees'

commitment to innovation (Amoako-Gyampah & Salam, 2003; Klein, Conn, & Sorra, 2001).

Although the IS literature considered people in the successful implementation of an IS change (Moore & Benbasat, 1991), results were often inconsistent (Sabherwal et al., 2006). In information system literature, user commitment is one of the most widely cited factors for information system success (Brown et al., 2007). Committed employees demonstrate better work performance and exhibit extra-role behaviour during times of change (Shum et al., 2008). Commitment to change is therefore a vital psychological driver of supportive employee behaviour during organisational change (Jaros, 2010).

Nonetheless, despite its presumed importance, many researchers have treated commitment as a 'black box' and have failed to define and measure this construct clearly. For organisations to benefit from committed users, more needs to be known about the nature, drivers and behavioural outcomes of commitment. Leaders of information system change must not only be able to initiate change – they must also know how to win the commitment and support of their followers.

Recent studies have begun to define, examine and measure commitment to organisational change (C2C) defining it “... as a force (mind-set) that binds an employee to a course of action deemed necessary for the successful implementation of an organisational change” (Herscovitch & Meyer, 2002, p. 475). Studies have also begun to explore the drivers and outcomes of C2C in various change contexts (e.g., Bernerth, Armenakis, Feild, & Walker, 2007; Meyer, Srinivas, Lal, & Topolnytsky, 2007; Parish, Cadwallader, & Bush, 2008).

However, several issues regarding C2C in the context of an information system change still require exploration: First, it must be determined whether the construct is equally portable to non-Western contexts; second, it must be determined whether an information system change can indeed become the focus of commitment; third, some unresolved conceptual issues pertaining to the psychometric properties of organisational commitment (OC) also require exploration in relation to C2C; fourth, previous studies have examined the behavioural outcomes of commitment without

exploring them within a wider framework of employee behaviour. Finally, most previous studies have employed a 'laundry list' approach in selecting the determinants of C2C without considering the underlying core mechanisms that foster C2C development.

Limited empirical evidence thus exists for the importance of user C2C in the context of an information system or ERP system change. More needs to be known about how user commitment to information system change develops and what the behavioural consequences are. To date, no study has defined and measured user commitment in such a context thus indicating the need for further research on the issue.

The scarcity of information on the role of user commitment is regrettable as such information could contribute to the successful implementation of a new information system in several ways: First, with a better understanding of the drivers of user commitment, more specific change management interventions for fostering user support for an information system could be implemented. Such interventions could influence the commitment levels of the users and thereby also promote cost savings. The interventions would then be based on empirical evidence, and managers could be confident that resources were deployed most economically. Second, the use of strategies to foster user commitment could also speed up user support and energy for a new information system. The users would then come 'on-board' faster and would be behind the information system change initiative. Companies would be guided on how to implement change that would be embraced by their employees (Armenakis & Harris, 2009).

The purpose of this thesis is to build on previous C2C research: First, the commitment to change construct is extended to the context of an information system change in a developing country; second, the thesis also tests the applicability of conceptual advances in the wider commitment literature; third, the behavioural outcomes of user commitment are placed in the wider framework of employee behaviour. Finally, by applying the general model of commitment (Meyer & Herschovitch, 2001), the determinants were selected on the basis of the change management and information systems literature and on the findings of the focus group discussions in the study.

## **RESEARCH OBJECTIVE**

This research presents an explanatory model of the determinants and behavioural outcomes of user commitment to mandatory information system change in the context of an ERP implementation. The objective of the thesis is to define, measure, and verify the determinants and behavioural outcomes of user commitment towards a mandatory new information system in Namibia, a developing country in Africa.

## **OUTLINE OF THESIS**

The next chapter reviews the literature that forms the basis for conceptualising C2C as an independent construct, including its determinants and behavioural outcomes. Expanding the literature review, Chapter 3 proposes an explanatory model of the determinants and outcomes of user commitment to mandatory information system change. It also includes findings from the information system and change management literature, as well as results from the focus group discussions. Chapter 4 describes how the study was conducted, and Chapter 5 summarises the results of the data analysis. The final chapter discusses the results in relation to previous literature and the research context.

# **CHAPTER 2: COMMITMENT TO ORGANISATIONAL CHANGE**

This chapter reviews the literature on commitment to organisational change (C2C) that forms the conceptual foundation for developing a model of the determinants and outcomes of user commitment to mandatory information system change described in Chapter 3. The first part positions commitment within the organisational change literature, and the second part summarises the major developments in the wider commitment literature towards the construct of C2C. The third part reviews studies on the nature of C2C while the fourth and fifth parts review studies on the determinants and outcomes of C2C.

An ongoing snowball method was used for the literature search. First, keywords such as ‘commitment to organisational/organizational change’, ‘change management’, ‘change success’ and ‘information system success’ were searched in various online databases provided by the online library portal of the University of Cape Town (e.g., PsychInfo, Ebsco Host, Science Direct, Emerald). The reference lists of key articles (e.g., meta-analyses; summaries of previous research) were then examined and relevant articles sourced. A cited reference search using the ‘IS Web of Knowledge’ database was also conducted. For inclusion in this literature review, studies had to be published in a peer-reviewed journal. In some cases, however, the findings of conference papers were also included.

## **ORGANISATIONAL CHANGE AND COMMITMENT**

For a better understanding of the role of employee commitment during organisational change, a brief review was conducted of how the wider literature viewed individual or people factors during organisational transformations.

A comprehensive review of the literature on organisational change during the 1990s indicates that little attention was paid to the study of people during change initiatives (Armenakis & Bedeian, 1999). Most of the research focused on a macro- and less person-centred perspective where content, context, process and criterion approaches to the study of organisational change featured most prominently:

- The content approach to organisational change examines the targets of successful transformations and how they relate to organisational effectiveness (e.g., alternative business models and organisational designs) (Armenakis & Bedeian, 1999).
- The contextual approach to organisational change examines the internal and external environment of organisations and the corresponding challenges (e.g., globalisation, specialisation, government intervention) (Armenakis & Bedeian, 1999).
- The process approach to organisational change examines the processes and actions undertaken before, during and after transformations (e.g., phases and stages of organisational change) (Armenakis & Bedeian, 1999).
- The criterion approach to organisational change examines the results and outcomes of organisational change (Armenakis & Bedeian, 1999).

The final approach in this review by Armenakis and Bedeian (1999) deals with people aspects of organisational change (e.g., attitudes and behavioural outcomes of organisational change). Organisational change has thus been examined extensively, but few studies have focused on aspects of organisational transformation that are important to individuals and that influence employee attitudes and behaviour (Judge, Thoresen, Pucik, & Welbourne, 1999; Rafferty & Griffin, 2006). These emerging studies consider a variety of people-centred outcomes:

- Cynicism about organisational change (e.g., Reichers, Wanous, & Austin, 1997; Stanley, Meyer, & Topolnytsky, 2005; Wanous, Reichers, & Austin, 2000).
- Resistance to organisational change (e.g., Coch & French, 1948; Kotter & Schlesinger, 1979; Oreg, 2003, 2006; Pardo del Val & Fuentes, 2003; Piderit, 2000).

- Readiness for organisational change (e.g., Armenakis, Harris, & Mossholder, 1993; Eby, Adams, Russel, & Gaby, 2000; Jones, Jimmieson, & Griffiths, 2005).
- Openness to organisational change (e.g., Chawla & Kelloway, 2004; Klecker & Loadman, 2000; Wanberg & Banas, 2000).
- Human reactions to organisational change (e.g., Ashford, 1988; Gardner, Dunham, Cummings, & Pierce, 1987; Mack, Nelson, & Quick, 1998; Morrell, Loan-Clarke, & Wilkinson, 2004; Porras & Hoffer, 1986; Worrall, Cooper, & Campbell-Jamison, 1998).
- Attitudes to organisational change and organisational commitment (e.g., Iverson, 1996; Lau & Woodman, 1995; Swailes, 2004; Yousef, 2000).
- Role of employee commitment during organisational change (e.g., Brewer & Hensher, 1998; Coetsee, 1999; Connor & Patterson, 1982; Klein & Sorra, 1996; Neubert & Cady, 2001; Piderit, 2000; Umble & Umble, 2002).

In contrast to most of the research in the previous century, the above studies adopted a person-focused approach to the study of organisational change. In particular, they investigated various human attitudes and behavioural reactions to organisational change.

The last category is of particular interest to those concerned with the human element in organisational change, as the authors of the studies have isolated employee commitment as the key ingredient for successful organisational change. However, these studies fail to offer a definition or measure of employee commitment. The next part of the literature review reviews the advances in commitment research towards the conceptualisation of C2C as an independent construct.

## NATURE OF COMMITMENT

Research on employee commitment in the workplace – broadly defined as a willingness to persist in a course of action (Copper-Hakim & Viswesvaran, 2005) – can be traced back to the middle of the last century when various researchers indirectly referred to the modern concept of commitment while focusing on organisational effectiveness. By the early 1960s, commitment had emerged as a distinct construct in its own right (Swailes, 2002).

Workplace commitments can be directed at various foci (e.g., towards supervisors, professions, unions, strategies, organisational changes), but organisational commitment (OC) represents the most developed focus (Meyer, Allen, & Topolnytsky, 1998; Meyer & Herscovitch, 2001) that can be defined as “the strength of an individual’s identification with and involvement in a particular organization” (Porter, Steers, Mowday, & Boulian, 1974, p. 604). For a better understanding of the origins of C2C, this part of the review traces the major advances in the literature towards the conceptualisation of C2C. These advances have a bearing on early conceptualisations of commitment, the three-component model of commitment, foci of commitment and, finally, the move towards a general model of commitment that forms the basis of C2C.

### **Calculative Commitment**

This first stream of commitment research is based on Becker’s (1960) side-bet theory (Cohen, 2007), which holds that commitment develops because of side-bets, or investments (financial and personal), that an employee collects during the course of employment. In particular, side-bets can be accumulated through broad cultural expectations, bureaucratic arrangements (e.g., pensions, provisions for seniority), social position adjustment (e.g., being unfit for other jobs/organisations), self-presentation concerns (e.g., living up to a social image) and, finally, non-work concerns (e.g., family and community considerations) (Shore, Tetrick, Shore, & Barksdale, 2000). These investments, sometimes also referred as sunk-cost, would be lost were the employee to leave the organisation. The threat of losing these investments would therefore commit an employee to the organisation. A close relationship consequently exists between commitment and turnover (Cohen, 2007) implying the more the side-bets, the greater the commitment to the organisation

(Alutto, Hrebiniak, & Alonso, 1973). This specific type of commitment based on the costs of leaving an organisation was later generally referred to as calculative or continuance commitment. Conceptually, though, continuance commitment appears to be broader in scope than calculative commitment (Cooper-Hakim & Viswesvaran, 2005).

## **Emotional Commitment**

The second research stream differs in that it contains an emotional bond. In this stream of research, the focus shifts from tangible investments to an attitudinal or psychological attachment approach (Cohen, 2007). This concept of commitment is commonly described as affective commitment (Gonzalez & Guillen, 2008).

During the 1970s, empirical research on organisational commitment gained momentum and culminated in the development of a specific definition and measurement instrument, the Organisational Commitment Questionnaire (OCQ) (Porter et al., 1974). Organisational commitment, as measured by this questionnaire, was defined as an employee's agreement with the organisation's objectives and principles; a readiness to exert considerable effort on behalf of the organisation; and a strong wish to maintain a member of the organisation (Porter et al.). Mowday, Steers and Porter (1979) considered the questionnaire both valid and reliable, and it became a widely used measure of organisational commitment. The OCQ was, however, also criticised in some quarters because it combined identification with behavioural intentions (Swales, 2002) thereby resulting in a conflation of predictors and outcomes. Organisational commitment was nevertheless still regarded as a one-dimensional construct that was defined by an employee's identification and involvement with an organisation (Mowday, 1999) and where little consensus existed on the underlying dimensionality (Meyer et al., 1998).

The dominant research method at that time was empirical and quantitative in nature, which gave the construct a new direction methodologically (e.g., by using quantitative methods) and conceptually (i.e. by defining organisational commitment and its antecedents, correlates and consequences) (Swales, 2002).

Organisational commitment thus became the most mature focus of employee workplace commitment in terms of theory and research (Meyer et al., 1998; Swailes, 2002). It was also regarded as an important predictor of behaviour in the workplace with important consequences for work-related variables, including employee turnover, absenteeism and job satisfaction (Mathieu & Zajac, 1990), as well as for non-work variables such as non-work satisfaction (Romzek, 1989). Begley and Czajka (1993) found that organisational commitment moderated employee stress, job dissatisfaction and turnover intentions during times of organisational change and turmoil.

### **Moral Commitment**

The third stream of research has its roots in morality (Gonzalez & Guillen, 2008) and consequently differs from the previous streams. This stream is based on Wiener's (1982) normative conceptualisation of commitment in terms of which employees are morally obliged to remain with an organisation (Gonzalez & Guillen). In particular, it can be defined as "the employees' feelings of moral obligation to the organization that push employees to remain in it" (Cohen, 2007, p. 342).

### **Foci of Commitment**

Despite the popularity of using organisational commitment to predict behaviour, many researchers were not impressed by its predictive validity (Becker, Randall, & Riegel, 1995) as they considered general attitudes poor predictors of behaviour (Ajzen, 2002). Other foci were equally important in predicting work-related outcomes (Becker, 1992; Becker, Billings, Eveleth, & Gilbert, 1996; Mueller, Wallace, & Price, 1992; Reichers, 1985, 1986; Swailes, 2004).

Such foci of commitment included the work itself, the union or the profession/occupation (Blau, 2003; Chang, Chi, & Miao, 2007, Meyer, Allen, & Smith, 1993; Morrow, 1983). Other foci included top management, co-workers, supervisors and customers (Gregersen, 1993; Snape, Chan, & Redman, 2006), work group (Riketta & Van Dick, 2005; Vandenberghe, Bentein, & Stinglhamber, 2004), strategy (Ford, Weissbein, & Plamondon 2003), programme (Neubert & Cady, 2001) and goals (Wright, O'Leary-Kelly, Cortina, Klein, & Hollenbeck, 1994).

Herscovitch and Meyer (2002) – consistent with Ajzen and Fishbein (2005) – noted that the best predictors of behaviour tended to be target related. This thinking is consistent with the principle of compatibility (Ajzen, 2005; Becker & Billings, 1993) and suggests that for a given attitude to predict behaviour, both must involve the same action, target (focus) and context. Therefore, by using a specific focus as the target of commitment, predictions of behaviour can be more accurate. For example, in situations of competing commitments (Kegan & Lahey, 2001; Reichers, 1986), the best approach is to measure multiple or target specific commitments to predict behaviour.

Today it is widely recognised that employees can be committed to multiple foci in the workplace (Meyer & Allen, 1997; Meyer & Herscovitch, 2001), but in the past organisational commitment was still seen as the key mediating focus (Hunt & Morgan, 1994) and attracted the attention of most researchers (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Mathieu & Zajac, 1990). However, even today, it is still unclear whether an individual has a finite amount of commitment to share between multiple foci or whether the aggregate level of commitment shown to multiple foci can increase (Swales, 2002).

### **Multidimensional Commitment**

Apart from streams of research that considered calculative, affective and moral commitment independently, a further stream of commitment research concerns the advent of multidimensional definitions of commitment (Cohen, 2007). The one-dimensional definition of organisational commitment changed during the 1980s and early 1990s when various frameworks of multidimensional organisational commitment emerged. Commitment was defined and measured in many different ways but was generally referred to as a stabilising or obliging force giving direction to behaviour (Meyer & Herscovitch, 2001). Despite other multidimensional definitions of commitment (e.g., O'Reilly & Chatman, 1986), the three-dimensional framework by Allen and Meyer (1990) has dominated and generated most research during the past 20 years (Cohen, 2007). This part of the literature review summarises the literature on the three-component model including its unresolved issues with regard to construct redundancy, dimensionality of continuance organisational commitment (COC), attitude-behaviour research and the cross-cultural portability of the measures.

### **Three-component Model of Organisational Commitment**

The observation that there were both differences and similarities in definitions of one-dimensional organisational commitment gave rise to Meyer and Allen's three-component model (Meyer & Herscovitch, 2001), which combined three distinct streams of research. Meyer and Allen (1997) argued that the lack of consensus on the definition of commitment helped establish commitment as a multidimensional construct and showed that the different dimensions were just different labels given to similar mindsets underlying commitment. Despite differences across frameworks of one-dimensional organisational commitment, there are also important similarities in that the frameworks share a core essence of commitment (Allen and Meyer, 1990; Meyer & Allen, 1997).

The first fundamental similarity is that the different frameworks of commitment are merely different mindsets of how an individual is compelled towards an entity (e.g., organisation or union) or a course of action (e.g., organisational goals).

The second fundamental similarity shared by the different frameworks of commitment is the assumption that commitment binds an individual to an organisation and that all definitions reflect an affective, cost-concerned and moral component. As such, the three-component model attempts to integrate three separate streams of research: First, Becker's (1960) side-bet view of commitment; second, Porter et al.'s (1974) identification and involvement commitment; and Wiener's (1982) normative commitment (Gonzalez & Guillen, 2008).

A significant overlap also exists in the definitions of affective commitment: Porter et al.'s (1974) commitment, O'Reilly and Chatman's (1986) internalisation commitment and Meyer and Allen's (1991) affective commitment overlap (Mowday, 1999). Meyer and Allen's affective organisational commitment scale also correlated strongly with the OCQ in a meta-analytic study ( $\rho = .88$ ) (Meyer et al., 2002).

In terms of Allen and Meyer's (1990) framework, organisational commitment is three-dimensional comprising affective (desire based) (AOC), normative (obligation based) (NOC) and continuance (cost based) (COC) organisational commitment. In their own words, they define the three commitment dimensions as follows.

Affective commitment refers to the employee's emotional attachment to, identification with, and involvement in the organization. Employees with a strong affective commitment continue employment with the organization because they *want* to do so. Continuance commitment refers to an awareness of the costs associated with leaving the organization. Employees whose primary link to the organization is based on continuance commitment remain because they *need* to do so. Finally, normative commitment reflects a feeling of obligation to continue employment. Employees with a high level of normative commitment feel that they *ought* to remain with the organization. (Meyer & Allen, 1991, p. 67)

Based on this model, employees can experience varying degrees of the three underlying commitments constituting a commitment profile resulting in varying behavioural consequences (Meyer & Herscovitch, 2001).

Several studies examined the differing consequences (Randall, Fedor, & Longenecker, 1990) of the dimensions of organisational commitment on turnover, absenteeism (Somers, 1995), turnover intentions (Jaros, 1997), job performance and citizenship behaviour (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989; Wasti, 2005).

Organisational commitment, as defined by the three-component model, was also found to be distinguishable from, yet related to similar constructs such as job satisfaction, job involvement, occupational commitment and motivation (Meyer et al., 2002; Meyer, Becker, & Vandenberghe, 2004).

**Interaction between Commitment Dimensions.** Earlier research focused mainly on the determinants and outcomes of each dimension separately (Wasti, 2005). However, recent studies have found evidence that different commitments can shape behaviour in 'concert'. The result is a possible 'context effect' whereby the meaning and outcome of the commitment dimension varies as a function of the other dimensions. This means that commitment dimensions combine or interact to predict behaviour (Gellatly et al., 2006; Sinclair, Tucker, Cullen, & Wright, 2005), and the interaction effects are reflected in different patterns of behaviour for employees with different commitment profiles (Meyer, Srinivas, Lal, & Topolnytsky, 2007). According to Meyer and Herscovitch (2001), the strength of the relationship between any dimension of commitment and behaviour will be stronger when the other dimensions are weak. Generally, the strength of the relation between any one form of

organisational commitment and intention to stay is stronger when the other commitment components are low (Gellatly et al.).

Various commitment profiles can therefore be specified that indicate dominance of any one, or two dimensions, such as highly committed, affective-normative dominant, continuance-normative dominant, continuance dominant and uncommitted (Somers, 2009). Research indicates that affective organisational commitment (AOC) is the primary driver of positive outcomes, especially when combined with low continuance organisational commitment (COC) (Wasti, 2005).

In another combination of commitment profiles, free agents (moderate NOC and low AOC) received significantly weaker performance, organisational citizenship behaviour and antisocial behaviour ratings compared to allied (moderate AOC and COC) and devoted (high AOC and COC) groups of employees (Sinclair et al., 2005).

A recent study on commitment profiles found evidence of the dual nature of normative organisational commitment (NOC): Depending on the context, NOC can take different forms, namely moral imperative or indebted obligation. In the context of a commitment profile with high AOC, NOC would be defined as moral imperative. In the context of low AOC and high COC, NOC would be defined as indebted obligation (Gellatly, Meyer, & Luchak, 2006).

The above findings accordingly indicate that the commitment dimensions cannot be viewed in isolation as they can also have a combined effect on focal and discretionary employee behaviour.

Today, organisational commitment is regarded as a multidimensional construct (Gonzalez & Guillen, 2008; Meyer & Herscovitch, 2001) with three distinguishable yet related dimensions (Allen & Meyer, 1996; Hackett, Bycio, & Hausdorf, 1994) that interact to predict behaviour. AOC and COC are considered the most distinguishable dimensions (Luchak & Gellatly, 2007). Nevertheless, some unresolved construct-related issues pertaining to the three-component model remain.

**Construct Redundancy.** The first unresolved issue relates to the relationship between AOC and NOC. Recent meta-analyses on the antecedents, correlates and consequences of organisational commitment confirmed the strong correlation between AOC and NOC ( $\rho = .63$ , Meyer et al., 2002) ( $\rho = .64$ , Cooper-Hakim & Viswesvaran, 2005). This points to a significant overlap between the two constructs indicating a lack of discriminant validity (Cooper-Hakim & Viswesvaran; Cohen, 2007; Solinger, Van Olffen, & Roe, 2008). Consequently, consensus is lacking on whether these two constructs are truly distinguishable from one another (Meyer & Herscovitch, 2001). Some researchers have therefore questioned the continued use of a separate NOC scale (Ko, Price, & Mueller, 1997). Cohen and Gonzalez and Guillen (2008), in particular, offer new insight into this problem.

In response to the concept redundancy between AOC and NOC, and the nature of the latter, Cohen (2007) presented a new view of the existing state of commitment research. With reference to the differing antecedents of AOC (influenced largely by work experience and situational variables) and NOC (shaped mainly by early socialisation), he suggested that a distinction should be drawn between pre- and post-organisational entry commitments. Consistent with Beck and Wilson (2001), Cohen argued that NOC – in contrast to AOC and COC – is minimally affected by specific work experiences and accordingly does not depend on an exchange process with the organisation. This form of commitment therefore develops before organisational entry and should accordingly be referred to as a NOC propensity. Cohen believes that this differentiation between pre- and post-entry commitments helps resolve the concept redundancy between AOC and NOC. This is why he suggested treating NOC as a propensity before organisational entry and using the existing NOC scale by Meyer and Allen (1997) to measure this propensity. With a minor adjustment (leaving out one item of the scale), the AOC commitment construct could then be retained. Because of the consistently significant correlation between the two constructs, NOC propensity would then become a possible determinant or correlate of AOC.

Gonzalez and Guillen (2008) also offered a theoretical proposal for a more accurate definition of AOC that would clearly distinguish it from NOC. In their conceptual critique, they applied Aristotle's philosophical distinction of human goods with regard to friendship and human relations. In this tripartite framework of friendship, three

types with the following aims are possible: Friendship for utility (usefulness), friendship for pleasure (pleasant) and friendship with good people (moral). Gonzalez and Guillen argue that this concept resembles the multidimensional view of commitment: COC would thus represent the concept of utility, AOC the concept of pleasure and NOC the concept of justice and duty. As a consequence, AOC should include only feelings and not rational judgements that belong in the Aristotelian sphere of morality. NOC would then fall within moral judgement (norms) and practice, which would imply revising the AOC scale by including only feelings and removing any rational judgement items. The NOC scale would then also include a wider dimension of moral judgements and virtues. This would resolve the currently existing concept redundancy between AOC and NOC (Gonzalez & Guillen).

It has also been argued that the commitment construct overlaps with other organisational behaviour constructs such as job satisfaction (Le, Schmidt, Harter, & Lauver, 2010), identification (Gautam, van Dick, & Wagner, 2004) and motivation (Meyer, Becker, & Vandenberg, 2004).

**Dimensionality of COC.** The second problematic issue concerns the dimensionality of COC. In the organisational commitment literature, this dimension was found to be divided into two separate, but highly correlated, sub-scales involving the costs of leaving an organisation: perceived high sacrifice (PHS) and perceived lack of alternatives (PLA) (McGee & Ford, 1987; Meyer, Allen, & Gellatly, 1990; Powell & Meyer, 2004). The correlation between the two components was higher in a recent meta-analysis ( $\rho = .86$ ) (Meyer et al., 2002) compared to McGee and Ford's original finding ( $r = .37$ ;  $p < .01$ ). Following this conceptual ambiguity, disagreement still exists in the commitment literature as to whether this form of commitment is indeed one-dimensional (Cohen, 2007; Meyer & Herscovitch, 2001). Powell and Meyer accordingly suggested that only the PHS items in the COC scale should be used – these items refer to employee side-bets or investments accumulated during the course of employment by an employee. The implication is therefore that COC corresponds to Becker's (1960) side-bet view. Due to the high correlation between the PHS and PLA sub-dimensions, the latter could be a potential antecedent of COC (Powell & Meyer). However, correlation does not imply causality, and more research is therefore required.

The next part contrasts this commitment-behaviour link with the wider attitude-behaviour literature.

**Attitude-behaviour Research.** The longstanding debate on the directional relationship between job attitudes and performance is still ongoing (Ricketta, 2008). Despite extensive research and the resulting empirical evidence indicating a link between commitment and behaviour, doubts still exist about the predictive ability of this construct. In particular, there is still disagreement about whether commitment constitutes an attitude or is a distinguishable construct that is separate from motives or attitudes.

On the one hand, Meyer and Herscovitch (2001) suggest that commitment is indeed more than a motive, or a positive attitude, that predisposes a person to engage in a particular course of action: “If not, commitment loses its value as an explanatory concept” (Meyer & Herscovitch, p. 301). They thus claim that authors generally view commitment as different from motivation and general attitudes (e.g., Brown, 1996; Scholl, 1981).

On the other hand, according to Solinger et al. (2008, p. 72): “There is widespread agreement in the literature that organizational commitment is an attitude.” They further argue that the various definitions of commitment display a structural similarity to what is commonly understood as an attitude, which is defined as an individual’s internal state, preceding and guiding action, and consisting of affect, cognition and behavioural intent. To improve the prediction of behaviour, the three-component model of commitment should therefore be adapted within the wider framework of attitude-behaviour research.

The above assumption that commitment leads to the above discretionary behaviour could therefore be gainsaid by attitude-behaviour research findings. In this field, general attitudes were found in recent research to be poor predictors of specific behaviour (Ajzen, 2005). Although it is generally recognised that attitudes are relevant for understanding behaviour (Ajzen, 2001), people often fail to act in accordance with their stated intentions (Ajzen, Brown, & Carvajal, 2004). For example, they may have a favourable attitude towards their church but fail to attend

church regularly or not at all. Attitudes toward specific behaviour regarding an object or target were, however, found to be better predictors of behaviour (Ajzen & Fishbein, 2005). The theory of reasoned action, and later the theory of planned behaviour, has guided most of the research on the attitude-behaviour connection during the past 15 years (Ajzen, 2005). So far, both theories have been shown to be powerful predictors of behaviour (Ajzen, 2002; Ajzen, 2005).

In terms of the theory of planned behaviour, behavioural performance is a function of intentions and perceived behavioural control (Ajzen, 1991). As such, human behaviour is guided by four major factors: A favourable or unfavourable evaluation of the attitude towards the behaviour (behavioural belief); perceived social pressure to perform or not to perform (subjective norm or normative beliefs); self-efficacy in relation to the behaviour; and, in extension of the original theory of reasoned action, a perception of behavioural control (control beliefs). Because a sufficient amount of actual control is given, people are expected to carry out their intentions when the opportunity arises (Ajzen, 2002; Ajzen, 2005). For a specific attitude to be a good predictor of behaviour, it has to follow the principle of compatibility: Measures of behaviour and attitude should involve the same action, target, context and time (Ajzen, 2005). With regard to commitment, this principle, however, does not hold for the prediction of discretionary behaviour (i.e. behaviour at the discretion of the individual) because such behaviour is not directly related to the focus of commitment.

Based on the above, commitment defined as a general attitude towards a target would therefore constitute a poor predictor of discretionary behaviour and would accordingly be meaningless as an explanatory concept.

Nevertheless, various studies have found commitment to be distinguishable from related constructs, such as motivation, motives or positive attitudes (Meyer & Herscovitch, 2001; Meyer, Becker & Vandenberghe, 2004), or the concept of expectancy (Scholl, 1981). In addition, the general model of commitment prescribes a distinct focus of commitment to predict focal behaviour, and the prediction of focal behaviour corresponds with the principle of compatibility. The prediction of non-focal, or discretionary behaviour, however, does not follow this principle and can therefore be debated.

The recent meta-analysis of the antecedents and consequences of organisational commitment provided empirical evidence that commitment influences behaviour independently of other motives and attitudes (Meyer et al., 2002). Similarly to research on job attitudes and performance, positive correlations are well established, yet the causal ordering is often still unclear (Ricketta, 2008). Commitment is thus a complex phenomenon and is subject to changing influences that are both internal and external (Brown, 1996). Commitment can also lead to persistence even in the face of conflicting motives or attitudes and has accordingly been broadly defined as a force that is experienced as a mindset (a psychological state or frame of mind that forces an individual towards a course of action) (Meyer & Herscovitch, 2001).

In a rare study comparing the predictive ability of the three-component model of organisational commitment and the theory of reasoned action, the three-component model performed better in the prediction of work-related behaviour (altruism and tardiness) (Becker et al., 1995). In contrast, a recent conceptual critique on the three-component model of organisational commitment concluded that it is, rather, a model for predicting turnover and that, in order to improve the prediction of discretionary behaviour, it should be conceptualised within the theory of reasoned action (Solinger et al., 2008).

The above discussion thus shows that there is still disagreement on the predictive value of the three-component model of organisational commitment.

**Cross-cultural Portability.** Most research on the three-component model of organisational commitment was conducted in Western countries, and little is known whether the model applies also in a non-Western context (Cohen, 2006). Regarding the cross-cultural portability of the three-component model of organisational commitment, a small but growing number of researchers are currently examining the commitment of employees beyond North America (Allen, 2003). However, some studies have investigated the construct in a non-Western environment and have found some evidence of its cross-cultural portability (e.g., Bagraim, 2003; Chang et al., 2007; Chen & Stockdale, 2003; Cohen; Snape et al., 2006). Other studies yielded mixed results with regard to the reliability and construct validity of the continuance and normative scales (Ko et al., 1997). More research is therefore required on the

cultural differences that may impact employee commitment in contexts outside North America (Vandenberghe, 2003).

### **General Model of Commitment**

Meyer and Herscovitch (2001) - as an extension of the three-component model of organisational commitment - suggested a general model for studying commitment in the workplace. Meyer and Herscovitch argued that commitment entails a core essence that clearly distinguishes it from related constructs such as motives or attitudes. In this model, commitment constitutes a mindset: A psychological state, or frame of mind, that compels or binds an individual towards a target or course of action. However, some authors (e.g., Solinger et al., 2008) have argued that the three-component model of organisational commitment does not represent a general model of commitment, but rather a model for predicting turnover

### **General Determinants of Commitment**

Meyer and Herscovitch (2001) argued that the three commitment dimensions are determined by the same underlying core processes regardless of their focus: Any factor that contributes to the determination of commitment does so through its impact on one or more of the mindsets that bind an individual to a course of action (e.g., a change initiative) or target (e.g., an organisation). As a consequence, it should be possible to differentiate between the general determinants of affective, normative and continuance commitment (Meyer & Herscovitch, 2001).

**General Determinants of Affective Commitment.** The affective commitment mindset is characterised by desire. In general, Meyer and Herscovitch (2001) argue that affective commitment develops when people become involved in (intrinsically, motivated, absorbed), recognise the value of or derive their identity from an entity (e.g., an organisation) or a course of action (e.g., an ERP system change). Individuals with high affective commitment *want* to pursue a course of action that is of relevance to a target. The fundamental mechanisms involved in the development of affective commitment are involvement (intrinsically, motivated, absorbed), shared values (recognise value relevance of association) and identification (with an entity or course of action) (Meyer & Herscovitch).

Empirical research on the determinants has been largely unsystematic and mostly focused on the development of affective organisational commitment (AOC) (Meyer & Herscovitch, 2001). With regard to organisational commitment, the development of AOC implies that an individual wants to remain with an organisation. In general, personal characteristics (demographics and individual differences) and work experiences have been the main focus of research. Empirical findings from a recent meta-analysis indicated that, generally, work experiences correlated more strongly with AOC than personal characteristics (Meyer et al., 2002). Individual differences therefore play a relatively minor role in the development of this form of commitment. Of the work experiences included in the meta-analysis, perceived organisational support had the strongest correlation thus indicating that organisations wanting affectively committed employees should first demonstrate their own commitment by providing a supportive work environment. AOC also correlated strongly with the various forms of organisational justice and transformational leadership (Meyer et al.).

**General Determinants of Continuance Commitment.** The continuance commitment mindset entails the perception that it would be costly to discontinue a course of action. In general, this mindset develops when individuals realise that they may lose investments, have no alternatives or be forced to comply with a particular course of action. In such a case, the perception, or the awareness of an employee, is important. The fundamental mechanism in the development of this commitment concerns investments, or side-bets, that would be lost if the individual were to discontinue the activity with regard to the foci (Meyer & Herscovitch, 2001). A further fundamental mechanism often referred to concerns a perceived lack of alternatives.

With regard to organisational commitment, it is generally agreed that continuance organisational commitment (COC) develops when an individual makes investments, or side-bets, that he or she would forfeit by leaving an organisation (Meyer & Allen, 1984). A perceived lack of alternatives is often used as a second determinant (Meyer & Herscovitch, 2001). Powell and Meyer (2004) propose the removal of the items pertaining to lack of alternatives in the COC scale. Empirical findings from a recent meta-analysis indicated that, generally, work experiences correlated more strongly, with COC than personal characteristics (demographics and individual differences)

(Meyer et al., 2002). Individual differences thus play a relatively minor role in the development of this form of commitment. The variables, availability of alternatives and transferability of skills, correlated more strongly with this form of commitment compared to the other two dimensions (Meyer et al.). Contrary to expectations, correlations involving general measures of investments correlated more weakly with this kind of commitment compared to the other two dimensions (Meyer et al.).

**General Determinants of Normative Commitment.** Normative commitment is characterised by the mindset of obligation to pursue a certain course of action. Normative commitment tends to develop in the early stages of socialisation and through an employee-organisation psychological contract (Van Vuuren, Veldkamp, De Jong, & Seydel, 2006). In general, normative commitment develops, first, through a set of internalised norms (e.g., early socialisation or induction); second, through the receipt of benefits and experiences that are difficult to reciprocate (financial or non-financial); and, third, through the recognition of obligations in terms of a psychological contract (Meyer & Herscovitch, 2001).

With regard to organisational commitment, the mindset of normative organisational commitment (NOC) is therefore obligation based, and its determinants have often been found to overlap with AOC (Meyer & Allen, 1997). Individuals with a high degree of NOC remain in an organisation because they feel an obligation to remain. The empirical findings of a recent meta-analysis indicated that, generally, work experiences correlated more strongly with normative commitment than personal characteristics (demographics and individual differences). The correlation, however, was less strong compared to AOC (Meyer et al., 2002). NOC is thus less influenced by work experiences than AOC. According to Cohen (2007), NOC generally develops in early socialisation and is minimally affected by work experiences. As an important finding, no unique antecedents of NOC were found. However, virtually no research has been done on the proposed determinants of normative commitment (Meyer et al., 2002), in particular with regard to socialisation (Cohen).

## **General Outcomes of Commitment**

Meyer and Herscovitch (2001) argue that commitment influences behaviour independently of other attitudes or motives. In the face of a conflict of motives or attitudes, commitment could lead to a heightened degree of persistence. The important consequence is that commitment can influence behaviour in the absence of extrinsic motivation or positive attitudes (Meyer & Herscovitch). Employee commitment in this general model is defined as a binding force towards an entity (e.g., an organisation) or course of action (e.g., goal). The binding force can reflect varying degrees and combinations of an affective (desire based), continuance (perceived cost) and normative (obligation) mindset. The three mindsets together constitute a commitment profile that interacts to predict behaviour, and the interaction will be reflected in different patterns of behaviour for employees with different commitment profiles (Meyer et al., 2007). The shaped behaviour is defined as focal, or discretionary (citizenship), behaviour that represents the outcomes of commitment, irrespective of the context (Meyer & Herscovitch, 2001).

**Focal Behaviour.** Focal behaviour refers to an employee's course of action affected by his or her commitment. Most research on outcomes has been in the area of organisational commitment (Meyer & Allen, 1997). With regard to such commitment, this would refer to staying with an organisation (the inverse of turnover or turnover intentions) (Meyer & Herscovitch, 2001) and fulfilling role requirements. As research on organisational commitment outcomes is extensive, this summary is based on the most widely empirically examined outcomes from previous meta-analyses (e.g., Mathieu & Zajac, 1990; Meyer et al., 2002). Based on a meta-analysis by Meyer et al., the following variables were examined as focal outcomes of organisational commitment: Turnover and turnover intentions, work attendance and absenteeism, and job performance.

Meyer et al. (2002) found that all three dimensions of organisational commitment correlated negatively with turnover intentions. The difference, however, was that AOC correlated most strongly ( $\rho = -.17$ ), followed by NOC ( $\rho = -.16$ ) and COC ( $\rho = -.10$ ). Correlations between organisational commitment and turnover intentions were stronger than correlations between organisational commitment and actual turnover.

The strongest correlations were again between AOC ( $\rho = -.56$ ) and NOC ( $\rho = -.33$ ) and turnover intentions. COC showed the weakest correlation ( $\rho = -.18$ ).

In the meta-analysis, only AOC was found to correlate negatively with absenteeism ( $\rho = -.15$ ). NOC and COC correlated positively, although they were close to zero (Meyer et al., 2002).

AOC ( $\rho = .16$ ) and NOC ( $\rho = .06$ ) correlated positively while COC ( $\rho = -.07$ ) correlated negatively with job performance (Meyer et al., 2002).

**Citizenship Behaviour.** Discretionary, or employee citizenship behaviour refers to an employee's behaviour that is not specified in terms of commitment but is affected by the discretion of the employee, such as showing extra effort. In the context of organisational commitment, this behaviour refers to extra-role, or organisational citizenship behaviour. Organisational commitment has also been linked to personal outcomes beyond the organisation such as stress and work-family conflict (Meyer et al., 2002).

Similarly to job performance, AOC ( $\rho = .32$ ) and NOC ( $\rho = .24$ ) correlated positively while COC correlated to an almost zero extent with organisational citizenship behaviour (Meyer et al., 2002). Not enough studies investigated NOC in the meta-analysis.

AOC correlated negatively with both work-life conflict ( $\rho = -.20$ ) and self-reported stress ( $\rho = -.21$ ). In contrast, COC correlated positively with both measures ( $\rho = .24$  and  $\rho = .14$ , respectively) (Meyer et al., 2002).

The above indicates that the three components of organisational commitment have different effects on behaviour. An important finding was that, generally, all three forms of commitment correlated negatively with turnover intentions but differently with other work-related behaviour such as attendance, job performance and citizenship behaviour. AOC showed the strongest positive correlation followed by NOC. COC correlated negatively or not at all with other work-related behaviour

(Meyer et al., 2002). The above part briefly summarised the key outcomes of organisational commitment, but it should be borne in mind that the three commitment dimensions can also work in concert (Meyer & Allen, 1997).

The general model of commitment is thus an expansion of Meyer and Allen's (1991) three-component model of organisational commitment and comprises three underlying dimensions that can be directed at multiple foci in the workplace. The important implication is that various foci of commitment can be specified to explain and predict change-related behaviour. The model also implies that the determinants and outcomes of commitment entail a core essence regardless of the context in which commitment is studied. Accordingly – as a course of action – organisational or information system change can become a focus of commitment.

## **NATURE OF COMMITMENT TO ORGANISATIONAL CHANGE**

An important implication of the general model of commitment is that organisational change can become a focus of commitment. In terms of Meyer and Herscovitch's (2001) general model of commitment, this focus would constitute a course of action. Rather than being directed to a relatively static entity, such as an organisation, change commitment represents an 'action commitment' (Jaros, 2010, p. 80). Using this particular focus, commitment to organisational change (C2C) was first conceptualised and measured in a study by Herscovitch and Meyer (2002), and, more recently, researchers have begun to examine this C2C construct (Table 2.1). Compared to organisational commitment research, research on C2C represents a fairly new focus on commitment. The first comprehensive summary and critique of previous C2C studies up until 2009 is provided by Jaros.

The present review includes only studies using Herscovitch and Meyer's (2002) C2C construct because it represents the most advanced conceptualisation of commitment. C2C has been conceptualised in different ways (Jaros, 2010), most notably by Neubert and Cady (2001) who conceptualised the construct of programme commitment similar to C2C. However, Herscovitch and Meyer's construct still represents a significant advance in the commitment literature, because it is based on the general model of commitment (Meyer & Herscovitch, 2001). For inclusion in this review, studies on C2C had to include at least one dimension of Herscovitch and

Meyer's model. Studies also had to be published in peer-reviewed journals, but relevant conference papers were also included. This review of the C2C literature includes published studies until December 2010 and is organised around sections on the nature of the C2C construct, and its determinants and outcomes. The remainder of this first section deals with construct-related contributions of studies and their limitations. First, studies conducted in a developed country context will be reviewed, followed by studies from developing countries. Thereafter, a study conducted in both contexts will be reviewed. This section concludes by discussing the construct-related limitations of current C2C research.

Studies on sets of determinants and outcomes of C2C will be discussed in the respective sections at a later stage.

## **Research in Developed Countries**

Research on the nature of C2C originated in North America and almost half of all studies were conducted in this context. Recently, researchers have also begun to examine C2C in Europe (Ireland, Portugal) and Australia (Table 2.1).

### **Research in North America**

Most studies in North America included the three-dimensional view of C2C. However, two studies only included the affective dimension of C2C. After reviewing the original study by Herscovitch and Meyer (2002), three studies examining the three-dimensional view of C2C will be reviewed, followed by the studies focussing on the affective dimension only.

**Studies Examining Three-dimensional C2C.** The lack of research on C2C, despite its stated importance in the organisational change literature, gave rise to the study by Herscovitch and Meyer (2002). The purpose of the study was accordingly to address this hiatus by defining and measuring C2C and its behavioural outcomes. As mentioned above, the study applied the general model of commitment proposed by Meyer and Herscovitch (2001) to a variety of organisational change situations (e.g., mergers of departments, introduction of new technology, modifications to shift work). If an employee is faced by an organisational change situation, he or she can develop a mindset towards the change consisting of varying degrees of affective (ACC),

continuance (CCC) and normative (NCC) C2C thereby constituting a commitment profile. More specifically, the authors define the three dimensions of C2C as follows:

Consequently, for the purposes of this research, we defined commitment to change as a force (mind-set) that binds an employee to a course of action deemed necessary for the successful implementation of a change initiative. The mind-set that binds an individual to this course of action can reflect (a) a desire to provide support for the change based on a belief in its inherent benefits (affective commitment to change), (b) a recognition that there are costs associated with failure to provide support for the change (continuance commitment to change), and (c) a sense of obligation to provide support for the change (normative commitment to change). That is, employees can feel bound to support a change because they want to, have to, and/or ought to. (Herscovitch & Meyer, 2002, p. 475)

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**Table 2.1: Commitment to Organisational Change Scales**

Author(s) & Year	Participants & Response Rate in Parentheses	Change Type	Country	Internal Consistency ( $\alpha$ ): ACC, CCC & NCC scales (number of items in parentheses)			Construct Validity (factor structure) & Intercorrelations between ACC, CCC & NCC (Pearsons $r$ and statistical significance level)
Herscovitch & Meyer (2002)	Study 1 (S1): 224 students (laboratory simulation); Study 2 (S2): 157 nurses (26%); Study 3 (S3): 108 nurses (public sector) (27%).	Hypothetical change (S1); Various changes (retrospective method) (S2 & S3).	Canada	S1: .94; S2: .94; S3: .88 (6)	S1: .94; S2: .71; S3: .81 (6)	S1: .86; S2: .78; S3: .74 (6)	S1: PAF (oblimin rotation) confirmed three distinct yet correlated factors. S2 & 3: Factor structure confirmed by CFA, ACC & NCC (S1: $r = .24, p < .01$ (factor correlation); S2: $r = .57, p < .01$ ; S3: $r = .48, p < .01$ ). ACC & CCC (S1: $r = -.03, ns$ , factor correlation); S2: $r = -.26, p < .01$ ; S3: $r = -.21, p < .01$ ). NCC & CCC (S1: $r = .41$ factor correlation, $p < .01$ ; S2: $r = .24, p < .01$ ; S3: $r = .24, p < .05$ ).
Cunningham (2006)	299 employees (National Collegiate Athletic Association) (37.5%).	Various changes (top-management change; restructuring).	USA	.93 (6)	.89 (6)	.74 (6)	Three distinct factors confirmed by CFA; ACC & NCC ( $r = .49, p < .05$ ). ACC & CCC ( $r = -.45, p < .05$ ). NCC & CCC ( $r = .10, ns$ ).
Chen & Wang (2007)	215 public sector employees (customs service staff) (84%).	Change in performance appraisal.	China	.83 (6)	.89 (6)	.71 (4)	Items back-translated into Chinese; No factor structure reported; ACC & NCC ( $r = .47, p < .01$ ). ACC & CCC ( $r = -.36, p < .01$ ). NCC & CCC ( $r = .05, ns$ ).
Meyer, Srinivas, Lal, & Topolnitsky (2007)	Repeated cross-sectional survey: Study 1 (S1): 699 employees at time 1 (t1) (67%), 640 at time 2 (t2) (60%). Study 2 (S2): 379 employees at t1 (45%), 280 at t2 (46%).	S1: Planned structural & cultural transformation. S2: Restructuring.	Canada (S1) & India (S2)	S1: .87 (t1); .89 (t2) (4) & S2: .94 (6)	S1: .66 (t1); .65 (t2) (4) & S2: .83 (6)	S1: .72 (t1); .72 (t2) (4) & S2: .67 (6)	S1: No results on factor structure reported. ACC & NCC (t1: $r = .23$ ; t2: $r = .17$ , both $p < .01$ ). ACC & CCC (t1: $r = -.20$ ; t2: $r = -.24$ , both $p < .01$ ). NCC & CCC (t1: $r = .55$ ; t2: $r = .58$ , both $p < .01$ ). S2: PAF (oblimin rotation) confirmed 3 distinct factors, but ACC & NCC not clearly distinguishable; ACC & NCC ( $r = .59, p < .01$ ). ACC & CCC ( $r = -.55, p < .01$ ). NCC & CCC ( $r = -.11, ns$ ).
Walker, Armenakis, & Bernerth (2007)/ Bernerth, Armenakis, Feild, & Walker (2007)	117 manufacturing employees (94%).	Restructuring (spin-off).	USA	.89 (6)	n/a	n/a	No factor structure of ACC reported. CFA indicates good measurement model fit.
Parish, Cadwallader, & Busch (2008)	191 employees of a transportation services department at a US university (32%).	Various changes (retrospective method).	USA	.95 (6)	.88 (5)	.84 (6)	Factor structure confirmed by CFA; ACC & NCC ( $r = .47$ ). ACC & CCC ( $r = -.33$ ). NCC & CCC ( $r = .15$ ). All $p < .05$ .
Conway & Monks (2008)	259 employees from Irish health service (20%).	Various changes.	Ireland	.89 (6)	n/a	n/a	Although all three dimensions were measured, only ACC was used in the article. No factor analysis of ACC reported.
Herold, Fedor, Caldwell, & Liu (2008)	Cross-level study: 343 employees from 30 different organisations (63%).	Various changes.	USA	.91 (4)	n/a	n/a	ACC measured on the individual level. No factor analysis of ACC reported.
Machin, Fogarty, & Bannon (2009)	342 public sector employees (45%).	Complete restructuring of client service.	Australia	.91 (6)	.88 (6)	.77 (6)	Three distinct factors confirmed by CFA; ACC & NCC ( $r = .39; p < .001$ ). ACC & CCC ( $r = -.44, p < .001$ ). NCC & CCC ( $r = .10, ns$ ).
Neves & Caetano (2009)	221 employees from 19 organisations (62% private sector).	Various changes (retrospective method).	Portugal	.86 (4)	.91 (3)	n/a	Factor structure confirmed by CFA. ACC & CCC ( $r = -.34, p < .01$ ).
Neves (2009)	88 university employees (77%).	New performance appraisal system.	Portugal	.83 (3)	n/a	n/a	Factor structure confirmed by principal components factor analysis with oblimin rotation.
Foster (2010)	218 employees (biotechnology, manufacturing, hospital/health care staff) (26%).	Ownership change, performance management system, merger	USA	.94 (6)	.86 (6)	.75 (4)	Factor structure confirmed by PAF with direct oblimin rotation (explaining 63.38% of the variance) & CFA resulting in moderately acceptable fit. ACC & NCC correlated ( $r = .46$ ). ACC & CCC negatively correlated ( $r = -.29$ ). CCC & NCC correlated ( $r = .21$ ) (all $p < .01$ ).
Kalyal, Berntson, Baraldi, Näswall, & Sverke (2010)/ Baraldi, Kalyal, Berntson, Näswall, & Sverke (2010)	149 public sector employees (23%).	Restructuring	Pakistan	.91 (6)	.90 (6)	.62 (4)	Factor structure confirmed by CFA. Two items removed from NCC scale. ACC & NCC ( $r = .45, p < .001$ ). ACC & CCC ( $r = -.59, p < .001$ ). NCC & CCC ( $r = -.18, p < .05$ ).
Rashid & Zhao (2010)	575 Information technology professionals (banking sector) (30%)	'Enterprise-wide change'	India & Malaysia	.92 (6)	.71 (6)	.78 (6)	Factor structure confirmed by CFA. No correlations among the commitment dimensions reported.

Note. All studies were cross-sectional survey studies unless specified otherwise; PAF (Principal-Axis Factor Analysis); CFA (Confirmatory Factor Analysis); ACC (Affective Commitment to Organisational Change); CCC (Continuance Commitment to Organisational Change); NCC (Normative Commitment to Organisational Change)

The samples of the cross-sectional survey studies comprised three groups: University students, and nurses from the public sector in Canada. In the first study ( $N = 224$ ), the provision of various vignettes of hypothetical change situations specified the type of change. The students then responded to the survey questionnaire by imagining how the employee would have responded. In study two ( $N = 157$ ) and three ( $N = 108$ ), the authors used a retrospective method to specify the type of change. The nurses briefly recalled and described a previous or current organisational change, and, using this change as a basis, they then responded to the questionnaire. The overall results indicate the validity and reliability of the C2C construct. Principal-axis factor analyses in study one indicated that the three dimensions of C2C were distinguishable from each other (three distinct factors explaining 67.8% of the variance) and distinguishable from organisational commitment. This factor structure was confirmed by confirmatory factor analysis in studies two and three. The internal consistency of the ACC scale was consistently high, and, in contrast, the reliabilities of the NCC and CCC were inconsistent (Table 2.1). Similarly to the findings on organisational commitment, the ACC and NCC scales were significantly correlated (Table 2.1) while the CCC and ACC scales were not correlated at all.

Cunningham (2006) conducted another study on the three dimensions of C2C in North America. As briefly mentioned, most earlier research on organisational change focused on organisational, or system-wide, variables and neglected a people-oriented approach. The purpose of a study by Cunningham was to integrate and expand emerging micro-focus organisational change research. The study examined the relationships between employees coping with change, C2C and turnover intentions. The sample comprised 299 private sector employees in 10 departments of the American National Collegiate Athletic Association (the administrative body for university athletics). Organisational changes experienced by the employees were top management turnover, restructuring, or both. Using confirmatory factor analysis (CFA), a structural equation model indicated the best fit for the expected three-dimensionality of the C2C construct. The results of the study confirmed the reliability of the ACC, NCC and CCC scales (Table 2.1). Similarly to the findings on organisational commitment, the ACC and NCC scales correlated positively, and CCC correlated negatively with ACC and was uncorrelated with NCC.

A further recent study in North America on three-dimensional C2C construct was conducted by Parish, Cadwallader and Busch (2008). The purpose of this recent cross-sectional survey study by the above authors was to propose and test a set of determinants and consequences in order to better understand the role of C2C. The study sample comprised 191 employees undergoing a variety of changes at a transportation services department (not-for profit organisation) at a large United States university. The respondents briefly recalled and described an organisational change they had experienced recently (retrospective method). They then completed the questionnaire on this change. The authors included all three components of C2C in the study, and CFA confirmed the underlying factor structure of the three scales consistent with Herscovitch and Meyer's (2002) initial finding. The internal consistency of the ACC, CCC and NCC scales was high (Table 2.1). ACC and NCC correlated significantly and positively while CCC correlated negatively with ACC and positively with NCC.

Finally, Foster (2010) also examined the three dimensions of C2C in the North American context. The objective of this recent study by the above author was to examine individual responses to organisational change in order to better understand the drivers of change success (Foster). The sample comprised 218 employees from three different organisations in the United States that were undergoing three different organisational changes: A biotechnology organisation (ownership change), a Fortune 500 manufacturer (new performance management system) and a health care organisation (merger). Variables included organisational justice (distributive, procedural, interpersonal and informational justice) and resistance to change disposition (routine seeking, emotional reaction, short-term thinking and cognitive rigidity) as determinants of commitment to change. The author included all three dimensions of C2C in the study. Whereas the ACC and CCC scales retained the original six items, the NCC scale comprised four items. The validity of the scales was established by exploratory and confirmatory factor analyses. Although the principal-axis factor analysis with direct oblimin rotation confirmed the three-dimensional nature of C2C, two of the NCC items also moderately loaded onto the ACC factor. As a result of this analysis, the author removed these two items. The subsequent confirmatory factor analysis resulted in a moderately acceptable fit of the three-component model ( $\chi^2 = 334.84$ ,  $df = 100$ ;  $\chi^2/df = 3.34$ ; CFI = .90; RMSEA = .10).

Except for the NCC scale, the scales resulted in high internal consistencies (Table 2.1). Similarly to previous studies, the dimensions of C2C correlated: ACC and NCC correlated strongly, ACC and CCC correlated moderately negatively, and NCC and CCC correlated moderately positively.

**Studies Examining One-dimensional C2C.** In contrast to the above studies, Bernerth, Armenakis, Feild and Walker (2007), as well as Walker, Armenakis and Bernerth (2007) only included the ACC scale in their study. The sample of this cross-sectional survey study by the above authors comprised 117 private sector employees from a recently restructured (spun-off; de-merged) manufacturing organisation in the United States, and the participants completed the questionnaire with reference to this restructuring. In contrast to the above studies, this study examined a specific change. However, the authors included only ACC in their study, and the factor structure of the ACC scale was confirmed by confirmatory factor analysis (CFA): The proposed measurement model indicated the best fit thus confirming the validity of the ACC scale. The internal consistency was high (Table 2.1). Based on the same sample, the results of the study were published in two separate articles that dealt with different research problems.

First, in an article that examined the influence of organisational justice on ACC (Bernerth et al., 2007). The research problem in this study was the lack of understanding of the drivers of successful organisational change. In particular, organisational leaders often lack understanding of how to implement change successfully. In response to this problem, the authors suggested organisational justice as a prescription for success for leaders during organisational change. The authors then examined the relationship between change justice and organisational change efforts although integration between change justice and organisational change efforts was still lacking. The purpose of the research was to examine the interactive effects of organisational justice on cynicism about C2C and C2C itself.

Second, in an article that examined the combined influence on ACC of change content (restructuring), context (cynicism about change), process (change communication) and individual differences (tolerance of ambiguity) (Walker et al., 2007). With little integration, previous researchers focused on each of these areas

separately even though change success may depend on the fit between these areas of organisational change. This study expanded previous research by integrating change content, context and process. It also included individual differences which, according to the authors, was an often ignored but important aspect of organisational change.

In addition to the above study, Herold, Fedor, Caldwell and Liu (2008) also conducted a study focussing on ACC only. The research problem in this recent cross-sectional, multi-level (individual and group level) survey study by the above authors was the lack of knowledge about the effects of transformational leadership on employees in an organisational change situation. Previous research in the field of organisational change had failed to link leader behaviour with the broader theory of leadership. The purpose of the study was therefore to examine the relationship between transformational leadership, change leadership, change impact and ACC. The study sample comprised 343 employees from 30 different private sector organisations in the United States. Employees in these organisations were faced with a variety of changes (reorganisation, new leadership, new technology, new strategies). The authors used only the ACC scale in the study, and the factor structure of the construct was not reported.

### **Research in Europe**

Recent research in Europe on the nature of C2C was conducted in Ireland and Portugal. Similar to some of the studies conducted in North America, these studies did not include all dimensions of C2C.

Conway and Monks (2008) conducted a study in Ireland examining the ACC dimension only. This cross-sectional survey study by the above authors dealt with the research problem of the lack of knowledge about how people management practices influence employee C2C. The purpose of the study was to examine the role of human resources practices regarding C2C. The study sample comprised 259 public sector employees in the Irish Health Service who had to contend with various changes (45% patient/client-focused service, 30% health service reform, 25% other) (Table 2.1). The participants were given a list of changes in the questionnaire, which had been previously identified in interviews with HR managers in the organisation. The participants then had to identify the change with the strongest impact. Changing to

patient-focused services was indicated as the main change experienced by the staff and the wider health service reform as the second most important change. The authors included only ACC – the findings on the factor structure of the scale were not reported.

Further research in Europe on ACC and CCC was conducted by Neves and Caetano (2009) in Portugal. This recent cross-sectional survey study by the above authors' linked commitment to organisational change to behavioural support for change. Commitment to change therefore became an area of interest for researchers and practitioners alike. The research problem in the study was the lack of empirical evidence on the relationship between C2C; trust in the supervisor, and several behavioural and work outcomes. The study sample comprised 221 employees from various organisations in Portugal (62% in the private sector). The authors used a retrospective method to enable the employees to specify an organisational change they had faced during the previous year. The employees then answered the questionnaire concerning their experiences with this change. More than 80% of the employees reported a transactional change, and a minority reported a transformational change. The authors included only ACC and CCC in their study, and the factor structure of the ACC and CCC scales was confirmed by CFA.

Finally, the first author of the above study also conducted a further study in Portugal on ACC (Neves, 2009). The lack of research linking employee readiness for change to employee behaviour gave rise to a cross-sectional survey study by the above author. The purpose of the study was to examine the relationship between self-efficacy, change appropriateness, work behaviour, turnover intentions and ACC. The sample comprised 88 university employees who had recently received a new performance appraisal system. The author included only a three-item version of the ACC scale, and its factor structure was confirmed by principal components factor analysis with oblimin rotation.

### **Research in Australia**

In addition to studies conducted in North America and Europe another study on C2C was conducted in an Australian context.

The need to understand the drivers of C2C gave rise to a cross-sectional survey study in Australia by Machin, Fogarty and Bannon (2009). The purpose of the study was to test Herscovitch and Meyer's (2002) model and to extend the nomological network by examining the influence of organisational climate on C2C and behavioural support. The study sample comprised 342 public service employees who were faced with a complete restructuring of the client service. The three-dimensional structure of the C2C construct was confirmed by confirmatory factor analysis (CFA), and the reliability of the ACC, CCC and NCC scales was considered acceptable (Table 2.1). ACC and NCC correlated positively while CCC was uncorrelated with NCC and negatively correlated with ACC. The results of the study were reported in a conference paper (Machin & Bannon, 2005), and a similar study, but with a different sample, was presented as a conference paper (Machin & Albion, 2007).

### **Research in Developing Countries**

Although studies from developed countries currently represent the majority C2C research, a small but growing number of studies were also conducted in a developing country context (China, Pakistan, Malaysia and India).

A first study on C2C in China was conducted by Chen and Wang (2007). The psychological reaction of employees to organisational transformation has become a topic of interest in the literature on organisational change. The purpose of a cross-sectional survey study by the above authors was to examine the influence of locus of control on C2C in order to understand and predict employee psychological reactions to organisational change. The study sample comprised 215 customs service staff from the public sector in China, and the variables included all three components of C2C (Herscovitch & Meyer, 2002): ACC, CCC and NCC. Although care was taken to translate and back-translate the scales into Chinese, the study did not report on the findings of the factor structure of the C2C scale in China. Similarly to the findings on organisational commitment, the ACC and NCC scales were moderately correlated while CCC was negatively correlated with ACC and uncorrelated with NCC.

Kalyal, Berntson, Baraldi, Näswall, and Sverke (2010) conducted a further study in a developing country on three-dimensional C2C in Pakistan. The determinants of commitment to organisational change (C2C) represent an under-researched topic, especially in a non-Western context. The objective of a recent cross-sectional survey study by the above authors was to examine whether employability mitigated the negative effect of job insecurity on employees' commitment to organisational change. The sample comprised 149 public sector employees in Pakistan who were undergoing transformation. All three components of commitment to change were included, and the factor structure was confirmed by CFA. Similarly to previous studies, ACC and NCC correlated moderately positively, ACC and CCC correlated moderately negatively, and NCC and CCC did likewise.

Using the same sample and context, but reporting the results in a second journal article, Baraldi, Kalyal, Berntson, Näswall and Sverke (2010) addressed a different research problem associated with restructuring, namely whether the adverse effects of uncertainty on employees' behavioural support could be mediated by C2C. The authors thus examined C2C as a mediator between role ambiguity/job insecurity and behavioural support for organisational change. In doing so, they examined the determinants as well as the outcomes of C2C.

Finally, Rashid and Zhao (2010) examined C2C in Malaysia and India. The authors of this recent cross-sectional survey study examined the influence of career/organisational commitment and change message effectiveness on C2C in a non-Western context. The study sample comprised 575 information technology software professionals in Malaysia and India. Although the authors reported the internal consistencies of the ACC, CCC and NCC scales (Table 2.1), they aggregated the three dimensions into a higher-level C2C construct in the multivariate analysis of the data. Consequently, no correlations between the C2C dimensions were reported. The authors also did not indicate the type of change examined, merely noting an 'enterprise wide change'. In the C2C scales in the appendix of the article, this change is referred to as change towards the 'pool model'.

## **Research Comparing Developed and Developing Countries**

In contrast to studies that were either conducted in a developed, or developing country context, one study comprised both a Canadian and Indian sample (Meyer, Srinivas, Lal & Topolnytsky, 2007).

The lack of empirical research on C2C, despite its stated importance during organisational transformation, gave rise to a study by Meyer et al. (2007). The study also addressed the problem that most research in the area of commitment was conducted in Western countries and generally used cross-sectional research designs. The purpose of the study was therefore to examine the C2C construct in a non-Western culture and across time. Meyer et al. examined the three components of employee C2C with private sector employees in Canada (study one) and India (study two) who were undergoing major transformation.

The Canadian sample in study one by Meyer et al. (2007) consisted of 699 (time 1) and 640 (time 2) employees undergoing structural and cultural transformation. Variables included ACC, NCC and CCC and OC. The factor structure of the C2C scale was not reported.

The Indian sample in study two by Meyer et al. (2007) comprised 379 employees (time one) and 280 employees (time two) from the first sample. Principal components factor analysis confirmed the factor structure of the C2C scale in the Indian environment (three distinct factors with eigenvalues greater than 1.0 and accounting for 62.3% of the variance).

In both studies by Meyer et al. (2007), the ACC and NCC scales correlated moderately positively (Table 2.1) while the ACC and CCC scales correlated negatively. In general, the results of the two studies confirmed Herscovitch and Meyer's (2002) findings and gave further evidence of a distinct C2C construct. The reliabilities of the ACC scale were high, and they were acceptable for the CCC scale. In contrast, the internal consistency of the NCC scale was below .70 thus indicating low reliability (Hair, Black, Babin, Anderson, & Tatham, 2006). In addition, the factor analysis indicated that some of the NCC items also loaded onto the ACC factor

thus pointing to construct overlap. Consequently, and also confirmed by the correlation, these two constructs were not clearly distinguishable from one another. However, the findings did partially support the constructs' cross-cultural generalisability to the Indian culture. Almost all the research on the construct to date has been conducted in Western countries (except for Chen & Wang, 2007). Consequently, not much empirical evidence exists on whether the construct will generalise to non-Western cultures. The findings of the two samples were similar but with some cultural differences. The correlation between NCC and ACC was stronger in the Indian sample, and that between NCC and CCC was stronger in the Canadian sample. Meyer et al. speculate that this may be attributable to the Indian employees being more accepting of their duties – because of Indians' greater acceptance of authority in general and their greater sense of collectivism – compared to the Canadian employees.

### **Limitations of Research on the C2C Construct**

The above studies contributed towards the verification of a distinct and measurable C2C construct with regard to public followed by private sector employees. Although the majority of research was conducted in developed countries, an indication of the cross-cultural portability of the scales to a developing country context was also given (Chen & Wang, 2007; Kalyal et al., 2010; Meyer et al., 2007; Rashid & Zhao, 2010). The findings of the above studies were, however, also constrained conceptually in terms of the two unresolved issues pertaining to the wider three-component model of commitment mentioned earlier: The first issue concerning possible concept redundancy between ACC and NCC, and the second the the nature of CCC. The studies were also constrained in terms of type of change, level of analysis, method and further cross-cultural portability.

### **Concept redundancy between ACC and NCC**

First, as mentioned earlier, affective organisational commitment (AOC) and normative organisational commitment (NOC) generally correlated positively with one another thus indicating significant construct overlap (Cooper-Hakim & Viswesvaran, 2005; Meyer & Herscovitch, 2001). A recent conceptual critique of the three-component model of organisational commitment suggested modifications to NOC

(Cohen, 2007; Solinger et al., 2008). This critique applied also to C2C as studies examining the three components of the commitment to change construct reported a positive correlation between ACC and NCC (Table 2.1). Therefore, similarly to the findings on organisational commitment, this indicates a possible concept redundancy between the two concepts. The consistent positive correlation between ACC and NCC suggests that these two constructs are not entirely independent of one another. In addition, findings on the internal consistency of the NCC scale were mixed. Some studies, for example, Meyer et al. (2007), Kalyal et al. (2010), Baraldi et al. (2010), reported a Cronbach alpha below the .70 minimum threshold for acceptable internal consistency (Hair et al., 2007).

More research is therefore required to examine the psychometric properties of the construct and, in particular, the nature of NCC. Several of the studies on C2C also did not include all dimensions of the construct (Table 2.1). Given that little research is currently being done, it is regrettable that previous studies did not pay more attention to the verification of the validity of the multi-dimensional construct. As suggested by Jaros (2010), an explanation should be given for using only a selected dimension of C2C.

### **Dimensionality of CCC**

Second, in the field of organisational commitment, continuance organisational commitment (COC) was often found to be two-dimensional, consisting of a perceived high sacrifice (PHS) and a perceived lack of alternatives (PLA) dimension (McGee & Ford, 1987). Concerning C2C, continuance commitment to organisational change (CCC) is conceptually derived from the three-component model of organisational commitment (Herscovitch & Meyer, 2002). Earlier empirical findings on the psychometric properties of the CCC scale showed borderline results with regard to its internal consistency (e.g., Meyer et al., 2007; Rashid & Zhao, 2010). More research is therefore needed on the psychometric properties of the CCC scale. Findings of research on the COC scale may inform further research on CCC.

### **Organisational Change Type**

The third limitation concerns the mixture of changes investigated. Previous studies generally did not differentiate between types of organisational change (e.g., evolutionary compared to transformational organisational change). Changes included in the studies ranged from transformational changes, such as mergers or restructuring, to evolutionary changes, such as the introduction of a new performance appraisal system. Burke (2002) noted that not all organisational changes were the same and that, accordingly, they should be differentiated in relation to employee commitment. A need therefore exists to investigate each organisational change separately or to control for change type in the analysis (Jaros, 2010).

### **Level of Analysis**

The fourth limitation concerns the almost exclusive use of the individual level of analysis. All the studies, except for Herold et al.'s (2008), applied the individual level of analysis only. Some researchers have argued that an individual's perceptions of change are best understood by applying a cross-level research design (Caldwell, Herold, & Fedor, 2004; Fedor, Caldwell, & Herold, 2006; Herold et al., 2007). This means that, apart from using the individual level of analysis, an organisational level should also be considered to understand fully the dynamics of an organisational change in relation to employee perceptions. Types of employees may also experience an organisational change differently (Jaros, 2010): While some employees may be the initiators of the change (e.g., management), others may have no choice but to accept it (e.g., front-line staff). Examining cross-level effects across organisational hierarchies may shed light on how different types of employees experience the change (Jaros).

### **Research Design**

The fifth limitation concerns the almost exclusive use of quantitative, in particular cross-sectional, research designs in research on C2C (except for Meyer et al., 2007). According to Mingers (2001), pluralist, or mixed-method, approaches that entail the collection of quantitative as well as qualitative data, as suggested by Creswell (2003), help in complementing research designs and also in overcoming their respective weaknesses.

### **Cross-cultural Portability of Scales**

The final limitation concerns the cross-cultural portability of ACC, NCC and CCC scales to non-Western countries. Apart from an emerging set of studies conducted in a developing country context, all the research in this field has been conducted in Western countries. As indicated earlier, the study by Chen and Wang (2007) did not report on the factor structure of the scales. Rashid and Zhao (2010) also did not differentiate between C2C dimensions in their study. The findings should therefore be interpreted with caution and the cross-cultural portability of the scales needs further exploration in non-Western contexts.

No study has been conducted in an African context yet. Consequently, little evidence for the cross-cultural portability of the C2C scales to this context exists.

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## **DETERMINANTS OF COMMITMENT TO ORGANISATIONAL CHANGE**

Table 2.2 summarises key findings of studies on determinants of commitment to organisational change. Research in previous studies on such determinants appears to be largely unsystematic leading to the examination of a large variety of different types of determinants. However, determinants in previous research can also be classified into emerging themes: The first theme represents a variety of individual difference variables and the second theme human resource practices and organisational climate. Although organisational justice and leadership may also represent human resource practices contributing to organisational climate, they nonetheless also emerged as important determinants in earlier research. As such, they will be discussed as a third and fourth theme.

### **Individual Differences**

When considering previous research on the determinants of commitment to organisational change, individual differences emerged as a first determinant theme. Individual differences included in earlier research ranged from variables such as change-related self-efficacy (e.g., Neves, 2009) to cynicism about change (e.g., Walker et al., 2007).

Chen and Wang (2007), in their study, examined the relationship between employee C2C and internal and external loci of control. The results of the hierarchical regression analyses indicated that locus of control could significantly predict a participant's ACC ( $\beta = -.23, p < .01$ ), CCC ( $\beta = .30, p < .001$ ) and NCC ( $\beta = -.18, p < .05$ ). The variance explained in ACC, CCC and NCC was five, nine and three percent, respectively. The results showed that staff members with a high internal locus of control scored higher on ACC and NCC. In contrast, staff members with an external locus of control scored higher on CCC. Individual differences, such as age, gender, education and organisational tenure, were insignificant in the prediction of the three components of C2C.

**Table 2.2: Determinants of Commitment to Organisational Change**

Author(s) & Year	Determinants & Internal Consistencies ( $\alpha$ )	Key Findings
Chen & Wang (2007)	Locus of Control (LOC) (.75).	Participants with internal LOC were more likely to have high ACC and NCC; Participants with external LOC were more likely to have high CCC. Variance explained was 5%, 9% & 3% for ACC, CCC & NCC, respectively.
Walker et al. (2007)	Change Beliefs (.91); Cynicism about Change (.81); Tolerance of Ambiguity (TOA) (.84).	ACC correlated positively with TOA ( $r = .20; p < .05$ ) & Change Beliefs ( $r = .73; p < .01$ ); negatively with Cynicism ( $r = -.42; p < .01$ ); Change Beliefs ( $\beta = .96; p < .01$ ) & Cynicism ( $\beta = -.71; p < .01$ ) significantly predicted ACC in the structural equation model. Change Beliefs mediated the relationship between Cynicism & ACC.
Bernerth et al. (2007)	Procedural Change Justice (.85); Distributive Change Justice (.82); Interactional Change Justice (.74); Organisational Cynicism (.81). Control questions: Age & Organisational Tenure.	ACC correlated positively with Distributive ( $r = .70$ ), Procedural ( $r = .63$ ) & Interactional justice ( $r = .30$ ). ACC & Organisational Cynicism correlated negatively ( $r = -.47$ ) (all $p < .01$ ). Each form of justice interacted with Organisational Cynicism to predict ACC ( $R^2 = .64$ , <i>adjusted R</i> <sup>2</sup> = .60).
Parish et al. (2008)	Fit of Organisational Change with Strategic Vision (.83); Quality of Relationship with Manager (.99); Motivation (.91); Role Autonomy (.87).	Fit with Vision correlated positively with ACC, CCC & NCC. Quality of Relationship with Manager correlated positively with ACC, NCC & negatively with CCC. Motivation correlated positively with ACC but not with CCC & NCC. Role Autonomy correlated positively with ACC, negatively with CCC and was uncorrelated with NCC. Variance explained was 64%, 16%, & 48% in ACC, CCC & NCC, respectively.
Conway & Monks (2008)	Sub-dimensions of HR Practices: Career & Performance Development (.91); Autonomy (.88); Communication (.84); Training (.86); Staffing (.72); Reward (.61); Teamwork (single item) & Job security (single item); Transformational (.96) and Transactional (.77) Leadership. Control questions: Change Context (type of change, individual differences & other).	Significant predictors in hierarchical regression analysis explained 25.9% of the variance in ACC: Change Context (move to patient-focused service) ( $\beta = .37, p < .001$ ); Communication ( $\beta = .26, p < .05$ ); Rewards ( $\beta = .18, p < .05$ ); Transactional Leadership ( $\beta = -.20, p < .05$ ). Transformational Leadership uncorrelated with ACC. Change Context explained 14% of the variance in ACC; HR practices 9% & Leadership 2%.
Herold et al. (2008)	Affective Organisational Commitment (individual level) (.83); Job-level Impact (individual level) (.73); Transformational Leadership (group level) (.94); Change Leadership (group level) (.89).	Transformational & Change Leadership not significantly correlated; Transformational & Change Leadership significantly positively correlated with ACC. Change Leadership correlated more weakly with ACC than with Transformational Leadership.
Machin et al. (2009)	PWC: Workplace Morale (.86); Supportive Leadership (.88); Participative Decision-Making (.84); Role Clarity (.80); Professional Interaction (.89); Appraisal & Recognition (.92); Professional Growth (.82) & Goal Congruence (.80). NWC: Workplace Distress (.85); Excessive Work Demands (.79).	In the structural equation model, PWC significantly predicted ACC (pathway $\beta = .31$ ), CCC ( $\beta = -.28$ ) & NCC ( $\beta = .18$ ). NWC predicted only CCC ( $\beta = .18$ ) (all $p < .01$ ). PWC & NWC together explained 12%, 3% & 15% of the variance in ACC, NCC & CCC, respectively.
Neves (2009)	Change Appropriateness (.74); Change-related Self-efficacy (.60).	Change Appropriateness ( $\beta = .48; p < .01$ ) correlated significantly positively with ACC and explained 23% of its variance. Change-related Self-efficacy was uncorrelated.
Foster (2010)	Organisational Justice: Distributive (.95), Procedural (.83), Interpersonal (.95) & Informational Justice (.92). Dispositional Resistance to Change: Routine Seeking (.75); Emotional Reaction (.80); Short-term Thinking (.83); Cognitive Rigidity (.75).	Organisational Justice correlated positively with ACC & NCC (weaker in magnitude for NCC). CCC correlated negatively with Organisational Justice. Strongest correlation between Procedural Justice & ACC ( $r = .49, p < .01$ ). Dispositional Resistance to Change uncorrelated with ACC, NCC & CCC, but a positive correlation between Emotional Reaction & CCC ( $r = .20, p < .01$ ). The structural equations model significantly explained 37%, 5% & 17% of the variance in ACC, CCC & NCC, respectively.
Kalyal et al. (2010)	Job Insecurity (.76) & Employability (.86)	Job Insecurity & Employability interacted to predict ACC ( $R^2 = .41, p < .001$ ), CCC ( $R^2 = .27, p < .001$ ), & NCC ( $R^2 = .17, p < .001$ ). Employability mitigated negative impact of Job Insecurity on ACC.
Baraldi et al. (2010)	Role Ambiguity (.79) & Job Insecurity (.78)	Role Ambiguity/Job Insecurity correlated negatively with ACC ( $r = -.34, p < .001$ ; $r = -.45, p < .001$ ) & NCC ( $r = -.35, p < .001$ ; $r = -.23, p < .01$ ) but positively with CCC ( $r = .42, p < .001$ ; $r = .44, p < .001$ ).
Rashid & Zhao (2010)	Organisational Commitment (.85); Career Commitment (.85); Change Message Effectiveness (.92)	Commitment to Change correlated positively with Change Message Effectiveness ( $r = .52, p < .05$ ); Organisational Commitment ( $r = .26, p < .05$ ); & Career Commitment ( $r = .32, p < .05$ ).

Note. ACC (Affective Commitment to Organisational Change); CCC (Continuance Commitment to Organisational Change); NCC (Normative Commitment to Organisational Change); PWC (Positive Work Climate); NWC (Negative Work Climate).

Walker et al. (2007) examined correlations between change beliefs, cynicism about change, tolerance of ambiguity and ACC. Change beliefs were measured by five sub-dimensions of an effective change message (discrepancy between desired and current state of the organisation; appropriateness of the selected change; efficacy of the organisation to implement the change; principal support of the change by management and the personal value of the change for the employees). The internal consistencies of the scales were high, and the results of the correlation analysis indicated that ACC correlated positively with tolerance of ambiguity, cynicism and change communication (Table 2.2). The results of the structural equation modelling analysis indicated a significant directional correlation between change communication and ACC and between cynicism and ACC. The results further indicated that change communication fully mediated the relationship between cynicism and ACC.

Parish et al. (2008) examined the fit with vision of the organisational change, employee-manager relationship quality, job motivation and role autonomy as proposed determinants of C2C. The internal consistency of the determinant variables was high (Table 2.2), and correlations between ACC and the proposed determinants were strong. However, ACC correlated the strongest with employee-manager relationship quality ( $r = .62, p < .05$ ). NCC correlated moderately positively with the determinants, and CCC correlated significantly negatively with the determinants but was uncorrelated with the fit with vision of the organisational change. The results of the structural equation modelling analysis indicated that the antecedents – fit with vision, employee-manager relationship quality, job motivation and role autonomy – influenced the three dimensions of C2C: In particular, fit with vision influenced ACC, NCC and CCC. Employee-manager relationship quality positively influenced ACC and NCC but negatively CCC. Job motivation significantly influenced ACC but less significantly CCC and NCC. Role autonomy positively influenced ACC, negatively CCC and was unrelated to NCC. All in all, based on the squared multiple correlations, the structural equations model significantly explained 64%, 16% and 48% of the variance in ACC, CCC and NCC, respectively.

Neves (2009) examined the relationships between change-related appropriateness and self-efficacy and ACC. Although the internal consistency of change-related appropriateness was acceptable, that of change-related self-efficacy was not (Table 2.2). The final and best-fit structural equations model resulted in a significant directional relationship between change appropriateness and ACC explaining 23% of its variance. Contrary to expectations, self-efficacy was uncorrelated with ACC.

Kalyal et al. (2010) examined the relationships between employability, job security and commitment to organisational change (C2C). In particular, the mitigating role of employability on the negative relationship between job security and C2C was examined. Employability and job security predicted ACC, CCC and NCC. A negative correlation was found between job insecurity and ACC and also NCC. However, the correlation between job insecurity and CCC was positive. Employability correlated positively with both ACC and NCC but negatively with CCC. Job insecurity and employability interacted to predict ACC but not CCC and NCC. The results showed that employability mitigated the negative impact of job insecurity on ACC. Job insecurity, employability and the interaction between the two variables significantly explained 41% of the variance in ACC. Job insecurity and employability explained 27% and 17% of the variance in CCC and NCC, respectively. In an associated study by Baraldi et al. (2010), the authors also reported role ambiguity as an additional determinant of C2C. Role ambiguity correlated significantly negatively with both ACC and NCC but positively with CCC.

Rashid and Zhao (2010) examined organisational/career commitment and change message effectiveness as determinants of a higher-level C2C construct. Change message effectiveness comprised the sub-dimensions change discrepancy, change appropriateness, change efficacy and change personal valence. As indicated previously, the authors did not report the results of the analysis on the individual C2C dimensions. C2C correlated positively and strongly with change message effectiveness and moderately with both organisational and career commitment (Table 2.2). The study also reported the results of change message effectiveness as a mediator between organisational/career commitment and C2C. The findings of this analysis showed that organisational commitment was uncorrelated with change message effectiveness but that career commitment was. The authors concluded that

employees with a strong career commitment – in contrast to organisational commitment – were more likely to understand and interpret change message communication. Apart from this finding, change message effectiveness had the greatest influence on C2C.

### **Human Resource Practices and Organisational Climate**

A second determinant theme can be classified as human resource practices and organisational climate.

Conway and Monks (2008) examined the influence of general human resources (HR) practices on ACC. In particular, they examined the influence of change context (location properties, individual differences and change type) and HR practices (career and performance development, autonomy, communication, training, staffing, reward, teamwork and job security) on employee-related outcomes (transformational and transactional leadership, work-life balance, perceptions of industrial relations climate, psychological contract) and ACC (Table 2.2). Internal consistencies of the variables were generally high, except for staffing and reward. The results of the hierarchical regression analysis with ACC as the dependent variable indicated that the change context (conceptualised as change to patient-focused services) was the most significant predictor in the model. Satisfaction with HR practices, in particular communication and reward, was also significant. Transactional leadership had a negative impact on ACC while transformational leadership did not explain any significant incremental variance. Overall, the hierarchical regression model explained 25.9% of the variance in ACC. Context (change to patient-focused services), followed by HR practices, explained the major portion of the variance (Table 2.2).

Machin et al. (2009) reported on a structural equations model that explained ACC, CCC, NCC and behavioural support. In this structural model, positive and negative work climate significantly explained 12% of the variance in ACC, 3% of the variance in NCC and 15% of the variance in CCC. Positive work climate predicted all three dimensions of C2C. In contrast, negative work climate predicted only CCC. With regard to the underlying dimensions of positive work climate, ACC correlated most strongly positively with supportive leadership ( $r = .31; p < .001$ ), participation ( $r = .36; p < .001$ ), professional growth ( $r = .33; p < .001$ ) and appraisal and recognition

( $r = .25$ ;  $p < .001$ ). The correlations for NCC with these determinants were weaker, and CCC correlated negatively with the determinants.

### **Organisational Justice**

Organisational justice emerged as a third theme in respect of earlier research on the determinants of commitment to organisational change (C2C).

Using the same sample as Walker et al. (2007), Bernerth et al. (2007) examined the relationships between organisational justice (distributive, procedural and interactional justice), organisational cynicism and ACC. All the scales had high internal consistencies, except for the interactional justice scale meeting the minimum reliability (Table 2.2). All three components of organisational justice correlated positively with ACC. In contrast, organisational cynicism correlated negatively with ACC. Moderated hierarchical regression analysis to predict ACC indicated distributive justice ( $\beta = .60$ ,  $p < .01$ ) as the strongest predictor. In addition, the interaction terms of distributive and procedural justice ( $\beta = .31$ ,  $p < .01$ ), as well as procedural and interactional justice ( $\beta = .35$ ,  $p < .01$ ), were also significant predictors. The results of a subsequent moderated hierarchical regression analysis also indicated that interactional, procedural and distributive justice related positively with organisational cynicism to significantly explain 64% of the variance in ACC. The authors also reported that distributive justice mediated the positive relationship between procedural justice and ACC. Overall, this study provided support for the importance of organisational justice in the prediction of ACC. However, fair procedures during organisational change are not enough. To maximise commitment, leaders should also honestly explain the reasons for the change. As a result, employees may still be willing to commit to a change if change communications are clear, transparent and reasonable.

Foster (2010) examined resistance to change (conceptualised as an individual disposition) and organisational justice as determinants of the C2C dimensions. He hypothesised that resistance to change would correlate negatively and that organisational justice would correlate positively with the C2C dimensions. Similarly to the study by Bernerth et al. (2007), the internal consistencies of the sub-dimensions of organisational justice were strong. Likewise, the internal consistencies of the sub-

dimensions of the resistance to change scale were also acceptable (Table 2.2). The author conducted a correlational analysis and devised a structural equations model. In the correlational analysis, the organisational justice dimensions correlated strongly with ACC. The strongest correlation was between procedural justice and ACC. Except for interpersonal justice, NCC also correlated moderately with the other organisational justice dimensions. Again, the strongest correlation was between NCC and procedural justice. In contrast, CCC correlated negatively with the organisational justice dimensions, the strongest negative correlation being with the procedural justice dimension. Apart from a moderately positive correlation between CCC and the resistance to change dimension – emotional reaction – resistance to change was uncorrelated with the dimensions of C2C. The structural model of organisational justice and resistance to change predicting ACC, CCC and NCC resulted in an acceptable fit ( $\chi^2 = 1,816.90$ ,  $df = 1,06$ ,  $\chi^2 / df = 1.71$ , CFI = .89, RMSEA = .05). The paths from organisational justice predicting ACC, CCC and NCC were significant. While the directional paths between organisational justice and both ACC and NCC were positive, the path between organisational justice and CCC was negative. In contrast, none of the directional paths between resistance to change and the C2C dimensions were significant. Overall, as indicated by the squared multiple correlations of the structural equations model, the model explained 37% of the variance in ACC, 5% of the variance in CCC and 17% of the variance in NCC.

## **Leadership**

A final theme with regard to the determinants of C2C can be classified as leadership. In addition to Conway and Monks (2008) and Machin et al. (2009), Herold et al. (2008) also examined leadership as a determinant of C2C.

Herold et al. (2008) examined the relationship between transformational leadership and change leadership – what leaders need to do to implement change effectively – as proposed determinants of ACC. They were also interested in whether change leadership and/or job level impact (change impact on day-to-day job) would moderate this relationship. Measures on the group level – reflecting behaviour shared or experienced by all individuals in the group – included transformational leadership and change leadership. Measures on the individual level included ACC, job level impact, and, as a control variable, affective organisational commitment (AOC). Internal

consistencies of the variables were generally strong. The results of the correlational analysis indicated, first, that ACC was significantly positively correlated with AOC ( $r = .28, p < .01$ ); second, that transformational leadership and change leadership were not significantly positively correlated with one another ( $r = .15, ns$ ); third, that transformational leadership ( $r = .35, p < .01$ ) and change leadership ( $r = .19, p < .05$ ) correlated significantly positively with ACC. Interestingly, the correlation between ACC and specific change leadership was weaker compared to that with transformational leadership. The results of the hierarchical linear modelling analysis indicated that, first, transformational leadership explained 17% of the variance in ACC; second, change leadership did not have a significant effect on ACC; third, when job level impact was low, transformational leadership correlated positively with ACC only when change leadership was low; fourth, when job level impact was high, regardless of change leadership, transformational leadership correlated positively with ACC.

Similarly to organisational justice, leadership was included in multiple studies that examined the determinants of C2C. Although earlier studies examined different leadership types (e.g., transformational, supportive, transactional and change leadership), the results were still inconsistent: Although ACC correlated positively most strongly with supportive leadership in the study by Machin et al. (2009), transformational leadership – in contrast to the finding in the study by Herold et al. (2008) – did not explain any significant incremental variance in the study by Conway and Monks (2008). Transactional leadership, on the other hand, had a negative impact on ACC (Conway & Monks).

### **Limitations of Research on the Determinants of C2C**

The above studies all contributed to the understanding of the determinants of C2C. However, this understanding was not constrained only by the cross-sectional research design and the reliance on self-report measures, as discussed earlier, but also by the selection method of the determinants.

### **Selection of Determinant Variables**

As indicated earlier, more needs to be known about the determinants of the three commitment dimensions in general (Meyer & Herscovitch, 2001) and, in particular, in the context of organisational change (Herscovitch & Meyer, 2002). Previous research on organisational commitment examined its determinants relatively unsystematically (e.g., Meyer & Allen, 1991; Meyer & Herscovitch). Researchers looked at the correlations between potential antecedent variables without giving much consideration to *why* these variables should influence commitment. Meyer and Herscovitch accordingly suggested that future investigations should be based on the general conceptual model of commitment. In their own words:

In the future, we suggest that the choice of antecedent variables for study be based on their relevance to the processes outlined in the model. This would not only serve to test the validity of our hypotheses concerning mechanisms, but would aid in the synthesis of research findings. That is, rather than appearing like a “laundry list” as Reichers (1985) described it, research pertaining to antecedents of commitment could be organized according to their relevance to underlying mechanisms (e.g. identification, investment, reciprocity). (Meyer & Herscovitch, 2001, p. 322)

This conceptual critique on the choice of antecedent variables in the field of organisational change also applies to studies investigating the determinants of C2C. None of the studies makes specific reference as to why a particular determinant would influence commitment in terms of the general model by Meyer and Herscovitch (2001): Based on this model, commitment, regardless of its forms, should have the same underlying core essence. Inferences can therefore be made from the wider commitment literature about possible determinants. Herscovitch and Meyer (2002) and Meyer et al. (2007) argue that many of the most widely recommended change management strategies should foster commitment. In particular, they argue that strategies concerning involvement, value relevance or identification, such as training, participation and empowerment, should foster ACC. NCC would be fostered when employees saw that the organisation was meeting its obligation to them: Supporting the change would then be a form of reciprocation. Finally, CCC could be developed by rewards for compliance and punishment for non-compliance. Further possible determinants include openness to, readiness for and coping with organisational change, as well as fairness, trust, communication and effective leadership (Meyer et al.).

## OUTCOMES OF COMMITMENT TO ORGANISATIONAL CHANGE

This part deals with recent studies that – in addition to verifying the psychometric properties of the C2C construct – also include proposed behavioural outcomes. Table 2.3 summarises the key findings and contributions with regard to the outcomes of C2C.

**Table 2.3: Outcomes of Commitment to Organisational Change**

Author(s) & Year	Outcomes & Internal Consistencies ( $\alpha$ )	Key Findings
Herscovitch & Meyer (2002)	Behavioural Continuum (single-item measure); Compliance (Study 2: .49), Cooperation (Study 2: .85) & Championing (Study 2: .90).	C2C better predictor than OC of behavioural support; ACC & NCC associated with a higher level of support than CCC; Only ACC & NCC correlate positively with Cooperation & Championing. CCC correlates positively only with Compliance; Components of C2C (ACCxCCC) interact to predict Compliance. Other two-way interactions (e.g., ACCxNCC; NCCxCCC), as well as three-way interactions (e.g., ACCxCCCxNCC), insignificant.
Cunningham (2006)	Coping with Change (.63); Turnover Intentions (.96).	Coping with Change fully mediates the relationship between ACC and Turnover Intentions but only partially mediates the relationship between CCC and Turnover Intentions; NCC has a direct relationship with Turnover Intentions.
Meyer et al. (2007)	Study 1 (S1): Behavioural Support for Change (behavioural continuum/single item); Study 2 (S2): Mere Compliance (.90), Compliance (.78), Cooperation (.71) & Championing (.91).	S1: ACC & NCC correlate positively with Behavioural Support for Change, CCC negatively. S2: ACC & NCC correlate positively with Compliance, Cooperation & Championing but negatively with Mere Compliance. CCC uncorrelated with Compliance, positively correlated with Mere Compliance but negatively correlated with Cooperation & Championing. C2C a better predictor of behavioural support than OC. Components of C2C do not interact to predict behaviour.
Parish et al. (2008)	Individual Learning (.89); Perceived Implementation Success (.91); Perceived Improved Organisational Performance (.96).	ACC has most significant effect on outcome variables in the model; CCC negatively correlated with variables in the model.
Machin et al. (2009)	Behavioural Support for Change (single-item scale).	ACC ( $r = .55$ ), CCC ( $r = -.37$ ) & NCC ( $r = .34$ ) (all $p < .001$ ) correlate positively with Behavioural Support. In the structural equations model: ACC (pathway $\beta = .33$ ), NCC ( $\beta = .20$ ) & CCC ( $\beta = -.19$ ) (all $p < .01$ ) significantly predict 39% of the variance in Behavioural Support.
Neves & Caetano (2009)	Trust in Supervisor (.92); Perceived Own Performance (.79); Organisational Citizenship Behaviour (.77); Turnover Intentions (.86).	Trust in Supervisor fully mediates the relationship between ACC and Perceived Performance, Organisational Citizenship Behaviour and Turnover Intentions. CCC not significantly correlated with any outcome. ACC & CCC correlate differently with the outcomes.
Neves (2009)	Level of Individual Change (employees' behavioural change resulting from the change) (.83); Turnover Intentions (.76).	ACC positively correlated with Level of Individual Change ( $\beta = .44$ ) and negatively with Turnover Intentions ( $\beta = -.33$ ). Change-related Self-efficacy negatively correlated with Turnover Intentions ( $\beta = -.37$ ) (all $p < .01$ ).
Baraldi et al. (2010)	Compliance (.89), Cooperation (.91) & Championing (.93)	ACC & NCC positively correlated with Compliance ( $r = .56$ ; $r = .46$ ), Cooperation ( $r = .67$ ; $r = .46$ ) & Championing ( $r = .66$ ; $r = .44$ ). CCC negatively correlated with Compliance ( $r = -.33$ ), Cooperation ( $r = -.49$ ) & Championing ( $r = -.53$ ) (all $p < .001$ )

Note: ACC (Affective Commitment to Organisational Change); CCC (Continuance Commitment to Organisational Change); NCC (Normative Commitment to Organisational Change); C2C (Commitment to Organisational Change); OC (Organisational Commitment).

In terms of themes, the above outcomes of commitment to organisational change can be classified into behavioural support as well as personal outcomes.

## **Behavioural Support of Organisational Change**

A first set of previous studies that examined the outcomes of commitment to organisational change included constructive change-related behavioural outcomes.

In addition to providing first empirical evidence of a distinct and measurable C2C construct, Herscovitch and Meyer (2002) also examined its relationship with a set of proposed behavioural outcomes (focal or discretionary behaviour) in study two. They termed these outcomes behavioural support of organisational change comprising three sub-dimensions: Compliance (adherence to the explicit requirements of the change) as focal behaviour, cooperation (going along with the spirit of the change and requiring modest sacrifices) and championing (behaviour requiring considerable personal sacrifice and promoting the value of the change to others) as discretionary or organisational citizenship behaviour. The authors also included a single-item behavioural continuum measure (study two and three) ranging from active resistance up to championing. Except for the CCC scale, internal consistencies were acceptable (Table 2.3).

Using hierarchical regression analyses with compliance as the dependent variable indicated that C2C was a better predictor than organisational commitment. In study two, ACC correlated positively with compliance ( $r = .32, p < .01$ ), cooperation ( $r = .53, p < .01$ ), championing ( $r = .57, p < .01$ ) and the single-item behavioural continuum measure ( $r = .61, p < .01$ ). CCC correlated positively with compliance ( $r = .17, p < .05$ ) but was uncorrelated with cooperation ( $r = -.01, ns$ ), championing ( $r = -.06, ns$ ) and the behavioural continuum ( $r = -.08, ns$ ). NCC correlated positively with compliance ( $r = .34, p < .01$ ), cooperation ( $r = .51, p < .01$ ), championing ( $r = .54, p < .01$ ) and the behavioural continuum ( $r = .60, p < .01$ ). In study three, the authors used only the behavioural continuum to measure change support.

The overall findings of the study by Herscovitch and Meyer (2002) provide the first empirical evidence of the importance of commitment during organisational transformation. However, the commitment dimensions resulted in different outcomes of behaviour: ACC and NCC were associated with higher levels of behavioural

support than was CCC. Compared to organisational commitment, the results also showed that C2C was a better predictor of behavioural support.

Meyer et al. (2007) examined the relationship between employee C2C and behavioural support over time (repeated cross-sectional survey design). In study two, behavioural support was measured by means of multi-item questions in addition to the behavioural continuum. The multi-item scales for compliance, cooperation and championing were adapted from Herscovitch and Meyer (2002). In addition, Meyer et al. refined compliance by adding mere compliance (doing only what is required in terms of the change). Internal consistencies were high except for the cooperation scale, which met the minimum reliability (Table 2.3). Overall, C2C explained more of the variance in behavioural support than did organisational commitment. ACC and NCC both correlated positively with focal (compliance) and discretionary behaviour (cooperation and championing). In contrast, CCC correlated positively with focal behaviour (compliance) only and negatively with discretionary behaviour (cooperation and championing). Contrary to expectations, ACC, CCC and NCC did not interact to predict behaviour. In addition to the above findings, Meyer et al. found that levels of commitment at time one correlated significantly positively with the level of behavioural support at time two. NCC and ACC at time two correlated significantly positively with level of behavioural support when the time one measures were controlled. CCC at time one correlated negatively with behavioural support at time two even when time one measures of support were controlled. These findings provided the first evidence of the causality between commitment and behavioural support. Finally, the results indicated that employees with a strong CCC would restrict their behavioural support to the minimum requirement: mere compliance.

In addition to examining work climate as a determinant of C2C, Machin et al. (2009) also examined the relationships with ACC, CCC, NCC and behavioural support for change (measured by a single-item behavioural continuum measure). The structural equation model using ACC, CCC and NCC predicted 39% of the variance in behavioural support. The results showed that ACC, CCC and NCC were significant predictors of behavioural support. ACC and NCC correlated positively with behavioural support whereas CCC correlated negatively. However, positive work climate also correlated positively with behavioural support indicating a partial

mediation effect. In other words, ACC, CCC and NCC partially mediated the positive correlation between positive work climate and behavioural support. Overall, the study demonstrated the differing impact of ACC and CCC on behavioural support.

### **Personal Outcomes of Commitment to Organisational Change**

A second set of studies examined a range of constructive personal outcomes of commitment to organisational change (C2C) such as coping with change (Cunningham, 2006), individual learning, perceived implementation success, perceived improved organisational performance (Parish et al., 2008); trust in supervisor, perceived own performance, organisational citizenship behaviour (Neves & Cetano, 2009) and level of individual change (behavioural change resulting from the change) (Neves, 2009). Apart from the above constructive outcomes, Cunningham, Neves and Caetano, and Neves also included turnover intentions as an adverse outcome of C2C.

Building on Herscovitch and Meyer's model (2002), Cunningham (2006) examined the relationships between C2C, coping with change and turnover intentions. The author hypothesised that ACC would relate positively to coping with change because, he thought, employees believing in the value of the change would have an important reason to support the change. Accordingly, he predicted that ACC would buffer the stress caused by the organisational change. Conversely, he expected, CCC to relate negatively with coping with change because employees high on CCC would feel that they had little choice but to follow the change. The author further hypothesised that coping with change would mediate the relationships between the dimensions of C2C and turnover intentions. With regard to turnover intentions, he hypothesised that ACC and NCC would relate negatively with turnover intentions. In contrast, CCC was hypothesised to relate positively with turnover intentions because employees with a high level of CCC might believe that they would be better off by leaving the organisation.

In contrast to the high reliability of the turnover intention scale, the coping with change scale was poor (Table 2.3). The results of the structural equation model showed, first, that coping with change fully mediated the relationship between ACC and turnover intentions; second, that CCC related positively to turnover intentions

both directly and through coping with change; third, that NCC had a direct impact on turnover intentions. The commitment dimensions correlated differently with turnover intentions: ACC ( $r = -.49; p < .05$ ), CCC ( $r = .33; p < .05$ ) and NCC ( $r = -.34; p < .05$ ). Likewise, ACC ( $r = .51; p < .05$ ), CCC ( $r = -.41; p < .05$ ) and NCC ( $r = .21; p < .05$ ) differed in their correlations with coping with change.

Parish et al. (2008) examined the relationships between the three components of C2C with perceptions of improved performance, implementation success and individual learning. The three outcome variables had high internal consistencies, and the three C2C dimensions correlated differently with the three outcomes: ACC correlated positively with improved performance ( $r = .72, p < .05$ ), implementation success ( $r = .65, p < .05$ ) and individual learning ( $r = .71, p < .05$ ). The strength of the correlation between NCC and the outcomes was weaker than that of ACC. Except for individual learning, CCC correlated negatively with the outcomes. The results of the structural equation model generally confirmed the correlational analysis; however, NCC related positively only with individual learning.

In their study, Neves and Caetano (2009) examined the influence of ACC and CCC on employees' trust in the supervisor, turnover intentions, organisational citizenship behaviour and perceived performance. Without exception, the outcome variables had strong internal consistencies (Table 2.3). On the basis of structural equation modelling, the results showed that the relationships between ACC and turnover intentions, organisational citizenship behaviour and perceived performance was fully mediated by trust in the supervisor. In contrast, CCC did not relate to the outcomes. Concerning correlations, ACC and CCC correlated differently with the work outcomes whereas ACC correlated positively with trust in the supervisor ( $r = .27, p < .01$ ) and CCC correlated negatively ( $r = -.19, p < .01$ ). Similarly, ACC ( $r = -.20, p < .01$ ) and CCC ( $r = .08, ns$ ) differed in their correlations with turnover intentions. Both ACC and CCC showed no correlation with perceived performance and organisational citizenship behaviour.

Neves (2009) examined the linkage between ACC and level of individual change and turnover intentions. Level of individual change was conceptualised as the behavioural change by the employees as a result of the change (e.g., item one: “The new appraisal system motivated me to be more efficient”, Neves, 2009, p. 223). Both outcome variables had strong internal consistencies (Table 2.3). The best-fit structural equations model resulted in a significant positive directional relationship between ACC and level of individual change. In contrast, ACC and turnover intentions were negatively related.

Using the same sample as used in the study by Kalyal et al. (2010), Baraldi et al. (2010) examined C2C as a mediator between role ambiguity/job insecurity and behavioural support for restructuring in Pakistan. The authors included the original Herscovitch and Meyer (2002) compliance (3 items), cooperation (8 items) and championing (6 items) multi-item scales resulting in excellent reliability (Table 2.3). Both ACC and NCC correlated positively with all three outcomes. In contrast, CCC correlated negatively with compliance, cooperation and championing. The correlation between ACC and the outcomes was stronger than that of NCC. Overall, this study found that the employees’ C2C could mediate the adverse effects of both role ambiguity and job insecurity on behavioural support.

### **Limitations of Research on the Outcomes of C2C**

Despite the contributions of the above studies towards understanding the outcomes of C2C, these studies were also constrained in terms of coverage of behavioural outcomes, research design, reliance on self-report measures and interactions.

#### **Inconsistent Coverage of Behavioural Outcomes**

The first limitation concerns the inconsistent examination of C2C in relation to broad areas of job performance. Job performance is increasingly being seen as having three broad performance facets: Task performance, organisational citizenship behaviour and counterproductive work behaviour (Dalal, 2005). Previous studies examined commitment in relation to compliance, cooperation and championing behaviour. Other variables examined included coping with change, turnover intentions, change success, individual learning and improved performance. All these variables, except turnover intentions, refer to positive or supporting behaviour with regard to the

organisational change situation. Previous studies thus neglected to examine how counterproductive work behaviour, such as passive and active resistance, related to C2C. Recently, Klein, Becker and Meyer (2009) also recommended examining how commitment relates to counterproductive work behaviour. Although it could be speculated that C2C would correlate negatively with counterproductive work behaviour, little empirical evidence exists to confirm this speculation. Bearing in mind that employees high on CCC restrict their performance to the minimum requirements (e.g., see Herscovitch & Meyer, 2002), including counterproductive work behaviour could help to examine whether employees high on CCC would also engage in negative workplace behaviours.

### **Cross-sectional Research Design**

The second limitation of these studies concerns the general use of a cross-sectional research design (except for Meyer et al., 2007). The weakness of such a design is that it measures a point in time thus providing limited evidence of cause and effect between C2C and behaviour. The link and direction between C2C and behavioural support has been confirmed only by multiple regression and structural equation modelling analyses thus providing limited evidence of causality. In addition, studies investigating the stability of employee attitudes during organisational (Weber & Weber, 2001) or information system change (Bhattacharjee & Premkumar, 2004) indicate that these attitudes can vary over time or during the course of the implementation project. Similarly, longitudinal studies have suggested that commitment, in particular organisational commitment, may not be stable over time (Banks & Henry, 1993). Beck and Wilson (2000), for example, found a decline in AOC with increasing organisational tenure of employees. Relatively few studies have applied a longitudinal cross-sequential research design, and, consequently, not much is known about the impact of changing environments on organisational commitment (Meyer et al., 2002). This indicates the need to apply longitudinal research designs to the study of organisational change. According to Jaros (2010), advanced forms of structural equations modelling, such as latent growth modelling, would be ideal for tracking the changes in C2C and outcome variables over the course of an organisational change.

### **Reliance on Self-report Measures**

The third limitation concerns the exclusive reliance on self-report measures including the problem of social desirability bias, central tendency and common method variance (Podsakoff & Organ, 1986). As suggested by Jaros (2010), instead of self-reported behaviour, actual workplace behaviour should be observed.

### **Interaction Effects**

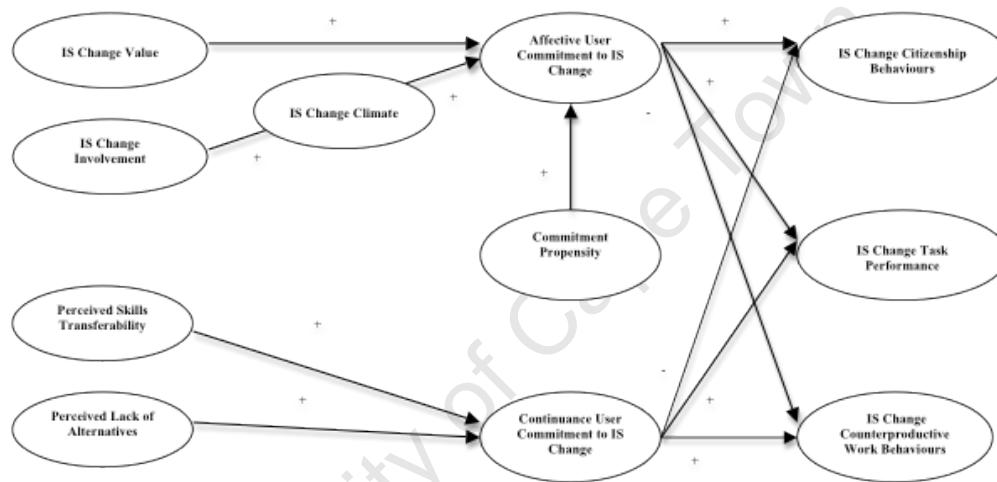
The final limitation concerns the failure of almost all studies (except for Herscovitch & Meyer, 2002; Meyer et al., 2007) to examine the combined effect of the C2C dimensions. Earlier studies examined the individual effects of the three C2C dimensions on outcomes separately. However, as discussed previously, ACC, CCC and NCC can also work 'in concert'; such interaction should therefore not be neglected in the prediction of outcomes.

Chapter 2 has provided the basis for the conceptualisation of the determinants and outcomes of user commitment towards a mandatory information system change. The next chapter uses this foundation to propose an explanatory model by adding findings from the change and information system change management literature, as well as findings from focus group discussions.

# CHAPTER 3: PROPOSED DETERMINANTS AND OUTCOMES OF USER COMMITMENT

The purpose of this chapter is to expand the literature review by proposing an explanatory model of the determinants and outcomes of user commitment to mandatory information system change (Figure 3.1).

**Figure 3.1: Proposed Determinants and Outcomes of User Commitment to Mandatory Information System Change**



The first part specifies the focus of commitment; the second part summarises the modifications to Herscovitch and Meyers' (2002) three-component model of C2C; the third part defines user commitment to mandatory information system (IS) change; the fourth part defines the proposed determinants by using the general model of commitment (Meyer & Herscovitch, 2001) to select variables from the commitment, change management and information system literature. Empirical findings from the focus group discussions with information system users were also used to guide the selection of determinants. The fifth part concludes this chapter by describing the proposed behavioural outcomes.

## INFORMATION SYSTEM CHANGE AS FOCUS OF COMMITMENT

The previous chapter provided the theoretical basis for the view that information system change can become a focus of commitment either as a target (i.e. the ERP *system*) or as a course of action (i.e. the ERP system *change*), or both. Concerning information system change, the focus of commitment will be on the *IS change* and not only the *IS itself*. The reason for specifying the focus of commitment as information system change is contextual. Limiting the focus of commitment to the new information system as an entity would neglect the wider context of the information system change.

Employees faced by a new enterprise resource planning (ERP) system are likely to view and/or evaluate the change in terms of their individual differences (e.g., personality traits, general resistance to change disposition, self-efficacy, negative/positive affectivity) and organisational (e.g., change management, organisational climate, training, leadership) and system experience (e.g., features of the system itself).

The nature of organisational change differs (Burke, 2002). Jaros (2010), too, noted that different organisational changes might have different effects on employees: In particular, the determinants of commitment to organisational change (C2C) could vary depending on the type of change. It is therefore important to distinguish between organisational changes and to define clearly the focus of commitment because an employee faced by organisational restructuring (e.g., a merger or acquisition, downsizing) may develop an entirely different commitment profile compared to being faced by a new information system. For example, restructuring may pose a direct threat to the employee regarding job security and future employment. A new information system, however, does not necessarily pose a direct threat to employment but often requires new learning and possibly role adjustments. In fact, a new information system could represent a benefit to its users (e.g., making the work easier or leaving the employee with more time to focus on more important/interesting tasks). In some cases, however, a new information system may require the re-engineering of organisational processes thus resulting in possible job changes for employees (e.g.,

being re-assigned or being laid off). Consequently, a possible job threat will be taken into account in the explanatory model by measuring IS job insecurity. In sum, by specifying the focus of commitment as information system change, predictions of behaviour can be more accurate. This implies that user commitment to mandatory information system change can be a distinct and measurable construct.

## **MODIFICATIONS TO THE COMMITMENT TO ORGANISATIONAL CHANGE MODEL**

Based on unresolved issues in the literature and recent conceptual advances with regard to the three-component model of organisational commitment (OC), two fundamental modifications concerning Herscovitch and Meyer's (2002) C2C construct are proposed.

### **Normative Commitment as Commitment Propensity**

As shown in the previous chapter, the positive correlation between affective commitment to organisational change (ACC) and normative commitment to organisational change (NCC) was consistently high in studies examining C2C (Table 2.1). To overcome the lack of discriminant validity between the two constructs, NCC could be regarded as a commitment propensity (CP), as suggested with regard to normative organisational commitment (NOC) (Cohen, 2007).

With reference to information system change, this implies that user commitment to mandatory information system change should be separated into pre- and post-information system implementation commitments: Commitment propensity would then represent stable pre-implementation individual propensity towards developing ACC. In contrast, both ACC and CCC would represent post-implementation commitments implying that these commitments could still be influenced by individual factors, work experiences and the nature of the information system itself. As a consequence, CP would become a determinant/correlate of affective commitment to mandatory IS change (see Figure 3.1) thus explaining the strong correlation between the two constructs.

Individuals with a strong CP have the individual propensity to support the information system change because they think it is the right and moral thing to do. Users high on CP support the change because they *want* to do so. Therefore, CP does not represent a form of commitment but an individual difference fostering ACC.

As a consequence of the above modification, the determinants of CP will not be examined for three reasons: First, as discussed, a significant construct overlap exists between ACC and NCC; second, as mentioned previously, no unique determinants of NOC were found in a recent meta-analysis (Meyer et al., 2002); third, virtually no research has been conducted on the determinants of NOC (Cohen, 2007).

### **Continuance Commitment as Perceived High Sacrifice**

The second modification concerns the nature of CCC. As discussed, the COC scale has been found to be two-dimensional, consisting of two highly correlated sub-dimensions: Perceived high sacrifice (PHS) and perceived lack of alternatives (PLA) (Meyer et al., 2002). According to Powell and Meyer (2004), the PLA dimension should be considered a determinant of the PHS dimension. Accordingly, in the field of organisational commitment, only this dimension should be used as continuance organisational commitment (COC).

With regard to user commitment to mandatory information system change, only the PHS items will therefore define CCC. Perceived lack of alternatives will then become a proposed determinant because it could cause individuals to perceive a high sacrifice in not supporting the information system change (see Figure 3.1).

## **DEFINING USER COMMITMENT**

As a result of the above modifications, and in terms of Herscovitch and Meyer's (2002) definition, user commitment to mandatory information system change could then be defined as a force (mindset) that binds an employee to a course of action deemed necessary for the successful implementation of the information system change initiative. The mindset that binds an individual to this course of action can reflect (a) a desire to provide support for the mandatory information system change based on the belief in its inherent benefits (affective user commitment) (ACC (IS)),

and (b) a recognition that costs are associated with failure to provide support for the information system change (continuance user commitment) (CCC (IS)).

To test the suggested modifications to Herscovitch and Meyer's (2002) model and to the definition of commitment to mandatory information system change, the following proposition is offered.

**Proposition 1. Affective (ACC (IS)) and continuance (perceived high sacrifice) (CCC (IS)) user commitment to mandatory information system change are distinct constructs. Both forms of user commitment are also distinct from commitment propensity (CP).**

The next section integrates this construct further into the conceptualisation of an explanatory model by putting the spotlight on the proposed determinants of user commitment to mandatory information system change.

## **PROPOSED DETERMINANTS OF USER COMMITMENT**

To establish the importance of C2C as a key mediator of organisational change, Klein et al. (2009) suggested that organisational-level change management should be linked to commitment theory. This part integrates the broader organisational change management and specific information system change literature by reviewing possible determinants of ACC (IS) and CCC (IS). As discussed earlier, the determinants of CP will not be investigated in the proposed model. First, the selection criteria for the determinants both in terms of previous research and empirical evidence from focus group discussions will be discussed. Thereafter, the proposed determinants of ACC (IS) and CCC (IS) will be summarised.

### **Choice of Determinant Variables**

For the purposes of this research, the term determinant is defined as a factor that decisively influences the nature of the respective commitment dimension. However, as Klein et al. (2009) argue, influence does not entail a proven causal ordering. Against this background, the selection of determinant variables is based on three fundamental decision support mechanisms: First, use of proximal determinants; second, determinant fit with general model of commitment; and third, guidance from focus group discussions.

### **Determinant Category**

According to Klein et al. (2009), one way to categorise the determinants of commitment is to use proximity: Determinants can be categorised into proximal and distal factors. To ensure the highest explanatory power with regard to conceptually related constructs, the more specific, or proximal, construct was selected (e.g., specific change leadership versus transformational leadership). The proximal construct is thus assumed to explain more of the variance in user commitment than the distal construct.

### **Fit with General Model of Commitment**

This selection decision refers to the fundamental core processes that underlie the formation of commitment. To avoid a random list of determinants, the choice of variables was based on the conceptual core processes that underlie the general formation of the affective and continuance commitment dimensions. The determinants identified from the commitment, information system and change management literature therefore had to be consistent with the general model of commitment by Meyer and Herscovitch (2001). As a consequence, some widely used organisational, or information system, success factors were not included as determinants.

First, these factors are readiness (Armenakis et al., 1993; Caldwell, Roby-Williams, Rush, & Rieke-Kiely, 2009; Jones et al., 2005) and openness (Wanberg & Banas, 2000) towards organisational change, and user attitude towards information systems (Wixom & Todd, 2005). An inspection of the single items of the three constructs revealed an overlap with affective commitment to change. These constructs are therefore likely to correlate with affective commitment because they measure the same underlying construct but give it another name or label.

Second, the widely applied user satisfaction factor in the information system literature (e.g., Rivard, 1987; Zviran, Pliskin, & Levin, 2005) was not included because, in the commitment literature, job satisfaction is generally treated as a correlate of organisational commitment. The reason is that job satisfaction has an “affective tone” (Meyer et al., 2002, p. 22) similar to affective commitment and therefore potentially overlaps with this otherwise distinct construct. There is also no consensus concerning

the causal ordering of the two constructs (Meyer et al.). The same applies to the construct of symbolic adoption (Seymour, Makanya, & Berrange, 2007) of the new information system whose items also tap into ACC (IS).

Third, the commonly examined information system variables of completeness, accuracy, format, currency and information satisfaction in relation to information system success were not included because they were, together with perceived ease of use, significant determinants of perceived usefulness (Wixom & Todd, 2005), which, in turn, serves as a determinant of affective commitment in the proposed explanatory model. This exclusion ensures that the variable with the highest explanatory power will be included in the model.

Fourth, reliability, flexibility, integration, accessibility, timeliness, system quality and system satisfaction were not included because they significantly explained 67% in the variance of perceived ease of use (Wixom & Todd, 2005), which, in turn, serves as a determinant of affective commitment in the proposed explanatory model. Again, this exclusion ensures that the variable with the highest explanatory power will be included in the model.

Fifth, individual differences – apart from basic differences such as gender, age, home language, educational level, tenure, information system tenure, organisational level, commitment propensity, positive affectivity (Kaplan, Bradley, Luchman, & Haynes, 2009) and (computer) self-efficacy (Chen, Gully, & Eden, 2001; Sabherwal et al., 2006; Yi, Wu, & Tung, 2006) – were not included in the explanatory model. Without doubt, the determinants underlying commitment to information system change can be both personal (e.g., personal innovativeness and computer experience) (Yi et al.) and contextual. Environmental (Eby et al., 2000; Martin, Jones, & Callan, 2005), organisational, process, system and individual factors – and/or their interaction – thus contribute to the formation of commitment. However, among these factors, work experiences have been found to have the strongest correlation with organisational commitment (Meyer et al., 2002). In contrast, correlations between demographic and personal variables, such as age, gender, tenure, need for achievement, work ethic, perceived competence and affective commitment, were neither strong nor weak (Meyer & Allen, 1997). Given that commitment has a core essence, as suggested by

the general model (Meyer & Herscovitch, 2001), individual differences should therefore play a relatively minor role as determinants of user commitment to IS change, and findings on organisational commitment should also be applicable to the context of an information system change. Individual differences, otherwise related to organisational commitment, and in particular to C2C, such as coping with change (Armstrong-Stassen, 2004; Ashford, 1988; Cunningham, 2006; Judge et al., 1999; Rafferty & Griffin, 2006; Woodward & Henry, 2004), tolerance of ambiguity, cynicism about change (Walker et al., 2007), locus of control (Chen & Wang, 2007) and motivation (Parish et al., 2008), will therefore not be included in the explanatory model.

Finally, affective organisational commitment, a possible determinant of ACC (Meyer et al., 2007), will also not be included in the explanatory model because it represents a distal variable. However, the effect of the three dimensions of organisational commitment will be controlled for in the proposed model. In particular, as suggested by Jaros (2010), special attention will be paid to distinguish C2C from organisational commitment and to examine their respective predictive abilities.

### **Focus Group Discussions**

The above selection of determinants is based on previous literature and, in particular, on the underlying theory of the development of commitment. In addition, and for exploratory purposes, focus group discussions were held to determine how employees in the context of an information system change felt and thought (Krueger & Casey, 2000). The findings assisted in decision making on which determinants to include in the proposed explanatory model. The results of the focus group discussions – after saturation – can be classified into four themes covering information system, communication, training and management.

**System Qualities.** The first theme that emerged in the focus group discussions concerned the qualities of the new information system itself. The participants all agreed that – in order for management to gain support for the new information system – it had to be practical and user friendly. The participants also agreed that it had to be thoroughly tested, correct and fast. In sum, it had to be better than the existing system. The participants further agreed that their current new information system appeared to

be built around the needs of the department and that therefore employees would support the system. Finally, the participants agreed that allowing staff members to make changes to the system, once in operation, would encourage additional support.

**Communication.** The second theme concerned the information provided to staff members about the new information system. Although the new system was operational at some sites, and employees were already familiar with it, some staff members were still unclear about when the new system would be implemented. All the participants agreed that management should provide more information about the system and the implementation process. This would foster acceptance by staff members of the new system. It was also mentioned, but not by all the participants, that staff members should be more involved in the implementation process.

**Training and Support.** The third theme concerned training regarding the new information system. All the participants agreed that employees who would use the new system should receive extensive training and support from experts on the system. In particular, it was emphasised that training should be conducted *before* going live with the new system.

**Role of Management.** The final theme concerned the role of the management of the organisation. The participants agreed that management should give its full backing to increase users' support of the new system. In particular, the participants mentioned that management should also be more involved, visible and approachable in the implementation process. They also agreed that management should give recognition to staff members for their hard work during the implementation process. Finally, some of the participants said that trust between users and management would help make employees more supportive of the new system.

The above findings cannot be generalised to all employees facing an information system change as the sample was relatively small (see the Method section for details on the procedure and the participants), and the focus group discussions did not reflect the dominant research method (Creswell, 2003) of this study. The findings accordingly apply only to the staff members in that specific context. Nonetheless, the findings generally confirm aspects of the information system success, change

management and commitment literature that inform the proposed explanatory model. First, system factors, such as ease of use and usefulness, appeared to matter to affected staff members; second, change management factors, such as communication, participation and training, were also mentioned in the focus groups; third, management, too, was mentioned, perhaps indicating the importance of leadership, support and fairness. Thus, in relation to previous literature, it was useful to explore how employees think and feel during an information system change. In sum, however, the results do not reveal how these factors relate to the three dimensions of user commitment to IS change or their relative importance. Consequently, the conceptual explanatory model needed more guidance from the literature for verification.

### **Proposed Determinants of Affective User Commitment**

It should be remembered that the mindset characterising affective commitment is desire. The underlying core mechanisms that determine this form of commitment are, first, involvement, second, recognition of value, and third, identification (Meyer & Herscovitch, 2001). Accordingly, employees would want to support the information system change because, by recognising the value of the change, *they want to do so*. In the field of organisational commitment – apart from the strong correlation between affective and normative commitment – employee work experiences correlated strongly with affective commitment. The work experiences of employees faced by a new information system can be broadly classified into three categories.

First, system-related factors such as the usefulness and utility of the new information system itself. Typically, system-related factors result in a perception of the value of the information system change among affected employees. Second, specific change management factors typically resulting in a perception of information system change involvement among employees. Third, organisation-wide factors facilitating the implementation of the new information system. Conceptually, and empirically, these groups of variables are proposed in order to explain ACC (IS) in the context of information system change. After clarifying the role of CP in the proposed model, a detailed summary of these three categories will be given.

### **Commitment Propensity**

CP serves as a first determinant of ACC (IS) because individuals with a strong CP may want to support the information system change because they feel morally obliged to do so (i.e. supporting the information system change is the right thing to do). As shown in Figure 3.1, the following proposition is therefore made.

**Proposition 2. Commitment propensity is positively related to ACC (IS).**

Examining the directional relationship of CP in relation to ACC (IS) also clarifies whether CP constitutes a correlate or a determinant of ACC (IS).

### **Information System Change Value**

Important system-related factors are information quality, perceived ease of use and the perceived usefulness of the new information system. Together, these three factors can be combined into a higher order perceived information system change value construct. They also represent three widely used components in the information system success model (Petter et al., 2008). In addition, system qualities, such as practicality, accuracy and user friendliness, emerged as a theme in the focus group discussions. For example, one of the participants remarked: “The new system must be better compared to the old one. Otherwise, why change?”

System-related factors refer to an employee’s direct experience of the new ERP system and often result in an opinion of the value of the new system and thus of the information system change. This area has been extensively researched in the information system literature, and user satisfaction and technology acceptance represent the most dominant approaches.

The user satisfaction literature regards information quality and system quality as key determinants of user satisfaction and, accordingly, system use (Gelderman, 1998; Igbaria & Tan, 1997; Melone, 1990; Wixom & Todd, 2005; Wu & Wang, 2006). In the technology acceptance literature, the technology acceptance model (TAM), originally proposed by Davis (1989), or TAM 2 (Venkatesh & Davis, 2000), is the most widely used model. This model regards perceived usefulness and perceived ease of use of an information system as the major determinants of information system use

and, consequently, as an important component of information system success. According to Petter et al. (2008), two aspects of information system success, namely system quality and net benefits, were measured in their study in terms of perceived ease of use and perceived usefulness, respectively.

Recent research has combined the user satisfaction and technology approaches to the unified theory of acceptance and use of technology to predict attitude towards an information system and intention to use it (Wixom & Todd, 2005).

To avoid construct overlap, only information quality, perceived ease of use and perceived usefulness are proposed as key determinants of ACC (IS).

**Information Quality.** Information quality (IQ) refers to the quality of the information provided by the information system, generally in the form of reports (DeLone & McLean, 1992). According to Wixom and Todd (2005), the information quality (conceptualised as completeness, accuracy, format and currency) provided by a new information system serves as an important determinant of the information satisfaction of the users and, as a consequence, also of perceived usefulness. Petter et al. (2008) also found moderate to strong support regarding the direct impact of IQ on the net benefits of a new information system. The quality of information is accordingly a necessary condition for the success of any new information system. For example, a new information system could be very useful, of high quality and easy to use but still be unreliable if it contains inaccurate data. Based on the general model of commitment, for any user to recognise the value of a new information system, IQ is therefore proposed as a necessary condition for developing ACC (IS). So far, IQ has not been examined in relation to ACC (IS).

**Perceived Ease of Use.** As a distinct and measurable construct, perceived ease of use (PEU) refers to the degree to which affected employees regard a new information system as not too difficult to understand, learn or operate (Adams, Nelson, & Todd, 1992; Karahanna & Straub, 1999; Ramayah & Lo, 2007). In terms of the technology acceptance model, which is based on the theory of reasoned action (Ajzen, 1991), PEU has been defined as the extent to which an employee thinks that using an information system will be free of effort (Davis, 1989). Related to this

construct is effort expectancy (Sabherwal et al., 2006). In the information system success model by Petter et al. (2008), PEU also constitutes system quality.

As a key determinant of employee intention to use an information system and actual information system use, PEU is examined extensively in the technology acceptance literature (e.g., Adams et al., 1992; Davis, 1989; 1993; Davis, Bagozzi, & Warshaw, 1989; Igarria, Zinatelli, Cragg, & Cavaye, 1997; Keil, Beranek, & Konsynski, 1995; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003; Zviran et al., 2005).

Conceptually, PEU serves as a potential determinant of ACC (IS) in the context of information system change because, by perceiving the system as effortless to use, users recognise the value of the ERP system change. So far, no study has examined this construct in relation to ACC (IS).

**Perceived Usefulness.** Related, but distinct from PEU, is perceived usefulness (PU) (Adams et al., 1992; Ramayah & Lo, 2007; Wixom & Todd, 2005). Although factor analyses generally have confirmed that PEU and PU represent distinct constructs, they are also highly correlated (Keil, Beranek, & Konsynski, 1995). PEU is widely regarded as one of the determinants of PU (Karahanna & Straub, 1999) and commonly represents the net benefits of the system in the information system success model by Petter et al. (2008).

PU refers to the degree employees believe that using a new information system will enhance their job performance and productivity (Ramayah & Lo, 2007). It represents a relative advantage or the degree to which the new system is perceived as better than the existing one (Keil et al., 1995). PU therefore correlates positively with user satisfaction (Zviran et al., 2005) and with performance expectancy (Sabherwal et al., 2006). Interestingly, facilitating conditions, such as the availability of training and support for the use of a new information system, had no impact on PU or PEU in a study by Karahanna and Straub (1999).

The information system success literature, in particular the technology acceptance literature (e.g., Adams et al., 1992; Davis, 1993; 1989; Davis et al., 1989; Keil et al., 1995; Venkatesh & Davis, 2000; Venkatesh et al., 2003) regards PU as an important determinant of employee intention to use an information system and, ultimately, information system use.

Conceptually, PU serves as a determinant of ACC (IS) in the context of information system change because, by perceiving the new information system as useful, users ultimately recognise its value. So far, no study has examined this construct in relation to ACC (IS), but a study on PU and AOC did indicate a significant correlation between the constructs (Magni & Pennarola, 2008). Other similar constructs such as change impact (Conway & Monks, 2008) and job-level impact (Herold et al., 2008) have also been linked positively to ACC (IS). In sum, IQ, PEU and PU can be categorised as the value of the information system change for the users. Accordingly, as shown in Figure 3.1, the following proposition is made.

**Proposition 3. Information system change value is positively related to ACC (IS).**

### **Information System Change Involvement**

In contrast to the above information system factors, change management factors refer to an employee's short-term experience of the implementation process of a new information system. The characteristics of the change process can enhance employee acceptance of the change (Van Dam, Oreg, & Schyns, 2008). To establish C2C as a key mediator for change success, more research is required linking change management with commitment research (Klein et al., 2009). Some of the most commonly cited change success factors from the organisational change and specific information system success literature include communication, participation and training. Communication and training also emerged as themes in the focus group discussions. Together, these factors result in employee involvement in the change process. As a consequence, these factors can be categorised as information system change involvement.

**Communication.** An organisational change can be considered a major life event for any employee. The most frequent psychological state resulting from it is uncertainty (Jimmieson, Terry, & Callan, 2004). Communication means providing information to employees to keep them informed of anticipated change, the nature of the change, when the change will occur and the resulting consequences on work roles. According to Walker et al. (2007), managers should prepare employees through open, honest communication about the change. The authors further argue that an effective change message should have five components: Discrepancy, appropriateness, efficacy, principal support and personal valence.

First, managers should explain the gap between the current and the desired organisational state (discrepancy). Second, the desired approach to bridge this gap should be explained and the employees told why this approach is the most suitable (appropriateness). Third, managers should explain why the organisation has the capability to execute the selected approach (efficacy). Fourth, managers should clearly demonstrate that they support the selected approach (principal support). Finally, they should communicate the benefits of the change to the affected employees (personal valence) (Walker et al., 2007). Communication can thus contribute to a perceived value of the information system change on the part of employees. In addition to these five core components, managers should also ensure consistency with regard to the change message (Armenakis & Harris, 2001).

The information will help reduce employees' uncertainty and possible anxiety about the change (Van Dam et al., 2008). Appropriate information can thus create openness to organisational change (Wanberg & Banas, 2000) and reduce dysfunctional outcomes (Schweiger & Denisi, 1991). Effective communication can also indirectly contribute to psychological wellbeing, client engagement and job satisfaction (Jimmieson et al., 2004). In contrast, insufficient communication can promote rumours and dissatisfaction (Van Dam et al.).

Given its importance, effective communication features prominently in organisational change (e.g., Armenakis & Harris, 2001; Elving, 2005; Goodman & Truss, 2004; Kitchen & Daly, 2002) and information system change literature (e.g., Botta-

Genoulaz, Millet, & Grabot, 2005; De Brabander & Thiers, 1984; Ebadi & Utterback, 1984).

Conceptually, effective communication may determine ACC (IS), first, by creating a sense of involvement in the change process. Employees who are well informed about the change may perceive themselves to be involved in the process. Second, effective communication may make employees realise the value of the change itself. Third, effective communication may help reduce the uncertainty associated with the change, indicating organisational support (Bordia, Hunt, Paulsen, Tourish, & DiFonzo, 2004; Jimmieson et al., 2004). Finally, effective communication may enhance employees' psychological attachment to their organisation because it may encourage them to perceive themselves as core members of the organisation through their contribution to organisational goals (Rousseau, 1998).

Empirically, management communication generally correlates positively with AOC (Ng, Butts, Vandenberg, DeJoy, & Wilson, 2006). In a study by Van Grinsven and De Natris (2008), employee satisfaction with horizontal and vertical communication also significantly explained AOC, and, as mentioned earlier, communication correlated positively with ACC in C2C studies (e.g., Conway & Monks, 2008; Machin & Albion, 2007; Walker et al., 2007).

In sum, given the conceptual and empirical evidence, effective communication is an important determinant of ACC (IS) in the context of an information system change situation. Communication also emerged as a distinct theme in the focus group discussions with employees who were experiencing a new information system. One of the participants said: "Management should not leave us in the dark!"

**Participation.** Together with communication, participation is another widely cited success factor in organisational change (Sverke, Hellgren, Näswall, Göransson, & Öhrming, 2008). Participation refers to change management procedures that allow employees to participate in the planning and implementation of organisational change initiatives (Van Dam et al., 2008). For more than 50 years it has been widely accepted that employee participation has beneficial effects for change acceptance (Coch & French, 1948).

More specifically, staff participation offers benefits such as a better understanding of the context that necessitates the change, a sense of involvement and ownership of the process and, as a result, heightened readiness for change (Armenakis et al., 1993; Van Dam et al., 2008). Participation contributes to trust during organisational change (Lines, Selart, Espedal, & Johansen, 2005) and also to work satisfaction and effectiveness (Sagie & Koslowsky, 1994).

The organisational change management literature regards employee participation and involvement as key determinants of organisational change (e.g., Chrusciel & Field, 2006; Lines, 2004; O'Brien, 2002; Sagie & Koslowsky, 1994; Zeffane, 1996) and specific information system success (e.g., Barki & Hartwick, 1994; Baronas & Louis, 1988; Ives & Olson, 1984; Mabert, Soni, & Venkataramanan, 2003). Top management involvement in the information system development process is a further widely cited IS success factor (De Sanctis & Courtney, 1983; Doll, 1985; Jarvenpaa & Ives, 1991).

According to Barki and Hartwick (1994), most researchers treat participation and involvement as having the same meaning, yet they are actually related but distinct constructs. Participation refers to the assignments, activities and behaviour of users or their representatives during the implementation process. In contrast, involvement refers to a subjective psychological state reflecting the importance and personal relevance that a user attaches to an ERP system change. Participation could thus be a determinant of this psychological state.

For the purposes of this thesis, only participation will be included in the proposed explanatory model because it has been linked empirically to ACC in various studies. Although participation may lead to a feeling of involvement in the information system change process, it will not necessarily always materialise in such a feeling.

In the context of an information system change, user participation therefore serves as a proposed determinant of ACC (IS) because it leads to the involvement of employees in the change process. Involvement, in turn, is a general determinant of affective commitment. Empirically, participation also correlated positively with ACC in various past studies (Machin & Albion, 2007; Machin & Bannon, 2005).

**Training.** In addition to communication and participation, training is a further proposed determinant of ACC (IS) in the context of an information system change. End-user training refers to a critical intervention to support the successful implementation of a new information system. Numerous research studies have examined the effectiveness of training in the transfer of knowledge to users (Santhanam & Sein, 1994). Information system implementations are accordingly commonly accompanied by a substantial investment in training programmes for affected staff members (Sharma & Yetton, 2007). Users generally receive formal classroom and/or on-the-job training on the features of a new information system by experts (Yi & Davis, 2003). This training enables users to operate the new system. In terms of a conceptual model on the effect of training on implementation success, Sharma and Yetton define application and business knowledge, transactive memory and collaborative task knowledge as measurable outcomes of training. These outcomes are, in turn, positively linked to implementation success, which is defined as system use and user satisfaction. User training has also been commonly linked to positive outcomes such as improved user attitude, behaviour and performance (Galletta, Ahuja, Hartman, Teo, & Peace, 1995). Training is accordingly an important factor in information system change (Al-Mashari et al., 2003; Berchet & Habchi, 2005; Mandal & Gunasekaran, 2003; Potosky, 2002; Sharma & Yetton).

Conceptually, training could be a determinant of ACC (IS) in the context of an information system change, first, because it entails user involvement in the change process; second, employees may realise the value of the new system through training (e.g., by being more effective in their jobs); third, training may also contribute to a global perception of organisational support, which, in turn, is linked to affective commitment. Empirically, training and capacity development were positively linked to ACC in Machin and Albion's study (2007).

On the basis of this conceptual and empirical evidence, end-user training is a determinant of ACC (IS) in the context of information system change. Training also emerged as a distinct theme in the focus group discussions. As one of the participants noted: "Give us a lot of training *before* going live with the new system!"

In sum, communication, participation and training serve as potential determinants of ACC (IS) in the context of information system change and are thought to result in a perception of information system change involvement by affected employees.

Accordingly, as shown in Figure 3.1, the following proposition is made.

**Proposition 4. Information system change involvement is positively related to ACC (IS).**

### **Information System Change Climate**

The wider organisational experiences of employees influencing affective organisational commitment (AOC) include support, justice and leadership (Meyer et al., 2002). Organisational factors represent an employee's distal and long-term experience with an organisation. In contrast to an instrumental exchange – based on rewards and benefits in the organisation – these variables fulfil the higher order needs of employees causing them to experience a more deeply felt responsibility towards the organisation (Cohen, 2007). As a consequence, employees will feel obliged to repay the organisation by being more affectively committed towards it (Cohen) or towards the information system change. Key organisational factors from the wider commitment literature that are proposed to influence AOC are perceived organisational support (POS), organisational justice (OJ) and transformational leadership (TL).

Regarding user commitment, more specific and proximal (highly relevant to information system change) constructs exist. Conceptually related to POS, OJ and TL, but more specific in the context of information system change, are the constructs of facilitating conditions (Venkatesh, Brown, Maruping, & Bala, 2008; Venkatesh et al., 2003), implementation fairness (Daly & Geyer, 1994; Joshi, 1989) and change leadership (Herold et al., 2008). Because of their direct relevance to the context of information system change, these factors are proposed to cause users to feel obliged to repay in the form of ACC (IS). As a result of the influence of information system change involvement (communication, participation and training), information system change climate is proposed to partially mediate the relationship with ACC (IS). A mediating relationship is suggested because the independent variable (information system change involvement) is proposed to influence the mediating variable (information system change climate), which, in turn, influences the outcome ACC

(IS) (Holmbeck, 1997). The relationship between the independent variable, mediator and dependent variable is of an influencing nature and therefore not necessarily causal (Holmbeck).

**Facilitating Conditions.** A first possible proximal mediator of ACC (IS) - by fulfilling employees' higher order needs - is user support in the form of information system facilitating conditions (FC). Apart from support from colleagues and relatives, employees may experience user support during an information system change from the organisation on three levels: First, by a perception of global support from the organisation (POS); second, by supervisor support (Rhoades, Eisenberger, & Armeli, 2001); and, third, by specific information system change implementation support (e.g., facilitating conditions). POS represents a broad, or distal, type of support whereas FC represent a more specific, or proximal, type of support. The two constructs are thus conceptually related.

To better understand the mechanism by which FC may influence ACC (IS), POS, as the most established construct measuring organisational support, will be discussed. POS is a measurable, related, yet distinct, construct in relation to affective commitment (Rhoades & Eisenberger, 2002). Distinct, yet conceptually related, supervisor support was found to be a determinant of POS in the study by Rhoades et al. (2001). It is today widely accepted that employees in organisations generally form global beliefs about the extent to which a company values their contributions and cares about their wellbeing (Eisenberger, Huntington, Hutchinson, & Sowa, 1986). Generally, POS increases when employees perceive supportive organisational policies as voluntary, discretionary actions (Rhoades & Eisenberger).

Conceptually, POS contributes to the development of ACC through social exchange theory (Gould-Williams & Davies, 2005), that is, when organisations give evidence of discretionary support to employees causing them to reciprocate by, for example, being more affectively committed. POS thus creates an implied obligation between the employee and the organisation (Wallace, Edwards, Arnold, Frazier, & Finch, 2009). Based on the norm of reciprocity, POS causes employees' felt obligation to care about a company's best interests to result in enhanced work behaviour (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001; Eisenberger, Fasolo, & Davis-LaMastro, 1990;

Shore & Wayne, 1993). Employees also use perceptions of support as a basis for determining the strength of their obligation to reciprocate in terms of job performance (Vandenberghe et al., 2007). Accordingly, POS was found to correlate positively with intra-role as well as citizenship behaviour by Rhoades and Eisenberger (2002). Empirically, POS also correlated strongly with affective organisational commitment (AOC) (Meyer et al., 2002; Meyer & Allen, 1997; Rhoades & Eisenberger). Interestingly, POS largely mediated the perceptions of human resource practices (e.g., performance appraisal, benefits, training and career development) in relation to AOC (Meyer & Smith, 2000).

As indicated above, more specific to the context of information system change is the construct of FC (e.g., processes and resources that facilitate an employee's ability to use the information system) (Venkatesh et al., 2003; Venkatesh et al., 2008). Similarly to supervisor support, employees may view FC as a contributor to POS. Consequently, FC may influence ACC (IS) by the same mechanism that links POS to AOC.

In sum, however, FC are proposed to be the construct with the highest explanatory power of ACC (IS) in the context of information system change. Whereas POS constitutes a proximal mediator of AOC, FC constitute a proximal mediator of ACC (IS). Similarly to POS, FC cause employees to be more affectively committed to information system change through the reciprocity norm. FC accordingly serve as a potential mediator of ACC (IS) in the context of information system change. According to Meyer et al. (2002), organisations should first show their own commitment towards employees before employees can be committed themselves. In the context of information system change, FC represent the most relevant type of user support. In addition, user support, together with training, also emerged as a theme in the focus group discussions.

**Overall IS Change Fairness.** A second proximal mediator of ACC (IS) - by fulfilling higher order needs of employees in the context of information system change - is the fairness of the information system implementation. Employees expect to be treated fairly and equitably by their organisation (Ullrich, Christ, & Van Dick, 2009) and can experience justice in the context of information system change on

various levels: First, in terms of anticipatory justice even before the organisational change initiative; second, in terms of supervisory fairness (Rodell & Colquitt, 2009); third, in terms of perceived overall justice (POJ) that prevails in the organisation; fourth, in terms of four distinct justice types: Distributive, procedural, interpersonal and informational organisational justice (Ambrose & Schminke, 2009); and fifth, in terms also of the fairness of the change or information system implementation itself (Daly & Geyer, 1994; Joshi, 1989).

As a distinct and measurable construct (Colquitt, Conlon, Wesson, Porter, & Ng, 2001), organisational justice serves as a possible distal mediator of ACC (IS) in information system change. Here, the terms fairness and justice are often used interchangeably (Cohen-Charash & Spector, 2001). The aim of most organisational justice research is to describe and explain the role of fairness in the workplace – one of the most widely researched topics in industrial-organisational psychology, human resource management and organisational behaviour (Colquitt et al.). In these fields, distributive (perceptions of outcome fairness), procedural (fairness of procedures), interactional (perceptions of fair interpersonal treatment when individuals are treated with respect, dignity, truthfulness and propriety) and informational (explanations as to why procedures were used in a certain way) justice are the most widely examined sub-dimensions (Barsky & Kaplan, 2007; Colquitt et al.).

Earlier research focused on how these sub-dimensions independently influence behaviour and attitudes (Ambrose & Schminke, 2009), and more recent research has also highlighted the importance of POJ in offering a more complete understanding of justice in organisations (Ambrose & Schminke). Research suggests that when an organisation is considered fair, employees are more likely to show extra-role behaviour. Important behavioural outcomes, such as job satisfaction, performance, organisational citizenship behaviour and commitment, have accordingly been linked to justice perceptions (Moon, Kamdar, Mayer, & Takeuchi, 2008).

In particular, concerning procedural justice, the underlying assumption is that as long as fair procedures are applied, employee reactions to unfavourable outcomes will be ameliorated. Procedural fairness is consequently most important in respect of negative outcomes (Ullrich et al., 2009). However, this assumption holds only if an outcome

does not violate an integral aspect of one's social or personal identity (Mayer, Greenbaum, Kuenzi, & Shteynberg, 2009).

Conceptually, organisational justice may contribute to the development of ACC through POS by indicating fair procedures, which, in turn, imply an organisation's respect for employee's rights and thus contribute positively to POS (Loi, Han-yue, & Foley, 2006). Through fair treatment, employees may feel obliged to their organisation in terms of social exchange theory (Cohen-Charash & Spector, 2001).

Empirically, procedural justice and distributive justice were found in recent research to contribute to the development of POS, which, in turn, mediated their effects on AOC (Loi et al., 2006). Overall, organisational justice also explained 35% of the variance in AOC in a meta-analysis covering 25 years of organisational justice research (Colquitt et al., 2001). Brockner, Tyler and Cooper-Schneider (1992) found that perceived unfairness impacted most negatively on the attitude of highly committed employees towards an organisation. Procedural and distributive justice have also been linked to AOC (Hopkins & Weathington, 2006; Meyer & Allen, 1997). Similarly to POS, it was found that procedural justice also mediated employees' perceptions of human resource management practices (e.g., performance appraisal, benefits, training and career development) and their AOC (Meyer & Smith, 2000). Cohen-Charash and Spector (2001) found that procedural justice was significantly more strongly related to AOC than distributive or interactional justice. In sum, however, organisational justice correlated consistently and strongly positively with AOC (Meyer et al., 2002) and related constructs such as trust.

Trust is conceptually related to organisational justice. In their meta-analysis, Colquitt et al. (2001) found that organisational justice explained 45% of the variance in trust. Trust also served as a moderator of procedural fairness (De Cremer & Tyler, 2007). Trust in management is furthermore considered to be a prerequisite for gaining employees' cooperation in organisational change (Van Dam et al., 2008).

Related to the construct of organisational justice in terms of procedural fairness in organisational change is the fairness of the information system implementation process. According to the organisational change management (e.g., Lines et al., 2005;

Lipponen, Olkkonen, & Moilanen, 2004) and specific information system success literature (e.g., Joshi, 1989; 1991), fairness is a key determinant of change or implementation success. With regard to the implementation of a new computer system, for example, Joshi (1991), in terms of distributive justice, argues that employees generally employ three levels of analysis when evaluating a computer system change: First, they assess the change in terms of gains and losses to their equity status; second, they compare their relative outcomes with those of the organisation; third, they compare their outcomes to the outcomes of other users in their reference group. As a consequence, users who evaluate the system change unfavourably because of inequity or loss of equity are likely to resist it. Fedor et al. (2006), for instance, found that the fairness of a change process interacts with organisational commitment. Likewise, employees who perceive organisational downsizing as distributive and procedurally just are more likely to exhibit constructive behaviour (Mishra & Spreizer, 1998). Procedural justice also helped explain organisational identification after an organisational merger (Lipponen, Olkkonen, & Moilanen), and, recently, studies on organisational justice and C2C also found evidence of the strong influence of justice on employees' ACC (Foster, 2010; Bernerth et al., 2007) (Table 2.2).

In sum, organisational justice overlaps with constructs such as trust and fairness during organisational change. However, in order to avoid construct overlap in the proposed explanatory model, only overall change fairness (CF) will be included as this construct represents the most proximal and relevant measure of organisational justice in the context of information system change. Given the conceptual and empirical evidence, this construct serves as a further potential mediator of ACC (IS) in the context of information system change.

**Information System Change Leadership.** In addition to facilitating conditions and overall change fairness, it is proposed that the third factor that mediates ACC (IS), by fulfilling the higher order needs of employees, is change leadership (CL). The organisational change management (e.g., Holt, Self, Thal, & Lo, 2003; Kavanagh & Ashkanasy, 2006; Moran & Brightman, 2001; Yu, Leithwood, & Jantzi, 2002) and specific information system success literature (Botta-Genoulaz, Millet, & Grabot, 2005) regards strong leadership as an important determinant of

organisational change or information system success. The role of management also emerged as a distinct theme in the focus group discussions. In particular, the participants agreed: “Management should be more approachable concerning the new information system!” and “A lot of problems could be avoided if management would be more hands-on involved on the ground!”

Herold et al. (2008) recently proposed the construct of CL including a measure – here it should be remembered that CL was found to be conceptually related to, but also distinct from, transformational leadership (TL) (Herold et al.). CL refers to the application of the recommendations on effective change management (e.g., communication, participation and justice) during organisational transformation. These recommendations refer to the effective leadership of change in the short term in terms of how leaders treat and involve their followers. In contrast, TL refers to leadership of the entire organisation and in the long term. Interestingly, TL was found to correlate more strongly with followers’ ACC compared to CL. Predominantly transformational leaders may therefore obtain more ACC regardless of their change relevant leadership style because of trust that was build up over time or perhaps over a series of organisational changes (Herold et al.). Conway and Monks (2008), however, in their study found that TL was unrelated to ACC. However, little research has so far been conducted on the relationship between CL and TL and their predictive power with regard to ACC. Because of the only recent conceptualisation of CL, a brief review of the more established TL construct is given below.

After two decades of extensive leadership research, TL, in contrast to transactional and non-transactional (*laissez-faire*) leadership (Rubin, Munz, & Bommer, 2005), currently represents the most widely accepted leadership paradigm. By appealing to employees’ higher order needs, TL includes the active involvement and engagement of followers’ personal values (Kearney & Gebert, 2009) and moving them beyond their immediate self-interests (Bass, 1999). Apart from its wide acceptance, TL also represents the most active and effective form of leadership in terms of closely engaging and motivating followers for extra-role performance (Rubin et al.). TL was accordingly found to correlate positively with work attitudes, behaviour (Avolio, Zhu, Koh, & Bhatia, 2004) and performance (Bass, Avolio, Jung, & Berson, 2003). Research has also confirmed a strong link between TL and AOC (Meyer et al., 2002).

A related and overlapping construct to TL is leader-member-exchange (LMX) (Scandura & Graen, 1984). According to the leadership literature, LMX has evolved into one of the more useful approaches in studying the links between leadership processes and follower outcomes (Gerstner & Day, 1997). Developed through a series of interpersonal exchanges, LMX refers to the quality of the interpersonal relationship between leader and follower. High-quality LMX relationships entail loyalty, emotional support, mutual trust and liking. In contrast, low-quality relationships entail transactional and impersonal exchanges (Furst & Cable, 2008). With regard to organisational change, employees use the quality of their LMX to interpret managerial influence tactics to achieve behavioural change-related support (e.g., consultation, ingratiation, legitimisation). In particular, LMX was found to moderate an employee's resistance to change (Furst & Cable). Employees with a high-quality LMX relationship and a strong development climate also received more information and opportunities for participation, experienced greater trust in management and, as a consequence, showed less resistance to change (Van Dam et al., 2008). With regard to ACC, and similarly to LMX, the quality of the relationship with managers was positively linked to ACC (Parish et al., 2008). And similarly to TL, LMX may therefore act as a mediator between change management factors and commitment. In relation to leadership, LMX is both transformational and transactional (Graen & Uhl-Bien, 1995). However, the behavioural outcomes of LMX, such as job performance and organisational commitment, also commonly correlate positively with transformational leadership. TL and LMX have been found to correlate strongly positively ( $r = .87$ ), and a factor analysis also did not find evidence of any distinction between the two constructs (Basu, 1992, as cited in Gerstner & Day). There is accordingly a potential construct overlap between TL and LMX.

The underlying mechanisms by which transformational leaders influence followers' motivation and performance are, however, not well understood (Avolio et al., 2004). So far, various attempts have been made to extract and explain the underlying dimensions of TL, but less attention has been paid to the importance of each factor for the prediction of outcomes (Herold et al., 2008). Generally, articulating a vision for the future and creating empowering opportunities were the most common dimensions. Other factors included personal credibility, trust and identification with the leader, challenging followers' thinking and supporting followers' individual needs (Herold

et al.). Conceptually – in the context of information system change – TL, but also CL, may mediate ACC (IS) in three ways.

First, by the involvement of employees in organisational processes (Walumbwa, Orwa, Wang, & Lawler, 2005; Walumbwa, Wang, Lawler, & Shi, 2004). As indicated above, empowerment and intellectual stimulation are key features of TL behaviour. Employees who are empowered to take decisions and whose thinking is challenged are more involved in the organisation, and this could lead to the development of affective commitment. In a recent study, perceived workplace empowerment also correlated positively with AOC (Culpepper, Gamble, & Blubaugh, 2004). This underlying mechanism may also apply in how change leadership influences ACC but with greater proximity. Item five of the CL scale refers specifically to empowerment: “My leader empowered people to implement the change” (Herold et al., 2008, p. 357).

Second, during information system change, TL appears to be crucial as transformational leaders are often supportive of their followers (Wang & Walumbwa, 2007) thus leading to affective commitment through POS. Transformational leaders establish an emotional bond between themselves and their followers by going beyond purely rational exchange processes (Kearney & Gebert, 2009). Specifically, this underlying mechanism may also apply to how CL influences ACC. Item seven of the CL scale refers specifically to support: “My leader gave individual attention to those that had trouble with the change implementation” (Herold et al., 2008, p. 357).

Third, transformational leaders may also evoke in employees a sense of identification with the organisation or work team (Cohen, 2007; Kearney & Gebert, 2009) thereby establishing a further underlying core mechanism in the formation of affective commitment. Epitropaki and Martin (2005) found that the positive effect of TL on organisational identification was far greater than that of transactional leadership. Interestingly, compared to the other dimensions of TL, only the articulating a vision sub-dimension had a significant main effect ( $\beta = .10$ ;  $p < .01$ ) on AOC in a study by Podsakoff, MacKenzie and Bommer (1996). Articulating a vision in the context of organisational change also represents an important aspect of change leadership. Item one of the CL scale refers specifically to a change vision: “My leader developed a clear vision for what was going to be achieved by our work unit” (Herold et al., 2008,

p. 357). This underlying mechanism may therefore also apply in how CL influences ACC in the case of organisational change. Given these underlying mechanisms, CL accordingly serves as a third proximal mediator of ACC (IS) during information system change with regard to change management factors.

In sum, FC, CF and CL are proximal organisational factors representing higher order needs of employees that have the potential to partially mediate change management factors. The mediation is partial because the factors in information system change involvement are proposed to relate positively to ACC (IS): In other words, *information system change involvement* contributes to ACC (IS) by creating a supportive *information system change climate*. Accordingly, as shown in Figure 3.1, the following propositions are made.

**Proposition 5. Information system change climate is positively related to ACC (IS).**

**Proposition 6: Information system change climate partially mediates the positive relationship between information system change involvement and ACC (IS).**

The above section reviewed system, change management and organisational factors that – in line with the general model of commitment and empirical evidence – could serve as proposed determinants of ACC (IS). Accordingly, the following proposition is made.

**Proposition 7. CP, IS change value, IS change involvement and IS change climate explain significant variance in ACC (IS).**

The next section reviews relevant factors in the formation of continuance commitment to organisational change (CCC (IS)).

### **Proposed Determinants of Continuance User Commitment**

As discussed earlier, based on the general model of commitment, the mindset characterising this commitment is cost (Meyer & Herscovitch, 2001). Accordingly, employees would want to support the ERP change because they recognise that it would be costly not to support the change or because they would lose investments (financial and social). Based on this fundamental cost-based mechanism, perceived lack of alternatives (PLA) and perceived skills transferability (PST) could potentially relate positively to CCC (IS).

### **Perceived Lack of Alternatives**

PLA refers to the role of available alternatives to not support information system change. The very nature of a information system change contributes to the lack of alternatives. Consequently, users faced with information system change have to use the new system the day it replaces the old system. In such a case, the only alternative would be to leave the organisation as non-usage of the system would not be possible. However, in previous studies (e.g., Herscovitch & Meyer, 2002; Meyer et al., 2007), employees with a high CCC restricted their behaviour to the minimum that was required. Therefore, to obtain higher levels of user support of a new information system, an element of ACC (IS) would be needed.

According to Meyer and Herscovitch (2001), employee perceptions play a key role in the formation of continuance commitment, and such perceptions depend on whether an employee in fact realises the lack of alternatives. Alternatively, an employee may attribute the lack of alternatives to any other factor such as the loss of financial or social rewards, transferability of skills by the information system or a lack of job alternatives.

It was said earlier that PLA and PHS were commonly regarded as a sub-dimension of continuance commitment and that both sub-dimensions correlated strongly positively with one another (Meyer et al., 2002). McGee and Ford (1987) accordingly proposed the inclusion of only the PHS items in the continuance commitment scale and suggested that PLA be regarded as a determinant because it relates directly to the underlying core mechanism that determines continuance commitment.

### **Perceived Skills Transferability**

A second factor that could contribute to the formation of CCC (IS) is PST. In the context of information system change, these skills would refer to the skills needed to operate the new information system. In 2008, organisations continued to invest in new information systems (Petter et al., 2008) in order to become more competitive and to streamline processes towards achieving industry best practice. ERP systems, in particular, provide organisations with numerous best practice processes (Seymour & Roode, 2008). When implementing ERP systems, instead of adapting the system to the specific needs of the business, organisations are also increasingly adopting the off-

the-shelf standard package (Prokopiev, Seymour, & Van Belle, 2006). Global market leaders of ERP software, namely SAP, Oracle and Microsoft – respectively holding 32.8%, 17.5% and 3.5% of the global market share in 2008 (Kerbusk & Schießl, 2009) – provide international standards of best practice. Adopting such a system often requires the organisation to undergo process re-engineering where information technology and information system skills are an important advantage for employees. These employees can then use the new system almost immediately and also require less training. Furthermore, specific information system skills in an internationally recognised system could result in better marketability and thus better career prospects for employees. Information system and also specific system-related skills (e.g., in SAP, Oracle) are also competencies that organisations increasingly advertise when hiring new employees.

Given the importance of information system and specific package-related skills, the perceived transferability of information system skills (e.g., in an internationally accepted system) could become a factor contributing to the formation of CCC (IS). Employees would thus support the information system change based on the costs associated with not learning the new information system. The costs in this case would be the loss of transferable skills. However, as indicated, employees should also be made aware of this fact.

In sum, the above section reviewed two factors that – consistent with the general model of commitment – could serve as determinants of CCC (IS). Accordingly, the following proposition is made.

**Proposition 8. Perceived lack of alternatives and perceived skills transferability explain significant variance in CCC (IS).**

## **PROPOSED OUTCOMES OF USER COMMITMENT**

As indicated earlier, previous research examined the behavioural outcomes of commitment to organisational change (C2C) without placing the resulting behaviours in a wider conceptual framework of work performance including counterproductive work behaviour. According to Klein et al. (2009), counterproductive work behaviour is also an important outcome of commitment. Herscovitch and Meyer's (2002) three-dimensional model of C2C conceptualised behavioural outcomes as focal and discretionary behaviour but neglected to examine counterproductive work behaviour such as specific change-related passive and active resistance. Other studies examined a variety of outcomes such as coping with change, turnover intentions (Cunningham, 2006), individual learning, implementation success and improved performance (Parish et al., 2008).

In order to place the outcomes of user commitment to information system change in a wider conceptual framework of work performance, behavioural outcomes will be defined as task (mere compliance and compliance), citizenship (cooperation and championing) and counterproductive work behaviour towards the organisation and/or individuals. These behaviours can then be regarded as three facets of performance that can be classified across an active-passive and constructive-destructive framework.

### **IS Change-related Task Performance**

The first facet of performance – task performance – generally has two features: First, employee activities or behaviour contributing to the technical core of the organisation and, second, employee activities or behaviour being recognised and rewarded formally as part of the job (Rotundo & Sackett, 2002; Viswesvaran & Ones, 2000). Task performance therefore refers to the effectiveness with which employees contribute to the basic functioning of the organisation (Borman & Motowidlo, 1997).

As discussed earlier, previous studies examined the relationship between C2C and task performance conceptualised as employee compliance with the requirements of the change (i.e. complying with management's directives regarding the change and accepting role changes) (Herscovitch & Meyer, 2002; Meyer et al., 2007). This behaviour can be explained in terms of an individual's commitment to the organisational change initiative. In accordance with the general model of commitment

(Meyer & Herscovitch, 2001), compliance refers to focal behaviour aimed at meeting the minimum requirements of a change (e.g., doing what is required). Later, Meyer et al. also distinguished between compliance and mere compliance to denote doing *only* what is required as an additional measure of focal behaviour. Empirical findings indicate that all three dimensions of C2C correlate positively with compliance and mere compliance (Herscovitch & Meyer; Meyer et al.). With reference to information system change, task performance will therefore be conceptualised as a two-dimensional compliance construct comprising mere compliance and compliance.

According to Klein et al. (2009), more research is needed on the linkage between theory on organisational change management and C2C. As indicated earlier, in the information system literature, information system success is widely defined by six factors: System quality, information quality, service quality, net benefits, user satisfaction and, as a behavioural consequence, use (DeLone & McLean, 1992; Petter et al., 2008). According to Petter et al., the information system literature is also experiencing problems understanding and measuring the information system use construct. By placing information system use in the wider, well-established framework of workplace performance, more light can be shed on its nature and interrelationships.

It can thus be concluded that – on an individual level of analysis – task performance, conceptualised as compliance with the information system change, relates directly to system use. It is consequently an important element of information system success. However, mere information system use does not necessarily imply overall information system success with regard to implementation success on an organisational level of analysis. Petter et al. (2008) maintain that most research in the technology acceptance literature has focused only on the individual level of analysis. As a result, the impact of a new information system on an organisational level is little understood and requires further exploration. According to Petter et al., asking information system users may also not be the best approach, and they suggested that organisational net benefits could be established by asking senior managers or by consulting data in annual reports. Thus, in order to capture fully the success of an information system implementation, the other elements of information system success

on an organisational level should also be considered (e.g., information system change project on time and on budget).

### **IS Change-related Organisational Citizenship Behaviour**

The second facet of performance, organisational citizenship behaviour (OCB), was originally conceptualised as discretionary intentional employee behaviour – not recognised formally but nonetheless still improving organisational performance (Dalal, 2005; Podsakoff & MacKenzie, 1997). Many terms, including supra-role behaviour (Schnake, 1991), prosocial organisational behaviour, extra-role behaviour and organisational spontaneity, were used to define such behaviour (Van Dyne, Graham, & Dienesch, 1994). Not being enforceable (Organ, 1997) and going beyond formal role or task requirements (Miles, Borman, Spector, & Fox, 2002; Smith, Organ, & Near, 1983), they contribute positively to organisational success (Rotundo & Sackett, 2002). Although discretionary behaviour is often subtle and difficult to measure (Smith, Organ, & Near), it is nevertheless considered essential for effective organisational functioning in a business environment characterised by flat organisational structures, global competition, and increased employee autonomy and responsibility (Hoffman, Blair, Meriac, & Woehr, 2007). The citizenship behaviour of an implementation team thus helps influence information system success (Yen, Li, & Niehoff, 2008). Examples of OCB include helping co-workers or attending functions that are not required formally as part of the job description (Lee & Allen, 2002).

Despite a lack of consensus on the underlying dimensionality of citizenship-like behaviour (Podsakoff, MacKenzie, Paine, & Bachrach, 2000), previous research generally conceptualised OCB as a multidimensional construct (Sackett, Berry, Wiemann, & Laczko, 2006). Originally conceptualised by Smith, Organ and Near (1983), it comprised two underlying dimensions: Altruism (helping other individuals in the organisation) and generalised compliance (following organisational rules and regulations) (LePine, Erez, & Johnson, 2002). An extended five-dimensional model was later proposed consisting of sportsmanship, civic virtue, conscientiousness, courtesy and altruism (Hoffman et al., 2007). Later, another two dimensions complemented the model: peacekeeping and cheerleading (Podsakoff, Whiting, Podsakoff, & Blume, 2009). Nonetheless, despite this multidimensionality, OCB can generally be divided into behaviour directed towards individuals, conceptualised as

OCB (I) (e.g., altruism, courtesy, peacekeeping and cheerleading) and to an organisation, conceptualised as OCB (O) (conscientiousness, civic virtue and sportsmanship) (Podsakoff et al.). Computing an aggregate OCB score from the underlying facets is also common (Sackett et al.).

As discussed earlier, previous studies examined discretionary behaviour, conceptualised as cooperation and championing as outcomes of C2C (e.g., Herscovitch & Meyer, 2002; Meyer et al., 2007). Discretionary behaviour in the context of organisational change refers to behaviour at the discretion of the employee, that is, doing more than is required formally. Accordingly, Herscovitch and Meyer called this behaviour cooperation (i.e. being tolerant of temporary disruptions and/or ambiguities in the job) and championing (i.e. encouraging the participation of others in the change). As shown previously, empirical findings indicated that only ACC and NCC correlated positively with cooperation and championing. CCC was uncorrelated, or negatively correlated, implying that employees with a predominant continuance commitment profile restricted their performance to the minimum requirements (Herscovitch & Meyer; Meyer et al.).

With regard to an information system change, both cooperation and championing would therefore represent facets of OCB. The reason for merging these two constructs into one OCB construct is twofold.

First, the performance literature distinguishes only conceptually between task, OCB and counterproductive behaviour. Cooperation and championing would thus both represent related underlying facets of OCB.

Second, previous empirical studies on the factor structure of compliance, cooperation and championing showed that the three dimensions were not clearly distinguishable from each other (e.g., Herscovitch & Meyer, 2002). Cooperation was also found to exhibit borderline internal consistency ( $\alpha = .71$ ) (Meyer et al., 2007). A Southern African study found that the dimensions were distinguishable only after the removal of several items (Schneider & Bagraim, 2006).

Therefore, as Herscovitch and Meyer (2002) recommended, the behavioural support items require refinement. An inspection of the individual cooperation and championing items indicated that they could be divided into behaviour towards the organisation (OCB (O)) and towards individuals (OCB (I)).

In the context of an information system change, OCB is accordingly conceptualised as a two-dimensional construct consisting of two underlying facets: Behaviour towards the organisation (OCB (O) or cooperation) or towards individuals (OCB (I) or championing).

### **IS Change-related Counterproductive Work Behaviour**

The final facet of performance is intentional employee behaviour that is harmful to organisational interests (Dalal, 2005). Counterproductive work behaviour (CWB), or workplace deviance, includes deliberate actions by individuals to violate central organisational policies and procedures. Accordingly, they harm the organisation and its members (Bordia, Restubog, & Tang, 2008; Kelloway, Loughlin, Barling, & Nault, 2002; Martinko, Gundlach, & Douglas, 2002). These unethical and destructive behaviours do occur and are very costly to organisations (Stewart, Bing, Davison, Woehr, & McIntyre, 2009). They can take many forms such as theft, fraud, absenteeism, destruction of property, misuse of information, misuse of time and resources, poor quality of work, as well as physical and verbal aggression (Marcus & Schuler, 2004; Sackett, 2002). CWB was found to correlate negatively with OCB and to represent a distinct construct (Sackett et al., 2006). Behaviours that are negative for organisational effectiveness have also been included in job performance (Viswesvaran & Ones, 2000). Previous studies (e.g., Herscovitch & Meyer, 2002; Meyer et al., 2007), however, neglected to examine this third facet of performance in relation to C2C. Nevertheless, similarly to championing, it can be speculated that both ACC and NCC will be negatively correlated and that CCC (IS) will be uncorrelated with CWB. This would indicate that staff members with strong continuance commitment would restrict their performance to the minimum job requirements. On the positive side, however, such employees would also not engage in CWB.

In the literature on CWB, it has become popular to distinguish between interpersonal (CWB (I)) and organisational deviance (CWB (O)) (Berry, Ones, & Sackett, 2007). CWB (I) refers to deviant behaviour that is directed towards individuals in the organisation (e.g., making fun of someone at work) while CWB (O) refers to deviant behaviour that is harmful to the organisation (e.g., coming late to work without permission) (Bennett & Robinson, 2000). Other authors (e.g., Spector et al., 2006) have conceptualised CWB beyond these two categories and have included dimensions such as abuse against others, production deviance and sabotage, theft and withdrawal. Broadly speaking, however, these dimensions can still be categorised as CWB (I) and CWB (O) ranging from minor to serious actions (Robinson & Bennett, 1995).

The general items of the interpersonal and organisational deviance scale (Bennett & Robinson, 2000) or the items of an OCB scale (Van Dyne et al., 1994) (opposite of obedience, loyalty and participation) can be adapted to the specific situation of an information system change. CWB in the context of information system change is thus conceptualised as a CWB construct that can be directed towards individuals (CWB (I)) or an organisation (CWB (O)).

### **Towards a Complete Typology of IS Change-related Behavioural Outcomes**

The above three facets of performance can be classified further into a complete typology of behavioural outcomes by categorising them as constructive-destructive and active-passive. A recent critique of the three-component model suggested categorising outcomes of commitment in a complete typology of resulting organisational behaviour (Solinger et al., 2008). In order to capture fully the behavioural outcomes of commitment, facets could be classified across two dimensions: constructive-destructive and active-passive (Hagedoorn, Van Yperen, De Vliert, & Buunk, 1999). Accordingly, with regard to the three facets of performance, not only behaviour in the constructive-active-passive quadrants (e.g., compliance and championing) could be seen as outcomes but also behaviour in the destructive-active-passive quadrants (e.g., CWB). This implies that CWB could be further classified into active and passive resistance towards both an organisation and individuals.

In sum, in order to place the behavioural outcomes into a complete set of behaviour, the three facets of performance, namely task performance (mere compliance and compliance), citizenship (cooperation and championing) and counterproductive work behaviour (CWB (O)) and CWB (I)), can be regarded as outcomes of user commitment to IS change. As a consequence of using CP as a determinant, only the predictive relationships between ACC (IS) and CCC (IS) and the behavioural outcomes were examined (see Figure 3.1).

Based on previous research, ACC (IS) is proposed to correlate positively with mere compliance, compliance, cooperation and championing. It is proposed that CCC (IS), in turn, correlates positively with mere compliance and compliance but may correlate negatively, or be uncorrelated, with cooperation and championing.

To date, no study has examined the relationship between the dimensions of C2C and change-related counterproductive work behaviour (CWB). Based on the wider commitment literature, however, it can be proposed that a negative correlation exists between ACC (IS) and CWB (O) and CWB (I). Conversely, CCC (IS) may be positively correlated, or uncorrelated, with CWB. Thus, the inclusion of CWB could clarify the role of CCC (IS) in the context of an information system change: In other words, are employees who are predominantly committed to information system change in terms of CCC (IS) restricting their behaviour to the minimum support only, or are they also potentially engaging in information system-related CWB?

Finally, as discussed earlier, previous research (e.g., Herscovitch & Meyer, 2002) found that the dimensions of commitment to change also interact to influence behaviour: The relationship between ACC (IS) and behaviour will be stronger when CCC (IS) is weak rather than strong. Conversely, the relationship between CCC (IS) and behaviour will be stronger when ACC (IS) is weak. Accordingly, as shown in Figure 3.1, the following propositions are made.

**Proposition 9. ACC (IS) relates positively to IS change-related mere compliance and compliance.**

**Proposition 10. ACC (IS) relates positively to IS change-related organisational citizenship behaviour towards an organisation (cooperation) and individuals (championing).**

**Proposition 11. ACC (IS) is unrelated, or negatively related, to IS change-related counterproductive work behaviour towards an organisation (CWB (O)) and individuals (CWB (I)).**

**Proposition 12. CCC (IS) relates positively to mere compliance and compliance.**

**Proposition 13. CCC (IS) is unrelated, or negatively related, to IS change-related organisational citizenship behaviour towards an organisation (cooperation) and individuals (championing).**

**Proposition 14. CCC (IS) is unrelated, or positively related, to IS change-related counterproductive work behaviour towards an organisation (CWB (O)) and individuals (CWB (I)).**

**Proposition 15. ACC (IS) and CCC (IS) interact to predict IS change-related mere compliance, compliance, cooperation, championing, CWB (O) and CWB (I) behaviour.**

This section proposed the behavioural outcomes of user commitment to IS change. In addition, the proposed relationships between ACC (IS) and CCC (IS) and the proposed outcomes were derived and specified. Interestingly, compliance as a consequence represents an important information system success factor: use (DeLone & McLean, 1992). Stated differently, an information system cannot be effective unless it is used (Mathieson, 1991).

In sum, this chapter expands on the previous chapter by using relevant aspects of the change and specific information system change literature. By combining findings from focus group discussions and the additional literature, an explanatory model was developed that proposes a set of determinants and outcomes of user commitment to mandatory information system change.

The propositions regarding the determinants of affective user commitment are arguably the most important. The results of the study will help determine whether the proposed determinants indeed significantly influence affective user commitment, their relative importance, and how much of the variance in affective user commitment could be explained.

## **CHAPTER 4: METHOD**

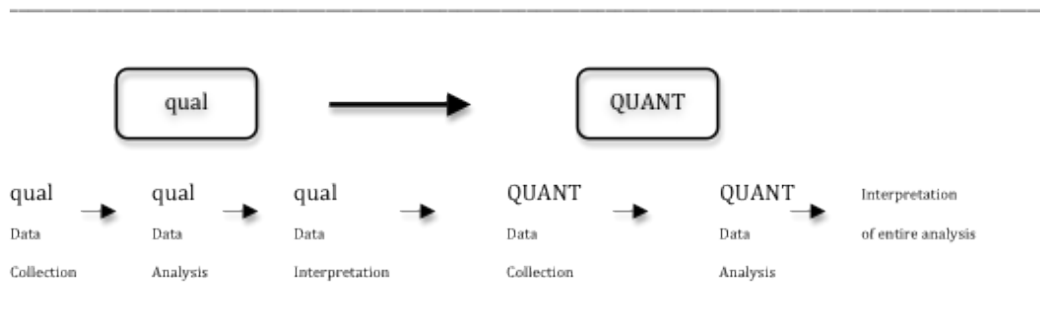
The purpose of this study was to develop and test an explanatory model of the determinants and outcomes of user commitment to information system change. The previous chapters reviewed the relevant literature and presented an explanatory model. This chapter describes how the research was conducted and its context: The first part presents the research design of the study; the second describes the research context; the third describes the sampling procedures; the fourth describes the characteristics of the research participants; the fifth describes the measures used; and the sixth part describes the rationale for the decisions taken for the statistical analysis of the quantitative data.

### **RESEARCH DESIGN**

A mixed-methods approach was applied (Creswell, 2003), combining both quantitative and qualitative components in a single study (Bergman, 2008). More specifically, a quantitative survey method was combined with a qualitative research method incorporating focus group discussions. Although this approach is fairly novel in the human sciences (Creswell), it has experienced a significant increase in popularity in recent times (Bergman). It can also be referred to as a pluralist approach (Mingers, 2001). A mixed-methods approach was used so that methods rooted in different research paradigms could be applied.

First, collecting diverse types of data promotes a better understanding of the research problem (Creswell, 2003). Second, richer and more reliable results can be obtained if methods from different paradigms are combined (Mingers, 2001). Third, a mixed-methods approach makes provision for both the exploration and explanation of a research problem (Creswell). Following Creswell, the study comprised two phases in a sequential explanatory design (Figure 4.1).

**Figure 4.1: Visual Model of a Mixed-methods Research Strategy**



Note. qual = qualitative sequence; QUANT = Quantitative sequence; Capital letters of QUANT indicate that this method represents the dominant research method in this study. Adapted from Creswell (2003).

During the first phase, focus group discussions (Kamfer, 1989) were conducted to collect qualitative data in terms of a research paradigm that could be described as constructivist. Grounded in this paradigm, the questions and answers in the discussions were open ended, allowing for themes to emerge. The purpose of this phase was twofold: First, to explore how the employees felt and thought during an information system change (Krueger & Casey, 2000); second, to confirm the findings of the theory driven literature review that underpinned the development of the explanatory model. The findings of the discussions thus also guided the inclusion of variables in the chapter proposing the determinants and outcomes of user commitment to information system change. Content analysis was used to extract emerging themes (Weber, 1990).

The second phase comprised a quantitative, cross-sectional survey at the individual level of analysis, and the survey included employees who had recently participated in an information system change. A self-administered questionnaire was administered as it is the most widely used data collection method in commitment research. The method paradigm can be described as post-positivism (Creswell, 2003). Positivism holds that knowledge is objective, measurable and guided by fundamental laws of human nature (Goles & Hirschheim, 2000). The survey questions were predetermined, and the answers were self-reported, closed-ended responses. The purpose of this second phase was to expand the findings of the first phase by testing

the proposed explanatory model against a larger sample of empirical data. The numerical data collected were analysed statistically.

In the study, priority was given to the second phase, and the quantitative method therefore constitutes the dominant method in the study (Creswell, 2003). Given the dominance of quantitative methods in commitment research, the qualitative sequence enriched the findings of the study.

## **RESEARCH CONTEXT**

Because the study was conducted in Namibia – a developing country in Africa that may be unfamiliar to many readers – an overview of the national context and its institutional setting will be given. The organisational context of the respondents will also be described.

### **National Context**

Namibia, previously under South African administration and also a former German colony, gained its independence in 1990. The capital is Windhoek, a city with some 306 000 inhabitants (Economist Intelligence Unit, 2010). The country with two Atlantic Ocean ports, Walvisbay and Lüderitz Bay, is located in the southwest of Africa, bordered by Angola in the north, Botswana in the east and by South Africa in the south. Other neighbours are Zambia and Zimbabwe in the northeast. The small population of 2.17 million (2009) is dispersed over a large area of 824 269 square kilometres (Economist Intelligence Unit). The official language of Namibia is English although most people speak Oshiwambo or Afrikaans followed by Otjihero and Damara/ Nama. A small minority speaks German.

Namibia's economy differs from most other economies (Sherbourne, 2010): First, Namibia's income inequality (Gini-coefficient of 0.6 in 2003/2004) is greater than that of any other country, including South Africa. Namibia is an upper middle-income country with significant unemployment (51.2% in 2008 - Sherbourne) and many people living in poverty (28% poor households in 2003/2004 – Sherbourne). Second, Namibia's currency, the Namibian dollar is pegged to the South African rand, and, because South Africa's economy is 40 times larger than Namibia's, South Africa's economic policy has a major impact on the Namibian economy. Third, Namibia

generates more savings than it can productively invest locally and consequently experiences capital outflow. Finally, the economy depends on a few main generators of income, namely diamonds, uranium, meat and beer. According to the World Economic Forum, Namibia is ranked 74 out of 133 countries in its Global Competitiveness Index. In Africa, Namibia is ranked seventh, below Tunisia (40<sup>th</sup>), South Africa (45<sup>th</sup>), Mauritius (57<sup>th</sup>), Botswana (66<sup>th</sup>), Egypt (70<sup>th</sup>) and Morocco (73<sup>rd</sup>) (Sherbourne).

Although Namibia has experienced positive economic growth almost every year since independence, levels of poverty and inequality have not significantly declined. According to Sherbourne (2010), the current challenge for Namibia is increasing the incomes of the poorest while achieving national prosperity without undermining fundamental freedoms. In 2001, the average life expectancy of a Namibian woman was 50 years (48 years for the men). Namibia has one of the world's highest HIV/AIDS prevalence rates in the adult population (HIV prevalence rate 17.3% in 2008) (Sherbourne).

Similarly to other countries following independence, Namibia's public sector offered government a quick way of creating jobs, but this also resulted in an excessively large public sector. In 2004, Namibia's total employed population was 385 329, and public sector employees (government and state-owned enterprises) accounted for 86 161 of this number, that is, 22% of all employees in Namibia. In comparison, private sector employees (194 516) made up 50% of all employed people (Sherbourne, 2010). Concerning the private sector, apart from the mines, only a few large organisations employ in the region of 5 000 employees such as the Olthaver & List and the Pupkewitz Group. Most private sector employees are employed in small to medium-sized enterprises.

Linked to the rapid growth of the public sector are state-owned enterprises (SOEs) or 'parastatals'. The number of SOEs grew from under 10 in 1990 to almost 70 in 2007. The SOE sector remains largely outside public scrutiny or market discipline resulting in inward-looking, inefficient companies with often worrying overall performance trends (Sherbourne, 2010).

## **Organisational Context**

Contracting with organisations to conduct the study proved challenging. According to Jaros (2010), researchers examining commitment to organisational change should pay careful attention to the change context. It was accordingly decided to target employees who had recently participated in an information system change. The first difficulty was to find Namibian organisations with large numbers of information system users that had recently implemented a mandatory new information system. Because some questions in the questionnaire referred specifically to the features of a new information system (e.g., information quality, perceived ease of use and perceived usefulness), the respondents had to be familiar with the system. A sampling frame of up to one year after going live with a new enterprise resource planning (ERP) system was adopted. A second difficulty was that some of the ERP implementations were regularly postponed. In 2009, 13 organisations meeting the inclusion criterion were identified, and ten agreed to participate. Although two organisations (a large private sector bank and a postal service) agreed to participate, their ERP implementations were postponed. Eight organisations were therefore included in the survey, and it was not possible to balance the number of private and public sector respondents. According to Johan de Meyer (personal communication, April 2009), a senior SAP consultant from GijimaAST (a company specialising in ERP implementations), most large ERP implementations in the Namibian private sector had been completed before this study (e.g., the mines, the Olthaver & List Group). The public sector lagged behind and had only recently conducted ERP implementations. For example, according to Dasa Padachi (personal communication, April 2009) Managing Director from Silnam Namibia (a company specialising in ERP implementations in the public sector), all government ministries had been equipped with an Oracle ERP from 2007 onwards.

The respondents in the study were consequently mainly from the public sector (Table 4.1). The survey was conducted at a time where SOEs were increasingly criticised for their poor performance by the Namibian government as well as the public. The government is currently planning to introduce performance management and also performance-related pay for the staff members, particularly for SOE executives.

## PROCEDURES

This part describes the sampling procedures followed during the qualitative and quantitative sequences of the study.

### **Focus Group Procedures**

A purposeful sampling method was used to prepare for the focus group discussions (Creswell, 2003). According to Jaros (2010), participants in a commitment to change study should be carefully selected. The participants in the present study were selected on the basis that they were all experiencing the implementation of a new information system. The research population thus comprised employees who had recently – within a sampling frame of one year – received a mandatory new information system. From this population, a convenience sample (Creswell) of easily accessible employees was drawn. After obtaining written ethical clearance for the focus group discussions from the Ethics Board of the Faculty of Commerce at the University of Cape Town (see Appendix E for the ethical clearance certificate), a diverse Namibian organisation in the agricultural sector that had recently implemented a new information system was asked to participate in the study.

After obtaining written permission from the head of the division concerned, a list of relevant participants in four Namibian locations of the organisation was secured. The total number of possible locations with affected staff members was eight sites throughout the country. A purposeful sampling method was employed (Creswell, 2003) to ensure a focus group size with at least five participants sharing the same experiences of the new information system (some locations had only one or two affected staff members). The participants were asked to participate in the focus group discussions by the personal assistant of the head of the division on the respective dates. Five one-hour focus group discussions were held with staff members during June and September 2008, at their respective offices. The number of participants per focus group ranged from six to seven participants. At the beginning of the individual focus group discussions, the researcher and author of this thesis, who also acted as the moderator, explained that participation was voluntary and that no names would be recorded. As suggested by Krueger and Casey (2000), care was taken to ensure that the supervisors or managers of the involved participants were not present. During the sessions, the researcher posed the individual questions, which were then discussed by

the participants. The responses during the individual sessions were taken down as field notes by the researcher. After the sessions, the participants completed an anonymous sheet eliciting basic demographic details (gender, age, home language, organisational tenure and highest qualification).

The field notes were then examined, categorised and summarised in terms of major themes. In line with Krueger and Casey's (2000) view that the purpose of focus group discussions is to inform analysis, it was decided to conduct content analysis (Weber, 1990) to categorise the findings in terms of major themes. To achieve this, the long-table approach (Krueger & Casey) was used to identify themes and to categorise results. From the analysis, four major themes emerged, which were reported in the previous chapter.

### **Survey Procedures**

As was the case with the focus group discussions, the population in the survey sample consisted of employees who had recently – within a sampling frame of one year – experienced a new information system. From this population, a non-probability, or convenience, sample was drawn based on the accessibility of the participants (Creswell, 2003).

After developing and designing the measuring instrument, written ethical clearance was obtained from the Ethics Board of the Faculty of Commerce at the University of Cape Town (see Appendix E for a copy of the ethical clearance certificate).

At the same time, 13 Namibian organisations that had implemented a new information system were approached to participate in the study. The organisations were selected on the grounds that they had implemented a new information system within the sampling frame of one year. Contact was made either by email or personally with the responsible information system implementation or project manager. As part of the first contact, a written one-page summary of the proposed research was submitted to the project manager. Of the 13 organisations, ten agreed to participate. In the end, only eight organisations participated because IS implementation were postponed. The number of information system users per site ranged from 30 to 620 (Table 4.1). The

names of the ERP systems were SAP, Oracle, HansaWorld, eVenus, MS Dynamics GP and SAGE Accpac X3.

After obtaining written permission from the information system project manager, survey questionnaires were distributed to the users of the new information system. Participation in the survey was voluntary and unpaid. As an incentive, however, a small donation for each fully completed questionnaire was made to a charity of choice in the first phase; in the second data collection phase, a N\$500 cash prize was offered to the lucky winner. On the first page of the survey questionnaire, the participants were assured of the confidentiality of the survey, and they were told not to write their names on the questionnaires.

The participating organisations – through the responsible project managers – were given two options concerning the survey: The participants (employees) could either complete the survey in paper form or online by logging onto the SelectSurveyASP platform hosted by the Faculty of Commerce IT Department at the University of Cape Town. Seven of the eight organisations preferred the self-administered paper survey questionnaire (a 12-page A5 booklet). In these cases, multiple sealed survey return boxes were placed at safe and accessible places (e.g., at reception).

The IT manager of one organisation – a pension fund administrator – preferred to do the survey online. In this case, the participants were emailed a link so that they could complete the survey online. The organisation did not offer their employees open access to the Internet, and therefore links to the specific webpage were opened. Upon completion of the online survey, the responses were added to a database. In order to ensure confidentiality, no Internet protocol (IP) addresses and email addresses were saved. However, those participants who wanted to participate in the prize draw could save their email address, and, in such cases, too, confidentiality was assured.

The data collection process for all eight organisations extended over a four-week period. The process differed slightly between the first data collection period in August 2009 and the second period during November 2009. The reason for the modification was the poor response rate from the municipality in the first phase.

### **First Survey Data Collection Period**

Concerning the first period of the data collection during August 2009, the IT manager of the municipality emailed a formal advance note to the 600 users of the new ERP system (Appendix D, first data collection period). Although the researcher requested direct access to the mailing list, the municipality preferred to act as the intermediary. The advance note contained details of the survey and also confirmation that the municipality had approved the questionnaire. This note was emailed during the first week of the four-week data collection period. Approved A3 posters informing employees about the research study were also put up on various organisational notice boards. The wording of the posters was similar to that of the advance note. At the beginning of the second week, the survey questionnaires were handed out, either personally by the researcher or by 30 specified distributors (mostly supervisors and managers) in the organisation. A first reminder was emailed to all the users (participants) at the end of the first week, and a second and third reminder were emailed to the users during the third and final weeks, respectively (Appendix D). At the end of the four-week period, the response rate was disappointing, and, in a final attempt to improve the rate, the researcher asked the IT manager to email the link of the online survey to all users. After approval of the online survey, the IT manager emailed a reminder from the researcher (including the link) to all users (Appendix D). The response to the online survey did not significantly improve the final response rate of 21%. Interestingly, following the same procedure as with the municipality, a much higher response rate (55%) was obtained from a private sector retailer and with much less effort.

### **Second Survey Data Collection Period**

Because of the poor response rate in the first period, it was decided to alter the process during the second period of the data collection by approaching the users directly. It was also decided to change the incentive from the small donation to participation in a random cash prize draw. The researcher obtained confidential access to the mailing lists of the users, but, to ensure confidentiality, he signed a non-disclosure form with each organisation (Appendix D, second data collection period). During the first week of the collection period, a personalised advance note was emailed to all the users (Appendix D). In the following week, the author of this thesis distributed the survey questionnaire personally to all the users (participants). He did

this by walking through the various office buildings starting from the top. Sealed survey return boxes were placed at safe, central locations. At the end of the second week, a first personalised reminder was emailed to the users. In weeks three and four, a further two personalised reminders were emailed (Appendix D). By the end of November 2009, a total of 279 usable survey questionnaires were returned, resulting in an overall response rate of 28%.

## **PARTICIPANT CHARACTERISTICS**

The participants in this study consisted of 310 staff members who had recently received a new information system. The focus group sample in the qualitative data collection phase comprised 31 participants, and, in the quantitative phase, the survey sample comprised 279 participants.

### **Focus Group Participants**

The participants in the focus group discussions were from the livestock division of a diverse agricultural organisation (private sector) with staff members throughout Namibia. A total of 31 private sector employees (total number of employees: approximately 450) agreed to participate in the focus group discussions on the implementation of the new information system. Approximately 72% of the participants were men and 21% women (the remainder did not declare their gender) with an average age of 36 years and an average organisational tenure of roughly seven years. Concerning home language, 96.8% of the participants stated Afrikaans and 3.2% English. With regard to highest educational level, 9.1% declared a university degree, 51.5% a Grade 12 certificate (senior school-leaving certificate) and 33.3% less than a Grade 12 qualification.

### **Survey Participants**

Survey questionnaires were distributed to 967 employees across eight Namibian organisations (Table 4.1) excluding the organisation whose employees participated in the qualitative sequence of the research. Two organisations were from the private sector, one organisation was a municipality, and the remaining organisations were state-owned enterprises (parastatals). The organisations were small to medium sized with the number of employees ranging from 50 to 2 000. In total, 279 questionnaires were returned, resulting in a response rate of 28.85%. Of the 279 questionnaires, 240

with usable data were retained. The majority of the participants in the revised sample were from a municipality (47%) followed by state-owned enterprises (35%) and the private retail sector (17%). More than 80% of the participants therefore came from the public sector.

**Table 4.1: Research Sites**

Site	Information System Type	Survey Period	Number of Users	Number of Responses	Response Rate
Municipality***	eVenus ERP	August 2009	600	130	21.67%
Retailer*	HansaWorld ERP	August 2009	40	22	55.00%
Pension Fund Provider**	Oracle ERP	November 2009	109	43	39.45%
Financial Services**	SAP ERP	November 2009	8	6	75.00%
Financial Services**	SAP ERP	November 2009	32	17	53.13%
Financial Services**	SAGE ERP X3	November 2009	98	30	30.61%
Retailer*	SAP ERP	November 2009	55	19	34.55%
Airline**	MS Dynamics GP	November 2009	25	12	48.00%
<b>Total</b>			<b>967</b>	<b>279</b>	<b>28.85%</b>

Note. \*Private sector; \*\*State-owned enterprise (parastatal); \*\*\*Public sector.

In this final sample, 46.3% of the participants were men, 52.5% were women, and 1.3% did not declare their gender. The participants ranged in age from 20 to 60 years with a mean age of 35.10 ( $SD = 8.11$ ) (5.8% did not declare their age). Home language was 36.3% Afrikaans, 19.2% English, 17.5% Oshiwambo, 9.6% other (1.3% did not declare their home language), 8.3% Otjiherero, 7.9% Damara>Nama. Concerning qualification level, 5.8% of the participants declared that they had less than a Grade 12 (senior school-leaving certificate), 20.8% a Grade 12, 31.7% a diploma/certificate, 32.9% a Bachelor's degree, 5.4% a Master's degree, and 1.7% declared another qualification (1.7% did not declare their highest qualification). Organisational tenure ranged from 0 to 35 years with a mean tenure of 7.40 years ( $SD = 6.49$ ) (3.8% did not declare tenure). Concerning organisational level, 7.9% of the participants were in top management, 28.7% in middle management, 33.3% supervisory staff and 25.8% general staff (4.2% did not declare their organisational level). New information system tenure ranged from 0 (7.1%) to 48 months (0.4%) with a mean of 9.11 months ( $SD = 8.24$ ) (5.8% did not declare how long they had

been working with the new information system). To ensure confidentiality, the location of the participants was not listed, but most were from Windhoek.

## MEASURES

Measures in the study comprised questions that were asked in the focus group discussions, as well as measurement scales in the survey questionnaire.

### Focus Group Measures

A total of nine questions were posed in the focus group discussions ranging from introductory (two questions), to key (five questions) to conclusive questions (two questions). Example of a key question: “What can (the organisation) do to increase support for the new information system?” (see Appendix A for a full schedule of questions).

### Survey Measures

The survey questionnaire contained 134 questions divided into eight sections (Appendix A). Following the psychometric analyses, several scales were shortened. As a consequence, only 104 items were retained in the final analysis. The items in the questionnaire were adapted from previous research and, unless stated, were unchanged from the original scales. To avoid confusion, whenever applicable, scales were reworded to reflect an information system change. According to Jaros (2010), using the wording of the specific organisational change in the items in the questionnaires reflects best practice. Unless otherwise indicated, the responses were measured on a continuous five-point Likert scale ranging from one (*fully disagree*) to five (*fully agree*).

### Affective and Continuance User Commitment to Mandatory Information System Change (ACC (IS) and CCC (IS))

Affective (six items, e.g., “I believe in the value of the information system change”) and continuance (four items, e.g., “Resisting the information system change is not a viable option for me”) user commitment to information system change was adapted from the original 18-item instrument by Herscovitch and Meyer (2002). The original items by Herscovitch and Meyer refer to an ‘organisational change’. In this study, the

items were adapted to reflect an ‘information system change’. The coefficient alphas of the affective and continuance scales were .93 and .59, respectively.

### **Commitment Propensity (CP)**

Four items from Herscovitch and Meyer (2002) (e.g., “I feel an obligation to support the information system change”) measured commitment propensity ( $\alpha = .90$ ).

### **Information System Change Involvement**

Three sub-scales containing a total of 15 items measured IS change involvement ( $\alpha = .92$ ): Quality of change communication ( $\alpha = .87$ ) (five items, e.g., “The official information about the information system change gave me as much information as possible”) (Bordia et al., 2004), participation ( $\alpha = .88$ ) (four items, e.g., “Steps were taken to involve me at an early stage in the information system change process”) (Lines, 2004) and training ( $\alpha = .94$ ) (six items, e.g., “My level of understanding was substantially improved by going through the training programme”) (Amoako-Gyampah & Salam, 2004).

### **Information System Change Value**

IS change value ( $\alpha = .92$ ) was measured by a seven-item instrument with two sub-dimensions, namely perceived usefulness ( $\alpha = .95$ ) (four items, e.g., “I find the new information system to be useful in my job”) (Venkatesh & Davis, 2000) and information quality ( $\alpha = .92$ ) (three items, e.g., “I feel the output of the information system is reliable”) (Wang, 2008). Because of construct redundancy with perceived usefulness, perceived ease of use (measured by a scale adapted from Venkatesh & Davis) was not included in the analysis.

### **Information System Change Climate**

IS change climate ( $\alpha = .90$ ) was measured by two sub-dimensions, namely overall change fairness ( $\alpha = .89$ ) (three items, e.g., “Overall, I am treated fairly regarding the information system change”) (adapted from Amrose & Schminke, 2009) and change leadership ( $\alpha = .93$ ) (seven items, (e.g., “My leader developed a clear vision for what was going to be achieved by our work unit”) (Herold et al., 2008). Because of construct redundancy with some of the other determinants, facilitating conditions

(measured by a scale adapted from Venkatesh et al., 2003) was not included in the analysis.

### **Perceived Skills Transferability (PST)**

Perceived skills transferability ( $\alpha = .85$ ) was adapted from two items from Bagraim (2004). A sample item was: “My skills and experiences with the new information system would be useful to another organisation”.

### **Mere Compliance, Compliance, Cooperation and Championing**

Nineteen items adapted from Herscovitch and Meyer (2002) measured the constructive behavioural outcomes in this study: Mere compliance ( $\alpha = .88$ ) (three items, e.g., “I will only work on information system change-related activities that are directly relevant to my job”), compliance ( $\alpha = .81$ ) (three items, e.g., “I will adjust the way I do my job as required by the information system change”), cooperation (OCB (O)) ( $\alpha = .89$ ) (nine items, e.g., “I will avoid former practices, even if they seem easier”) and championing (OCB (I)) ( $\alpha = .92$ ) (four items, e.g., “I speak positively about the information system change to outsiders”).

### **Counterproductive Work Behaviour (CWB)**

IS-related counterproductive work behaviour was measured by nine items adapted from Van Dyne et al. (1994). This scale comprised counterproductive work behaviour towards the organisation (CWB (O)) (three items, e.g., “I work slower on the new information system than I could”) and towards individuals (CWB (I)) (six items, e.g., “I have difficulties cooperating with others on working with the new information system”). The coefficient alpha of the CWB (O) and CWB (I) scale were .93 and .85, respectively.

### **Control Questions**

Control questions in the study comprised participant self-reported as well as indirect measures. According to Jaros (2010), controls regarding the employees and the change type should be included when examining C2C. Because the participants were from different organisations with different types of new information systems, several control questions were included: First, AOC ( $\alpha = .90$ ) (four items, e.g., “I feel a

strong sense of belonging to this organisation”), COC ( $\alpha = .86$ ) (four items, e.g., “Too much of my life would be disrupted if I decided that I wanted to leave this organisation now”) and NOC ( $\alpha = .89$ ) (four items, e.g., “I would violate a trust if I quit my job with this organisation now”) (Bagrami, 2004). The purpose of including the three dimensions of organisational commitment was twofold: First, to examine whether user commitment to information system change can be distinguished from organisational commitment and, second, whether user commitment is indeed a better predictor of change-related behaviour (also recommended by Jaros).

Second, change significance (one item) (e.g., “How significant is the information system change for your organisation?”). The responses were measured on a five-point Likert scale ranging from one (*extremely minor*) to five (*extremely major*).

Third, change impact on job performance, climate in the organisation, and non-work life ( $\alpha = .77$ ) (three items) (e.g., “To what extent will the information system change affect the performance in your job?”) (Herscovitch & Meyer, 2002). The responses were measured on a five-point Likert scale ranging from one (*large negative effect*) to five (*large positive effect*).

Fourth – in order to control for a possible threat to employment by the new information system – information system job insecurity was measured by one item adapted from De Witte (1999) (“How large, in your opinion, is the possibility that you will become unemployed in the near future because of the new information system?”). The responses were measured on a five-point Likert scale ranging from one (*very small*) to five (*very large*).

Finally, information system tenure was measured by an item developed for the study: “For how many months have you been working on the new information system?”. The answers were given by writing the number of months in a textbox provided in the questionnaire.

Two additional indirect controls were added to the above control questions: Whereas employee self-report measured the above control questions in the survey

questionnaire, the organisation (categorical variable: Organisation one to eight) and ERP system type (categorical variable, e.g., SAP = 1, Oracle = 2) were also accounted for.

### **Individual Differences**

To control for individual differences with regard to the new information system, several personal variables were included: First, self-efficacy ( $\alpha = .95$ ) (eight items, e.g., “I will be able to achieve most of the goals that I have set form myself”) (Chen et al., 2001). Second – as a personal disposition – positive ( $\alpha = .90$ ) (five items, e.g., “In general, I feel determined”) and negative affect (five items, e.g., “In general, I feel irritable”) (Watson, Clark, & Tellegen, 1988). In the analysis, only positive affect was retained. Finally, basic demographic questions included gender (measured by two categories: ‘Male’ or ‘Female’), age (written in a text box), home Language (measured by six categories: ‘English’, ‘Afrikaans’, ‘Oshiwambo’, ‘Otjiherero’, ‘Damara>Nama’ or ‘Other’), highest qualification (measured by six categories: ‘Less than Grade 12’, ‘Grade 12/Matric’, ‘Diploma/Certificate’, ‘Bachelor’s degree’, ‘Master’s degree’, ‘Other’), organisational tenure in years (written in a text box) and organisational level (measured by four categories: ‘Top Management’, ‘Middle Management’, ‘Supervisory Staff’, ‘General Staff’).

## **STATISTICAL ANALYSIS OF SURVEY SAMPLE**

This part describes the procedures followed in preparing the data for multivariate data analysis.

### **Data Screening**

Upon receipt of the completed paper survey questionnaires, the responses were transferred to an MS Excel spreadsheet. In the case of online answers, the responses were copied from the online database onto the main spreadsheet. Great care was taken to avoid errors while transferring the responses. The MS Excel spreadsheet was then imported into the PASW STATISTICS 18.0 (previously known as SPSS) analysis package.

To prepare the data ( $N = 279$ ) of the survey sample for multivariate analysis, the screening procedures outlined by Hair et al. (2006) were followed: First, by

graphically examining the data and reviewing the normal distribution plots and frequencies of the variables. This initial step served to identify and rectify any data input errors. In the course of this process, one error was detected and corrected by reviewing the original response in the paper survey.

The second step served to assess the extent of missing data. During this process, individual cases with severe missing data (more than 30%) were identified (Hair et al., 2006). In total, 39 such cases were identified and removed, resulting in a 13.97% reduction in the original sample size (see Appendix C for the cases that were removed). The participants in the online survey were responsible for a large number of significantly missing answers ( $n = 20$ ; 54.0%). Next, using the updated sample ( $N = 240$ ), the extent of ignorable missing data and the randomness thereof was examined. Graphical inspection of the missing data indicated that only a few responses (less than 10%) were missing. According to Hair et al., missing data of fewer than 10% for an individual case can generally be ignored. It was therefore decided to cease further assessments of the nature of the missing data. Except for the demographic variables, missing values were replaced by the median (McKnight, McKnight, Sidani, & Figueredo, 2007) of nearby points (span of nearby points: all). The resulting sample with replaced missing values was used throughout the statistical analysis.

### **Psychometric Properties of Constructs**

The functional validity of the constructs was established through exploratory and confirmatory factor analysis. Validity indicates whether a scale actually measures what it is supposed to measure (Field, 2005). Reliability was established by computing the Cronbach coefficient alpha, an indicator of the internal consistency of a scale. Reliability indicates whether a scale can be interpreted consistently in different circumstances (Field, 2005). This part describes the statistical analyses used to establish the validity and reliability of the constructs in the study. Because the scales used in this study were mainly constructed in Western countries, special care was taken to ensure the validity of the constructs in a Namibian context. The validity of constructs with a previously known dimensionality was examined by means of confirmatory factor analysis (CFA) (e.g., C2C, OC). Conversely, exploratory factor

analysis (EFA) was used to establish the dimensionality of constructs with an uncertain (Byrne, 2001) dimensionality (e.g., the determinants of ACC (IS)).

### **Confirmatory Factor Analyses**

CFA was conducted by using a structural equations modelling (SEM) programme, the AMOS 18.0 (Arbuckle, 2006; Byrne, 2001) analysis of moment structures package. In SEM, CFA is an important component in terms of generating a measurement model. Whereas such a model measures the indicators (e.g., items) of a construct and its associated construct validity, a structural model depicts the dependence relationships between the constructs. CFA is theory driven and therefore ideal for verifying underlying dimensionalities of predefined constructs (Tabachnick & Fidell, 2001). Whenever CFA is used, a good understanding of its constructs and items is needed (Hair et al., 2006). CFA thus provides a confirmatory test of how well items represent a construct. In contrast to EFA, CFA is a sophisticated technique that usually requires larger sample sizes to produce more stable solutions (Hair et al.). Although no clear guidelines on sample size exist, Hair et al. argue that a structural equations model with less than five constructs (with more than three items each) and high item commonalities ( $> .60$ ) could be sufficiently estimated with a small sample (between 100 and 150 cases). With modest item commonalities (.45 to .55), or constructs with fewer than three items, sample size should be in the order of 200 cases. A small sample may therefore be insufficient in the case of a more complex model (MacCallum & Austin, 2000) for SEM or path analysis. The following paragraphs briefly describe the major decisions that were taken on CFA in the study.

**Model Identification.** In AMOS, a model can be under-identified (or unidentified), just identified or over-identified (Byrne, 2001). Whenever possible, a model should be over-identified (Hair et al., 2006). This means that there should be enough information available to identify a solution. In a situation where more information needs to be estimated than is available, a model is considered under-identified. Among other researchers, Hair et al. recommend the use of at least three indicators (or items) per construct to avoid model under-identification.

**Model Complexity.** As a consequence of the moderate sample size in the present study, measurement models were limited to models with less complexity. In addition, the recommendations on sample size by Hair et al. (2006) were implemented. As a consequence, multiple regression analysis was used in this study to predict user commitment to IS change and its behavioural outcomes.

**Estimation Technique.** In AMOS, the maximum likelihood estimation technique was used as an estimation procedure. This estimation theory is the default parameter estimation theory in most statistical analysis packages (Thompson, 2004) as well as in AMOS.

**Construct Validity.** Construct validity was established by examining the item factor loadings (standardised loading estimates). As suggested by Hair et al. (2006), individual loadings should be statistically significant and at least .50 or, ideally, larger than .70.

**Model Fit.** In general, several fit statistics should be examined when establishing model fit (Thompson, 2004). In particular, as recommended by Hair et al. (2006), at least one goodness-of-fit, badness-of-fit, absolute, and incremental fit index should be considered when comparing alternative models. Consequently, apart from the chi-square value ( $\chi^2$ ) and associated degrees of freedom ( $df$ ) and statistical significance ( $p$ ), several other indexes were selected: The goodness-of-fit (GFI) index and the comparative fit (CFI) index. In addition, one badness-of-fit index, the root mean square error of approximation (RMSEA). Finally, the expected cross-validation index (ECVI) was also included. Whereas the chi-square value, GFI, RMSEA and ECVI represent absolute fit indexes, the CFI represents an incremental fit index. An absolute fit index measures how well a specific model represents the underlying data. In contrast, an incremental fit index measures how well a model fits relative to an alternative benchmark model (Hair et al.).

The chi-square value compares theory and reality as measured by the data (Hair et al., 2006). An indication of good fit between the theorised and measured model is given by a small chi-square value, relative to the degrees of freedom, that is not statistically significant (Hair et al.). Values on the GFI and CFI can range from zero to one.

Values for both indexes above .90 indicate good fit (Hair et al.). Whereas the GFI provides a basic assessment of how well the data fit with the sample, the CFI compares the specified model with an alternative benchmark model and is one of the most widely used indexes (Hair et al.). With regard to the RMSEA, lower values indicate a better fit with the specified model and its observed data. Values of below .10 indicate good fit. Especially in a competing models strategy, the RMSEA index is appropriate because it also provides a confidence interval. The ECVI indicates how well the estimated model could be generalised to another sample of the same size (Hair et al.) and is based on the cross-validation coefficient (Browne & Cudeck, 1989). Although no guidelines exist on the ECVI and its confidence intervals, this index is most useful for comparing alternative models. Smaller values indicate better generalisation to other models. Apart from the above four fit indexes, the standardised residuals of the items were also examined for values of above |4.0|. As suggested by Hair et al., values above that value indicate a possible degree of error and should therefore be considered for deletion.

**Competing Models Strategy.** To identify the model with the best fit, a competing models strategy was followed (Hair et al., 2006; Thompson, 2004). When examining model fit, the fit of several plausible competing models was compared and evaluated with regard to the chi-square value, statistical significance and associated degrees of freedom, the GFI, CFI, RMSEA and ECVI.

### **Exploratory Factor Analyses**

Exploratory factor analysis (EFA) was conducted using the PASW STATISTICS 18.0 statistical package. In contrast to CFA, EFA explores data by showing how many factors best represent the data. EFA is thus concerned with theory development (Tabachnick & Fidell, 2001) and is statistical results driven (Hair et al., 2006). EFA also makes provision for the correlation of variables (Hair et al.). To test the underlying dimensionalities of constructs with less established dimensionalities in the proposed model, principal-axis factor analysis, starting off with oblique rotation (direct oblimin), was used. In contrast to principal components factor analysis that simply represents a data reduction method (Costello & Osborne, 2005), principal-axis factor analysis extracts a theoretical solution to identify the latent constructs or dimensions that are represented by the items (Hair et al.; Tabachnick & Fidell).

Apart from CFA, principal-axis exploratory factor analysis is also the most widely used factor analytic technique examining the underlying dimensionality of the C2C construct (e.g., used by Herscovitch & Meyer, 2002; Machin & Albion, 2007; Meyer et al., 2007).

**Rotational Strategy.** With the objective of simplifying and clarifying the data (Costello & Osborne, 2005), oblique rotation was selected as the default method. In contrast to orthogonal (e.g., varimax) rotation, oblique rotation (e.g., direct oblimin) allows for the correlation of the factors of the solution (Hair et al., 2006; Tabachnick & Fidell, 2001). To ensure adequacy of the rotation method, the factor correlation matrix was subsequently examined for correlations in excess of .32 and above (Tabachnick & Fidell). In cases where the majority of factors correlated below this cut-off point – resulting in inadequate oblique rotation (Tabachnick & Fidell) – orthogonal rotation was used (varimax normalised). According to Costello and Osborne, the use of orthogonal rotation when the factors are indeed correlated results in the loss of valuable information whereas oblique rotation renders a more reproducible and accurate solution. Because the factors are not correlated, both rotation methods will produce almost the same results. Solutions using direct oblimin rotation are generally more difficult to interpret, but they are ideal for generating theoretically meaningful factors because, in the real world, few constructs are uncorrelated (Hair et al.).

**Number of Factors.** The latent root criterion as well as the scree test criterion (Hair et al., 2006) were used in connection with the number of factors that had to be extracted and retained. The default setting of retaining factors with eigenvalues greater than one was used for the latent root criterion. Although this is one of the most common approaches, it is also one of the least accurate (Costello & Osborne, 2005). Consequently, the scree plots of the eigenvalues were also examined carefully by looking for the natural bend (inflection point) or break in the graph (Costello & Osborne).

**Adequacy of Exploratory Factor Analysis.** To establish the adequacy of EFA in terms of sample size and assumptions, the guidelines of Hair et al. (2006) were followed: First, by examining the ratio of cases to variables that should be at least 5:1, but preferably 10:1. According to Costello and Osborne (2005), strict rules concerning minimum sample size have disappeared, and they maintain that the adequacy of factor analysis also depends on the nature of the data. They argue that larger samples could solve problems concerning poor commonalities, factor loadings and in the case of unstable factors (e.g., fewer than three items per factor). Second, by using Bartlett's test of sphericity to determine the existence of sufficient correlations between the variables. Third, by reviewing the measures of sampling adequacy (MSA) for each variable that also give an indication of the intercorrelations between the variables. Thereafter, composite scales (summated mean scales) were created by combining the items that loaded onto their respective factors. Reliability analysis was done to establish the internal consistency of the summated scales by reporting Cronbach alphas. According to Hair et al., a Cronbach alpha of .70 and above indicates adequate scale reliability.

**Higher Order Factor Analyses.** The use of oblique rotation implies that the factors are correlated. According to Thompson (2004), whenever variables are correlated, higher order factors may be implied: Factors extracted from variable correlations can be referred to as *first-order* or *primary factors*. Conversely, factors derived from factor correlations can be referred to as *secondary* or *higher order factors*. The use of higher order factor analysis allows the identification of a secondary, higher order factor that affects the first-order factors (Thompson, 2004; Wherry, 1984). The existence of a higher order factor consequently indicates that the individual determinants can be combined (e.g., communication, participation and training).

Hierarchical factor analysis (principal-axis factoring with varimax normalised rotation) available in the STATISTICA 9.0 statistical analysis package was done to verify possible higher order factors among the individual determinants. In PASW STATISTICS 18.0, this option is available only by creating and executing scripts (e.g., see Thompson, 2004). Compared to using a standard analysis, writing and executing scripts can be more error prone. The use of a different statistical analysis

package was therefore warranted. Oblique rotation not available in the STATISTICA 9.0 statistical package, varimax rotation was used. Varimax rotation does not allow the correlation of factors (Tabachnick & Fidell, 2001). Nonetheless, as an alternative to oblique rotation – whose results are often difficult to interpret – the STATISTICA 9.0 package offers sound hierarchical factor analysis. This factor extraction method allows for the correlation of oblique first-order factors to extract a secondary factor.

### **Variable Transformations**

The assumptions of multivariate data analysis were examined to prepare the data for inferential statistical analysis. According to Field (2005), the assumptions of parametric data are, first, normally distributed data; second, homogeneity of variance; third, interval data; fourth, independence. Concerning multiple regression analysis, the applicable assumptions were examined on completion of the analyses. The assumption of normality was nevertheless tested after establishment of the psychometric properties by examining the distribution statistics.

The values of skewness and kurtosis need to be examined (Field, 2005) to determine whether the distribution of scores is approximately normal. Positive kurtosis indicates a peaked distribution (negative kurtosis a flat distribution) whereas skewness indicates an either positive or negative tendency from the mean. Ideally, skewness and kurtosis of the summated mean scales should fall within the range of minus to plus one (Field, 2005).

In terms of this guideline, several of the variables did not fall within this range (see Table 5.9 in the next chapter). The compliance, cooperation, championing, counterproductive work behaviour (individuals), organisational tenure, information system tenure, change significance, information system job insecurity, self-efficacy and positive affect scales deviated from the guideline in terms of skewness and/or kurtosis.

To improve the normality of these scales, variables were transformed using the guidelines (e.g., a logarithmic or square root transformation for positive skewness) of Hair et al. (2006). In all, four transformation types were used to transform the variables: first a logarithmic transformation. By using this transformation, the

organisational tenure, information system tenure and counterproductive work behaviour (Individuals) variables were successfully transformed to follow a normal distribution. The distribution of the other variables, however, was not improved. As a second alternative, a square root transformation was attempted that improved the distribution of the information system job insecurity scale. The remaining variables were either improved by a square (e.g., change significance, self-efficacy and positive affect) or a cubed transformation (compliance, cooperation and championing). (See Table B9 in Appendix B for the distribution statistics of the transformed variables.)

Although the above variables were transformed, every inferential analysis started off using the original variables because larger samples (> 200 cases) reduce the negative effect of non-normality (Hair et al., 2006). However, after using the original variables, the analysis was repeated using the transformed variables. Any significant difference in the results was noted.

### **Inferential Statistical Analyses**

Upon establishment of the psychometric properties of the constructs in the sample, inferential statistical methods were used to analyse the correlations between the variables. The analysis began by examining the correlations and was followed by standard multiple regression analysis, hierarchical multiple regression and moderated hierarchical multiple regression.

### **Correlation Analysis**

Variable intercorrelations were calculated before variable transformations – these intercorrelations represent the Pearson product moment correlation coefficients (or Pearson's  $r$ ) (Chen & Popovich, 2002; Field, 2005). The correlation coefficient indicates the strength and direction of the relationship between two variables. The direction of the relationship is indicated by either a positive or a negative relationship. The strength of the relationship is indicated between zero and either minus or plus one. A correlation coefficient of one indicates a perfect linear relationship between two variables (e.g., between Variable A and B): As Variable A increases (or decreases in the case of a negative relationship) by one, Variable B also increases (or decreases in the case of a negative relationship) by one. A correlation coefficient of less than, or equal to  $|\cdot 10|$ , indicates a weak relationship. A medium relationship is indicated by a

correlation of up to  $|.30|$ ; the relationship can be regarded as strong if the correlation is  $|.50|$  or more (Field).

### **Multiple Regression Analysis**

Standard hierarchical and moderated hierarchical multiple regression analysis was conducted to test the main propositions in the study. Overall, regression models were examined for overall regression model significance ( $F$ -test value significantly different to zero), significance of variance explained ( $R^2$  and adjusted  $R^2$ ) and a statistically significant change in  $R^2$ . In addition, the individual regression coefficients (unstandardised and standardised regression coefficients  $B$  and  $\beta$ , respectively) were examined for statistical significance.

**Hierarchical Multiple Regression Analysis.** Hierarchical multiple regression analysis was done to determine whether additional predictors would significantly increase the variance explained in the dependent variable (Jaccard & Turrisi, 2003). This analysis also assisted in controlling for the individual differences and control variables. With regard to hierarchical regression analysis, as suggested by Tabachnick and Fidell (2001), the order of entry of predictors was determined on the basis of logical or theoretical reasons: Predictors assumed to be causally prior were included first. The purpose of this analysis was to establish whether the determinants explained variance in the dependent variable above and beyond the control variables.

**Moderated Multiple Hierarchical Regression Analysis.** Moderated multiple hierarchical regression analysis was done to determine statistically significant interaction or moderator effects. According to Baron and Kenny (1986), moderating effects are usually examined in cases of unexpectedly weak or inconsistent correlations between an independent and a dependent variable. A moderator – which is often difficult to detect statistically – changes the effect (i.e. strength or direction) of the independent variable in relation to the dependent variable (Holmbeck, 1997). Jaccard and Turrisi's (2003) guidelines were followed in order to conduct moderated hierarchical regression analysis: To avoid problems with multicollinearity, the respective variable mean was subtracted from the predictors. The predictors were thus converted to deviation scores resulting in each variable having a mean of zero. The

interaction terms of the respective centred variables were subsequently formed by multiplication (e.g., positive affect x IS change value). To conduct the actual analysis, the respective interaction terms were added as an interaction effect after the main effects in the hierarchical regression analysis. According to Holmbeck (1997), the main effects may be entered in any order, but before the interaction effect. Statistically significant interaction terms then indicate a moderator effect. According to Tabachnick and Fidell (2001), the unstandardised regression coefficients of the interaction term are the same as for the main effect. However, the standardised coefficients are not, and thus only the unstandardised coefficients were used in the interpretation. The strength of the interaction was then assessed by examining the value of the unstandardised regression coefficient as well as by using the squared semi-partial correlation of the product term. According to McClelland and Judd (1993), the greater the regression coefficient of the interaction term, the greater the moderator effect. Conversely, the squared semi-partial correlation indicates the unique variance accounted for by the product term (Jaccard & Turrisi). As suggested by Tabachnick and Fidell, a graphical display by means of a plot was used to interpret the interaction effect.

**Testing for Mediation.** In contrast to a moderator that changes the effect (strength and direction) of an independent variable on a dependent variable, a mediator intervenes between an independent and a dependent variable (Baron & Kenny, 1986). The independent variable thus influences, or ‘causes’, the mediator, which, in turn, influences the dependent variable (Holmbeck, 1997). The procedure by Baron and Kenny was used to test for mediation. In this procedure, a series of simple regression equations are calculated.

According to Baron and Kenny (1986), a mediation relationship between two variables is confirmed if, first, a significant relationship exists between the independent variable (e.g., IS change involvement) and the mediator (e.g., IS change climate); second, a significant relationship exists between the independent variable (e.g., IS change involvement) and the dependent variable (e.g., ACC (IS)); third, the mediator (e.g., IS change climate) still predicts the dependent variable (e.g., ACC (IS)) by controlling for the independent variable (e.g., IS change involvement); fourth, the mediator (e.g., IS change climate) reduces the relationship between the

independent variable and the dependent variable. The mediation is a full mediation if the relationship between the independent variable and the dependent variable goes to zero if the mediator is in the regression equation. If the relationship is decreased, it is said to be a partial mediation.

In addition to the above procedures to assess mediation, the Sobel test (Sobel, 1982) was conducted to assess whether the mediator significantly moves the effect of the independent variable to the dependent variable.

**Testing of Assumptions.** After each multiple regression analysis, the checklist by Tabachnick and Fidell (2001) was used to examine the issues and assumptions. The checklist was examined after each regression analysis, and deviances or issues were noted in the results. Tabachnick and Fidell suggest checking the ratio of cases to the number of predictors and missing data, normality, linearity, homoscedasticity of residuals, outliers, multicollinearity and, finally, outliers in the solution.

**Sample Size and Statistical Power:** The preferred ratio of cases to variables should be at least 20:1, as suggested by Hair et al. (2006). In addition, in the study, the post hoc power (Cohen, 1992; Gillett, 1994) of the regression model was calculated by using the G\*Power (Version 3.1) statistical package (Faul, Erdfelder, Lang, & Buchner, 2007; Faul, Erdfelder, Buchner, & Lang, 2009). The power of the regression analysis is the probability that the null hypothesis will be rejected given that it is actually false. According to Hair et al. (2006) and Field (2005), a power of at least 80% should be achieved.

The *F*-tests family was selected to calculate the post hoc power of the multiple regression models. In this family, the “Fixed model,  $R^2$  deviation from zero” option was selected (type of power analysis: post hoc: “Compute achieved power given  $\alpha$ , sample size, and effect size”). With regard to input parameters, the sample size, number of predictors and an  $\alpha$  error probability of .05 (default setting in G\*Power) was specified for each multiple regression model. The built-in function calculated the actual effect size ( $f^2$ ). In this function, the actual effect size can be determined by the

squared multiple correlation. The statistical power of the regression model was then calculated.

***Normality and Linearity of Variables:*** The skewness and kurtosis of the variables were examined to assess normality. Tabachnick and Fidell (2001) suggest a range of  $\pm 1$  for skewness and kurtosis. Variables deviating from this range were transformed. Thereafter, the analysis was conducted with the original and transformed variables. Although the results with the original variables were reported in the Results chapter, significant changes were noted when using the transformed variables. Linearity was determined by examining the correlations of the variables. Significant correlations between the dependent and independent variables indicate linearity (Tabachnick & Fidell, 2001).

***Homoscedasticity of Residuals:*** The scatter plot of the residuals was used to assess homoscedasticity, and any deviations were noted in the individual analyses.

***Independence of Errors:*** The Durbin-Watson statistic was examined to verify the assumption of independent errors (Field, 2005). According to Field, this value should neither be less than one nor greater than three.

***Multicollinearity:*** The presence of multicollinearity was examined by examining the variable inflation factors (VIF) and tolerance statistics against their acceptable ranges (Field, 2005).

***Outliers:*** Outliers were scanned after each regression analysis. If any outliers were found, the impact of the specific outlier on the multiple regression equation was assessed and any adverse impact reported.

## **CHAPTER 5: RESULTS**

This chapter summarises the results of the quantitative data analysis of the survey sample. The chapter is divided into six main parts: The first part summarises the analyses conducted to establish the psychometric properties of the variables in the study; the second part summarises the descriptive and distribution statistics of the constructs; the third part summarises the intercorrelations and reliabilities of the constructs; the fourth and fifth parts summarise the prediction of user commitment and its behavioural outcomes; the last part summarises the results of the proposition testing.

### **PSYCHOMETRIC PROPERTIES OF VARIABLES**

As a foundation for subsequent analyses, this part summarises the results of the factor and reliability analyses that were conducted to establish the psychometric properties of the constructs in the study. All subsequent inferential analyses will depend on this foundation. The first section of this part describes the results of the analyses regarding user commitment to information system change; the second, third and fourth sections summarise, respectively, the dimensionality of the determinants and behavioural outcomes of ACC (IS) and CCC (IS); the final section summarises the analyses regarding the control variables.

#### **Psychometric Properties of User Commitment**

This section summarises the factor and reliability analyses regarding the user commitment scale: First, the confirmatory factor analysis (CFA) of affective commitment (ACC (IS)), continuance commitment (CCC (IS)) and commitment propensity (CP) is described; second the nature of CCC (IS) is further explored; thereafter, the distinguishability of user commitment compared to organisational commitment is examined. Explanations of the CFA and exploratory factor analysis (EFA) methods can be found in the Method chapter.

### Dimensionality of User Commitment and Commitment Propensity

Confirmatory factor analysis (CFA) was used to test the proposition (Proposition 1) that ACC (IS) (six items), CCC (IS) (six items) and CP (six items) can be distinguished from each other. Model fit was established by examining the chi-square value as well as the GFI, CFI, RMSEA and ECVI indexes (Table 5.1).

**Table 5.1: Fit Indexes of Confirmatory Factor Analysis: ACC (IS), CCC (IS) and CP**

Model	$\chi^2$	$\Delta \chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
							Low	High		Low	High
3-factor model with correlated errors	153.67*	-	72	.91	.96	.06	.05	.08	0.91	0.78	1.08
3-factor model	190.83*	37.16	74	.89	.94	.08	.06	.09	1.05	0.9	1.24
2-factor model <sup>1</sup>	207.76*	54.09	76	.88	.94	.08	.07	.09	1.11	0.94	1.3
2-factor model <sup>1</sup> with correlated errors	170.81*	17.14	74	.90	.95	.07	.05	.08	0.97	0.83	1.15
2-factor model <sup>2</sup>	368.55*	214.88	76	.79	.86	.12	.11	.14	1.78	1.55	2.05
2-factor model <sup>3</sup>	850.36*	696.69	76	.6	.65	.20	.19	.21	3.8	3.42	4.2
1-factor model	925.25*	771.58	77	.54	.62	.21	.20	.22	4.1	3.71	4.53

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval; <sup>1</sup>Commitment Propensity and Continuance Commitment to Change combined; <sup>2</sup>Affective and Continuance Commitment to Change combined; <sup>3</sup>Affective Commitment to Change and Commitment Propensity combined.

In the first stage of the analysis, a CFA was conducted on the 18-user commitment to mandatory information system change items. As discussed in the previous chapter, these items were adapted from the original 18 commitment to organisational change items (Herscovitch & Meyer, 2002). The CFA resulted in a chi-square value of 500.80 ( $df = 132$ ) ( $p = .000$ ) and poor model fit (GFI = .80; CFI = .86; RMSEA = .10; ECVI = 2.42) (Appendix B, Table B1). Although all items significantly ( $p < .001$ , two-tailed) loaded onto their respective factors, the standardised regression weights of two of the continuance commitment items was below the .50 minimum benchmark for adequate construct validity (Hair et al., 2006). The standardised residual covariances of two of the continuance commitment and one of the commitment propensity items were also above |4.0| (Hair et al.). Consequently, a total of two items from

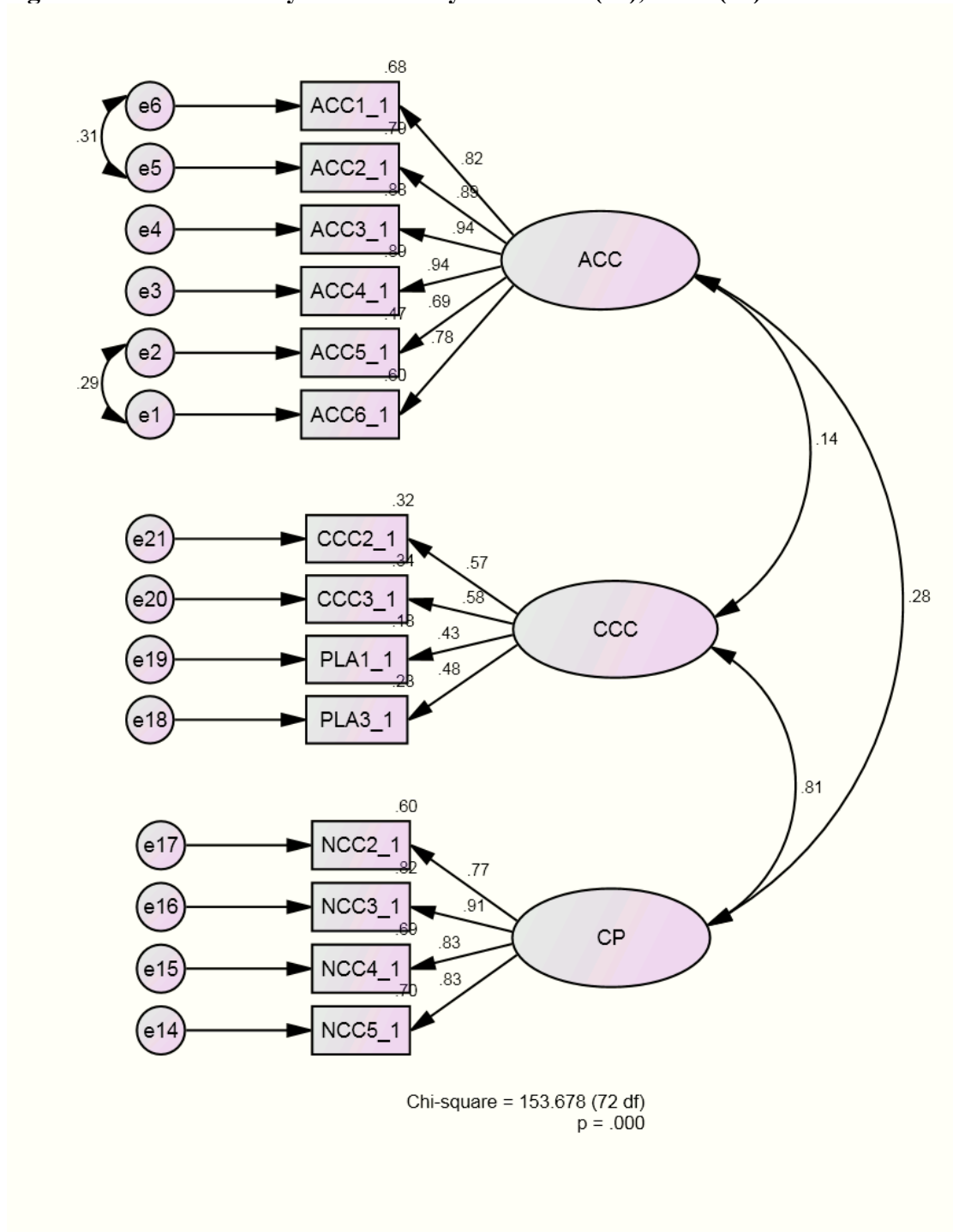
continuance user commitment and commitment propensity were removed one by one. Fit was best when using the reduced 14-item solution.

Alternative models were subsequently compared using the 14-item solution (Table 5.1). The expected three-factor solution comprising affective (six items), continuance (four items) user commitment to information system change and commitment propensity (four items) generated a better fit than any other model. This solution was closely followed by an alternative two-factor model combining continuance user commitment and commitment propensity ( $\Delta\chi^2 = 16.93$ ). Other alternative two-factor models combining affective and continuance commitment and affective commitment and commitment propensity did not result in a significantly better fit. Finally, a one-factor model also did not result in a better fit compared to the three-factor model.

Although the GFI index in the best fitting model remained below the .90 benchmark for acceptable goodness-of-fit (Hair et al., 2006), both the CFI and the RMSEA index resulted in acceptable fit. The ECVI also compared better with regard to the alternative models. To improve the fit of the three-factor model, the modification indexes in the AMOS results output were consulted (Byrne, 2001; Hair et al.). The modification indexes suggested how the chi-square value could be approximately reduced (Arbuckle, 2006). Consequently, the error terms of two pairs of items from the affective user commitment to information system change were correlated (Error 1 and Error 2 as well as Error 5 and Error 6), resulting in an improved and acceptable model fit, even with regard to the GFI (Table 5.1 and Figure 5.1). All factor loadings were statistically significant ( $p < .001$ , two-tailed). With one exception, factor loadings for both the affective user commitment and commitment propensity items were above the .70 benchmark (Hair et al.). However, two of the continuance user commitment items were below the .50 minimum benchmark (Hair et al.), but above .43, indicating poor construct validity. With regard to the standardised residual covariances, none of the items exceeded the |4.0| benchmark (Hair et al.). Similarly to previous findings (e.g., Herscovitch & Meyer, 2002), factors were correlated. Affective user commitment correlated .28 with commitment propensity and .14 with continuance user commitment. Continuance user commitment and commitment propensity were strongly correlated ( $r = .81$ ).

As a consequence, composite scales of the three factors were created and labelled affective (ACC (IS)) and continuance (CCC (IS)) user commitment to information system change, as well as commitment propensity (CP). The reliability of the scales was then computed using Cronbach alpha as an indication of the internal consistency of the constructs. The Cronbach alpha of the ACC (IS), CCC (IS) and CP scales was .93, .59 and .90, respectively. While the reliability of the ACC (IS) and CP scales was excellent, the internal consistency of the CCC (IS) scale was problematic and below the .70 threshold level (Hair et al., 2006). This poor reliability thus mirrors the two fair factor loadings in the CFA. For exploratory purposes, however, it was decided to retain the scale, but results using the CCC (IS) construct should be interpreted with caution. Overall, Proposition 1 can be confirmed: ACC (IS), CCC (IS) and CP are distinguishable constructs.

**Figure 5.1: Confirmatory Factor Analysis of ACC (IS), CCC (IS) and CP**



Note.  $N = 240$ ; ACC = affective user commitment to mandatory IS change; CCC = continuance user commitment to mandatory IS change (PLA = perceived lack of alternatives); CP = commitment propensity

### **Nature of Continuance User Commitment**

Although the above analysis confirmed the distinctness of ACC (IS) and CCC (IS), it did not confirm whether CCC (IS) could indeed be conceptualised as two-dimensional. However, because of the poor fit of the original 18-item model, the CCC (IS) scale was shortened. To examine the dimensionality of CCC (IS), the fit of the original 18-item three-factor model was compared to an alternative four-factor model. In this four-factor model, CCC (IS) was split into two dimensions: CCC (IS) conceptualised as perceived high sacrifice (PHS) (three items) and perceived lack of alternatives (PLA) (three items). Both models resulted in poor fit (Appendix B, Table B1). The four-factor model resulted in a slightly better fit ( $\Delta\chi^2 = 57.61$ ). As discussed previously, removing two items from CCC (IS) significantly improved model fit but resulted in a shortened version of the scale. This reduction in items then rendered a four-factor model obsolete.

Consequently, the dimensionality of the CCC (IS) scale was examined in isolation from ACC (IS) and CP. This approach offered a closer look at the factor structure of CCC (IS). To ensure at least three indicators per construct (Hair et al., 2006), a CFA was conducted on the six CCC (IS) items, comparing two alternative models: First, a one-factor model where all CCC (IS) items loaded onto one factor; second, a two-factor model comprising two sub-dimensions, namely PHS and PLA. Both models resulted in poor model fit, but the two-factor solution resulted in slightly better fit ( $\Delta\chi^2 = 13.93$ ) (Appendix B, Table B2).

Overall, the results of the above CFAs indicate that CCC (IS) (PHS) is not clearly distinguishable from PLA. As a result, it was decided to conceptualise only CCC (IS). An inspection of the item content indicates that the distinction between the two constructs is difficult to recognise, and it could be debated which item constitutes PHS or PLA. The original six CCC items from Herscovitch and Meyer's (2002) research were used as the basis for the above examination of the underlying nature of CCC (IS). This left only three items per sub-scale resulting in a potentially unstable factor structure (Costello & Osborne, 2005). The above results indicate not only the need to refine the original items but also to create further items to shed more light on the dimensionality of this construct.

### **User Commitment and Organisational Commitment**

CFA was used to test whether ACC (IS), CCC (IS) and CP could also be distinguished from the respective dimensions of organisational commitment. This analysis included the ACC (IS) (six), CCC (IS) (four) and CP (four) items, as well as the items comprising AOC (four items), COC (four items) and NOC (four items). A six-factor model with separate ACC (IS), CCC (IS), CP, AOC, COC and NOC factors was compared with alternative five-factor models. In these five-factor models, the affective, continuance and normative dimensions of the two foci of commitment were combined. The six-factor model had a better fit than any other model (Appendix B, Table B3). Factor loadings, except for two items from the CCC (IS) scale were all significant ( $p < .001$ , two-tailed) and above the .50 minimum benchmark for acceptable construct validity (Hair et al., 2006). Four items had a factor loading of less than .70 but were above the minimum threshold. Correlations across foci were small to moderate. CP and CCC (IS) correlated strongly ( $r = .80$ ). The strongest correlations in organisational commitment were between NOC, AOC ( $r = .66$ ) and COC ( $r = .65$ ). AOC and COC correlated .44. In sum, these results indicate that the dimensions of C2C can be distinguished from the dimensions of organisational commitment.

### **Psychometric Properties of IS Change Involvement, Value and Climate**

Testing the underlying dimensionality of the proposed determinants of ACC (IS) comprised two stages: First, it was established whether the proposed determinants were indeed distinguishable from one another; second, hierarchical factor analysis was conducted to explore whether the individual determinants could be aggregated into the proposed three higher order constructs of IS change involvement, value and climate.

### **Dimensionality of Individual Determinants**

A principal-axis factor analysis with direct oblimin rotation on the 42 variables using the 240 cases sample was conducted to test whether the proposed determinants of ACC (IS), perceived usefulness (PU), perceived ease of use (PEU), information quality (IQ), quality of change communication, participation, training, overall change fairness (CF), facilitating conditions (FC) and change leadership (CL) represented

distinguishable constructs. The initial solution generated eight factors (one factor less than expected) with eigenvalues greater than one explaining 73.66% of the common variance (Appendix B, Table B4). An inspection of the scree plot also suggested the presence of eight factors above the point of inflection. The inspection of the pattern matrix, however, indicated significant cross-loadings of the FC items with training (e.g., FC2), CF (e.g., FC4) and PEU (e.g., FC1 and FC2). PEU also cross-loaded significantly on PU. Those items were consequently removed, and a second principal-axis factor analysis with direct oblimin rotation using the remaining 34 variables was conducted. In the subsequent pattern matrix, COM1 and COM2 also cross-loaded on other factors, and these variables were accordingly also removed. Table 5.2 shows the revised principal-axis factor analysis of the 32 remaining items that generated the expected factor structure with seven eigenvalues greater than one explaining 78.61% of the initial common variance. An inspection of the scree plot also suggested the presence of seven factors above the point of inflection (Appendix B, Figure B1).

An inspection of the pattern matrix indicated that all variables loaded high on their respective factors. Commonalities, except for COM7 (.50), were all well above .50.

**Table 5.2: Revised Exploratory Factor Analysis of the Proposed Determinants of Affective User Commitment**

Item	Factor							Commonalities
	I	II	III	IV	V	VI	VII	
COM5: Gave me as much information as possible	<b>0.75</b>	-0.03	-0.11	-0.01	0.06	0.05	-0.10	0.71
COM4: Was accurate	<b>0.67</b>	0.03	-0.09	-0.06	0.10	-0.03	-0.11	0.67
COM3: Addressed my personal concerns regarding the information system change	<b>0.59</b>	0.11	-0.12	0.08	-0.06	-0.03	-0.08	0.62
COM6: Involved employees in the information system change process and decisions made	<b>0.58</b>	0.02	0.02	0.18	-0.03	-0.12	-0.03	0.56
COM7: Communicated the reasons for the information system change	<b>0.50</b>	0.05	-0.11	0.08	0.06	-0.19	0.11	0.50
CL 6: Carefully monitored and communicated progress of the information system change implementation	-0.06	<b>0.90</b>	0.04	-0.04	-0.05	-0.11	0.01	0.75
CL 3: Made a case for the urgency of this information system change prior to implementation	0.04	<b>0.84</b>	-0.02	0.09	0.06	0.16	-0.04	0.79
CL 2: Made it clear up front to those in our unit why the information system change was necessary	0.10	<b>0.81</b>	0.02	0.01	0.13	0.05	0.03	0.76
CL 5: Empowered people to implement the information system change	-0.07	<b>0.79</b>	-0.09	0.08	-0.06	-0.05	0.03	0.65
CL1: Developed a clear vision for what was going to be achieved by our work unit	0.12	<b>0.78</b>	0.12	-0.10	0.08	-0.02	-0.01	0.64
CL 4: Built a broad coalition up front to support the information system change	-0.04	<b>0.76</b>	-0.13	0.03	0.04	0.01	-0.02	0.69
CL 7: Gave individual attention to those that had trouble with the information system change implementation	0.00	<b>0.75</b>	-0.09	0.02	-0.08	-0.06	-0.09	0.67
PU3: Using the new information system enhances my effectiveness in my job	0.02	0.02	<b>-0.91</b>	0.02	0.01	0.00	-0.02	0.90
PU2: Using the new information system in my job increases my productivity	0.04	0.03	<b>-0.90</b>	0.02	0.03	-0.02	0.05	0.90
PU1: Using the new information system improves my performance in my job	0.17	0.06	<b>-0.76</b>	-0.06	0.00	-0.05	-0.03	0.83
PU4: I find the new information system to be useful in my job	0.05	-0.01	<b>-0.76</b>	0.01	0.08	-0.04	-0.08	0.78
PART2: I became actively involved in the development of the information system change content	0.11	0.05	0.02	<b>0.88</b>	0.06	0.12	-0.05	0.86
PART3: I was actively involved in the development of solutions to identified problems	-0.05	0.06	-0.03	<b>0.85</b>	0.00	0.00	0.00	0.73
PART4: Suggestions from me were considered seriously	-0.09	-0.04	-0.12	<b>0.68</b>	0.07	-0.14	-0.06	0.62
PART1: Steps were taken to involve me at an early stage in the information system change process	0.16	-0.02	0.13	<b>0.64</b>	-0.06	-0.11	-0.02	0.56
IQ2: The information system provides up-to-date information	-0.03	0.04	0.02	0.03	<b>0.88</b>	-0.08	0.02	0.83
IQ1: I feel the output of the information system is reliable	0.02	0.00	0.00	0.02	<b>0.87</b>	0.03	-0.04	0.77
IQ3: The information system provides the precise information I need	0.03	0.01	-0.07	-0.02	<b>0.82</b>	-0.06	-0.01	0.80
CF2: In general, I can count on being treated fairly regarding the information system implementation	0.02	0.02	-0.11	-0.01	0.07	<b>-0.81</b>	0.00	0.81
CF1: Overall, I am treated fairly regarding the information system implementation	0.05	0.00	0.01	0.07	0.03	<b>-0.75</b>	-0.12	0.78
CF3: In general, the treatment I receive regarding the information system implementation is fair	0.07	0.05	0.00	0.06	0.10	<b>-0.66</b>	-0.09	0.69
T2: My level of understanding was substantially improved by going through the training programme	-0.04	-0.04	-0.02	0.02	0.03	-0.01	<b>-0.91</b>	0.82
T5: The training was of adequate detail	0.02	0.07	0.05	-0.01	-0.01	-0.01	<b>-0.89</b>	0.82
T4: The training was of adequate length	0.06	0.00	0.06	0.03	-0.02	0.03	<b>-0.84</b>	0.73
T1: The kind of training provided to me was complete	0.04	-0.03	0.01	0.02	-0.07	-0.05	<b>-0.82</b>	0.71
T3: The training gave me confidence in the new information system	-0.03	0.01	-0.13	0.01	0.15	0.05	<b>-0.78</b>	0.76
T6: The trainers were knowledgeable and aided me in my understanding of the new information system	0.00	0.04	-0.03	-0.01	-0.02	-0.10	<b>-0.77</b>	0.75
<b>Initial Eigenvalue</b>	<b>12.94</b>	<b>3.68</b>	<b>2.80</b>	<b>2.04</b>	<b>1.59</b>	<b>1.05</b>	<b>1.02</b>	
<b>Initial Variance Explained %</b>	<b>40.46</b>	<b>11.52</b>	<b>8.76</b>	<b>6.38</b>	<b>4.99</b>	<b>3.30</b>	<b>3.20</b>	
<b>Cum. Variance Explained %</b>	<b>40.46</b>	<b>51.98</b>	<b>60.74</b>	<b>67.12</b>	<b>72.11</b>	<b>75.41</b>	<b>78.61</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Oblimin with Kaiser Normalisation.

Each item's highest loading is presented in boldface.

To verify that oblique rotation was appropriate, the factor correlation matrix was inspected. Table 5.3 shows that most of the correlations fell above the .32 cut-off point indicating oblique rotation as adequate (Tabachnick & Fidell, 2001). Factors three and four ( $r = -.16$ ) and factors four and five ( $r = .17$ ) correlated the lowest. Nonetheless, generally, the remaining factors were sufficiently intercorrelated.

**Table 5.3: Factor Correlation Matrix: Proposed Determinants of User Commitment**

Factor	1	2	3	4	5	6
1						
2	.35					
3	-.50	-.38				
4	.39	.24	-.16			
5	.30	.34	-.53	.17		
6	-.44	-.22	.41	-.45	-.37	
7	-.48	-.30	.34	-.43	-.29	.43

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Oblimin with Kaiser Normalisation.

The factor analysis assumptions were examined to determine the adequacy of the factor analysis: The ratio of cases to variables of 7.5 to 1 was just above the minimum ratio of 5 to 1. Nevertheless, as suggested by Costello and Osborne (2005), rigid guidelines concerning sample size are less problematic with robust solutions that yield strong expected factor loadings and high commonalities. The Bartlett's test of sphericity was significant (approximate  $\chi^2 = 6934.83$ ,  $df = 496$ ,  $p = .000$ ) indicating sufficient intercorrelations among the variables for factor analysis. The MSA of the variables were all above .80 indicating meritorious intercorrelations (Hair et al., 2006).

In sum, the above analysis indicates that the determinants (except for FC and PEU) were correlated but also distinguishable from each other. Principal-components analysis with direct oblimin rotation also confirmed the seven-factor structure. Consequently, factors one to seven were labelled with the expected construct names, and composite scales from the respective items were created. The resulting internal consistencies were strong: Quality of change communication ( $\alpha = .87$ ), participation ( $\alpha = .88$ ), training ( $\alpha = .94$ ), PU ( $\alpha = .95$ ), IQ ( $\alpha = .92$ ), CF ( $\alpha = .89$ ), and change

leadership ( $\alpha = .93$ ). The above factor and reliability analysis shows that the constructs in the study were valid and reliable.

### **Higher Order Nature of Determinants**

The above factor analysis resulted in moderate factor correlations warranting further analyses concerning possible higher order factors. A hierarchical factor analysis (principal-axis with varimax normalised rotation) on all the variables was conducted to test whether the individual determinants could be grouped into the proposed higher order constructs, namely IS change involvement (communication, participation and training), value (PU and IQ) and climate (CF and CL). Thereafter, the analysis was repeated by including only the theoretically related determinants.

Initially, a higher order factor analysis was conducted on all the 32 items and revealed *one* higher order factor affecting all the determinants. In subsequent analyses, only the theoretically related items were grouped together, and the higher order factor analysis was repeated. Conducting the analysis with the theoretically related variables revealed three higher order constructs.

Table 5.4 shows the results of the higher order factor analysis of the communication (five items), participation (four items) and training (six items) variables. The table indicates that all the variables loaded significantly (factor loadings greater than .39) onto their respective first-order factors. The variables also loaded onto a secondary, or higher order, factor. Given the sample size of 240, factor loadings of .35 or higher are significant at the five percent level of significance (Hair et al., 2006). Currently, no guidelines exist on the significance of loadings onto a higher order factor, but the variables of the three first-order factors also loaded significantly (factor loadings greater than .50) onto the higher order factor.

**Table 5.4: Higher Order Factor Analysis of Communication, Participation and Training**

Item	Primary Factors			Higher Order Factor
	I	II	III	
COM3: Addressed my personal concerns regarding the information system change	0.04	0.01	<b>0.46</b>	<b>0.63</b>
COM4: Was accurate	0.06	-0.10	<b>0.53</b>	<b>0.62</b>
COM5: Gave me as much information as possible	0.04	-0.08	<b>0.54</b>	<b>0.63</b>
COM6: Involved employees in the information system change process and decisions made	0.00	0.13	<b>0.39</b>	<b>0.61</b>
COM7: Communicated the reasons for the information system change	-0.06	0.05	<b>0.43</b>	<b>0.52</b>
PART1: Steps were taken to involve me at an early stage in the information system change process	-0.02	<b>0.51</b>	0.01	<b>0.53</b>
PART2: I became actively involved in the development of the information system change content	0.00	<b>0.62</b>	0.01	<b>0.65</b>
PART3: I was actively involved in the development of solutions to identified problems	-0.03	<b>0.64</b>	-0.05	<b>0.56</b>
PART4: Suggestions from me were considered seriously	0.04	<b>0.50</b>	-0.01	<b>0.56</b>
T1: The kind of training provided to me was complete	<b>0.55</b>	0.00	-0.02	<b>0.63</b>
T2: My level of understanding was substantially improved by going through the training programme	<b>0.62</b>	-0.02	-0.04	<b>0.66</b>
T3: The training gave me confidence in the new information system	<b>0.54</b>	-0.05	0.04	<b>0.64</b>
T4: The training was of adequate length	<b>0.56</b>	0.00	-0.02	<b>0.63</b>
T5: The training was of adequate detail	<b>0.61</b>	-0.02	-0.02	<b>0.67</b>
T6: The trainers were knowledgeable and aided me in my understanding of the new information system	<b>0.53</b>	-0.02	0.03	<b>0.64</b>
<b>Initial Eigenvalue</b>	<b>7.19</b>	<b>1.65</b>	<b>8.36</b>	
<b>Initial Variance Explained %</b>	<b>47.92</b>	<b>11.03</b>	<b>8.36</b>	
<b>Cum. Variance Explained %</b>	<b>47.92</b>	<b>58.95</b>	<b>67.31</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Varimax. Each item's highest loading is presented in boldface.

The analysis indicated three unique areas (or sub-dimensions) that underpin a higher order construct that could be conceptualised as the involvement of users in the information system change process. As a consequence, a composite scale labelled 'IS change involvement' was formed. Establishing the internal consistency of the composite scale resulted in a Cronbach alpha of .92.

Table 5.5 shows the higher order factor analysis of perceived usefulness (four items) and information quality (three items). Perceived ease of use was omitted in the analysis because of significant construct overlap with perceived usefulness in the initial exploratory factor analysis that included all the determinants (Table B4 in Appendix B). The extraction shows that the variables loaded significantly onto their respective first-order factors (factor loadings greater than .53) but also onto the higher order factor (factor loadings greater than .66).

**Table 5.5: Higher Order Factor Analysis of Perceived Usefulness and Information Quality**

Item	Primary Factors		Higher Order Factor
	I	II	
PU1: Using the new information system improves my performance in my job	<b>0.57</b>	-0.01	<b>0.69</b>
PU2: Using the new information system in my job increases my productivity	<b>0.60</b>	-0.01	<b>0.73</b>
PU3: Using the new information system enhances my effectiveness in my job	<b>0.61</b>	-0.02	<b>0.72</b>
PU4: I find the new information system to be useful in my job	<b>0.53</b>	0.04	<b>0.70</b>
IQ1: I feel the output of the information system is reliable	-0.01	<b>0.55</b>	<b>0.66</b>
IQ2: The information system provides up-to-date information	-0.03	<b>0.59</b>	<b>0.69</b>
IQ3: The information system provides the precise information I need	0.04	<b>0.55</b>	<b>0.72</b>
<b>Initial Eigenvalue</b>	<b>4.65</b>	<b>1.11</b>	
<b>Initial Variance Explained %</b>	<b>66.41</b>	<b>15.92</b>	
<b>Cum. Variance Explained %</b>	<b>66.41</b>	<b>82.32</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Varimax. Each item's highest loading is presented in boldface.

The results show that two unique sub-dimensions underpinned a higher order construct that could be conceptualised as the value of the IS change. Consequently, a composite scale of the seven items was formed and labelled 'IS change value' ( $\alpha = .92$ ).

Table 5.6 shows the higher order factor analysis of overall change fairness (three items) and change leadership (seven items). Similarly to perceived ease of use, the construct facilitating conditions was omitted because of construct overlap with some of the other determinants (Table B4, Appendix B). The extraction shows that the

variables all loaded significantly onto their respective first-order factors (factor loadings greater than .62) as well as onto the higher order factor (factor loadings greater than .46).

**Table 5.6: Higher Order Factor Analysis of Overall Change Fairness and Change Leadership**

Item	Primary Factors		Higher Order Factor
	I	II	
CF1: Overall, I am treated fairly regarding the information system implementation	-0.03	<b>0.70</b>	<b>0.51</b>
CF2: In general, I can count on being treated fairly regarding the information system implementation	-0.02	<b>0.73</b>	<b>0.54</b>
CF3: In general, the treatment I receive regarding the information system implementation is fair	0.04	<b>0.65</b>	<b>0.51</b>
CL1: Developed a clear vision for what was going to be achieved by our work unit	<b>0.63</b>	-0.02	<b>0.46</b>
CL 2: Made it clear up front to those in our unit why the information system change was necessary	<b>0.69</b>	0.00	<b>0.52</b>
CL 3: Made a case for the urgency of this information system change prior to implementation	<b>0.73</b>	-0.07	<b>0.49</b>
CL 4: Built a broad coalition up front to support the information system change	<b>0.65</b>	0.02	<b>0.50</b>
CL 5: Empowered people to implement the information system change	<b>0.63</b>	0.02	<b>0.49</b>
CL 6: Carefully monitored and communicated progress of the information system change implementation	<b>0.69</b>	-0.01	<b>0.50</b>
CL 7: Gave individual attention to those that had trouble with the information system change implementation	<b>0.62</b>	0.06	<b>0.51</b>
<b>Initial Eigenvalue</b>	<b>5.28</b>	<b>1.81</b>	
<b>Initial Variance Explained %</b>	<b>52.83</b>	<b>18.08</b>	
<b>Cum. Variance Explained %</b>	<b>52.83</b>	<b>70.92</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Varimax. Each item's highest loading is presented in boldface.

The results indicate that two unique areas (or sub-dimensions) underpinned a higher order construct that could be conceptualised as the climate of the IS change. As a consequence, a composite 'IS change climate' scale of the items comprising overall change fairness (CF) and change leadership (CL) was created, resulting in a Cronbach alpha of .90.

## **Psychometric Properties of Perceived Skills Transferability**

Two determinants were proposed to explain CCC (IS): Perceived lack of alternatives (PLA) and perceived skills transferability (PST). To examine whether the proposed determinants of CCC (IS) represented distinct constructs, it was first determined whether PLA could indeed be distinguished from CCC (IS) conceptualised as perceived high sacrifice (PHS). The CFA on CCC (IS) and PLA indicated that the two constructs were not clearly distinguishable from one another (Appendix B, Table B2). As a consequence, PLA was not included in the analysis.

Second, a principal-axis factor analysis with direct oblimin rotation on the PST scale was conducted to verify its one-dimensionality. The analysis extracted one factor with an eigenvalue greater than one, which explained 66.80% of the common variance. The scree plot also suggested one factor above the inflection point, and an inspection of the pattern matrix indicated that one of the items (PST 2) loaded weaker (.42) on the one factor compared to PST 1 (.84) and PST 3 (.87). The commonalities were high for PST 1 (.71) and PST 2 (.77) but low for PST2 (.17). It was therefore decided to remove item PST 2 and to request a second principal-axis factor analysis. The analysis extracted one factor with an eigenvalue greater than one, which explained 87.17% of the common variance. Both items loaded strongly onto the factor (factor loadings greater than .86). As a consequence, it was decided to verify whether factor analysis was appropriate by examining the Bartlett's test of sphericity and the measures of sampling adequacy (MSA). While the Bartlett's test was significant at the  $p < .000$  level, the MSA was just .50 indicating a mediocre intercorrelation of the two variables. In conclusion, a composite scale of the two items was formed ( $\alpha = .85$ ).

## **Psychometric Properties of IS-related Task Performance and Citizenship and Counterproductive Work Behaviour**

To establish whether the proposed behavioural outcomes could be distinguished from each other, two CFAs were conducted on the sample of 240 information system users with the outcome items. The first CFA analysed the dimensionality of task and citizenship behaviour while the second CFA examined the factor structure of counterproductive work behaviour. Two separate analyses were conducted to limit model complexity and also to separate productive from counterproductive behaviour.

### **Information System-related Task Performance and Citizenship Behaviour**

A CFA was conducted on the original outcome items by Herscovitch and Meyer (2002) in order to examine the dimensionality of IS-related task performance and citizenship behaviour. Initially, the original three-factor solution comprising compliance (6 items), cooperation (8 items) and championing (6 items) was specified and analysed. The CFA resulted in a poor fit to the data ( $\chi^2 = 950.32$ ,  $df = 168$ ,  $p = .000$ ; GFI = .68; CFI = .76; RMSEA = .14; ECVI = 4.32). Although all factor loadings were significant, several items loaded below the .50 benchmark for adequate construct validity (Hair et al., 2006). In particular, three items from compliance loaded poorly as well as one item from cooperation. As a consequence – based on a recent refinement of the compliance scale (Meyer et al., 2007) – a four-factor model was fitted. In this CFA, a four-factor model was specified that entailed the separation of compliance into two dimensions: mere compliance and compliance. This four-factor model resulted in a significantly better fit to the data ( $\chi^2 = 519.95$ ,  $df = 165$ ,  $p = .000$ ). All the factor loadings were significant, but one of the cooperation items loaded below the .50 benchmark (Hair et al., 2006). Removing this item (OCB6: “I will not complain about the change”) resulted in improved fit ( $\Delta\chi^2 = 51.41$ ) (Table 5.7). All subsequent analyses were accordingly conducted with the remaining 19 items. In addition to the three- and four-factor models, two-factor models were also fitted and examined: First, a two-factor model combining compliance and cooperation; second, a two-factor model combining championing and cooperation (Table 5.7).

To test the proposition that IS-related citizenship behaviour can be directed at the organisation or individuals, a modified four-factor model was also tested. In this model, two of the original championing items (OCB9: “I will try to find ways to overcome change-related difficulties” and OCB10: “I will persevere with the change to reach goals”) were combined with the remaining cooperation items. As a consequence, the cooperation items were then all directed at behaviour towards the organisation (e.g., “I will avoid former practices, even if they seem easier”), and the remaining four championing items then all referred to individuals (e.g., “I will encourage the participation of others in the change”). Compared to the original four-factor solution, this minor adjustment to the cooperation and championing scales resulted in improved fit ( $\Delta\chi^2 = 39.03$ ). Overall, this model also resulted in a better fit than any other model (Table 5.7).

**Table 5.7: Fit Indexes of Confirmatory Factor Analysis: Mere Compliance, Compliance, Cooperation and Championing**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
4-factor model <sup>1</sup>	429.51*	146	.83	.91	.09	.08	.10	2.16	1.92	2.44
4-factor model <sup>2</sup>	468.54*	146	.80	.90	.09	.08	.10	2.32	2.07	2.61
3-factor model <sup>3</sup>	902.02*	149	.68	.77	.14	.13	.15	4.11	3.73	4.52
2-factor model <sup>4</sup>	933.64*	151	.69	.76	.14	.13	.15	4.23	3.84	4.65
2-factor model <sup>5</sup>	967.29*	151	.66	.75	.15	.14	.16	4.37	3.97	4.8
3-factor model <sup>6</sup>	515.92*	149	.79	.88	.10	.09	.11	2.50	2.22	2.8
1-factor model	1078.32*	152	.64	.71	.16	.15	.16	4.83	4.4	5.28

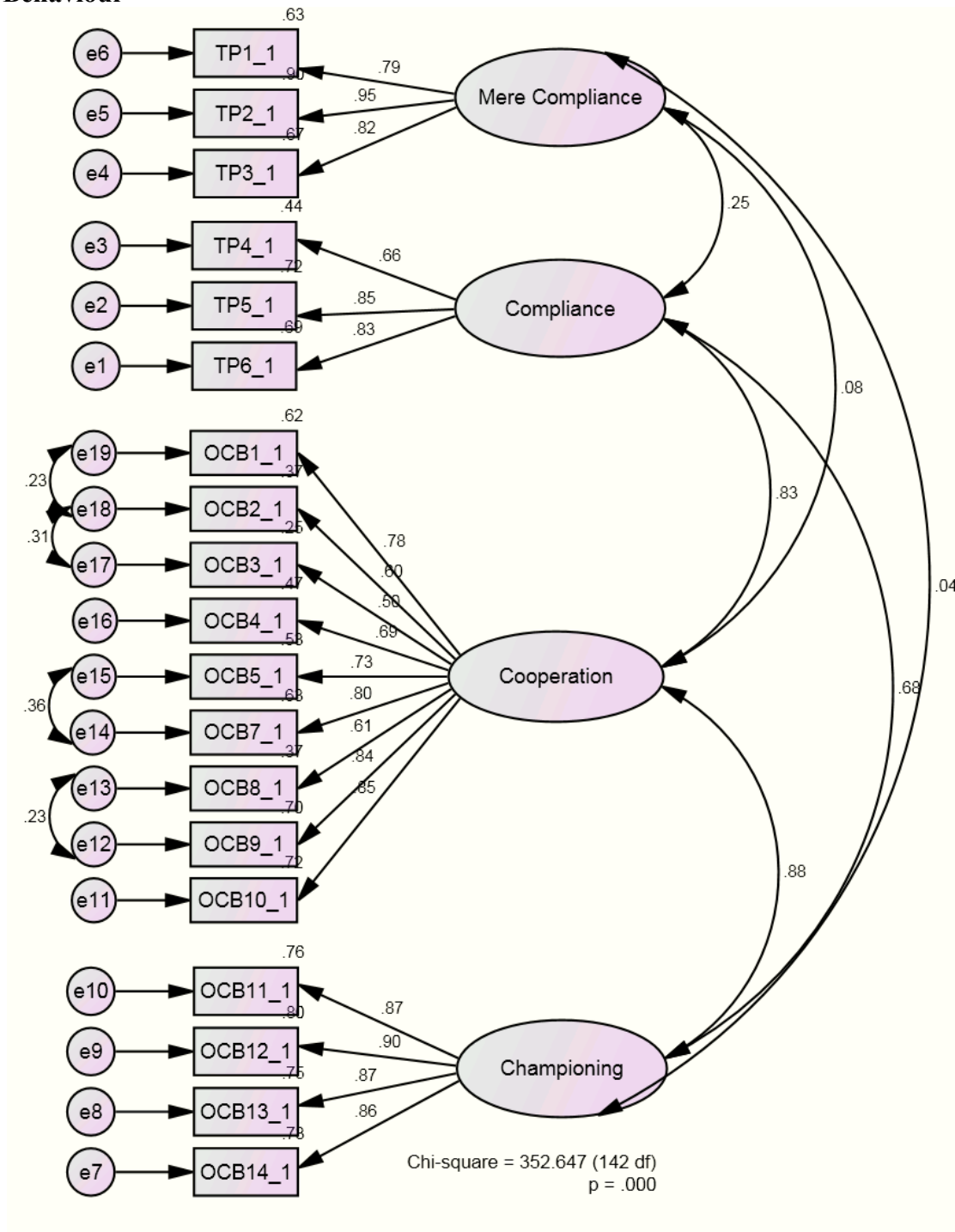
Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval; <sup>1</sup>Mere Compliance (3 items), Compliance (3 items), OCB (O): Cooperation (9 items), & OCB (I): Championing (4 items); <sup>2</sup> Mere Compliance (3 items), Compliance (3 items), Cooperation (7 items), & Championing (6 items); <sup>3</sup>Compliance (6 items), Cooperation (7 items), Championing (6 items); <sup>4</sup>Compliance and Cooperation items combined; <sup>5</sup>Cooperation and Championing items combined; <sup>6</sup> Mere Compliance (3 items), Championing (4 items) and a combined Compliance/ Cooperation (12 items) factor.

Consulting the modification indexes (Byrne, 2001; Hair et al., 2006) allowed the correlation of several error terms (Error 18 and Error 19; Error 18 and Error 17; Error 15 and Error 14; Error 12 and Error 13). The correlation of the error terms further improved model fit ( $\chi^2 = 352.647$ ,  $df = 142$ ,  $p = .000$ ; GFI = .86, CFI = .93, RMSEA = .07, ECVI = 1.87) (Figure 5.2). Although the GFI remained below the .90 benchmark for goodness-of-fit (Hair et al.), both the CFI and RMSEA indicated acceptable model fit. The ECVI also compared better with regard to the alternative models. This four-factor structure was therefore adopted to conceptualise task and citizenship behaviour in the study. All factor loadings were significant ( $p < .001$ , two-tailed) and above the .50 minimum benchmark for adequate construct validity (Hair et al.). None of the standardised residual co-variances resulted in a value of above |4.0|, and the factors in the model correlated strongly. Cooperation correlated .88 with championing and .83 with compliance. Compliance and championing correlated .68. Mere compliance was uncorrelated with both championing ( $r = .04$ ) and cooperation ( $r = .08$ ). Mere compliance and compliance correlated .25.

In sum, composite scales of the items comprising the four factors were created, resulting in a Cronbach alpha of .88, .81, .89, and .92 for mere compliance, compliance, cooperation and championing, respectively. Task performance then represented mere compliance and compliance. As a result of the modification of the scales, cooperation then represented citizenship behaviour towards the organisation (OCB (O)) and championing towards individuals (OCB (I)). The outcomes of C2C were thus aligned with the wider framework of workplace behaviour representing task and citizenship performance.

In addition to the above CFA, a higher order CFA (Hair et al., 2006) in AMOS on the four dimensions examined whether the four dimensions could be regarded as sub-dimensions of IS-related task and citizenship performance. In this higher order CFA, mere compliance and compliance were fitted as two sub-dimensions of a second-order factor structure, namely IS-related task performance. Cooperation and championing were fitted as sub-dimensions of IS-related organisational citizenship behaviour. The analysis resulted in a negative variance of error terms 22 and 23 resulting in an inadmissible solution. According to the build-in AMOS 18.0 reference guide, this indicates either a wrong model or a sample that is too small. Mere compliance, compliance, cooperation and championing were consequently treated as related, yet separate constructs in the remainder of the study.

**Figure 5.2: Confirmatory Factor Analysis of Task Performance and Citizenship Behaviour**



Note.  $N = 240$ . TP = IS-related task performance (mere compliance and compliance); OCB = IS-related organisational citizenship behaviour (cooperation and championing).

### Information System-related Counterproductive Work Behaviour

A CFA was conducted on the 12 items adapted for the study in order to examine the dimensionality of the IS-related counterproductive work behaviour scale. Initially, a two-factor model was examined that separated counterproductive work behaviour towards the organisation and towards individuals. The resultant model fit with the data was poor ( $\chi^2 = 433.08$ ,  $df = 53$ ,  $p = .000$ ; GFI = .73, CFI = .79, RMSEA = .17, ECVI = 2.02). Although all items loaded significantly ( $p < .001$ , two-tailed) onto their respective factors, two items loaded below the .50 benchmark for acceptable construct validity (Hair et al., 2006). In addition, three items resulted in a standardised residual covariance of above |4.0|.

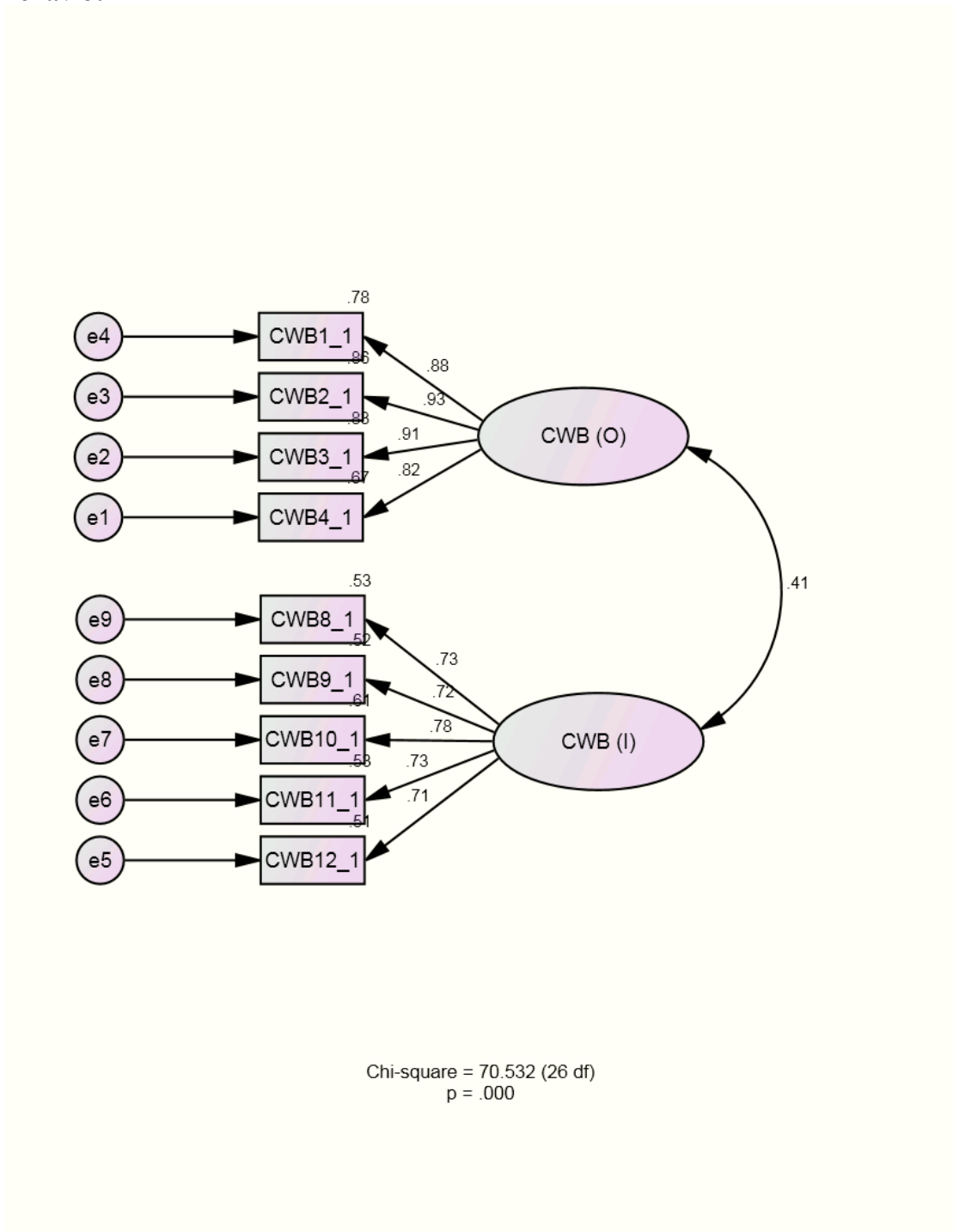
Consequently, in subsequent analyses, three items were removed one by one (CWB5, CWB6 and CWB7). The removal of these three items led to a significantly better model fit ( $\Delta\chi^2 = 362.54$ ). The two-factor model culminated in the best fit to the data: The GFI and CFI both resulted in a value of above the recommended .90 benchmark for good fit (Hair et al.). The RMSEA also indicated acceptable fit (Table 5.8).

**Table 5.8: Fit Indexes for Confirmatory Factor Analysis: Counterproductive Work Behaviour**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
2-factor model	70.53*	26	.94	.96	.08	.06	.10	.45	.36	.57
1-factor model	434.45*	27	.62	.70	.25	.23	.27	1.96	1.70	2.26

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval.

**Figure 5.3: Confirmatory Factor Analysis of Counterproductive Work Behaviour**



Note.  $N = 240$ ; CWB (O) = counterproductive work behaviour (Organisation); CWB (I) = counterproductive work behaviour (Individuals).

All factor loadings were significant ( $p < .001$ , two-tailed) and above .70 indicating good construct validity (Hair et al., 2006). The standardised residual co-variances were all below |4.0|. Both factors correlated moderately ( $r = .41$ ). Because the alternative one-factor solution resulted in a poor fit with the data, this two-factor solution was adopted to conceptualise CWB (O) and CWB (I) (Figure 5.3). As a consequence, composite scales were created from the items for CWB (O) and CWB (I) resulting in a Cronbach alpha of .93 and .85, respectively.

As with task and citizenship performance, a higher order CFA was attempted in order to verify whether CWB (O) and CWB (I) could be regarded as facets of a general IS-related counterproductive work behaviour construct. However, no result was generated because the specified model was unidentified – such a model does not provide a unique outcome because of the lack of information needed to identify a solution (Hair et al., 2006). Although it could still be possible to generate a solution, further constraints would need to be imposed on the model (Byrne, 2001). However, to limit model complexity, it was decided to remain with the above two-factor solution.

### **Psychometric Properties of Control Variables**

To control the influence of change context and individual differences, additional single and multi-item constructs were added to the analysis (see Method chapter: Control Questions and Individual Differences). CFA, EFA and reliability analyses were conducted to verify the psychometric properties of the multidimensional control variables. The analyses confirmed the dimensionality of the organisational commitment, self-efficacy, positive affect and change impact scales.

### **Dimensionality of Organisational Commitment**

Table B5 and Figure B2 in Appendix B show the results of the CFA on the 12 organisational commitment items. The three-factor model had a better fit than any of the other models ( $\chi^2 = 111.81$ ,  $df = 51$ ,  $p < .001$ ; GFI = .93; CFI = .96; RMSEA = .07; ECVI = .69). Factor loadings were all significant and above .70 except for one item (Item COC4 with a factor loading of .62) thus indicating acceptable construct validity. The factors were strongly correlated: Normative organisational commitment correlated .67 with affective commitment and .65 with continuance commitment.

Affective commitment and continuance organisational commitment correlated .45. Despite these correlations, the CFA confirmed the three-factor structure of the organisational commitment construct. The factors were labelled, and three composite scales of the AOC, COC and NOC constructs were created, resulting in a Cronbach alpha of .90, .86, and .89, respectively.

### **Dimensionality of Self-efficacy, Affectivity and Change Impact**

Principal-axis factor analyses confirmed the dimensionalities of self-efficacy (Table B6, Appendix B) ( $\alpha = .95$ ), and positive ( $\alpha = .90$ ) and negative ( $\alpha = .89$ ) affect (Table B7, Appendix B), as well as change impact (Table B8, Appendix B) ( $\alpha = .77$ ). An inspection of the scree plots also confirmed the extracted number of factors. No problems concerning the psychometric properties of the control variables were identified except for significant item overlap in respect of the positive and negative affect scales. As a consequence, these scales were shortened to five items per scale. Upon establishment of the internal consistencies, composite scales from the items of the respective factors were formed. Although negative affect was measured, only positive affect was included in subsequent analyses.

## **DESCRIPTIVE STATISTICS**

Table 5.9 summarises the descriptive (sample size, mean, mean standard error and standard deviation) and distribution statistics (skewness and kurtosis) of the variables in the study. These statistics are based on the final composite scales derived after factor analyses but before variable transformations. The sample size varied for some of the variables because some of the participants only partially answered the demographic questions. The mean indicates the average response of all the participants in the sample to a specific variable whereas the standard error of the mean represents the standard deviation of the sample mean (Field, 2005). According to Field, the standard error of the mean is also an indication of the representativeness of the sample with regard to the overall population. A small standard error with regard to the sample mean indicates that the sample is more likely to be a good representation of the overall population. The standard deviation indicates the variance from the mean of the sample. With regard to the sample mean, self-efficacy, change significance, championing, positive affect and ACC (IS) were relatively high.

Conversely, the sample means of IS change involvement, IS-related CWB (I) and IS job insecurity were relatively low.

**Table 5.9: Descriptive and Distribution Statistics before Variable Transformations**

Variable	N	Mean	S.E. Mean	SD	Skewness	Standard Error of Skewness	Kurtosis	Standard Error of Kurtosis
Affective User Commitment to Mandatory IS Change	240	3.66	0.06	0.93	-0.99	0.16	0.83	0.31
Continuance User Commitment to Mandatory IS Change	240	3.23	0.05	0.71	-0.20	0.16	0.83	0.31
Commitment Propensity	240	3.33	0.06	0.95	-0.54	0.16	-0.06	0.31
IS Change Involvement	240	2.88	0.05	0.77	-0.02	0.16	-0.27	0.31
IS Change Value	240	3.27	0.06	1.00	-0.54	0.16	-0.49	0.31
IS Change Climate	240	3.16	0.05	0.74	-0.46	0.16	0.22	0.31
Perceived Skills Transferability	240	3.50	0.06	0.98	-0.40	0.16	-0.02	0.31
Mere Compliance	240	3.29	0.06	0.97	-0.51	0.16	-0.39	0.31
Compliance	240	3.86	0.04	0.68	-1.43	0.16	4.71	0.31
Cooperation	240	3.84	0.04	0.62	-1.31	0.16	4.92	0.31
Championing	240	3.83	0.05	0.83	-0.98	0.16	1.63	0.31
Counterproductive Work Behaviour (Organisation)	240	2.77	0.07	1.08	0.36	0.16	-0.59	0.31
Counterproductive Work Behaviour (Individuals)	240	2.10	0.05	0.73	0.75	0.16	1.83	0.31
Gender	237	1.53	0.03	0.50	-0.13	0.16	-2.00	0.31
Age (Years)	226	35.10	0.54	8.11	0.82	0.16	0.41	0.32
Language	237	2.78	0.10	1.54	0.83	0.16	-0.38	0.31
Qualification	236	3.17	0.07	1.07	-0.01	0.16	-0.18	0.32
Organisational Tenure (Years)	231	7.40	0.43	6.49	1.58	0.16	2.69	0.32
Organisational Level	230	2.80	0.06	0.93	-0.22	0.16	-0.90	0.32
IS Tenure (Months)	226	9.11	0.55	8.24	1.45	0.16	2.37	0.32
Change Significance	240	3.95	0.07	1.16	-1.02	0.16	0.24	0.31
Change Impact	240	3.47	0.06	0.97	-0.56	0.16	0.02	0.31
IS Job Insecurity	240	2.00	0.08	0.08	1.09	0.16	-0.04	0.31
Self Efficacy	240	4.12	0.04	0.04	-1.53	0.16	4.37	0.31
Positive Affect	240	3.86	0.06	0.06	-1.03	0.16	0.70	0.31
Affective Organisational Commitment	240	3.47	0.06	0.92	-0.43	0.16	0.15	0.31
Continuance Organisational Commitment	240	3.20	0.06	0.95	-0.26	0.16	-0.30	0.31
Normative Organisational Commitment	240	2.99	0.07	1.06	-0.17	0.16	-0.73	0.31

Note. N = Sample Size; S.D. = Standard Deviation; S.E. Mean = Standard Error of the Mean.

## INTERCORRELATIONS AND RELIABILITIES

Table 5.10 shows the intercorrelations and reliabilities (Cronbach alpha) of the variables in the study using pair-wise deletion of missing data (Field, 2005) with regard to the demographic variables. Missing data on the other variables were replaced by the median of nearby points (see Method: Data Screening). In contrast to case-wise deletion of missing data, pair-wise deletion ensures that more cases are included in the analysis. The intercorrelations were calculated before variable transformations and represent Pearson product moment correlation coefficients (or Pearson's  $r$ ) (Chen & Popovich, 2002; Field, 2005). The correlations between ACC (IS), CCC (IS), CP and the individual determinants can be found in Appendix B, Table B10.

**Table 5.10: Intercorrelations and Reliabilities of the Variables in the Study**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. Affective User Commitment to Mandatory IS Change	(.93)																											
2. Continuance User Commitment to Mandatory IS Change	.12	(.59)																										
3. Commitment Propensity	.31**	.59**	(.90)																									
4. IS Change Involvement	.46**	.06	.15*	(.92)																								
5. IS Change Value	.67**	.00	.27**	.53**	(.92)																							
6. IS Change Climate	.50**	.04	.18**	.59**	.59**	(.90)																						
7. Perceived Skills Transferability	.54**	.18**	.29**	.46**	.53**	.41**	(.85)																					
8. Mere Compliance	-.01	.25**	.07	.04	.06	.14*	(.88)																					
9. Compliance	.44**	.34**	.32**	.33**	.39**	.30**	.34**	.24**	(.81)																			
10. Cooperation	.65**	.27**	.34**	.43**	.52**	.39**	.48**	.09	.69**	(.89)																		
11. Championing	.67**	.18**	.34**	.44**	.54**	.41**	.57**	.05	.59**	.79**	(.92)																	
12. Counterproductive Work Behaviour (Organisation)	-.34**	.35**	.10	-.17**	-.45**	-.21**	-.21**	.20**	.01	-.10	-.17**	(.93)																
13. Counterproductive Work Behaviour (Individuals)	-.05	.17**	.17**	-.10	-.06	-.05	-.15*	.12	-.11	-.10	-.14*	.39**	(.85)															
14. Gender	-.09	.10	.03	-.13*	-.07	-.01	-.07	.05	-.04	-.02	-.03	.03	.02	-														
15. Age	-.09	-.10	-.07	-.04*	-.16*	-.14*	-.15*	-.20**	-.09	-.07	-.13*	-.04	-.10	-.21**	-													
16. Language	.06	-.02	-.06	.05	.02	-.03	.19**	.11	-.01	.00	.10	.00	-.02	-.13*	-.24**	-												
17. Qualification	.12	.00	.00	.14*	.05	.01	.07	-.06	.22**	.19**	.13*	-.05	-.05	-.17**	.00	.16**	-											
18. Organisational Tenure	-.28**	-.08	-.13	-.14*	-.36**	-.19**	-.33**	-.01	-.17**	-.22**	-.28**	.14*	-.08	-.11	.63**	-.11	-.13	-										
19. Organisational Level	-.10	.10	.04	-.05	-.05	-.01	-.07	.12	-.02	-.12	-.14*	.06	.07	.21**	-.31**	-.03	-.14*	-.13*	-									
20. IS Tenure	.04	.04	-.04	.10	.02	.07	.11	-.03	.03	.07	.08	-.02	-.11	.02	.26**	-.13	-.06	.15*	-.19**	-								
21. Change Significance	.62**	.04	.20**	.28**	.51**	.35**	.38**	-.12	.31**	.45**	.43**	-.25**	-.11	-.09	.04	.03	.18**	-.16*	-.09	.05	-							
22. Change Impact	.53**	.06	.25**	.28**	.55**	.40**	.36**	-.03	.31**	.41**	.38**	-.24**	-.03	-.04	.00	.04	.12	-.21**	-.09	.01	.59**	(.77)						
23. IS Job Insecurity	-.31**	.09	-.06	-.18**	-.21**	-.17**	-.13	.18**	-.17**	-.25**	-.24**	.23**	.23**	.06	-.02	.04	-.21**	.17**	.08	.03	-.30**	-.26**	-					
24. Self Efficacy	.38**	.25**	.21**	.31**	.33**	.28**	.37**	.10	.36**	.41**	.39**	-.10	-.10	.02	-.10	-.04	.05	-.17**	-.01	.06	.18**	.16*	-.25**	(.95)				
25. Positive Affect	.52**	.06	.15*	.43**	.45**	.45**	.47**	.00	.29**	.39**	.48**	-.26**	-.13*	.01	-.12	.09	.10	-.29**	-.07	.05	.38**	.34**	-.13	.41**	(.90)			
26. Affective Organisational Commitment	.32**	.10	.20**	.36**	.34**	.49**	.24**	.03	.25**	.32**	.37**	-.05	-.07	-.05	-.02	.06	.02	-.03	-.12	-.01	.14*	.22**	-.05	.34**	.30**	(.90)		
27. Continuance Organisational Commitment	.09	.19**	.22**	.22**	.12	.31**	.17**	.12	.13*	.13*	.17**	.10	.03	.02	.01	-.10	.07	-.03	.01	.07	.13*	.07	.25**	.11	.41**	(.86)		
28. Normative Organisational Commitment	.26**	.00	.24**	.27**	.36**	.52**	.22**	-.02	.14*	.22**	.29**	-.11	.05	.02	.00	.05	-.04	-.06	-.11	-.06	.12	.27**	-.06	.23**	.20**	.60**	.59**	(.89)

Note. Values are Pearson correlation coefficients. Scale internal consistencies (Cronbach alpha) in parentheses on the diagonal. Sample size ranging from N = 217 to N = 240 (pairwise deletion of demographic missing data). Dashes indicate a single item measure. \*\* Correlation is significant at the .01 level (2-tailed). \* Correlation is significant at the .05 level (2-tailed).

## DETERMINANTS OF USER COMMITMENT

This part summarises the analyses that endeavoured to test the propositions that the determinants are significantly related to and explain significant variance in ACC (IS) and CCC (IS). The first section of this part summarises the results of the analyses concerning the explanation of ACC (IS), and the second section summarises the findings concerning the explanation of CCC (IS).

### Predicting Affective User Commitment

It was proposed that CP (Proposition 2), IS change value (Proposition 3), IS change involvement (Proposition 4) and IS change climate (Proposition 5) relate positively to, and explain significant variance in, ACC (IS) (Proposition 7). It was also proposed that IS change climate partially mediates the positive correlation between IS change involvement and ACC (IS) (Proposition 6).

### Correlation Analysis

Table 5.10 shows the correlations of the variables in the study. As expected, the proposed determinants all correlated significantly ( $p < .01$ , two-tailed) and in the proposed direction with ACC (IS). Using the guidelines by Field (2005) concerning the interpretation of the Pearson correlation coefficients, IS change value ( $r = .67, p < .01$ ) correlated strongly with ACC (IS); IS change involvement ( $r = .46, p < .01$ ) and IS change climate ( $r = .50, p < .01$ ) correlated moderately with ACC (IS) as did commitment propensity (CP) ( $r = .31, p < .01$ ). Table B10 in Appendix B shows the correlations between ACC (IS), CCC (IS), CP and the individual determinants. Although ACC (IS) correlated significantly positively with all the proposed determinants, the strongest correlation was with information quality ( $r = .59, p < .01$ ) and perceived usefulness ( $r = .59, p < .01$ ).

Among the control variables, change significance ( $r = .62, p < .01$ ) and change impact ( $r = .53, p < .01$ ) correlated strongly with ACC (IS) while positive affect ( $r = .52, p < .01$ ) and self-efficacy ( $r = .38, p < .01$ ) correlated moderately with ACC (IS). Organisational tenure ( $r = -.28, p < .01$ ) and IS job insecurity ( $r = -.31, p < .01$ ) correlated negatively with ACC (IS). The other control variables were not significantly correlated, but AOC ( $r = .32, p < .01$ ) and NOC ( $r = .26, p < .01$ ) both correlated moderately positively with ACC (IS). The findings of the correlation

analysis are twofold: First, the proposed determinants did indeed correlate significantly with ACC (IS); second, unexpectedly, some of the control variables correlated significantly with ACC (IS) as well.

The strong correlation of the control variables with ACC (IS) could give rise to multicollinearity (Hair et al., 2006). The correlations between the control variables and the proposed determinants were accordingly examined. Table 5.10 indicates moderate correlations, especially between the proposed determinants and change significance, change impact, self-efficacy and positive affect. In particular, IS change value correlated moderately with change significance ( $r = .51, p < .01$ ) and strongly with change impact ( $r = .55, p < .01$ ). Positive affect correlated moderately with IS change value ( $r = .45, p < .01$ ), involvement ( $r = .43, p < .01$ ) and climate ( $r = .45, p < .01$ ). Organisational tenure and IS job insecurity correlated negatively with the proposed determinants. Interestingly, the strongest negative correlation was between organisational tenure and IS change value ( $r = -.36, p < .01$ ). The results indicate that some of the control variables correlated not only with ACC (IS) but also with the proposed determinants. Nevertheless, none of the correlations was strong enough to warrant exclusion due to multicollinearity.

Next, the correlations between the control variables were examined. The purpose of this analysis was again to detect any strong correlations that could result in multicollinearity (Hair et al., 2006) in the subsequent regression analysis. The presence of strong correlations (i.e. multicollinearity) between the independent (individual differences, control variables or determinants) variables affects the explanatory power of a regression equation by adding only common (i.e. variance shared by the variables) and not unique variance thus indicating that the independent variables are not independent.

The strongest correlation was between age and organisational tenure ( $r = .63, p < .01$ ) and change significance and change impact ( $r = .59, p < .01$ ). Positive affect and self-efficacy ( $r = .41, p < .01$ ) had a moderate correlation. Nevertheless, none of the intercorrelations was strong enough to warrant exclusion because of potential multicollinearity.

Next, the intercorrelations of the determinants to detect the possibility of multicollinearity were examined. The strongest correlation was between IS change climate and both IS change involvement ( $r = .59, p < .01$ ) and IS change value ( $r = .59, p < .01$ ). CP correlated moderately with the three determinants ( $r$  ranging from .15 to .27,  $p < .01$ ). Nevertheless, the strength of the correlations did not warrant any exclusion to prevent multicollinearity.

### Regression Analyses Explaining Affective User Commitment

The results of the correlation analysis indicated a moderate to strong correlation between ACC (IS), CP and the proposed determinants. Multiple regression analyses were subsequently conducted to establish the direction of the relationship between the determinants and ACC (IS). A standard multiple regression analysis, followed by a hierarchical and moderated regression analysis, was conducted to test the proposition that the determinants correlate significantly with, and explain significant variance in, ACC (IS).

A standard multiple regression was performed on ACC (IS) as the dependent variable and commitment propensity, IS change involvement, value and climate as the independent variables. Table 5.11 shows the unstandardised (including standard error) and standardised regression coefficients, exact  $p$ -values and variance in ACC (IS) explained.

**Table 5.11: Multiple Regression Analysis Predicting ACC (IS)**

	<i>B</i>	<i>B SE</i>	<i>Beta</i>	<i>p</i>
Commitment Propensity	.13	.04	.13	.005
IS Change Involvement <sup>1</sup>	.12	.07	.10	.083
IS Change Value <sup>2</sup>	.48	.05	.51	.000
IS Change Climate <sup>3</sup>	.13	.07	.11	.081

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;

$Beta$  = Standardised Coefficient;  $p$  = Significance Level.

$R = .70$ ;  $R^2 = .49$ ; Adjusted  $R^2 = .48$  ( $p < .001$ ); Post hoc power of this model: 100%.

<sup>1</sup> Comprising Communication, Participation, Training; <sup>2</sup> Comprising Perceived Usefulness, Information Quality; <sup>3</sup> Comprising Overall Change Fairness, Change Leadership.

The four independent variables together explained 49% of the variance in ACC (IS). The adjusted  $R^2$  was .48. This indicates that there was only a minor decline in explanatory power due to multicollinearity (Tabachnick & Fidell, 2001). The change

in  $R^2$  in the model was significant ( $p = .000$ ).  $R$  for the regression equation was significantly different from zero ( $F(4, 235) = 56.90, p = .000$ ) indicating a significant overall regression model. Concerning the individual regression paths, only CP ( $\beta = .13, p = .005$ ) and IS change value ( $\beta = .51, p = .000$ ) were significant. The  $p$ -values of IS change involvement ( $\beta = .10, p = .083$ ) and climate ( $\beta = .11, p = .081$ ) were, however, close to the five percent significance level. It could thus be argued that they could still play a key role in the prediction of ACC (IS). The large standardised regression coefficient of IS change value indicates that this determinant was the most important predictor of ACC (IS).

The semi-partial correlations (Field, 2005) were examined to establish the unique relationship between the independent variables and ACC (IS). The semi-partial correlations between ACC (IS) and CP, IS change involvement, value and climate were .13, .08, .39, .08, respectively. This result indicates that IS change value, followed by CP, explained most of the unique variance not explained by the other predictors.

Overall, the model indicates that the proposed determinants significantly explain almost 50% of the variance in ACC (IS) thus confirming Proposition 7. The analysis also confirmed Propositions 2 and 3, namely that CP and IS change value relates positively to ACC (IS). Propositions 4 and 5, namely that IS change involvement and IS change climate related positively to ACC (IS), could, however, not be verified by standard regression analysis. Nevertheless, the results of the correlation analysis showed a positive correlation between those determinants and ACC (IS).

To explore the influence of commitment propensity on ACC (IS), commitment propensity (CP) was excluded in a subsequent regression model. Excluding CP in the analysis resulted in a minor decline in variance explained ( $R^2 = .47, \text{adjusted } R^2 = .46, p = .000$ ). The significance of the remaining determinants did not change, and IS change value emerged as the only significant predictor.

Given the moderate significant correlation between ACC (IS) and both AOC and NOC, their predictive ability was also explored. Interestingly, the inclusion of the three components of organisational commitment (AOC, COC and NOC) in the prediction of ACC (IS) did not significantly increase the variance explained. The resulting variance explained was 50% (adjusted  $R^2 = .48$ ,  $p = .000$ ), and the individual regression coefficients of AOC, COC and NOC were insignificant in the prediction of ACC (IS).

Upon completion of the analysis, the checklist for standard multiple regression by Tabachnick and Fidell (2001) was used to examine the issues and assumptions of the regression analysis.

First, the sample size requirements, including statistical power, were examined. The ratio of cases to variables was 60:1, which was significantly higher than the preferred ratio of 20:1, as suggested by Hair et al. (2006). Using the G\*Power statistical package, the power for the above model was 100% thus indicating a large enough sample size.

Second, the normality and linearity of the variables and the homoscedasticity of the residuals were examined. Concerning normality, the skewness and kurtosis of the variables were looked at. In this analysis, all variables were between the  $\pm 1$  range of skewness and kurtosis, as suggested by Tabachnick and Fidell (2001). Linearity was determined by examining the correlations of the variables. In this analysis, significant correlations between ACC (IS) and the independent variables indicated linearity. The scatter plot of the residuals was used to assess homoscedasticity, but no problems were identified.

Third, the Durbin-Watson statistic for establishing the assumption of independent errors (Field, 2005) was reviewed. The statistic was found to be neither less than one, nor greater than three, as suggested, to cause concern.

Fourth, the cases were scanned for outliers, but none were found.

Fifth, the presence of multicollinearity was determined by examining the VIF and tolerance statistics. The VIF and tolerance values were all within acceptable ranges thus indicating no problems with multicollinearity.

### **Hierarchical Regression Analysis Explaining Affective User Commitment**

The above analysis examined the influence of the determinants on ACC (IS) without considering individual differences and the control variables included in the study. Subsequently, hierarchical (or sequential) regression analysis – and entering the predictors in blocks of variables (Tabachnick & Fidell, 2001) – was used to establish whether the proposed determinants explained variance in ACC (IS) *above and beyond* demographic and control variables. A logical pattern was followed, and causally prior predictors were included first. The analysis comprised three steps: In step one, the individual differences including CP were introduced; in step two the control variables were introduced; and, in step three, the proposed determinants were introduced. The change in variance explained was noted to control for the effect of the individual differences and control variables.

The analysis of the assumptions of multiple regression analysis led to the transformation of several of the control variables to reduce skewness and kurtosis (Appendix B, Table B9). The analysis started off with the transformed variables and was later repeated using the original untransformed variables. Comparison of the results of the two analyses resulted in no significant differences. The total variance explained in ACC (IS) using the original variables differed by 2% (Table B13, Appendix B). Neither the direction nor the significance of the predictors in the model changed in step three. Consequently, the results of the analysis using the original variables are summarised in Table 5.12, which shows the unstandardised (including standard error) and standardised regression coefficients including the exact  $p$ -value as well as  $R$ ,  $R^2$ , adjusted  $R^2$  and change in  $R^2$ .

**Table 5.12: Hierarchical Regression Analysis Predicting ACC (IS)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Individual Differences</b>				
Gender	-.16	.10	-.08	.139
Age	.00	.00	.04	.416
Language	.01	.03	.03	.610
Qualification	.02	.05	.02	.689
Organisational Tenure	-.02	.01	-.17	.020
Organisational Level	-.06	.05	-.05	.316
Self-efficacy	.22	.08	.16	.009
Positive Affect	.37	.06	.37	.000
Commitment Propensity	.20	.05	.21	.000
<b>Step 2: Control Questions</b>				
Gender	-.12	.09	-.06	.180
Age	-.00	.00	-.04	.503
Language	.01	.03	.02	.599
Qualification	-.03	.04	-.04	.402
Organisational Tenure	-.01	.00	-.06	.307
Organisational Level	-.04	.05	-.04	.377
Self-efficacy	.18	.07	.13	.010
Positive Affect	.22	.05	.21	.000
Commitment Propensity	.12	.04	.12	.009
Change Significance	.28	.04	.35	.000
Change Impact	.14	.05	.14	.013
IS Tenure	.00	.00	.02	.644
IS Job Insecurity	-.06	.03	-.09	.068
<b>Step 3: Proposed Determinants</b>				
Gender	-.05	.08	-.02	.531
Age	-.00	.00	-.01	.834
Language	.02	.02	.03	.406
Qualification	-.01	.04	-.01	.679
Organisational Tenure	-.00	.00	-.02	.701
Organisational Level	-.03	.04	-.03	.410
Self-efficacy	.12	.06	.08	.080
Positive Affect	.14	.05	.14	.011
Commitment Propensity	.10	.04	.10	.026
Change Significance	.23	.04	.29	.000
Change Impact	.04	.05	.04	.456
IS Tenure	.00	.00	.00	.930
IS Job Insecurity	-.06	.03	-.09	.061
IS Change Involvement	.07	.07	.06	.285
IS Change Value	.26	.06	.27	.000
IS Change Climate	.05	.07	.04	.447

Note. Sample size ranging from  $N = 226$  to  $N = 240$  (pair-wise deletion of demographic variables); *B* = Unstandardised Coefficient; *B S.E.* = *B* Standard Error; *Beta* = Standardised Coefficient; *p* = Significance Level.

After Step 1:  $R = .62$ ;  $R^2 = .38$ ; Adjusted  $R^2 = .36$ ;  $\Delta R^2 = .38$  ( $p < .001$ )

After Step 2:  $R = .75$ ;  $R^2 = .57$ ; Adjusted  $R^2 = .54$ ;  $\Delta R^2 = .18$  ( $p < .001$ )

After Step 3:  $R = .79$ ;  $R^2 = .63$ ; Adjusted  $R^2 = .60$ ;  $\Delta R^2 = .05$  ( $p < .001$ )

Post hoc power of this model: 100% (based on  $N = 226$ )

$R$  was significantly different from zero after each step: After step three with all the predictors in the model,  $F(16, 200) = 21.41$  ( $p = .000$ ), indicating that the overall model was significant. The model thus significantly explained 63% (adjusted  $R^2 = .60$ ) of the variance in ACC (IS).

By introducing the individual differences in step one, the change in  $R^2$  was .38 ( $p = .000$ ); by introducing the control variables in step two, the change in  $R^2$  was .18 ( $p = .000$ ); and, finally, by introducing the proposed determinants, the change in  $R^2$  was only .05 in step three. This finding was unexpected and indicates that the determinants did not explain more variance in ACC (IS) than did the control and demographic variables. However, the determinants did explain additional variance above and beyond the control and demographic variables.

In step one, organisational tenure ( $\beta = -.17, p = .020$ ), self-efficacy ( $\beta = .16, p = .009$ ), positive affect ( $\beta = .37, p = .000$ ) and CP ( $\beta = .21, p = .000$ ) were the only significant predictors of ACC (IS). In step two, self-efficacy ( $\beta = .13, p = .010$ ), positive affect ( $\beta = .21, p = .000$ ), CP ( $\beta = .12, p = .009$ ), change significance ( $\beta = .35, p = .000$ ) and change impact ( $\beta = .14, p = .013$ ) were all significant predictors. Finally, in step three, positive affect ( $\beta = .14, p = .011$ ), CP ( $\beta = .10, p = .026$ ), change significance ( $\beta = .29, p = .000$ ) and IS change value ( $\beta = .27, p = .000$ ) remained as significant predictors of ACC (IS). However, IS change insecurity was close to the 5% level of significance.

The semi-partial correlations after step three were strongest for change significance ( $r = .21$ ), IS change value ( $r = .17$ ), positive affect ( $r = .11$ ), CP ( $r = .09$ ), self-efficacy ( $r = .07$ ), IS change involvement ( $r = .04$ ) and change impact ( $r = .03$ ). Overall, these variables added the most unique variance to the prediction of ACC (IS).

Taking into account individual differences and control variables, the influence of change significance and positive affect was unexpected as was the non-significance of the regression coefficients of IS change involvement and climate. Interestingly, the other demographic variables and control questions did not play a role in the prediction of ACC (IS). In particular, IS job insecurity and IS tenure were insignificant.

Because the data were from different organisations that implemented different types of ERP systems, the influence of the organisation and the ERP system type (e.g., SAP, Oracle, Sage) was controlled. To achieve this, organisation and ERP system type were included as predictors in the hierarchical regression analysis in the step two. Both variables were indirectly accounted for during the data collection process. The results of this analysis indicated that neither organisation (step three:  $\beta = .52, p = .125$ ) nor ERP system type (step three:  $\beta = -.44, p = .198$ ) had a significant impact on ACC (IS) in step two or three. The inclusion of these two control variables increased the variance explained in ACC (IS) by one percent ( $R^2 = .64, p = .000$ ) in the final model. The significance and direction of the other predictors remained unchanged.

Because this regression analysis was conducted with additional independent variables, the assumptions of multiple regression analysis were examined by reviewing Tabachnick and Fidell's (2001) checklist.

Concerning sample size, the ratio of cases to variables was 14:1 (using the 16 independent variables and the minimum of 226 cases as the basis) (excluding organisation and ERP system type). Although this ratio was below the preferred 20:1 ratio, it nevertheless met the minimum ratio of 5:1 (Tabachnick & Fidell, 2001). In addition, the post hoc power of the model was 100% thus indicating a sufficiently large sample.

The normality of the variables was addressed by including the transformed variables instead of the original variables. The transformed variables all fell within the suggested range of kurtosis and skewness thus suggesting that they were normally distributed (Table B9, Appendix B). However, the use of the transformed variables resulted in an almost identical solution to that with the use of the original variables (Table B13, Appendix B). Thus the results of the analysis using the original variables were shown.

Adequate linearity between the predictors and the dependent variables was indicated by the sufficient intercorrelations, especially between the proposed determinants and ACC (IS) (Table 5.10).

Homoscedasticity was examined by reviewing the residual plot of the regression equation and indicated the possibility of heteroscedasticity.

Multi-collinearity, however, was not a problem as indicated by acceptable VIF and the tolerance values of the variables. The Durbin-Watson statistic, an indication of the independence of errors, was acceptable with a value of 2.12.

The significant regression coefficients and strong semi-partial correlations of change significance and positive affect pointed to a possible interaction between the control variables and the proposed determinants (the strength of the relationship between ACC (IS) and the proposed determinants depends on the strength of the control variables). That the predictive relationship between the proposed determinants and ACC (IS) depended on the strength of the control variables change significance, change impact, positive affect and self-efficacy was especially plausible because the proposed determinants alone explained 49% in the variance in ACC (IS). According to Tabachnick and Fidell (2001), the solution of a regression analysis depends largely on the combination of the included variables; in other words, whether a predictor appears to be important also depends on the other variables in the solution.

To control the effect of the individual differences and control variables, the three steps in the analysis were reversed. Using the same blocks of variables as in Table 5.12, the three determinants were introduced in step one and the control variables in step two followed by the individual differences, including commitment propensity (CP) as the last variable, in step three. Reversing the order of entry revealed that the three determinants in step one explained 47% of the variance in ACC (IS) ( $\Delta R^2 = .47$ ,  $p = .000$ ). Excluding CP reduced the variance explained by 2%. The control variables in step two explained 11% of the variance ( $\Delta R^2 = .11$ ,  $p = .000$ ), and the individual differences accounted for only 4% of the variance ( $\Delta R^2 = .04$ ,  $p = .009$ ). The overall model significantly explained 63% of the variance in ACC (IS) in step three ( $F(16, 200) = 21.41$ ,  $p = .000$ ). The statistical significance of the individual regression coefficients did not change with positive affect ( $p = .011$ ), CP ( $p = .026$ ), change significance ( $p = .000$ ) and IS change value ( $p = .000$ ) remaining the only significant predictors of ACC (IS) in step three. This result shows that the predictive power of

the proposed determinants depended to a large extent on the other variables in the solution.

The proposed higher order determinants were used as the independent variables to report the regression analyses explaining ACC (IS). However, in order to assess any differences in the variance explained, the analysis was repeated using the individual determinants. The results of this analysis were consistent with the analysis using the higher order independent variables – a summary of the analysis can be found in the appendix (Appendix B, Tables B11 and B12). In the standard multiple regression analysis, IQ and PU were, apart from CP, the only significant determinants of ACC (IS). In the hierarchical multiple regression analysis, IQ and PU emerged as the only significant individual predictors in step three (apart from CP, positive affect and change significance).

### **Moderated Hierarchical Regression Analysis Explaining Affective User Commitment**

A moderated hierarchical regression analysis was conducted to identify possible interactions between the individual differences, control variables and the proposed determinants. The predictors were converted into deviation scores resulting in each variable having a mean of zero (Tabachnick & Fidell, 2001). Interaction terms of the respective centred variables were subsequently formed (e.g., positive affect x IS change value). The respective interaction terms were then added as a two-way interaction effect in step four after the main effects (steps one, two and three).

Chaplin (1991) stresses the importance of theory when examining interaction effects: Small interaction effects should rest on a solid theoretical foundation. In this case, however, there was no theoretical foundation regarding an interaction between the variables because they were examined for the first time in this context. In the absence of theory, the potential interaction effects between change significance, change impact, positive affect, self-efficacy and the proposed determinants (CP, IS change involvement, value and climate) were explored, but the results should be interpreted with caution. The resulting moderated regression analyses culminated in 16 different analyses. Only one significant interaction emerged from this analysis, namely between change impact and IS change value.

**Interaction of Change Impact and IS Change Value.** The interaction term of change impact and IS change value in the prediction of ACC (IS) was significant ( $B = -.08, p = .026$ ) (Table 5.13) in the moderated hierarchical regression analysis in step four. The change in  $R^2$  in step four was significant ( $p = .026$ ) with  $R$  also being significantly different from zero ( $F(17, 199) = 20.85, p = .000$ ) indicating overall regression model significance. The moderated hierarchical regression model explained 64% of the variance in ACC (IS) thus implying that the interaction term explained an additional one percent in the ACC (IS) variance. The adjusted  $R^2$  was .61 and the semi-partial correlation of the interaction term -.095. The resulting squared semi-partial correlation, an indication of the unique effect of the interaction term, was .009. This shows that approximately 0.90% of the variance explained in ACC (IS) was due to the interaction between change impact and IS change value.

This finding implies that the predictive power of IS change value in predicting ACC (IS) depends on the strength of change impact (Figure 5.4). The strength of the relationship between ACC (IS) and IS change value will therefore be relatively stronger when change impact is high. In other words, if there is a large positive effect of the change on job performance, the climate in the organisation and non-work life (high change impact), and the relationship between ACC (IS) and IS change value will be stronger. Conversely, the strength of the relationship between ACC (IS) and IS change value will be relatively weaker when change impact (large negative effect of the change) is low. However, this relationship holds only in the case of low IS change value. In the case of high IS change value, the strength of the relationship between ACC (IS) and IS change value will remain approximately the same, regardless of how high or low change impact is.

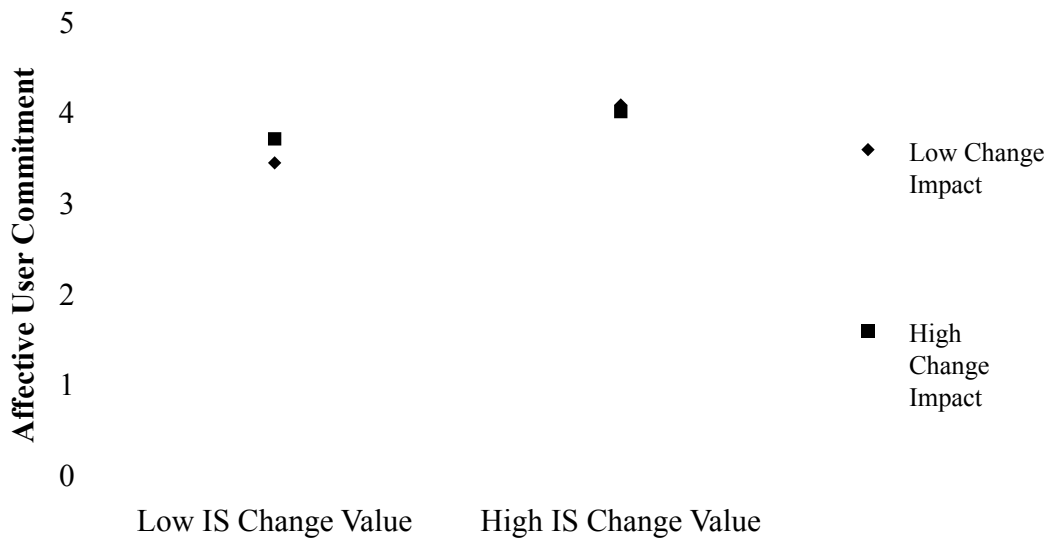
Because the interaction term was added in step four, the assumptions of multiple regression analysis were re-examined, but no significant difference was noted compared to the previous hierarchical regression analysis without the interaction term.

**Table 5.13: Moderated Hierarchical Regression Analysis Predicting ACC (IS)**

	Step 1: Main Effect	Step 2: Main Effect	Step 3: Main Effect	Step 4: Interaction Effect
Gender	-.16	-.12	-.05	-.05
Age	.00	.00	.00	.00
Language	.01	.01	.02	.02
Qualification	.02	-.03	-.01	-.01
Organisational Tenure	-.02*	-.01	.00	-.00
Organisational Level	-.06	-.04	-.03	-.04
Self-efficacy	.22*	.18*	.12	.12
Positive Affect	.37**	.22**	.14*	.14*
Commitment Propensity	.20**	.12*	.10*	.10*
Change Significance		.28**	.23**	.21**
Change Impact		.14*	.04	.04
IS Tenure		.00	.00	.00
IS Job Insecurity		-.06	-.06	-.06
IS Change Involvement			.07	.09
IS Change Value			.26**	.23**
IS Change Climate			.05	.06
Change Impact x IS Change Value				-.08*
<b><math>R^2</math></b>	.38**	.57**	.63**	.64**
<b>Adjusted <math>R^2</math></b>	.36**	.54**	.60**	.61**
<b><math>\Delta R^2</math></b>	.38**	.18**	.05**	.009*

Note. Sample size ranging from  $N = 226$  to  $N = 240$  (pair-wise deletion of demographic variables); Continuous predictor variables are mean centered; Values are unstandardised regression coefficients; \* $p < .05$ , \*\* $p < .01$ . Post hoc power of this model: 100% (based on  $N = 226$ ).

**Figure 5.4: Interaction between Change Impact and Change Value to Predict ACC (IS)**



Note. Unstandardised regression coefficients were used in plotting the interaction.

### Summary

In conclusion, the above standard multiple regression analysis shows that the proposed determinants explained 49% of the variance in ACC (IS). The subsequent hierarchical regression analysis further showed that the determinants did explain variance in ACC (IS) above and beyond the individual differences and control variables. The moderated hierarchical regression analysis also pointed to a small, but significant, interaction between change impact and IS change value. According to Chaplin (1991), even very small interaction effect sizes may be important but only in the context of a strong theoretical foundation. A theoretical rationale (i.e. how the moderator operates to influence the relationship) for this interaction does not yet exist, and therefore this result should be interpreted with caution. Overall, the result supports Proposition 7: The proposed determinants explain significant variance in ACC (IS). However, only CP (confirming Proposition 2) and IS change value (confirming Proposition 3) emerged as significant individual predictors. Surprisingly, IS change involvement (disconfirming Proposition 4) and IS change climate (disconfirming Proposition 5) were insignificant.

### **Mediation of Determinants to Predict Affective User Commitment**

The procedure suggested by Baron and Kenny (1986) was used to test Proposition 6, namely that IS change climate partially mediates the positive relationship between IS change involvement and ACC (IS).

In the first equation, it was tested whether IS change involvement was a significant predictor of ACC (IS), and the results confirmed that it was ( $\beta = .46, p = .000; F(1, 238) = 65.35, p = .000$ ).

Next, it was tested whether IS change climate was a significant predictor of ACC (IS), and the results indicated that it was ( $\beta = .50, p = .000; F(1, 238) = 79.46, p = .000$ ).

In the third regression equation, it was tested whether the mediator IS change climate remained a significant predictor while controlling for IS change involvement.

Entering IS change involvement before IS change climate in the multiple regression equation indicated that it did remain so ( $\beta = .34, p = .000, F(1, 237) = 49.24, p = .000$ ).

Finally, it was tested whether the relationship between IS change involvement and ACC (IS) was reduced when controlling for the mediator, and the results indicated that the correlation was indeed reduced by a decline in the standardised regression coefficient ( $\beta = .25, p = .000$  compared to  $\beta = .46, p = .000$  without the mediator). In sum, these results confirm Proposition 6, namely that IS change climate partially mediates the positive correlation between IS change involvement and ACC (IS).

As recommended by Baron and Kenny (1986), the Sobel test (Sobel, 1982) was used to determine whether the mediator significantly moves the effect of the independent variable to the dependent variable. The outcome of the Sobel test thus offers a test of whether the mediation effect is statistically significant. The Sobel test statistic resulted in a value of 4.67 ( $p = .00000288$ ) ( $SE = .053$ ) showing that IS change climate indeed significantly carries the influence of IS change involvement onto ACC (IS).

## **Predicting Continuance User Commitment**

To test Proposition 8, namely that perceived lack of alternatives (PLA) and perceived skills transferability (PST) explain significant variance in CCC (IS), a correlation, followed by multiple regression analyses, was performed. As a result of the analysis that revealed the poor psychometric properties of PLA, only PST was examined as a determinant.

### **Correlation Analysis**

Table 5.10 shows the correlations of the variables in the study. Except for commitment propensity ( $r = .59, p < .01$ ), self-efficacy ( $r = .25, p < .01$ ) and COC ( $r = .19, p < .01$ ), CCC (IS) did not correlate with the individual difference and control variables. The proposed determinant, PST, correlated mildly with CCC (IS) ( $r = .18, p < .01$ ). As a consequence, further regression analyses were conducted on the prediction of CCC (IS).

### **Regression Analyses Explaining Continuance User Commitment**

Table 5.14 shows the results of the regression analysis using CCC (IS) as the dependent variable and PST as the predictor.  $R$  for the regression equation was significantly different from zero ( $F(1, 238) = 8.16, p = .005$ ) indicating that the overall regression model was significant. Although the standardised regression coefficient of PST was significant ( $\beta = .18, p = .005$ ), the variance explained was only 3% (adjusted  $R^2 = .02$ ), and the resulting semi-partial correlation between CCC (IS) and PST was .18. Although the result of this analysis confirms that PST correlated positively with CCC (IS), the statistical power of 77.44% of the regression model was poor and below the suggested 80% (Hair et al., 2006). In addition, the scatter plot of the residuals indicated homoscedasticity.

**Table 5.14: Multiple Regression Analysis Predicting CCC (IS)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
Perceived Skills Transferability	.13	.04	.18	.005

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error

$Beta$  = Standardised Coefficient;  $p$  = Significance Level

$R = .18$ ;  $R^2 = .03$ ; Adjusted  $R^2 = .02$  ( $p < .01$ ); Post hoc power of this model: 77.44%

An examination of the other assumptions of multiple regression analysis with regard to the above model did not result in any further deviations. In addition to the above standard multiple regression analysis, a hierarchical regression analysis was conducted to determine whether PST explained the variance in CCC (IS) above and beyond individual differences and control variables.

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## Hierarchical Regression Analysis Explaining Continuance User Commitment

Table 5.15 shows the unstandardised (including standard error) and standardised regression coefficients, exact  $p$ -values and variance explained in CCC (IS).

**Table 5.15: Hierarchical Regression Analysis Predicting CCC (IS)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Individual Differences</b>				
Gender	.11	.10	.07	.271
Age	-.00	.00	-.05	.592
Language	-.00	.03	-.00	.945
Qualification	.01	.04	.01	.796
Organisational Tenure	.00	.01	.00	.933
Organisational Level	.05	.05	.06	.341
Self-efficacy	.28	.07	.27	.000
Positive Affect	-.04	.05	-.05	.468
<b>Step 2: Control Questions</b>				
Gender	.10	.10	.07	.279
Age	-.00	.00	-.04	.616
Language	-.00	.03	-.01	.851
Qualification	.03	.04	.04	.500
Organisational Tenure	-.00	.01	-.01	.872
Organisational Level	.05	.05	.07	.331
Self-efficacy	.32	.07	.31	.000
Positive Affect	-.07	.06	-.09	.239
Change Significance	.01	.05	.02	.739
Change Impact	.05	.06	.07	.351
IS Tenure	.00	.00	.04	.564
IS Job Insecurity	.10	.04	.19	.009
<b>Step 3: Proposed Determinant</b>				
Gender	.12	.10	.08	.224
Age	-.00	.00	-.04	.609
Language	-.01	.03	-.03	.610
Qualification	.03	.04	.05	.425
Organisational Tenure	.00	.01	.01	.866
Organisational Level	.05	.05	.07	.304
Self-efficacy	.29	.08	.28	.000
Positive Affect	-.09	.06	-.12	.129
Change Significance	.00	.05	.00	.924
Change Impact	.04	.06	.05	.487
IS Tenure	.00	.00	.02	.750
IS Job Insecurity	.10	.04	.18	.012
Perceived Skills Transferability	.10	.06	.14	.088

Note. Sample size ranging from  $N = 226$  to  $N = 240$  (pair-wise deletion of demographic variables);  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

After Step 1:  $R = .29$ ;  $R^2 = .08$ ; Adjusted  $R^2 = .05$ ;  $\Delta R^2 = .08$  ( $p = .014$ )

After Step 2:  $R = .34$ ;  $R^2 = .12$ ; Adjusted  $R^2 = .07$ ;  $\Delta R^2 = .03$  ( $p = .095$ )

After Step 3:  $R = .36$ ;  $R^2 = .13$ ; Adjusted  $R^2 = .07$ ;  $\Delta R^2 = .01$  ( $p = .088$ )

Post hoc power of this model: 90.37% (based on  $N = 226$ )

In step three, the independent variables together explained 13% of the variance in CCC (IS) (adjusted  $R^2 = .07$ ). The relatively strong decline in the adjusted  $R^2$  value indicates multicollinearity between PST, the individual differences and the control variables. The change in  $R^2$  after introducing PST was small ( $\Delta R^2 = .01$ ), but close to the five percent level of significance ( $p = .088$ ). In contrast, the change in  $R^2$  when introducing the individual differences was significant ( $p = .014$ ), but not when introducing the control questions ( $p = .095$ ).  $R$  for the regression equation in step three was significantly different from zero ( $F(13, 203) = 2.41, p = .005$ ) indicating that the overall regression model was significant.

In step one ( $\beta = .27, p = .000$ ) and in step two ( $\beta = .31, p = .000$ ), self-efficacy was significant. In addition, IS job insecurity was significant at the five percent level of significance in step two. In step three, self-efficacy ( $\beta = .28, p = .000$ ) and IS job insecurity ( $\beta = .18, p = .012$ ) remained the only significant predictors. PST ( $\beta = .14, p = .088$ ) was insignificant, but close to the five percent level of significance. The semi-partial correlation between CCC (IS) and self-efficacy was the strongest ( $r = .24$ ) followed by IS job insecurity ( $r = .16$ ), PST ( $r = .11$ ) and both positive affect ( $r = -.10$ ) and. Self-efficacy and IS job insecurity, followed by PST and positive affect, explained the most unique variance in CCC (IS). Interestingly, CCC (IS) and positive affect had an inverse relationship in terms of a semi-partial correlation.

An examination of the assumptions of multiple regression analysis with regard to the above model did not result in any deviations. The power of the model was 90.37%.

The results of the standard multiple regression analysis with CCC (IS) as the dependent variable confirmed the finding of the correlation analysis: PST related positively to CCC (IS), but explained only a small portion of its variance. However, PST did not explain variance above and beyond the individual difference and control variables. As a result of the poor psychometric properties of the CCC (IS) scale, and the poor statistical power of the standard multiple regression model, the interpretation of all analyses regarding CCC (IS) should be treated with caution. Given the results of the hierarchical multiple regression analysis, Proposition 8 can therefore not be confirmed.

## BEHAVIOURAL OUTCOMES OF USER COMMITMENT

Correlation, hierarchical - and moderated hierarchical multiple regression analysis was conducted to test the propositions concerning the prediction of IS-related task, citizenship and counterproductive work behaviour. In the correlation and hierarchical multiple regression analysis, the influence of user commitment on the behavioural outcomes was examined by using ACC (IS) and CCC (IS) as separate predictors. However, as discussed previously, components of commitment can also work in 'concert'. Moderated hierarchical regression analysis was conducted to test the proposition that ACC (IS) and CCC (IS) interact to predict behaviour.

The first section of this part summarises the findings of the correlation analysis, and the second, third and fourth sections summarise the analyses regarding the explanation of IS-related task performance (mere compliance, compliance), citizenship (cooperation, championing) and IS-related CWB (O) and (I). The fifth section details the analyses regarding the interactive effect of ACC (IS) and CCC (IS) in the prediction of IS related behaviour. The sixth section summarises the analysis regarding the influence of commitment propensity on IS related behaviour. The final section summarises the results of the comparative analysis of user commitment and organisational commitment in the prediction of behaviour.

### Correlations between User Commitment and the Behavioural Outcomes

Table 5.10 shows the intercorrelations between affective and continuance user commitment to mandatory information system change and the proposed behavioural outcomes. Concerning task and citizenship performance, ACC (IS) was uncorrelated with mere compliance ( $r = -.01, ns$ ), moderately correlated with compliance ( $r = .44, p < .01$ ) and strongly positively correlated with cooperation ( $r = .65, p < .01$ ) and championing ( $r = .67, p < .01$ ). With regard to counterproductive work behaviour, ACC (IS) correlated negatively with CWB (O) ( $r = -.34, p < .01$ ) but was uncorrelated with CWB (I) ( $r = -.05, ns$ ).

CCC (IS) correlated positively with mere compliance ( $r = .25, p < .01$ ), compliance ( $r = .34, p < .01$ ), cooperation ( $r = .27, p < .01$ ) and championing ( $r = .18, p < .01$ ). In

contrast to ACC (IS), however, CCC (IS) also correlated positively with IS-related CWB (O) ( $r = .35, p < .01$ ) and CWB (I) ( $r = .17, p < .01$ ).

### **Explaining IS Change-related Task Performance: Mere Compliance and Compliance**

Hierarchical multiple regression analyses with mere compliance and compliance as the dependent variables were conducted to test the propositions that ACC (IS) and CCC (IS) predict (Proposition 9 and 12) mere compliance/ compliance. To control for possible influences of individual differences and control variables on the relationship between the two forms of user commitment and the behavioural outcomes, the hierarchical regression analyses comprised five steps of blocks of variables:

In the first step, individual differences were introduced (gender, age, language, qualification, organisational tenure, organisational level, self efficacy, positive affect). Except for commitment propensity (added in step three), these variables were the same as for the hierarchical multiple regression analysis predicting ACC (IS) and CCC (IS). As a predictor of ACC (IS), commitment propensity was included in the block together with the other determinants of ACC (IS).

In the second step, the control variables were added (change significance, change impact, information system tenure, information system job insecurity). Again, these variables were also included in the second step when predicting ACC (IS) and CCC (IS).

The third step introduced the determinants of user commitment: Commitment propensity, IS change involvement, value, climate, and perceived skills transferability.

In the fourth step, the three dimensions of organisational commitment were introduced.

Finally, in the fifth step, affective and continuance user commitment were added.

## Explaining Mere Compliance

The results of the hierarchical multiple regression analysis predicting mere compliance are summarised in Table 5.16, which show the regression coefficients, *p*-values and variance explained.

Step five in Table 5.16 shows that CCC (IS) significantly predicts mere compliance above and beyond individual differences, control questions, determinants of user commitment and organisational commitment.

**Table 5.16: Hierarchical Regression Analysis Predicting Mere Compliance**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	.00	-.01	.01	.01	.00
Age	-.28*	-.26*	-.24*	-.21*	-.21*
Language	.08	.07	.05	.07	.06
Qualification	-.05	-.01	.01	.02	.01
Organisational Tenure	.19*	.16	.21*	.19*	.20*
Organisational Level	.05	.05	.06	.04	.03
Self Efficacy	.12	.15*	.11	.10	.04
Positive Affect	-.03	-.03	-.08	-.08	-.05
Change Significance		-.11	-.16	-.19*	-.18
Change Impact		.10	.04	.04	.03
IS Tenure		.02	.00	-.02	-.03
IS Job Insecurity		.16*	.15*	.14	.10
IS Change Involvement			-.03	-.06	-.06
IS Change Value			.10	.15	.21*
IS Change Climate			.03	.10	.08
Commitment Propensity			.02	.03	-.13
Perceived Skills Transferability			.18	.16	.15
Affective Organisational Commitment				-.01	-.03
Continuance Organisational Commitment				.16	.12
Normative Organisational Commitment				-.21*	-.14
ACC (IS)					-.03
CCC (IS)					.26**
<b>R<sup>2</sup></b>	.08*	.12**	.15**	.17**	.20**
<b>Adjusted R<sup>2</sup></b>	.05*	.06**	.07**	.09**	.11**
<b>Δ R<sup>2</sup></b>	.08*	.04	.03	.02	.03*

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \**p* < .05, \*\**p* < .01. Post-hoc power of this model: 99.87 % (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

In step five,  $R$  was significantly different to zero ( $F(22, 194) = 2.33, p = .001$ ) showing overall significance of the regression model. Surprisingly, ACC (IS) was insignificant as a predictor of mere compliance. Overall, in step five, the regression model significantly explains 20% of the variance in mere compliance. In addition to CCC (IS), age, organisational tenure and IS change value also emerged as significant predictors of mere compliance in the final step.

### **Explaining Compliance**

The results of the hierarchical multiple regression analysis predicting compliance are summarised in Table 5.17, which show the regression coefficients,  $p$ -values and variance explained.

Step five in Table 5.17 shows that CCC (IS) also significantly predicts compliance above and beyond individual differences, control questions, predictors of user commitment and organisational commitment.

In step five,  $R$  was significantly different to zero ( $F(22, 194) = 5.19, p = .000$ ), indicating overall regression model significance. Surprisingly, again, ACC (IS) was insignificant as a predictor. The final model significantly explains 37% of the variance in compliance. In addition to CCC (IS), qualification also emerged as an additional predictor of compliance.

**Table 5.17: Hierarchical Regression Analysis Predicting Compliance**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	-.03	-.03	.00	.01	-.01
Age	-.04	-.09	-.07	-.05	-.05
Language	-.06	-.06	-.05	-.05	-.06
Qualification	.19**	.17**	.18**	.18**	.17**
Organisational Tenure	-.05	.01	.04	.03	.04
Organisational Level	.01	.02	.01	.01	.01
Self Efficacy	.28**	.27**	.20**	.18*	.116
Positive Affect	.14*	.06	.00	-.02	-.01
Change Significance		.12	.07	.06	.01
Change Impact		.16*	.07	.07	.05
IS Tenure		.03	.02	.01	.00
IS Job Insecurity		.01	.00	-.01	-.03
IS Change Involvement			.07	.05	.05
IS Change Value			.11	.13	.15
IS Change Climate			.03	.05	.02
Commitment Propensity			.17**	.18**	.01
Perceived Skills Transferability			.07	.07	.04
Affective Organisational Commitment				.09	.07
Continuance Organisational Commitment				.05	.03
Normative Organisational Commitment				-.15	-.07
ACC (IS)					.16
CCC (IS)					.26**
<b>R<sup>2</sup></b>	.20**	.25**	.31**	.32**	.37**
<b>Adjusted R<sup>2</sup></b>	.17**	.21**	.25**	.25**	.29**
<b>Δ R<sup>2</sup></b>	.20**	.05**	.06**	.01	.04**

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \*p < .05, \*\*p < .01. Post-hoc power of this model: 100 % (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

In sum, the above two analyses confirm Proposition 12 that CCC (IS) relates positively to both mere compliance and compliance. In contrast, Proposition 9 was not confirmed: ACC (IS) does not relate positively to both mere compliance and compliance. Instead, ACC (IS) was unrelated to both forms of IS related task performance.

## **Explaining IS Change-related Citizenship Behaviour: Cooperation and Championing**

Hierarchical multiple regression analysis was conducted to test the propositions that ACC (IS) (Proposition 10) relates positively to cooperation/ championing and that CCC (IS) (Proposition 13) relates negatively or is unrelated. To control for the possible influence of individual differences and control questions on the relationship between ACC (IS) and CCC (IS) and the behavioural outcomes, the same five step approach as for the prediction of mere compliance and compliance was followed.

### **Explaining Cooperation**

Table 5.18 shows the regression coefficients, *p*-values and variance explained in the model predicting cooperation.

Step five shows that both ACC (IS) and CCC (IS) significantly predict cooperation above and beyond individual differences, control questions, determinants of user commitment and organisational commitment. Interestingly, both forms of user commitment emerged as the only predictors of cooperation in the final step. Surprisingly, in contrast to Proposition 13, CCC (IS) emerged as a significant predictor of cooperation. Nonetheless, both the strength and significance of CCC (IS) in the prediction of cooperation was much less compared to ACC (IS).

In step five; *R* for the regression model was significantly different to zero showing overall regression model significance ( $F(22, 194) = 10.21, p = .000$ ). Overall, the regression model significantly explains 53% of the variance in cooperation.

**Table 5.18: Hierarchical Regression Analysis Predicting Cooperation**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	.00	.01	.05	.06	.05
Age	.04	-.05	-.03	-.02	-.01
Language	-.03	-.03	-.04	-.04	-.05
Qualification	.12*	.09	.11	.10	.10
Organisational Tenure	-.14	-.05	.01	.00	.01
Organisational Level	-.09	-.08	-.08	-.08	-.07
Self Efficacy	.28**	.26**	.16**	.15*	.09
Positive Affect	.22**	.10	.01	.00	-.03
Change Significance		.22**	.15*	.15*	.05
Change Impact		.16*	.06	.06	.03
IS Tenure		.04	.02	.02	.01
IS Job Insecurity		-.04	-.05	-.05	-.04
IS Change Involvement			.13	.12	.10
IS Change Value			.16	.15	.10
IS Change Climate			.00	-.01	-.04
Commitment Propensity			.15**	.15**	.02
Perceived Skills Transferability			.14	.14*	.10
Affective Organisational Commitment				.12	.08
Continuance Organisational Commitment				-.03	-.02
Normative Organisational Commitment				-.05	-.01
ACC (IS)					.36**
CCC (IS)					.16*
<b>R<sup>2</sup></b>	.27**	.37**	.46**	.47**	.53**
<b>Adjusted R<sup>2</sup></b>	.24**	.33**	.41**	.41**	.48**
<b>Δ R<sup>2</sup></b>	.27**	.10**	.08**	.00	.06**

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \*p < .05, \*\*p < .01. Post-hoc power of this model: 100% (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

## Explaining Championing

To predict championing, a hierarchical multiple regression analysis was conducted. As for the analyses regarding mere compliance, compliance and cooperation, the same five steps were included in the analysis. Table 5.19 displays the results of the hierarchical multiple regression analysis.

**Table 5.19: Hierarchical Regression Analysis Predicting Championing**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	-.01	-.01	.03	.03	.04
Age	.00	-.08	-.06	-.07	-.06
Language	.05	.05	.03	.02	.01
Qualification	.04	.01	.03	.03	.04
Organisational Tenure	-.16*	-.09	-.01	-.02	-.02
Organisational Level	-.13*	-.12	-.11*	-.10	-.08
Self Efficacy	.23**	.20**	.10	.06	.03
Positive Affect	.32**	.22**	.13	.12	.08
Change Significance		.20**	.12	.14*	.03
Change Impact		.11	-.02	-.02	-.04
IS Tenure		.07	.04	.05	.05
IS Job Insecurity		-.05	-.06	-.07	-.04
IS Change Involvement			.08	.08	.06
IS Change Value			.16*	.15	.06
IS Change Climate			.00	-.07	-.08
Commitment Propensity			.16**	.14**	.10
Perceived Skills Transferability			.22**	.23**	.19**
Affective Organisational Commitment				.14*	.12
Continuance Organisational Commitment				-.02	.01
Normative Organisational Commitment				.03	.03
ACC (IS)					.36**
CCC (IS)					.01
<b>R<sup>2</sup></b>	.32**	.39**	.50**	.52**	.57**
<b>Adjusted R<sup>2</sup></b>	.30**	.36**	.46**	.47**	.52**
<b><math>\Delta R^2</math></b>	.32**	.07**	.11**	.01	.04**

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \*p < .05, \*\*p < .01. Post-hoc power of this model: 100 % (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

In step five,  $R$  for the regression model was significantly different to zero, showing overall regression model significance ( $F(22, 194) = 11.81, p = .000$ ). ACC (IS) emerged as a significant predictor of championing; whereas CCC (IS) was insignificant.

In all, ACC (IS) significantly explains variance above and beyond the individual differences, control questions, determinants of user commitment and organisational commitment. In addition to ACC (IS), perceived skills transferability also emerged as a significant predictor. The final model in step five explains 57% of the variance in championing.

The above results confirm Proposition 10 that ACC (IS) relates positively to both cooperation and championing. In contrast, Proposition 13 is only partially confirmed: As proposed, CCC (IS) was unrelated to championing. Surprisingly, however, CCC (IS) emerged as a positive predictor of cooperation.

### **Explaining IS Change-related Counterproductive Work Behaviour: CWB (O) and CWB (I)**

Hierarchical multiple regression analysis was conducted to test the propositions that ACC (IS) relates negatively, or is unrelated (Proposition 11) to CWB, and that CCC (IS) relates positively, or is unrelated (Proposition 14), with CWB.

### **Explaining Counterproductive Work Behaviour (Organisation)**

Table 5.20 shows the results of the hierarchical multiple regression analysis with CWB (O) as the dependent variable.

**Table 5.20: Hierarchical Regression Analysis Predicting CWB (O)**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	.01	.00	-.04	-.03	-.06
Age	-.20*	-.15	-.16	-.14	-.15
Language	.00	-.01	.00	.00	-.01
Qualification	.01	.05	.00	.01	-.01
Organisational Tenure	.21*	.15	.03	.00	.02
Organisational Level	.01	.00	-.03	-.03	-.04
Self Efficacy	.01	.056	.09	.04	-.02
Positive Affect	-.23**	-.19*	-.15	-.14	-.10
Change Significance		-.074	.03	.01	.05
Change Impact		-.07	.05	.04	.03
IS Tenure		.00	.01	.01	.00
IS Job Insecurity		.16*	.16*	.13*	.08
IS Change Involvement			.12	.08	.08
IS Change Value			-.58**	-.52**	-.42**
IS Change Climate			.06	.05	.03
Commitment Propensity			.23**	.21**	.05
Perceived Skills Transferability			-.03	-.05	-.05
Affective Organisational Commitment				.08	.07
Continuance Organisational Commitment				.23**	.17*
Normative Organisational Commitment				-.18*	-.10
ACC (IS)					-.13
CCC (IS)					.30**
<b>R<sup>2</sup></b>	.10**	.14**	.32**	.36**	.41**
<b>Adjusted R<sup>2</sup></b>	.06**	.09**	.26**	.29**	.34**
<b>ΔR<sup>2</sup></b>	.10**	.04*	.18**	.03*	.05**

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \*p < .05, \*\*p < .01. Post-hoc power of this model: 100 % (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

The analysis comprised the same five hierarchical steps as used in the analysis for the other behavioural outcomes. In step five; *R* for the regression model was significantly different to zero showing overall regression model significance ( $F(22, 194) = 6.19, p = .000$ ).

Table 5.24 shows that CCC (IS) significantly predicts CWB (O) in step five, above and beyond the individual differences, control variables, determinants of user commitment and organisational commitment. In contrast, ACC (IS) was insignificant as a predictor. In addition to CCC (IS), IS change value (as a negative predictor) and

continuance organisational commitment also emerged as predictors of CWB (O). In all, the model in step five explains 41% of the variance in CWB (O).

### **Explaining Counterproductive Work Behaviour (Individuals)**

Table 5.21 shows the results of the hierarchical regression analysis predicting CWB (I). Although  $R$  for the overall regression model was significantly different to zero, indicating overall regression model significance ( $F(22, 194) = 2.18, p = .003$ ), CCC (IS) failed to predict CWB (I). The change in  $R^2$  in step five was statistically not significant, showing that ACC (IS) and CCC (IS) do not explain variance above and beyond the individual differences, control questions, determinants of user commitment and organisational commitment.

In contrast, organisational tenure (inverse predictor), information system job insecurity and commitment propensity emerged as significant predictors of CWB (I).

**Table 5.21: Hierarchical Regression Analysis Predicting CWB (I)**

Variable	Step 1: Individual Differences	Step 2: Control Questions	Step 3: Proposed Determinants of C2C	Step 4: Organisational Commitment	Step 5: ACC (IS) & CCC (IS)
Gender	-.02	-.01	-.03	-.03	-.04
Age	-.05	.00	.02	.02	.02
Language	-.03	-.05	.01	.01	.01
Qualification	-.04	.00	.00	.01	.01
Organisational Tenure	-.11	-.15	-.20*	-.20*	-.19*
Organisational Level	.03	.01	.00	-.01	.00
Self Efficacy	-.07	-.01	.00	-.01	-.04
Positive Affect	-.13	-.13*	-.11	-.09	-.10
Change Significance		-.05	-.03	-.04	-.09
Change Impact		.08	.06	.05	.03
IS Tenure		-.09	-.06	-.06	-.06
IS Job Insecurity		.24**	.25**	.24**	.24**
IS Change Involvement			.01	.00	.00
IS Change Value			-.03	-.01	-.03
IS Change Climate			.06	.05	.04
Commitment Propensity			.23**	.22**	.15*
Perceived Skills Transferability			-.22*	-.23	-.25
Affective Organisational Commitment				-.12	-.13
Continuance Organisational Commitment				.11	.11
Normative Organisational Commitment				.04	.06
ACC (IS)					.17
CCC (IS)					.09
<b>R<sup>2</sup></b>	.04	.10*	.16**	.18**	.19**
<b>Adjusted R<sup>2</sup></b>	.00	.05*	.09**	.10**	.10**
<b><math>\Delta R^2</math></b>	.04	.06**	.06**	.01	.01

Note. Sample size ranging from N = 226 to N = 240 (pairwise deletion); Values are standardised regression coefficients; \*p < .05, \*\*p < .01. Post-hoc power of this model: 99.75 % (Step 5).

ACC (IS): Affective User Commitment to Mandatory Information System Change.

CCC (IS): Continuance User Commitment to Mandatory Information System Change.

In sum, Proposition 11 can be confirmed: ACC (IS) is unrelated to both forms of IS related counterproductive work behaviour. Additionally, Proposition 14 can also be confirmed: CCC (IS) is positively related to CWB (O), but unrelated to CWB (I).

## Interaction between ACC (IS) and CCC (IS) to predict IS Change-related Behaviour

### Testing for Interaction between ACC (IS) and CCC (IS) to predict Mere Compliance and Compliance

Moderated regression analyses with mere compliance and compliance as the dependent variables were conducted to test the propositions that ACC (IS) and CCC (IS) interact (Proposition 15) to predict mere compliance/compliance. The results of these analyses are summarised in Table 5.22 and Table 5.23, which show the regression coefficients,  $p$ -values and variance explained.

**Table 5.22: Moderated Hierarchical Regression Analysis Predicting Mere Compliance**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Main Effect</b>				
ACC (IS)	-.04	.06	-.04	.467
CCC (IS)	.34	.08	.25	.000
<b>Step 2: Two-way Interaction Effect</b>				
ACC (IS)	-.07	.06	-.06	.275
CCC (IS)	.30	.08	.22	.000
ACC (IS) × CCC (IS)	-.19	.06	-.18	.005

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level; Predictor variables are mean centered.

After Step 1:  $R = .25$ ;  $R^2 = .06$ ; Adjusted  $R^2 = .05$  ( $p < .001$ )

After Step 2:  $R = .31$ ;  $R^2 = .09$ ; Adjusted  $R^2 = .08$ ;  $\Delta R^2 = .03$  ( $p < .01$ )

Post hoc power of this model: 98.95%

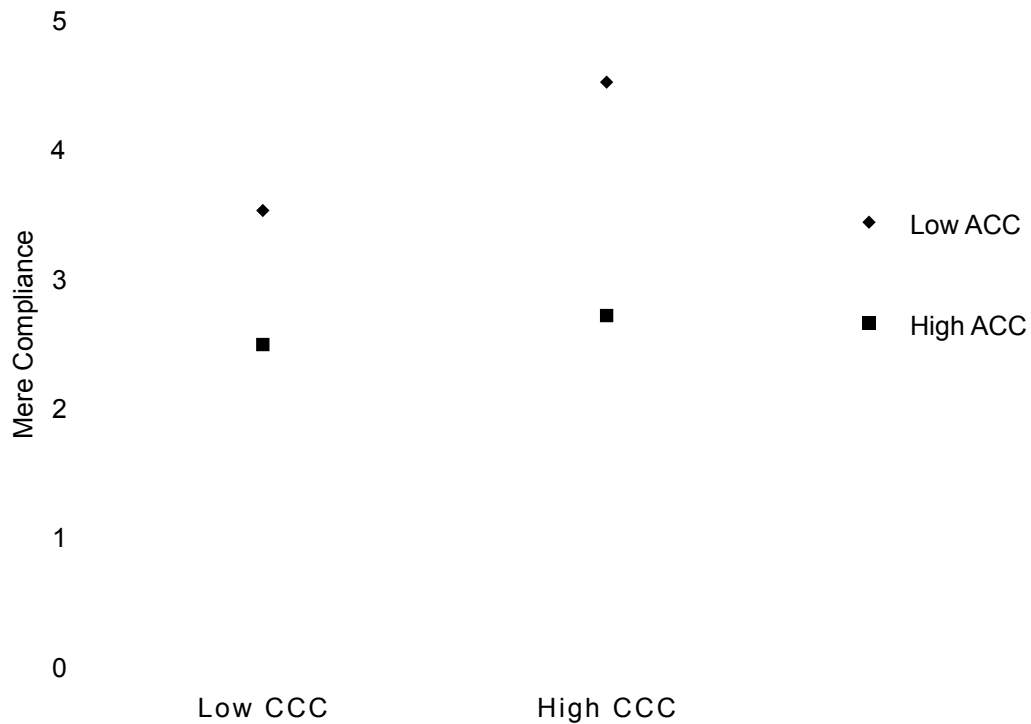
Following the advice of Tabachnick and Fidell (2001), the predictors were centered, and, subsequently, multiplying ACC (IS) by CCC (IS) created a two-way interaction term. The analyses comprised two steps: In step one ACC (IS) and CCC (IS) were introduced as main effects, and, in step two, the two-way interaction effect was added. In step one, the results show that  $R$  was significantly different from zero ( $F(2, 237) = 8.26, p = .000$ ) indicating overall regression model significance. The change in  $R^2$  of .06 was significant ( $p = .000$ ), the adjusted  $R^2$  being .05. The model thus explained only six percent of the variance in mere compliance. The individual regression coefficient of CCC (IS) ( $B = .34, p = .000$ ) was significant whereas ACC (IS) did not

help in predicting mere compliance ( $B = -.04, p = .467$ ). The semi-partial correlation of CCC (IS) with mere compliance was .25 whereas that of ACC (IS) was -.04. (See Appendix B, Table B14, for the standard multiple regression analysis using the original uncentred variables.)

In step two,  $R$  for the model was significantly different from zero ( $F(3, 236) = 8.39, p = .000$ ) indicating a significant overall model fit. The change of .03 in  $R^2$  in step two was also significant ( $p = .005$ ). Total variance explained by this model was 9%; a three percent difference compared to the standard multiple regression analysis without the interaction between ACC (IS) and CCC (IS). The unstandardised regression coefficient of the interaction term was significant ( $B = -.19, p = .005$ ) indicating an interaction effect. The semi-partial correlation of this interaction was -.17. The resulting squared semi-partial correlation indicated that the interaction uniquely contributed three percent to the prediction of mere compliance.

Figure 5.5 shows the interaction between ACC (IS) (moderator) and CCC (IS) (independent variable) in the prediction of mere compliance (dependent variable). The figure shows that the positive relationship between mere compliance and CCC (IS) depends on the strength of ACC (IS); in other words, the relationship between mere compliance and CCC (IS) will be relatively stronger when ACC (IS) is low. Conversely, the relationship will be weaker when ACC (IS) is strong.

**Figure 5.5: Interaction between ACC (IS) and CCC (IS) to Predict Mere Compliance**



Note. Unstandardised regression coefficients were used in plotting the interaction.

Because the CFA confirmed a two-dimensional factor structure of compliance, a further analysis with compliance as the dependent variable was conducted (Table 5.23).

**Table 5.23: Moderated Hierarchical Regression Analysis Predicting Compliance**

	B	B S.E.	Beta	p
<b>Step 1: Main Effect</b>				
ACC (IS)	.29	.04	.41	.000
CCC (IS)	.27	.05	.29	.000
<b>Step 2: Two-way Interaction Effect</b>				
ACC (IS)	.26	.03	.37	.000
CCC (IS)	.22	.05	.23	.000
ACC (IS) × CCC (IS)	-.23	.03	-.31	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level; Predictor variables are mean centered.

After Step 1:  $R = .53$ ;  $R^2 = .28$ ; Adjusted  $R^2 = .27$  ( $p < .001$ )

After Step 2:  $R = .61$ ;  $R^2 = .38$ ; Adjusted  $R^2 = .37$ ;  $\Delta R^2 = .09$  ( $p < .001$ )

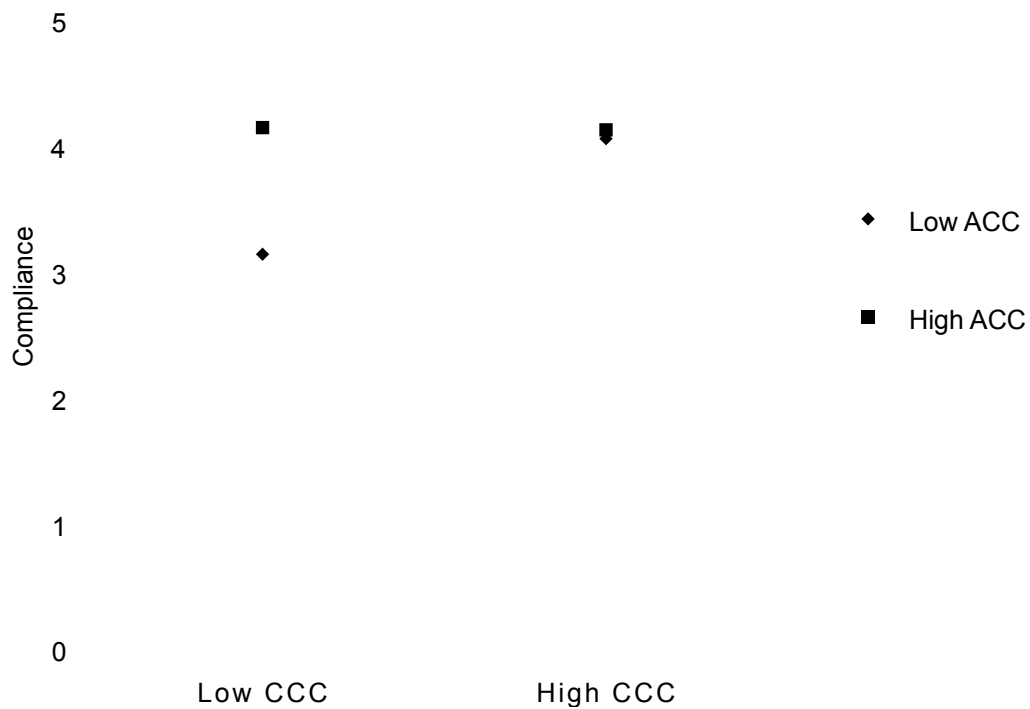
Post hoc power of this model: 100%

In step one, the multiple regression model was significant as indicated by an  $R$ -value significantly different from zero ( $F(2, 237) = 47.07, p = .000$ ). The change in  $R^2$  of .28 was also significant ( $p = .000$ ). The model explained 28% of the variance in compliance. The individual regression coefficients of CCC (IS) ( $B = .27, p = .000$ ) and ACC (IS) ( $B = .29, p = .000$ ) were significant. The semi-partial correlation of ACC (IS) with compliance was .40 whereas that of CCC (IS) was .29. (See Appendix B, Table B15, for the standard multiple regression analysis using the original uncentered variables.)

In step two,  $R$  for the model was significantly different from zero ( $F(3, 236) = 48.16, p = .000$ ) indicating a significant overall model fit. The change of .095 in  $R^2$  in step two was also significant ( $p = .000$ ). Total variance explained by this model was 38% – a 10% difference compared to the standard multiple regression analysis without the interaction between ACC (IS) and CCC (IS). The unstandardised regression coefficient of the interaction term was significant ( $B = -.23, p = .000$ ) indicating a moderator effect. The semi-partial correlation of this interaction was -.30, and the resulting squared semi-partial correlation indicated that the interaction uniquely contributed six percent to the prediction of compliance.

Figure 5.6 shows the interaction between ACC (IS) (moderator) and CCC (IS) (independent variable) in the prediction of compliance (dependent variable). The relationship between compliance and CCC (IS) depends on the level of ACC (IS): If ACC (IS) is low; a weak relationship will exist between compliance and CCC (IS). However, at high levels of ACC (IS), a stronger relationship will exist between compliance and ACC (IS). At high levels of ACC (IS), high CCC (IS) will also result in high compliance (and the converse is true as well), and at low levels of ACC (IS), a weak relationship will exist between CCC (IS) and compliance.

**Figure 5.6: Interaction between ACC (IS) and CCC (IS) to Predict Compliance**



Note. Unstandardised regression coefficients were used in plotting the interaction.

Concerning the adequacy of the multiple regression analysis, as with previous analyses, Tabachnick and Fidell's (2001) checklist was used in relation to the regression results. The sample size, indicated by the ratio of cases to variables, was significantly above the preferred ratio of 20:1 (Tabachnick & Fidell), and the post hoc power was also high for both models. As indicated by the values for kurtosis and skewness, mere compliance was normally distributed. In contrast, the results of the evaluation of assumptions indicated the need to transform the compliance variable in the analysis (Table 5.9). Compliance was therefore transformed using a cubed transformation (Table B9, Appendix B). However, the results of the analysis, compared to using the original variable, did not change significantly in steps one and two.

In step one, using the transformed variable x3compliance as the dependent variable resulted in a variance explained of 23% compared to 28% using the original variable. The direction and significance of the predictors did not change. In step two, variance explained in x3compliance declined to 26%. Both the direction and significance of

ACC (IS) and CCC (IS) remained the same, but the significance of the interaction term changed to the five percent level of significance.

The original variable was therefore used in this analysis, and the residual plots may indicate a mild form of homoscedasticity. Multicollinearity between ACC (IS) and CCC (IS), as indicated by the VIF and tolerance values, was not a problem in the regression model. The Durbin-Watson statistic was also acceptable.

All in all, the results show that nine percent of the variance in mere compliance can be explained by CCC (IS) and the interaction between ACC (IS) and CCC (IS), but not by ACC (IS) itself. By contrast, ACC (IS), CCC (IS) and the interaction explain 38% of the variance in compliance. This finding partially confirms Proposition 15. Nevertheless, due to the poor psychometric properties of the CCC (IS) scale, the results concerning this construct should be interpreted with caution.

### **Testing for Interaction between ACC (IS) and CCC (IS) to predict Cooperation and Championing**

Moderated hierarchical multiple regression analysis was used to test whether ACC (IS) and CCC (IS) would also interact to predict behaviour (Proposition 15).

Cooperation and championing were specified as the dependent variables and ACC (IS) and CCC (IS) as the independent variables.

In step one,  $R$  for the model was significantly different from zero ( $F(2, 237) = 101.42, p = .000$ ) indicating a significant overall model fit. The change in  $R^2$  was also significant ( $p = .000$ ) as were the individual regression coefficients of ACC (IS) ( $B = .41, p = .000$ ) and CCC (IS) ( $B = .16, p = .000$ ). The semi-partial correlation of ACC (IS) with cooperation was .62 whereas that of CCC (IS) was .19. (See Appendix B, Table B16, for the standard multiple regression analysis using the original uncentered variables.)

**Table 5.24: Moderated Hierarchical Regression Analysis Predicting Cooperation**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Main Effect</b>				
ACC (IS)	.41	.03	.62	.000
CCC (IS)	.16	.04	.19	.000
<b>Step 2: Two-way Interaction Effect</b>				
ACC (IS)	.39	.03	.60	.000
CCC (IS)	.13	.04	.15	.001
ACC (IS) × CCC (IS)	-.14	.03	-.20	.000

Note.  $N = 240$  (pair-wise deletion);  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level; Predictor variables are mean centered.

After Step 1:  $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$  ( $p < .001$ )

After Step 2:  $R = .70$ ;  $R^2 = .50$ ; Adjusted  $R^2 = .49$ ;  $\Delta R^2 = .04$  ( $p < .001$ )

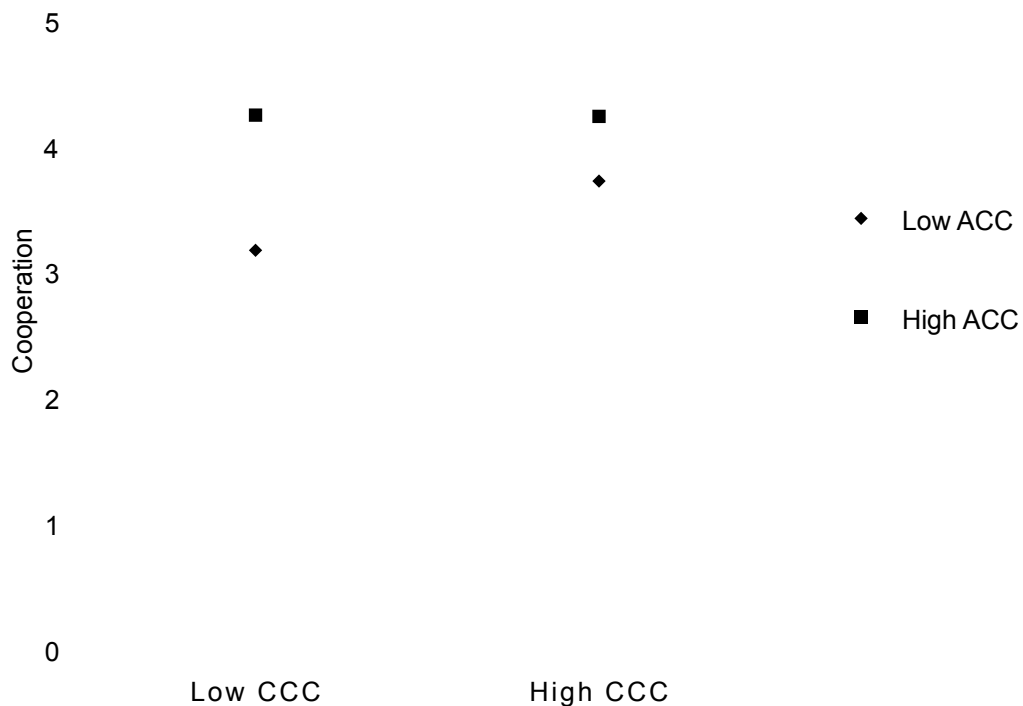
Post hoc power of this model: 100%

Because the analysis was conducted with a different independent variable, the assumptions of multiple regression analysis were re-examined. To improve normality, the results of the evaluation of assumptions indicated the need to transform the cooperation variable in the analysis (Table 5.9). Cooperation was therefore transformed by using a cubed transformation (Table B9, Appendix B). Using the transformed x3cooperation variable resulted in a decline in  $R^2$  of six percent to .40. The significance of CCC (IS) as a predictor also declined to the five percent level of significance. However, the direction of the predictors remained similar, and therefore the untransformed variable was used in this analysis. No deviations were noted regarding the other assumptions.

In step two,  $R$  for the model was significantly different from zero ( $F(3, 236) = 79.40$ ,  $p = .000$ ) indicating a significant overall model fit. The change of .04 in  $R^2$  in Step 2 was also significant ( $p = .000$ ). Overall variance explained was 50% – a four percent difference compared to the standard multiple regression analysis without the interaction. The unstandardised regression coefficient of the interaction term was significant at the five percent level of significance ( $B = -.14$ ,  $p = .000$ ) indicating a moderator effect. The semi-partial correlation of this interaction was -.20. The resulting squared semi-partial correlation indicated a four percent unique contribution of the moderator in the prediction of cooperation.

Figure 5.7 shows the interaction between ACC (IS) (moderator) and CCC (IS) (independent variable) in the prediction of cooperation (dependent variable). The figure also shows that the relationship between cooperation and CCC (IS) depends on the strength of ACC (IS); in other words, the relationship between cooperation and CCC (IS) will be relatively stronger when ACC (IS) is high, and, conversely, the relationship will be weaker when ACC (IS) is low.

**Figure 5.7: Interaction between ACC (IS) and CCC (IS) to Predict Cooperation**



Note. Unstandardised regression coefficients were used in plotting the interaction.

Specifying the transformed variable  $x_3$ cooperation as the dependent variable significantly changed the outcome of the moderated regression analysis. In contrast to the analysis with the original variable, the interaction term was insignificant ( $p = .652$ ). In addition, the change in  $R^2$  when introducing the moderator effect in step two was also insignificant ( $p = .652$ ). Bearing in the mind the assumption of normality, the results of the analysis should be considered with caution.

To predict championing, a moderated multiple regression analysis was conducted. (See Table B17, Appendix B, for the analysis with the uncentred variables.)

The results of the moderated hierarchical regression analysis are shown in Table 5.25.

**Table 5.25: Moderated Hierarchical Regression Analysis Predicting Championing**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>P</i>
<b>Step 1: Main Effect</b>				
ACC (IS)	.58	.04	.65	.000
CCC (IS)	.11	.05	.10	.037
<b>Step 2: Two-way Interaction Effect</b>				
ACC (IS)	.56	.04	.63	.000
CCC (IS)	.07	.05	.06	.163
ACC (IS) × CCC (IS)	-.17	.04	-.19	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level; Predictor variables are mean centered.

After Step 1:  $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$  ( $p < .001$ )

After Step 2:  $R = .70$ ;  $R^2 = .49$ ; Adjusted  $R^2 = .49$ ;  $\Delta R^2 = .03$  ( $p < .001$ )

Post hoc power of this model: 100%

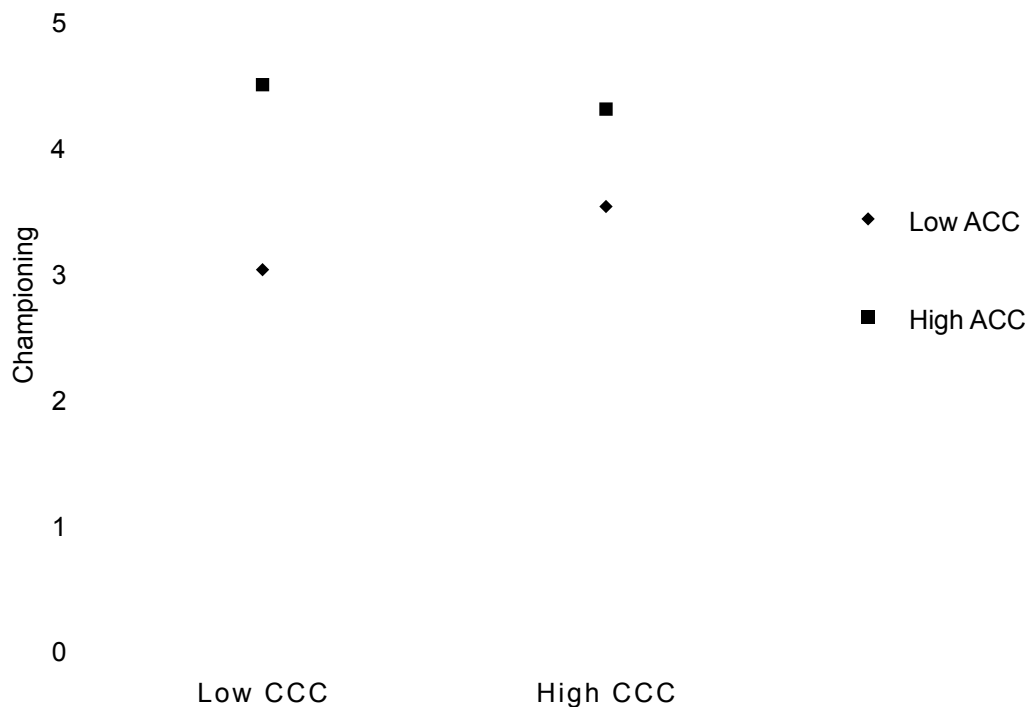
In step one,  $R$  for the model was significantly different from zero ( $F(2, 237) = 101.32, p = .000$ ) indicating a significant overall model fit. The change in  $R^2$  was also significant ( $p = .000$ ) as were the individual regression coefficients of ACC (IS) ( $B = .58, p = .000$ ) and CCC (IS) ( $B = .11, p = .037$ ). The semi-partial correlation of ACC with cooperation was .65 whereas that of CCC (IS) was .10. Although this result was almost identical to the prediction of cooperation, the strength and significance of CCC (IS) differed.

With regard to the assumptions of the regression analysis, similar to cooperation, the championing variable was transformed by a cubed transformation to follow a normal distribution. However –in contrast to the x3cooperation analysis – using the x3championing variable instead of the original variable significantly changed the result in terms of variance explained. The difference in variance explained was over 10% when using x3championing as the dependent variable ( $R^2 = .35, p = .000$ ), and, in addition, CCC (IS) was insignificant in predicting x3championing. Although the original variable was used in this analysis, the results should be interpreted with caution. No deviations were noted in the other assumptions.

In step two,  $R$  for the regression model was significant ( $F(3, 236) = 77.50, p = .000$ ) as was the change in  $R^2$  when introducing the interaction term ( $\Delta R^2 = .03, p = .000$ ). Overall variance explained was 49%, a three percent difference compared to the standard multiple regression model. The squared semi-partial correlation (-.188) indicates that 3.53% of the variance in championing can be uniquely attributed to the moderator effect.

Figure 5.8 shows the results of the interaction effect. To plot this effect, championing was specified as the dependent variable, CCC (IS) as the independent variable and ACC (IS) as the moderator. The figure shows that the relationship between championing and CCC (IS) depends on the strength of ACC (IS); in other words, the relationship between championing and CCC (IS) will be relatively stronger when ACC (IS) is high, and, conversely, the relationship will be weaker when ACC (IS) is low. In the case of high ACC (IS), the relationship between championing and CCC (IS) will be negative, and, in the case of low ACC (IS), the same relationship will be positive.

**Figure 5.8: Interaction between ACC (IS) and CCC (IS) to Predict Championing**



Note. Unstandardised regression coefficients were used in plotting the interaction.

Because championing was transformed using a cubed transformation, the analysis was repeated using  $x^3$ championing. Similarly to cooperation, using  $x^3$ championing significantly altered the result of the regression model. Using  $x^3$ championing resulted in an insignificant regression coefficient of the interaction term ( $p = .131$ ) as well as an insignificant change in  $R^2$  in step two ( $p = .131$ ). Therefore, as with cooperation, the results with regard to championing should be interpreted with caution.

In sum, the two models significantly explained 50% and 49% of the variance in cooperation and championing, respectively: ACC (IS) and CCC (IS) interacted to predict behaviour thus confirming Proposition 15. Because of the poor psychometric properties of the CCC (IS) scale and the mixed results concerning the prediction of championing when using the transformed variable, the results should be interpreted with caution.

### Testing for Interaction between ACC (IS) and CCC (IS) to predict CWB (O) and CWB (I)

To test for interaction, moderated hierarchical regression analysis was conducted. CWB (O) and CWB (I) were specified as the dependent variables and ACC (IS) and CCC (IS) as the independent variables. (See Table B18, Appendix B, for the analysis with the uncentred variables.)

Table 5.26 shows the regression coefficients, *p*-values and variance explained by the model predicting CWB (O)

**Table 5.26: Moderated Hierarchical Regression Analysis Predicting Counterproductive Work Behaviour (Organisation)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>P</i>
<b>Step 1: Main Effect</b>				
ACC (IS)	-.45	.06	-.39	.000
CCC (IS)	.61	.08	.40	.000
<b>Step 2: Two-way Interaction Effect</b>				
ACC (IS)	-.48	.06	-.41	.000
CCC (IS)	.56	.08	.37	.000
ACC (IS) × CCC (IS)	-.22	.06	-.18	.001

Note. *N* = 240; *B* = Unstandardised Coefficient; *B S.E.* = *B* Standard Error; *Beta* = Standardised Coefficient; *p* = Significance Level; Predictor variables are mean centered.

After Step 1: *R* = .52; *R*<sup>2</sup> = .28; Adjusted *R*<sup>2</sup> = .27 (*p* < .001)

After Step 2: *R* = .56; *R*<sup>2</sup> = .31; Adjusted *R*<sup>2</sup> = .30; Δ *R*<sup>2</sup> = .03 (*p* < .01)

Post hoc power of this model: 100%

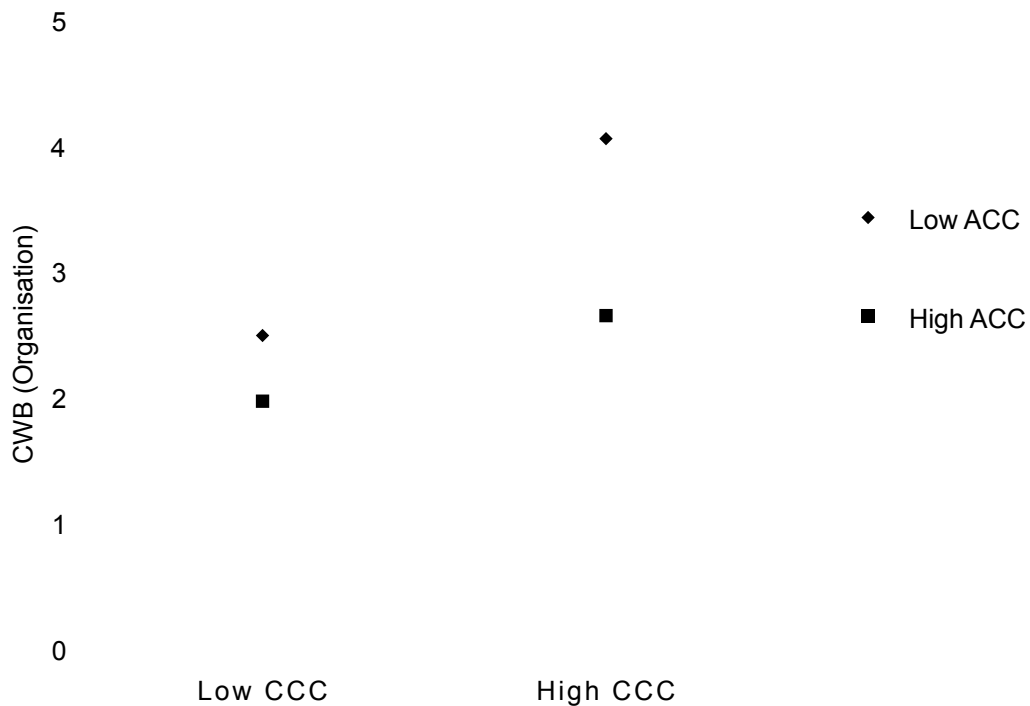
In step one, *R* for the model was significantly different from zero ( $F(2, 237) = 46.03$ ,  $p = .000$ ) indicating a significant overall fit. The change in variance explained ( $R^2 = .28$ ,  $p = .000$ , adjusted  $R^2 = .27$ ,  $p = .000$ ) was also significant. The model therefore significantly explains 28% of the variance in CWB (O). Both predictors, ACC (IS) ( $B = -.45$ ,  $p = .000$ ) and CCC (IS) ( $B = .61$ ,  $p = .000$ ) were significant but in opposite directions. The semi-partial correlation of CCC (IS) with CWB (O) was .40 whereas that of ACC (IS) was -.39.

No significant problems were found concerning the assumptions of multiple regression analysis as was also the case with previous models using the same independent variables.

In step two, the regression model was significant ( $F(3, 236) = 35.85, p = .000$ ) as was the change in  $R^2$  when introducing the interaction term. Overall variance explained was 31%, a three percent difference compared to the standard regression model. The squared semi-partial correlation (-.182) indicates that 3.3% of the variance in CWB (O) can be uniquely attributed to the interaction between ACC (IS) and CCC (IS).

Figure 5.9 shows the interaction between ACC (IS) (moderator) and CCC (IS) (independent variable) in the prediction of CWB (O). The figure further shows that the positive relationship between CWB (O) and CCC (IS) depends on the strength of ACC (IS); in other words, the relationship between CWB (O) and CCC (IS) will be relatively stronger when ACC (IS) is low. Conversely, the same relationship will be weaker when ACC (IS) is high.

**Figure 5.9: Interaction between ACC (IS) and CCC (IS) to Predict CWB (O)**



Note. Unstandardised regression coefficients were used in plotting the interaction.

Concerning the second sub-dimension of CWB, a further regression analysis, specifying IS-related CWB (I) as the dependent variable, was conducted. The moderated hierarchical regression analysis, specifying CWB (I) as the dependent variable, did not produce evidence of an interaction between ACC (IS) and CCC (IS).

In sum, the results of the above analyses indicate that ACC (IS) and CCC (IS) did interact to predict mere compliance, compliance, cooperation, championing and CWB (O), but not CWB (I). However, this interaction could not be confirmed using the transformed variables  $x_3$ cooperation and  $x_3$ championing. Caution should therefore be exercised when interpreting the results. As a consequence, Proposition 15 is confirmed but with reservations.

### **Commitment Propensity and IS Change-related Behaviour**

Compared to previous research, the re-conceptualisation of commitment propensity (CP) as an individual difference was tested for the first time. However, to test whether CP contributes above and beyond ACC (IS) and CCC (IS) to the prediction of behaviour, separate standard and hierarchical multiple regression analyses were conducted by including CP as a third predictor after ACC (IS) and CCC (IS). The results of the standard regression analyses show that the variance explained in mere compliance, compliance, cooperation, championing, CWB (Organisation) and CWB (Individuals) did not increase significantly. Only in the case of mere compliance (+ 1%), championing (+ 1%), and CWB (I) (+ 3%) did the prediction in variance explained increase.

After adding CP in step two after ACC (IS) and CCC (IS), the change in  $R^2$  was significant only for the prediction of championing (change in  $R^2 = .01$ ;  $p < .05$ ) in the subsequent hierarchical multiple regression analysis. In the prediction of the other IS change-related behaviour; CP did not add additional significance above and beyond ACC (IS) and CCC (IS). Reversing the order of entry by including CP in step one and ACC (IS) and CCC (IS) in step two resulted in a different result. The change in  $R^2$  after adding CP was significant for the prediction of compliance, cooperation and championing, but not for mere compliance, CWB (O) and CWB (I). However, the variance explained by CP was much less than that explained by ACC (IS) and CCC (IS). In sum, these mixed results demonstrate that CP – in contrast to ACC (IS) and

CCC (IS) – is redundant in the prediction of behaviour. However, more research is needed to explore the predictive value of CP.

### **Organisational Commitment and IS Change-related Behaviour**

This part compares the relative predictive power of two foci of commitment regarding IS change-related behaviour. Hierarchical regression analysis was conducted to demonstrate that more of the variance in IS-related behaviour can be explained by user commitment than by organisational commitment. The analysis comprised two steps: In step one, ACC (IS) and CCC (IS) were introduced, and, in step two, AOC and COC were introduced. The difference in variance explained was then noted and compared. To account for the effect of the order of entry, the order of entry was changed by introducing the two dimensions of organisational commitment first followed by user commitment to information system change dimensions.

#### **User and Organisational Commitment Predicting Mere Compliance**

Table B20 in Appendix B shows the results of the hierarchical regression analysis specifying mere compliance as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .06 ( $p = .000$ ) and .00 ( $p = .441$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the insignificant change in  $R^2$  after step two – shows the superiority of user commitment in the prediction of mere compliance. When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .01 ( $p = .153$ ) and .05 ( $p = .001$ ), respectively. Again, the change in  $R^2$  was significantly more for ACC (IS) and CCC (IS). All in all, user commitment explained more of the variance in mere compliance.

#### **User and Organisational Commitment Predicting Compliance**

Table B21 in Appendix B shows the results of the hierarchical regression analysis with compliance as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .28 ( $p = .000$ ) and .00 ( $p = .212$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the smaller change in  $R^2$  after step two, shows the superiority of user commitment in the prediction of compliance. When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .06 ( $p = .000$ ) and .22 ( $p = .000$ ),

respectively. When controlling for the order of entry, ACC (IS) and CCC (IS) still accounted for more of the variance in compliance.

### **User and Organisational Commitment Predicting Cooperation**

Table B22 in Appendix B shows the results of the hierarchical regression analysis with cooperation as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .46 ( $p = .000$ ) and .01 ( $p = .075$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the smaller change in  $R^2$  after step two – shows the superiority of user commitment in the prediction of compliance. When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .10 ( $p = .000$ ) and .36 ( $p = .000$ ), respectively. When controlling for the order of entry, ACC (IS) and CCC (IS) still accounted for more of the variance in cooperation.

### **User and Organisational Commitment Predicting Championing**

Table B23 in Appendix B shows the results of the hierarchical regression analysis with championing as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .46 ( $p = .000$ ) and .02 ( $p = .002$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the smaller change in  $R^2$  after step two – shows the superiority of user commitment in the prediction of championing. When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .14 ( $p = .000$ ) and .34 ( $p = .000$ ), respectively. When controlling for the order of entry, ACC (IS) and CCC (IS) still accounted for more of the variance in championing.

### **User and Organisational Commitment Predicting CWB (Organisation)**

Table B24 in Appendix B shows the results of the hierarchical regression analysis using IS-related CWB (O) as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .28 ( $p = .000$ ) and .01 ( $p = .055$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the insignificant change in  $R^2$  after step two – shows the superiority of user commitment in the prediction of CWB (O). When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .04 ( $p = .003$ ) and .25 ( $p = .000$ ), respectively.

= .000) respectively. When controlling for the order of entry, ACC (IS) and CCC (IS) still accounted for more of the variance in CWB (O).

### **User and Organisational Commitment Predicting CWB (Individuals)**

Finally, Table B25 in Appendix B shows the results of the hierarchical regression analysis using IS-related CWB (I) as the dependent variable. When entering ACC (IS) and CCC (IS) in step one, and AOC and COC in step two, the change in  $R^2$  was .03 ( $p = .011$ ) and .01 ( $p = .140$ ), respectively. Entering ACC (IS) and CCC (IS) first – indicated by the insignificant change in  $R^2$  after step two – shows the superiority of user commitment in the prediction of CWB (I). When entering AOC and COC first, and ACC (IS) and CCC (IS) thereafter, the change in  $R^2$  was .02 ( $p = .052$ ) and .02 ( $p = .030$ ) respectively. When controlling for the order of entry, ACC (IS) and CCC (IS) still accounted for significantly more of the variance in CWB (I).

Because this analysis included new independent variables in the form of AOC and COC, the assumptions of the multiple regression analysis were re-examined. As mentioned earlier, the compliance, cooperation, championing and CWB (I) variables were transformed to improve normality. Similarly to the previous regression analyses, the variance explained in x3compliance, x3cooperation, x3championing and lgCWB (I) was less compared to using the original variables. However, ACC (IS) and CCC (IS) still accounted for more of the variance in the transformed variable compared to organisational commitment. Concerning the other assumptions, no significant problems were identified.

In sum, it can thus be confirmed that user commitment explains more of the variance in IS change-related behaviour than does organisational commitment and that the use of a context-specific focus of commitment improves predictions of behaviour. This finding therefore confirms the importance of using context-specific foci of commitment in the prediction of behaviour.

## SUMMARY OF PROPOSITION TESTING

**Table 5.27: Results of Proposition Testing**

Proposition	Findings
P1. Affective (ACC (IS)) and continuance (perceived high sacrifice) (CCC (IS)) user commitment to mandatory information system change are distinct constructs. Both forms of user commitment are also distinct from commitment propensity (CP).	Confirmed by CFA. Nonetheless, poor reliability of CCC (IS) scale.
P2. Commitment propensity is positively related to ACC (IS).	Confirmed by standard and hierarchical multiple regression analysis.
P3. Information system change value is positively related to ACC (IS).	Confirmed by standard and hierarchical multiple regression analysis.
P4. Information system change involvement is positively related to ACC (IS).	Not confirmed by standard and hierarchical multiple regression analysis. However, the two variables are significantly and moderately correlated.
P5. Information system change climate is positively related to ACC (IS).	Not confirmed by standard and hierarchical multiple regression analysis. However, the two variables are significantly and strongly correlated.
P6. Information system change climate partially mediates the positive relationship between information system change involvement and ACC (IS).	Confirmed by a series of standard multiple regression equations.
P7. CP, IS change value, IS change involvement and IS change climate explain significant variance in ACC (IS).	Confirmed by standard ( $R^2 = .49, p < .001$ ) and hierarchical regression analysis ( $R^2 = .63, p < .001$ ) and above and beyond individual differences and control variables. Change impact interacts with IS change value to predict ACC (IS) ( $R^2 = .64, p < .01$ ).
P8. Perceived lack of alternatives and perceived skills transferability explain significant variance in CCC (IS).	Confirmed for perceived skills transferability by standard multiple regression analysis ( $R^2 = .03, p < .01$ ), but not by hierarchical multiple regression analysis: Overall, P8 not confirmed. Note: Perceived lack of alternatives not included.
P9. ACC (IS) relates positively to IS change-related mere compliance and compliance.	Not confirmed by hierarchical multiple regression analysis: ACC (IS) unrelated to mere compliance and compliance.
P10. ACC (IS) relates positively to IS change-related organisational citizenship behaviour towards an organisation (cooperation) and individuals (championing).	Confirmed by hierarchical multiple regression analysis: ACC (IS) significantly positively related to both cooperation ( $R^2 = .53, p < .001$ ) and championing ( $R^2 = .57, p < .001$ ).
P11. ACC (IS) is unrelated, or negatively related, to IS change-related counterproductive work behaviour towards an organisation (CWB (O)) and individuals (CWB (I)).	Confirmed by hierarchical multiple regression analysis: ACC (IS) unrelated to CWB (O) and CWB (I).
P12. CCC (IS) relates positively to mere compliance and compliance.	Confirmed by hierarchical multiple regression analysis: CCC (IS) significantly positively related to both mere compliance ( $R^2 = .20, p < .01$ ) and compliance ( $R^2 = .37, p < .01$ ).
P13. CCC (IS) is unrelated, or negatively related, to IS change-related organisational citizenship behaviour towards an organisation (cooperation) and individuals (championing).	Partially confirmed by hierarchical multiple regression analysis: CCC (IS) significantly positively related to cooperation, but unrelated to championing.
P14. CCC (IS) is unrelated, or positively related, to IS change-related counterproductive work behaviour towards an organisation (CWB (O)) and individuals (CWB (I)).	Confirmed by standard multiple regression analysis: CCC (IS) significantly positively related to CWB (O) and unrelated to CWB (I).
P15. ACC (IS) and CCC (IS) interact to predict IS change-related mere compliance, compliance, cooperation, championing, CWB (O) and CWB (I) behaviour.	Confirmed by moderated hierarchical regression analysis for mere compliance, compliance, cooperation, championing and CWB (O). Not confirmed for CWB (I).

## **CHAPTER 6: DISCUSSION**

This final chapter discusses the results and significance of this study in relation to the original research propositions and previous research. The first part of the chapter reflects on the personal factors that motivated the study and the author's epistemological assumptions. The second, third and fourth parts summarise the findings and implications of the results of the study for the nature, determinants and outcomes of user commitment to information system change. The fifth part discusses the practical implications of the findings for IS change management. The sixth part discusses the directions for future research, and the seventh part summarises the contributions of this thesis to new knowledge. The final notes conclude the chapter with comments on the overall significance of the findings.

### **PERSONAL REFLECTIONS**

#### **Own Experience**

I experienced the phenomenon of user commitment to a new information system by being part of a team responsible for the implementation of an inventory management information system. This experience dates back to early 2002 when, in my first job, I worked for a South African supply chain management company on projects in Windhoek, Namibia. As a junior team member, I initially assisted the senior consultants in the implementation of the system and was later responsible for the countrywide rollout and administration. A large part of the job also entailed what we called change management and included communication and user training. This experience stimulated my interest in investigating the topic further.

The major challenge during the implementation of the system was to elicit 'buy-in' from the information system users after the system became fully operational. We had always thought the technical implementation would be the most difficult part, but the really challenging phase came after we had implemented the system technically.

Many of the users were outspoken in their criticism of the system. They argued that it was unnecessary and "does not work in Namibia". Other users, however, welcomed the new system and said that it made their work "easier and faster", giving them more time to spend on more important tasks such as customer service. How could it be that

the implementation of a proven and arguably useful system could result in such different reactions? This scenario was especially surprising as the system had a successful track record in many other countries.

The polarisation of the users culminated in increased pressure on the implementation team and resulted in a decision to postpone the implementation. Workshops were held with the users, and the root causes of the differing attitudes towards the information system change were identified. It emerged that the system had some functional shortcomings in the Namibian context, and these shortcomings were duly addressed with the intensive engagement and involvement of the users. Further emphasis was also placed on the training of and communication with the users.

Without this grassroots engagement of the users, the implementation would have failed. At that stage, I asked myself whether our approach could be generalised to other implementations: Stated differently, could there be a distinct and universal set of variables, or models, that influenced the success or failure of an information system implementation? This question influenced my decision to investigate the topic further.

### **Epistemological Assumptions**

I began the research project without giving much thought to alternative knowledge claims. My plan was to develop a concrete and perhaps universal *model* of the determinants and outcomes of user commitment to information system change. I envisaged building a distinct model with clear guidelines for the management of a information system change. On reflection, my implicit epistemological assumptions were what Creswell (2003) termed 'post positivist'. Post-positivism differs from positivism (Goles & Hirschheim, 2000; Mingers, 2004) in that it challenges the assumption of the absolute truth of knowledge advocated by positivism. According to Creswell, post-positivism represents a school of thought that holds that outcomes are probably determined by causes. Following this philosophy, research problems are examined by modelling causes that influence outcomes. Post-positivists follow a reductionist approach by specifying larger ideas in terms of small discrete variables, and, in doing so, they advocate the careful measurement of an objective reality. Because of the research objective of specifying and testing the determinants and

outcomes of user commitment to information system change, this research was implicitly guided by post-positivism.

During the course of the project, my epistemological assumptions shifted as my objectives became more pragmatic. Although the research is dominated by the quantitative research method that is rooted in post-positivism (Creswell, 2003), the less dominant qualitative method contributed to an overall mixed-methods approach. According to Creswell, a mixed-methods research approach has its roots in what he termed a 'pragmatic' epistemological stance. This school of thought emphasises pragmatic solutions to problems. For the pragmatic researcher, the problem is more important than the method, and therefore methods rooted in different epistemological stances may be combined to address a particular problem (Creswell).

Because this study employed both a quantitative and a qualitative component drawn from different epistemological stances, it assumes a pragmatic position about claims of knowledge: A quantitative survey questionnaire approach was selected as the dominant method as it best represents the method used in previous research on the commitment to organisational change construct (Table 2.1). This quantitative approach was therefore appropriate for building on the existing body of knowledge on commitment to organisational change. A qualitative approach was selected to explore the topic and prepare the survey questionnaire. At that stage, the focus group discussions were ideal for exploring the topic in relation to the literature. The findings of the qualitative component of the research thus influenced the selection of determinant variables in the quantitative phase and were also used again during the discussion of the results.

A major learning curve for me during the course of the research was the shift in my epistemological assumptions: Because the phenomenon of commitment to change is far more complex than I initially thought, I now realise that it is not possible to build a concrete and universally applicable model. The model developed and measured in this study therefore applies to the specific context and situation examined. Consequently, this study is one way of looking at the phenomenon of commitment to change, but, in another context and situation, it may not apply. Compared to my stance at the

beginning of the project, I am now more convinced of the need to apply a pragmatic perspective (Creswell, 2003) and to use a more pluralist approach (Mingers, 2001).

## **NATURE OF USER COMMITMENT**

This part of the chapter discusses the findings and implications of the study regarding the nature of user commitment to information system change in terms of the original research propositions and previous research: The first section of this part summarises the findings of the study on the validity and reliability of user commitment, and the second section discusses the relationship between the two dimensions of user commitment. The final section deals with the distinctiveness of two foci of commitment: user and organisational commitment.

### **The Two Dimensions of User Commitment**

Following recent advances in the wider commitment literature, this study proposed changes to the traditional tripartite commitment to change model: First, normative commitment was defined as reflecting an individual propensity driving the development of affective user commitment. The study therefore regards commitment propensity (CP) not as a form of commitment but as an individual difference. Second, continuance user commitment (CCC (IS)) was reconceptualised as reflecting a perceived high sacrifice. These conceptual changes were then tested in the Namibian context with regard to a information system change.

### **Validity of Affective and Continuance User Commitment**

Construct validity issues regarding the C2C construct require urgent attention (Jaros, 2010). The validity of these issues is important to show that ACC (IS) and CCC (IS) apply to IS change in a Namibian context.

As suggested by Proposition 1, the study confirmed affective and continuance user commitment as distinct constructs. This means that these constructs are valid in the Namibian context and with regard to the focus of a mandatory information system change. Namibian information system users have developed a bipartite commitment profile in respect of information system change comprising an affective and a cost-based mindset.

However, the implied suggestion in Proposition 1 regarding the underlying dimensionality of CCC (IS) was not confirmed as CCC (IS) was found to be one-dimensional. As a post hoc explanation, this means that the continuance dimension has a tendency to reflect either a perceived lack of alternatives or a perceived high sacrifice on the part of information system users. Previous research treated CCC as one-dimensional and therefore, although proposed otherwise here, this result confirms previous research. The finding on the nature of CCC (IS) also has implications for commitment research: The original items by Herscovitch and Meyer (2002) were intentionally included and measured, which resulted in only three items per sub-dimension. Associated recommendations for further research will be given in the respective section later in the chapter.

### **Reliability of Affective and Continuance User Commitment**

Despite the unexpected finding regarding the dimensionality of CCC (IS), the two dimensions of user commitment still emerged as valid constructs. However although ACC (IS) emerged as highly reliable, CCC (IS) also revealed borderline internal consistency. The finding that the two dimensions of user commitment were valid was consistent with the results of previous research (Table 2.1).

The high internal consistency of the ACC (IS) scale in the study is also consistent with previous research (e.g., Cunningham, 2006; Herscovitch & Meyer, 2002; Meyer et al., 2007). However, the borderline internal consistency of the CCC (IS) scale was unexpected as in previous studies the CCC scale generally resulted in a higher reliability (Table 2.1). The results on this scale were, however, also weak in the study by Meyer et al. (study one) with their Canadian sample and in the studies by Herscovitch and Meyer (2002) (study two) and Rashid and Zhao (2010). The findings of the present study thus confirm the reliability inconsistency of the CCC (IS) scale.

This research used the original six ACC items by Herscovitch and Meyer (2002), but, to improve distinguishability, the CCC (IS) scale was shortened to four items. Such a reduction was not uncommon in previous research: For example, Meyer et al. (2007) used four items in the CCC scale in their Canadian sample, and Neves and Caetano (2009) included only three items to measure CCC in their study. The unreliability of

the CCC (IS) scale points to the need for further scale development and construct verification.

### **Correlation between Affective and Continuance User Commitment**

Compared to previous research, the finding of this study on the correlation between ACC (IS) and CCC (IS) was unexpected: Although most previous studies reported a significantly moderate negative correlation between ACC and CCC (e.g., Cunningham, 2006; Meyer et al., 2007), one previous study (study one in Herscovitch & Meyer, 2002) found an insignificant correlation as did the present study. It should be borne in mind, however, that study one by Herscovitch and Meyer was a laboratory simulation with students. Their finding is therefore not comparable with that of the present study as a laboratory simulation differs widely from a survey study not only in terms of context, change type and participants, but also in terms of method.

In contrast to previous studies, the two constructs in this study are therefore even more distinct from and independent of each other: Whereas in previous studies, an increase/decline in ACC resulted in a proportional decline/increase in CCC and vice versa, the results of the present study indicate more independence between the two constructs. In this study, an increase in ACC (IS) did not result in a proportional change in CCC (IS) and vice versa. It could be speculated that the type of change could influence the correlation between ACC and CCC. With regard to an information system change, ACC (IS) (desire based) and CCC (IS) (cost based) mindsets may not influence one another. However, in other change contexts, such as in previous research, the two constructs could display interrelated mindsets.

### **Distinguishability of User and Organisational Commitment**

A key aspect of construct verification (Jaros, 2010) is the distinctiveness of C2C in relation to other forms of commitment such as organisational commitment. In this study, as expected, ACC (IS) and CCC (IS) were also clearly distinguishable from the dimensions of affective and continuance organisational commitment.

Two previous studies – Herscovitch and Meyer (2002) and Meyer et al. (2007) – also included the dimension of organisational commitment in order to distinguish this focus from C2C and also to compare the predictive power of two foci of commitment. The findings of the present study are consistent with those of the two previous studies in that they also demonstrate the distinguishability of the two foci of commitment. In the Western samples of these previous studies, the correlation between CCC and continuance organisational commitment (COC) was significantly moderate to strong. However, in the Indian sample in study two (Meyer et al.), CCC was uncorrelated with COC. In contrast, in the present study, the correlation between CCC (IS) and COC was moderate. Thus, so far, the correlation between COC and CCC appears to be stronger in Western samples than in non-Western samples, which could imply that the two constructs are more distinguishable in a non-Western context.

In their study, Herscovitch and Meyer (2002) argue that the strong correlation between COC and CCC in their Western sample could imply that failing to comply with the requirements of the change could result in job loss for the participants. In the present study, the opposite implication could apply: Mandatory information system users in Namibia do not so easily associate failure to comply with the information system change with job loss.

This result is surprising, as the users of a new information system have no choice but to accept the new system. As mentioned previously, similarly to a restructuring, the only alternative would be to leave the organisation as the new system will replace the old one entirely. Because of the high unemployment in Namibia (over 50% according to Sherbourne, 2010), leaving may not be a viable option. However, information system users could also associate failure to support the new information system less with job loss because of the skills shortage of educated and experienced employees: Over 65% of the users in the Namibian sample reported having a tertiary education as well as an average organisational tenure of more than seven years. In contrast to the rest of the Namibian population, the sample thus represents an elite group of employees in terms of education and experience. As a result of this status and the associated job security, information system users in Namibia may associate failure to support the new information system less with job loss. It should also be noted that in both previous studies the type of change differed from an information system change.

Because organisational changes may differ in their impact on employees (Jaros, 2010), comparisons should be made with circumspection.

## **DETERMINANTS OF USER COMMITMENT**

This part of the chapter discusses the findings and implications of the study with reference to the determinants of user commitment to information system change. The first section of this part discusses the findings on the prediction of affective user commitment (ACC (IS)) against the background of the original research propositions, and the second section discusses the findings on the continuance user commitment (CCC (IS)) dimension. In both sections the findings of the study are compared with relevant previous research, unexpected findings highlighted and important implications for commitment research discussed.

### **Determinants of Affective User Commitment**

This section discusses the results of the study on the prediction of affective user commitment. First, the findings on the nature of IS change value, involvement and climate and commitment propensity are discussed. Thereafter, the prediction of affective user commitment by these determinants concludes this section.

#### **Nature of Determinants**

Based on the general model of commitment by Meyer and Herscovitch (2001) and the findings of focus group discussions with information system users, the study proposed a unique set of determinants selected from the commitment, change management and information system literature. The selected determinants were classified into theoretically meaningful themes, namely IS change value, involvement and climate. In addition, normative commitment to organisational change, a traditional component of the three-component model of commitment to change, was reconceptualised as a commitment propensity driving the development of ACC (IS).

**Nature of IS Change Value, Involvement and Climate.** The findings of the study on the psychometric properties of the determinants were as expected: Except for the individual determinants facilitating conditions and perceived ease of use, the study showed that the determinants could be distinguished from each other. There was thus little construct overlap between the individual determinants. The construct overlap of facilitating conditions and perceived ease of use with some of the other determinants indicates that these two constructs are not clearly distinguishable. They share similarities with some of the other constructs such as training (also a form of facilitating condition) and perceived usefulness. If the individual items of the facilitating conditions scale are considered, it becomes evident that some of the items refer to training thus resulting in construct redundancy. Similarly, items in the perceived ease of use scale tap into items in the perceived usefulness scale. As previous research found the two constructs to be distinct, yet highly correlated (e.g., Keil et al., 1995), this result was not surprising. Some authors also regard perceived ease of use as a determinant of perceived usefulness (Wixom & Todd, 2005).

The additional higher order factor analyses in the study showed that the individual determinants could be grouped into the proposed higher-level constructs. This grouping was based on theoretically meaningful categories regarding the value of information system change (information quality and perceived usefulness), user involvement (communication, participation and training) and employee higher order needs conceptualised as IS change climate (overall IS change fairness and change leadership).

Unexpectedly, the initial higher order factor analysis of all the items did not reveal three but only one higher order factor. This implies that the individual determinants represent facets of this overarching higher order factor, which could be explained by the presence of an overarching factor that underpinned all the determinants as well as the three areas: IS change involvement, value and climate. Because all the determinants represent positive, or supportive, aspects of the information system change, this overarching factor may represent overall change value. Consequently, the individual determinants could represent facets of this overarching factor within which further sub-factors could exist, as demonstrated in this study.

**Nature of Commitment Propensity.** In the commitment literature, normative commitment traditionally forms part of the tripartite model of organisational and change commitment. In the present study, however, commitment propensity (CP) was conceptualised as an individual propensity driving the development of ACC (IS). The study therefore did not treat normative commitment as a form of commitment but as an individual difference.

For construct verification purposes, CP was included in the confirmatory factor analysis that analysed the dimensionality of ACC (IS), CCC (IS) and CP. As demonstrated in the study, CP was found to be distinct from both ACC (IS) and CCC (IS). The CP scale – comprising IS change-specific items of the original NCC scale – resulted in a higher internal consistency compared to previous research. Results on this scale were mixed in previous research with some studies reporting poor reliabilities (e.g., Kalyal et al., 2010; Meyer et al., 2007, study two).

This study reduced the CP scale to four items in order to improve the distinctiveness of ACC (IS) and CCC (IS). Such reduction was also not uncommon in previous studies: Chen and Wang (2007) and Kalyal et al. (2010) both reduced the NCC scale by two items in their non-Western samples indicating that some of the CCC (IS) and CP items still overlapped with each other or with the ACC (IS) scale.

Some studies examined the correlation between the three dimensions of C2C. However, the strong correlation between CP and CCC (IS) in the Namibian sample was inconsistent with previous studies, which reported a moderate (e.g., Herscovitch & Meyer, 2002) or insignificant correlation (e.g., Cunningham, 2006; Chen & Wang, 2007). Only Meyer et al. (2007) found a similar strong correlation between NCC and CCC in their Canadian sample with regard to a planned structural and cultural transformation. This finding suggests that CCC and CP may be less distinguishable in some change contexts. Because a mandatory IS change does not leave users with a choice, users may differentiate less between cost (CCC (IS)) and obligation (CP) based motives. In other words, obligation-based CP matters less in this context because users have no choice but to go along with the change. With regard to other – perhaps less imposed – changes, users may differentiate more between these the underlying motives of CP and CCC.

The significant positive correlation between ACC (IS) and CP in this study was weaker than that in previous studies (e.g., Herscovitch & Meyer, 2002; Meyer et al., 2007). This implies that in the context of an information system change, the two constructs are more distinguishable from one another. However, this difference could also be explained by the reduction of the CP scale by two items, which may have improved the discriminant validity between the two constructs in this particular context.

Because the present study used the original items by Herscovitch and Meyer (2002), it could be speculated that CP still did not reflect a true individual difference, as suggested by Cohen (2007). In order to reflect such a difference, Cohen recommended refining and rewording the normative commitment items. This study represents the first attempt to apply the commitment to change construct in Namibia – using the original items was therefore a conscious choice. Before any further changes can be made to the CP construct, its portability to the Namibian context should first be established.

### **Predicting Affective User Commitment**

As suggested by Proposition 7, the present study demonstrated that a large portion of the variance in ACC (IS) could be explained by the proposed determinants. However, only CP (Proposition 2) and IS change value (Proposition 3) emerged as significant determinants in the multiple regression analysis. Unexpectedly, together with IS change value and commitment propensity, IS change involvement and climate were insignificant in this analysis. Propositions 4 and 5 were accordingly not confirmed. Strictly speaking, this means that CP and IS change value (information quality and perceived usefulness) are the drivers of ACC (IS) in the context of an information system change in Namibia.

However, the underlying facets of IS change involvement and climate still correlated significantly with ACC (IS). In addition, Proposition 6 of the study shows why IS change involvement and climate (unexpectedly) did not emerge as significant predictors of ACC (IS) when analysed together with CP and IS change value.

Consistent with Proposition 6, IS change climate partially mediated the positive relationship between IS change involvement and ACC (IS) indicating that IS change involvement influenced IS change climate, which, in turn, influenced ACC (IS). As shown by the partial mediation, IS change involvement also directly influenced ACC (IS). This indirect mechanism could explain the insignificance of IS change climate and IS change involvement as predictors in combination with CP and IS change value. It could be argued that IS change involvement is therefore an indirect determinant that influences ACC (IS) through IS change climate. Both components were therefore insignificant when analysed together with CP and IS change value.

The remainder of this part places the spotlight on the relationship between affective user commitment and the determinants, individual differences and control variables.

#### **Role of Commitment Propensity in the Prediction of ACC (IS).**

Confirming Proposition 2 of the study, the multiple regression analysis showed CP to be a significant predictor of ACC (IS) thus indicating that users with a strong CP are more likely to develop ACC (IS). However, the temporal and causal ordering between the two constructs has not yet been established. In particular, it is still not clear whether in terms of time, CP occurs before ACC (IS) or vice versa: Instead of CP influencing ACC (IS), it could also be the other way around. Nevertheless, the finding that CP did not explain significant variance in behaviour above and beyond ACC (IS) and CCC (IS) indicates that this dimension may be redundant in the prediction of IS change-related behaviour.

**IS Change Value as the strongest Predictor of ACC (IS).** Confirming Proposition 3 of the study, IS change value emerged as a significant determinant in addition to CP. Overall, IS change value had the strongest correlation with ACC (IS). The significance of IS change value implies that concrete system factors are important in the development of affective user commitment. This finding is not surprising as information quality and perceived usefulness represent potential minimum factors, or 'must haves', for a new information system. It would be difficult for a user to trust and support a system with inaccurate or irrelevant data. Likewise, a user could also not be convinced of the value of a new information system if it was perceived as not useful. After all, the users would be working on the new information system on a

daily basis, and a lack of information quality or usefulness would be felt immediately and have a strong negative impact on the work life and job performance of the users. Users might consequently simply attach more value to visible system factors compared to softer factors such as involvement and leadership.

The finding of the quantitative analysis is also consistent with the findings of the focus group discussions: In all the focus group discussions, the quality of the new information system emerged as a first theme. The participants noted, in particular, the importance of the user friendliness and practicality of the new system, which could be represented by perceived usefulness. The participants also noted the importance of a thoroughly tested and correct system thus indicating the centrality of information quality. For example, one of the users said: “The new system must be better than the old one: Otherwise, why change the existing system?”

However, it could be argued that the strong correlation between IS change value and ACC (IS) was due to some conflating items in the scales (John P. Meyer, personal communication, 7.11. 2011, Conference on Commitment in Columbus, Ohio, USA). For example, one item in the ACC (IS) scale refers specifically to the value of the change (Item ACC1 (IS): “I believe in the value of the information system change”). The items in the ACC (IS) and IS change value scales could therefore have conflated, resulting in a strong correlation between the two constructs. However, the higher order construct IS change value in the study comprised information quality and perceived usefulness, and none of the items contained the word ‘value’. Thus, the wording of the items probably did not influence the correlation between IS change value and ACC (IS).

#### **Change Impact as Moderator between IS Change Value and ACC (IS).**

The significant interaction between IS change value and change impact in the prediction of ACC (IS) was another unexpected finding of the study. As discussed in the previous chapter, this finding did not rest on a previous theoretical foundation as these constructs were examined for the first time in this study. This interaction was therefore not proposed here in the first place. For exploratory purposes, moderator (interaction) and mediator effects between the independent variables were examined.

The significant interaction implies that the strength of the relationship between IS change value and ACC (IS) also depends on the strength of change impact. Change impact therefore intervenes in the relationship between the two variables. The interaction indicates that in the case of low IS change value, the relationship between ACC (IS) and IS change value will be even stronger when the change has a positive impact on performance, organisational climate and non-work life (high change impact). This may imply that employees also evaluate an organisational change in terms of positive and negative impact: A low IS change value will accordingly be moderated if the impact is positive. However, this effect does not hold in the case of high IS change value.

With regard to IS change value and change impact, it could also be speculated that the constructs may be more similar than initially assumed. A high change impact implies a strong positive effect on the work and non-work life of the users. Similarly, a high IS change value also has a positive effect on the users in terms of information quality and perceived usefulness. Thus, the two constructs could tap into the same underlying construct by measuring the value of the IS change for the users in terms of work and non-work life.

**Role of IS Change Involvement in the Prediction of ACC (IS).** Proposition 4 of the study was not confirmed by the multiple regression analysis explaining ACC (IS). However, IS change involvement correlated moderately, almost strongly, with ACC (IS). Although the present study found IS change involvement – comprising communication, participation and training – insignificant in the multiple regression analysis together with CP and IS change value, the underlying facets of this construct nevertheless matter in the prediction of ACC (IS).

**Communication and Training.** As individual determinants, communication correlated strongly, and training moderately, with ACC (Table B10, Appendix B). This result was similar to the moderate correlation between the two variables and ACC in the study by Conway and Monks (2008). However, whereas the determinants in the present study were proximal IS change-specific variables, the variables in the previous study represented general HR practices. They therefore represented more distal determinants. Not surprisingly, the correlation between communication and

training with ACC in the Conway and Monks study was weaker than in the present study. This means that proximal IS-related determinants are better predictors than more distal or general determinants.

The practical significance of communication also emerged as a distinct theme in the focus group discussions: “Management should not leave us in the dark about the new system”. Training also emerged as a theme in the focus group discussions. Given the significant correlations and focus group themes, the practical significance of communication and training for the development of ACC (IS) should not be underestimated.

**Participation.** In the present study, participation correlated moderately with ACC (IS) (Tables B10, Appendix B). The results of the study are consistent with previous research as participative decision making was, for example, included as an individual determinant in the study by Machin and Bannon (2005) and also correlated moderately with ACC. Overall, and consistent with previous research, the findings of this study underscore the importance of communication, participation and training in the prediction of ACC (IS) during an information system change.

**Role of IS Change Climate in the Prediction of ACC.** Proposition 5 of the study was not confirmed by the multiple regression analysis. However, IS change climate correlated strongly with ACC (IS). Although this study found IS change climate – comprising overall change fairness and change leadership – insignificant in the multiple regression analysis together with commitment propensity and IS change value, the underlying facets of the construct are nevertheless important in the prediction of ACC (IS) during an information system change.

**Change Justice:** The moderately significant correlation between ACC (IS) and overall change fairness (Table B10, Appendix B) in this study was consistent with similar previous research: In Bernerth et al. (2007), for example, two forms of change-related organisational justice (distributive and procedural change justice) correlated strongly with ACC. Interactional change justice correlated moderately with ACC while distributive change justice, in particular, correlated strongly with ACC. However, the correlation between overall change fairness with ACC (IS) in the

present study was still stronger than that with interactional change justice in the previous study. As a consequence of representing a proximal but more general construct, overall change fairness had a weaker correlation with ACC (IS) than distributive change justice in the previous study. The result of the present study – in the light of previous research – shows that the more general overall change fairness construct correlates weaker with ACC than more specific types of justice such as distributive change justice. This comparison also shows that certain types of justice, such as distributive change justice, have a stronger influence on ACC than proximal, and also broader, constructs that may entail a variety of justice types.

***Change Leadership and Supportive Leadership:*** In the present study, change leadership correlated moderately with ACC (IS) (Table B10, Appendix B). In Herold et al.'s (2008) study, change leadership was measured on the group level and also correlated moderately with individual level ACC. However, the variables were measured on different organisational levels, and consequently any comparisons should be interpreted with caution. Supportive leadership in the study by Machin, Fogarty and Bannon (2009) also correlated moderately with ACC. The findings of this study were therefore consistent with those of previous research. The role of management with regard to trust also emerged in the focus group discussions.

All in all, the findings of the present study with regard to the individual determinants or correlates of ACC (IS) compare well with previous research. Most of the differences can be attributed to (a) the difference in change context (e.g., a restructuring compared to an IS change) or (b) the nature of the determinant under investigation. While generally consistent with previous research, the findings of this study show that organisational changes differ in respect of their impact on user commitment. Future research should accordingly carefully distinguish between organisational changes and not treat all changes the same. Although constructs may be named similarly (e.g., training), they may differ in terms of specificity (e.g., specific or general training) or proximity (e.g., general job insecurity compared to specific IS change-related job insecurity) to the information system change. In the light of previous research, the results of this study show that proximal IS-related factors matter more in the development of ACC (IS) than do broader, more general factors.

**Individual Differences and ACC (IS).** In addition to CP, the present study also included a set of individual differences control variables, namely age, organisational tenure, positive affect and self-efficacy. Similar variables also included in previous studies include age, organisational tenure (Bernerth et al., 2007) and change-related self-efficacy (Neves, 2009).

*Age.* Consistent with Bernerth et al.'s (2007) study, age was uncorrelated with ACC (IS) in the present study. In other words, the chronological age of users did not have an influence on ACC (IS). Older users were accordingly not less likely to develop ACC (IS) than younger users.

*Organisational Tenure.* In contrast, the moderate negative correlation of organisational tenure with ACC (IS) in the present study was inconsistent with previous research: In the study by Bernerth et al. (2007), organisational tenure was uncorrelated with ACC in the context of a restructuring. With regard to a specific information system change, users with a longer organisational tenure may be more used to the old system and may therefore be less likely to develop ACC (IS) because learning the new system does not necessarily represent additional value for them. In fact, mastering a new system requires effort. In the light of previous research, the findings of this study show that the type of change matters for the development of ACC: For some organisational changes (e.g., an information system change), organisational tenure matters for the development of ACC. For other changes (e.g., a restructuring), organisational tenure may matter less for the development of ACC.

*Positive Affectivity.* Unexpectedly, positive affect emerged as a significant predictor in the multiple regression analysis explaining ACC (IS) in this study. This means that users with a generally more positive outlook on life may be more likely to develop ACC (IS). It could be speculated that such users view the information system change more optimistically and consequently may focus on the positive aspects of the change instead of on the negative aspects. By focusing on the positive aspects, such users may find it easier to find value in the change. The implication of this result for commitment theory is therefore that – at least in the Namibian context – individual differences, apart from CP, do play a role in the explanation of ACC (IS). To build on

this finding, future research should accordingly continue to control for individual differences such as positive affectivity.

***Self-efficacy.*** Self-efficacy correlated moderately with ACC (IS) in the present study (Table 5.10). In contrast, in Neves' (2009) study, change-related self-efficacy was uncorrelated with ACC in the context of the implementation of a new performance management system. The result of this study is therefore inconsistent with that of previous research. However, because the context of the change in the Neves study differs significantly, caution should be exercised when making comparisons. In addition, in contrast to the study by Neves, the present study applied general self-efficacy: First, because self-efficacy was included as a control variable and, second, because of a lack of established IS change-related self-efficacy scales. Nevertheless, the result of the present study indicates that general self-efficacy does influence ACC (IS) in the context of an information system change. Users with a higher general sense of self-efficacy may perceive themselves more able to master the information system change. Such users may consequently find it easier to believe in the value of the IS change and therefore develop ACC (IS).

**Change Significance, Impact, Job Insecurity and ACC (IS).** In addition to a set of individual differences, this study also included a set of change-related control variables that were also included in previous research, namely change significance and change impact (Herscovitch & Meyer, 2002) as well as IS job insecurity. Conway and Monks (2008) (general job security) and Kalyal et al. (2010) (job insecurity) examined similar constructs.

***Change Significance.*** Unexpectedly, change significance emerged as a significant predictor in the multiple regression analysis explaining ACC (IS) in this study. Because users may attach more value to a perceived more significant change, it could be speculated that the perceived significance of the information system change also drove the development of ACC (IS).

Change significance was also included in the study by Herscovitch and Meyer (2002): In studies one and two, change significance was uncorrelated with the three dimensions of C2C. It was also insignificant in the final step of the hierarchical and moderated multiple regression analysis predicting behavioural support (single-item measure) and compliance, respectively. In contrast, this study found a strong positive correlation between change significance and ACC (IS). Thus, the findings of this study were inconsistent with those of previous research. Furthermore, in contrast to the initial study, change significance also emerged as a highly significant predictor of ACC (IS) in the hierarchical multiple regression analysis. In the light of previous research, this finding shows that the significance of the information system change matters for the prediction of ACC (IS).

A possible explanation for this finding in the present study can be found in the nature of the change under investigation. Herscovitch and Meyer (2002), for example, mixed organisational changes: In addition to change impact, they included this control question in the survey questionnaire to control for the type of change. Because the participants in the study by Herscovitch and Meyer experienced a variety of changes, change significance was insignificant. In contrast, the present study focused on a specific change, and the construct emerged as a significant predictor of ACC (IS).

Another explanation regarding the importance of change significance in the prediction of ACC (IS) could relate to cultural differences: As discussed later, Namibian information system users – like the citizens of other African countries (Eton & Louw, 2000; Triandis, 1989) – may be more collectively oriented. An information system change that is highly significant for an organisation may be viewed as an important collective organisational event. Because of this collective importance, information system users in Namibia may consider the information system change more valuable than do employees in a Western setting.

***Change Impact.*** Change impact was also included in the study by Herscovitch and Meyer (2002): In study two, change impact correlated strongly with ACC. The variable was insignificant in the final step of the hierarchical and moderated multiple regression analysis predicting behavioural support (single-item measure) and compliance, respectively. In the present study, job impact correlated strongly with

ACC (IS) and also significantly moderated the relationship between IS change value and ACC (IS). Except for the moderator effect, the findings of this study are therefore consistent with those of previous research. The findings show that the impact of information system change on performance and work and non-work life matters for the development of ACC (IS).

In Herold et al.'s (2008) study, job level impact, a similarly labelled variable (measured on the individual level), was unrelated to ACC. However, although the two constructs are labelled similarly, they may have different meanings. In the present study, a high change impact represents a large positive effect on job performance, the climate in the organisation and non-work life. In contrast, the study by Herold et al. focused on the impact on job performance only: A large job-level impact represents increased job demands. These two constructs may therefore differ significantly in what they measure, and consequently they may not be comparable. The strong positive correlation of change impact with ACC (IS) in this study implies that the users evaluated the information system change in terms of how it would affect their private and work lives. In other words, a positive change impact fosters the development of ACC (IS).

***Job Insecurity.*** In this study, IS-related job insecurity correlated moderately negatively with ACC (IS) (Table 5.10). The findings in previous research were mixed: In Conway and Monks (2008), general job security was uncorrelated with ACC whereas Kalyal (2010) found that ACC correlated strongly negatively with general job insecurity. However, in contrast to previous research, the present study applied a proximal IS change-specific job insecurity variable, and the results should accordingly be compared with caution. The finding of this study shows that IS-related job insecurity negatively impacts the formation of ACC (IS) in the context of an information system change. In the light of previous research, it could be speculated that general job insecurity matters less during organisational change. In contrast, specific change-related job insecurity does have an adverse effect on the formation of ACC (IS).

## **Determinants of Continuance User Commitment**

Perceived skills transferability did not predict CCC (IS) in the hierarchical multiple regression analysis and therefore Proposition 8 was not confirmed. This results shows that, at least in this sample, perceived skills transferability does not drive the development of CCC (IS). It may be speculated that users in this sample may not have been aware of the transferability of skills learned by the new information system.

As a consequence of the analysis of the psychometric properties of CCC (IS), it was not possible to include perceived lack of alternatives as the second predictor in this study. Because CCC (IS) was found to be one-dimensional, it could be argued that the potential determinant perceived lack of alternatives was included in this construct. CCC (IS) in this study may represent either a tendency to reflect a perceived lack of alternatives or a perceived high sacrifice, or both.

An unexpected finding in the study was the significance of the control variable self-efficacy in the prediction of CCC (IS) in the multiple regression analysis. The only previous study that also examined self-efficacy was that of Neves (2009). However, Neves included only the ACC dimension in his study, and therefore the correlation between CCC and self-efficacy could not be compared. With regard to the significance of self-efficacy, it could be speculated that users with a high general sense of self-efficacy may develop CCC (IS) because they may generally feel more competent to master the skills required for the information system change. They may develop a sense of high sacrifice/lack of alternatives if they do not go along with the information system change because they will then lose the chance to improve their skills. These information system skills could well be useful in the Namibian job market.

The findings of the present study on the determinants of CCC (IS) also have implications for commitment theory. Because CCC (IS) was found to be one-dimensional, the proposed determinant perceived lack of alternatives was not included – only perceived skills transferability with regard to information system skills was included. However, the variance explained in the standard multiple regression analysis in CCC (IS) by this predictor was practically small but statistically

significant. The inclusion of the control questions and individual differences increased variance explained in the hierarchical multiple regression analysis, but PST was insignificant. However, the variance explained remained small, and, as a consequence, the determinants of CCC (IS) continue to be under-researched, especially with regard to an information system change. Because an information system change is by its nature a mandatory change, further research is required on its impact on user perceptions and its implications for the development of CCC (IS).

Overall, analyses regarding CCC (IS) were compromised because of the psychometric properties of the scale. Propositions regarding CCC (IS) were not confirmed. Although the findings on CCC (IS) could justify its removal from this thesis, it was decided to retain CCC (IS). First, CCC represents an important facet of commitment. Returning to a one-dimensional definition of commitment because of psychometric issues of this scale would not contribute to further development in commitment research. Second, based on the findings of this study, various suggestions for future research on the psychometric properties of CCC have been made. These suggestions may in turn inform future development of the CCC construct and its measurement.

## **OUTCOMES OF USER COMMITMENT**

The previous two parts discussed the findings of this study on the nature and determinants of user commitment. In relation to the original research propositions and previous research, this part discusses the findings and implications of the study for the behavioural outcomes of user commitment to information system change. The first section of this part discusses the nature of IS-related task, citizenship and counterproductive behaviour; the second section covers the findings on the prediction of this IS-related behaviour; and the third section deals with the findings on the interaction between the commitment dimensions in the prediction of behaviour. A discussion on the findings on the relative predictive value of user and organisational commitment concludes this part.

## **Nature of IS Change-related Behaviour**

In contrast to previous research, this study proposed and tested a different approach to the behavioural outcomes of commitment to change. With regard to an information system change, the behavioural outcomes were classified across the three traditional facets of performance: Task, citizenship and counterproductive work behaviours.

As expected, the study demonstrated that the proposed behavioural outcomes of user commitment are valid and can be measured reliably as mere compliance, compliance, cooperation, championing and counterproductive work behaviour towards an organisation or individuals. Furthermore, as expected, it was also demonstrated that the cooperation and championing scales could be refined to reflect citizenship behaviour towards an organisation or individuals. For the first time, it was shown that IS-related counterproductive behaviour could be conceptualised and reliably measured. In the study, all the outcome variables resulted in high internal consistencies. However, unexpectedly, the outcomes could not be aggregated into three higher-level constructs, namely task performance, citizenship and counterproductive behaviour. The study therefore treated these outcomes as interrelated, distinct dimensions although they may still belong in higher order dimensions of support.

Few previous studies examined the outcomes of commitment to organisational change (C2C) using the Meyer et al. (2007) framework of mere compliance, compliance, cooperation and championing. Furthermore, so far only Meyer et al. have differentiated between mere compliance and compliance. The majority of C2C research focused on outcomes beyond specific behavioural support for the change initiative. The results of this study can therefore be compared only to studies that examined constructs similar to behavioural support for a change initiative (e.g., Baraldi et al., 2010; Herscovitch & Meyer, 2002; Machin, Fogarty, & Bannon, 2009; Meyer et al.). The results of this study on the psychometric properties of mere compliance, compliance, cooperation and championing were similar to those of previous research. With the exception of compliance in study two by Herscovitch and Meyer, and cooperation in study two by Meyer et al., previous studies showed high

internal consistencies of the outcomes. The classification of the behavioural outcomes in this study has two important implications for commitment research.

First – as previously suggested by Meyer et al. (2007) – the study demonstrated the value of distinguishing between mere compliance and compliance as IS-related task performance: (a) because the confirmatory factor analysis (CFA) distinguished between the two constructs, and (b) because of the differing correlation with ACC (IS) and CCC (IS). However, the failure of the secondary CFA to show that these constructs reflect two facets of task performance also indicates that the two constructs may be more different than proposed. It could therefore be argued that mere compliance potentially represents a form of passive counterproductive work behaviour and not task performance. The failure of the present study to explain a large portion of mere compliance suggests that this form of behaviour may be driven by factors other than ACC (IS) and CCC (IS), for example by individual differences. Second, this study demonstrated that cooperation and championing could be refined to reflect organisational citizenship behaviour (OCB (O) and OCB (I)) as facets of discretionary behaviour. However, the secondary CFA failed to show that these two constructs reflect facets of a wider OCB construct, which could indicate that the two constructs may be more distinct than initially thought. It could be speculated that cooperation may, in fact, represent a form of task performance and only championing a form of OCB.

### **Predicting IS Change-related Behaviour**

As proposed in this study, ACC (IS) and CCC (IS) significantly predict IS change-related behaviour above and beyond individual differences, control questions, determinants of user commitment and organisational commitment.

### **Prediction of IS Change-related Mere Compliance and Compliance**

Proposition 9 was not confirmed in this study. ACC (IS) was not significantly related to mere compliance and compliance. The study could therefore not confirm a negative relationship between ACC and mere compliance previously found by Meyer et al. (2007). This unexpected result in this study may signify that ACC (IS) and mere compliance are not related in the context of an IS change, whereas in other change contexts, such as in Meyer et al., they may be negatively related.

Consistent with Proposition 12 in this study, CCC (IS) predicted both mere compliance and compliance. This result is consistent with the finding by Meyer et al. (2007) and shows that a cost-based commitment mindset can result in minimum support for information system change.

### **Prediction of IS Change-related Cooperation and Championing**

Consistent with Proposition 10 of this study, ACC (IS) related positively to both cooperation and championing. This result was also consistent with earlier work by Herscovitch and Meyer (2002) and Meyer et al. (2007).

The significant positive relationship between CCC (IS) and cooperation was most unexpected: Contrary to Proposition 13 of the study, CCC (IS) also positively predicted cooperation. In previous research (e.g., Herscovitch & Meyer; Meyer et al.), CCC correlated positively only with compliance and correlated negatively with both cooperation and championing.

This unexpected result could be explained by the refinement of the cooperation and championing scales into OCB (O) and OCB (I) in the present study. The cooperation and championing scales therefore differ slightly from the scales applied in the previous studies. The results may consequently not be comparable, and caution should be exercised when making comparisons. However, the unexpected finding on the predictive value of CCC (IS) has an important implication for commitment research.

This study demonstrated that ACC (IS) and CCC (IS) differed in the prediction of behaviour, especially with regard to mere compliance, CWB (O) and CWB (I), the distinction was weaker than expected and with regard to previous research. For example, both ACC (IS) and CCC (IS) correlated positively with compliance, cooperation and championing, but the strength of the correlation was much weaker for CCC (IS) than for ACC (IS). Consequently, although distinct in the CFA, the difference between ACC (IS) and CCC (IS) was less differentiated with regard to the prediction of behaviour in the study. A noteworthy unexpected and inconsistent finding with regard to CCC (IS) was its positive correlation with cooperation *and* CWB (O) and CWB (I). How could it be that CCC (IS) correlated the same with discretionary as well as counterproductive behaviour? Unfortunately, because of this

unexpected finding, the findings of the study failed to clarify the role of CCC (IS) in the case of an information system change. The role of CCC (IS) accordingly still remains unclear: Employees with a strong CCC (IS) engage not only in focal and discretionary behaviour but also in counterproductive work behaviour. Apart from a psychometric explanation (see Suggestions for Future Research in this chapter), other possible explanations for this finding may be found in the nature of a mandatory information system change or in cultural differences.

**Nature of IS Change.** The inconsistent finding in relation to previous research could be explained by the difference in organisational change examined by the present study: Whereas this study examined a specific change, Herscovitch and Meyer (2002) mixed a variety of changes in their study. The inconsistent finding of the present study emphasises the importance of distinguishing between organisational changes when examining C2C. Changes differ in their impact on employees (Jaros, 2010), and results may therefore not be comparable.

It could also be speculated that in the context of a mandatory information system change, the distinctions between task and citizenship behaviour could be less important.

Users have no choice but to accept mandatory information system change: As a final form of counterproductive work behaviour, the only alternative would be to leave the organisation. Given the high unemployment in Namibia (over 50% according to Sherbourne, 2010), this may not be a viable option. However, as discussed earlier, compared to the rest of the Namibian population, mandatory information system users in Namibia may also represent a group of employees with higher job security. This speculation confirms the finding of the relatively weaker correlation between CCC (IS) and COC in the present study compared to previous research (e.g., Herscovitch & Meyer, 2002). It was mentioned earlier that Herscovitch and Meyer argued that the relatively strong correlation between COC and CCC could imply that failing to support the change could result in job loss. The finding of the present study implies the opposite: Mandatory information system users associate failure to support the change with job loss to a lesser extent.

**Cultural Differences.** Apart from the above implication regarding the impact of the nature of the information system change, there may also be a cultural explanation for the lack of differentiation between ACC (IS) and CCC (IS) in the prediction of behaviour in the Namibian context. Insufficient research has been conducted on the differences between the Western and Namibian cultures. It may also be difficult to identify a unifying culture in Namibia because the country's diverse population is made up of many different tribes with different languages. The sample in this study was consequently diverse in respect of home language.

However, it could be argued that Namibians – like the citizens of other African countries – are generally more collectively (Eaton & Louw, 2000; Triandis, 1989) than individualistically oriented. In contrast to the more Western individualistic orientation, Namibians may regard collective (society, family, cultural group, organisation) objectives more important than their own objectives. As such, the 'we' may be more important than the 'I' in respect of the implementation of information system change. Users in Namibia may therefore, for cultural reasons, put the objectives of the collective organisation above their own objectives and consequently be more accepting of information system change.

### **Prediction of IS Change-related Counterproductive Work Behaviour**

Confirming Proposition 11 of the study, ACC (IS) was unrelated to both CWB (Organisation) and CWB (Individuals). Interestingly, ACC (IS) was also unrelated to mere compliance thus suggesting that factors other than ACC (IS) drive these two behavioural outcomes.

With regard to counterproductive work behaviour, CCC (IS) significantly positively predicted CWB (Organisation) but not CWB (Individuals). However, the variance explained in CWB (Individuals) was minor.

No previous study examined any dimension of C2C in relation to IS-related counterproductive work behaviour. Similar adverse outcomes, such as turnover intentions (Cunningham, 2006; Neves & Caetano, 2009), were examined, but they represented a more distal outcome compared to specific IS-related behaviour. However, it could be argued that turnover intentions represents a form of pre-final resistance to mandatory information system change as users have no choice but to

accept the new information system. But some users may leave the organisation as a final show of resistance against the mandatory information system change. Although CWB (O) and CWB (I) may not be directly comparable with turnover intentions, the correlation between these constructs and ACC (IS) and CCC (IS) should be similar as turnover intentions may represent a further consequence of workplace counterproductive behaviour. Interestingly, ACC correlated moderately negatively with turnover intentions in both studies (Cunningham; Neves & Caetano). The finding of the present study on ACC (IS) and CWB (O) is therefore not consistent with previous research.

Neves and Caetano (2010), however, found CCC to be uncorrelated with turnover intentions while Cunningham (2006) found a moderate positive correlation between CCC and turnover intentions. The latter finding compares well with the finding of the present study on both CWB (O).

Both ACC (IS) and CCC (IS) failed to explain a large portion of the variance of CWB (I) in this study. It could be speculated that this form of behaviour might not represent behaviour strongly influenced by work experiences but might rather represent an individual disposition. It could also be speculated that this form of behaviour might be more strongly influenced by individual differences such as agreeableness and assertiveness. For example, information system users low on agreeableness may trigger more tension among information system users. Such users high on assertiveness may also cause more interpersonal tension among information system users. However, almost no research has been done on the relationship between commitment and deviant behaviour – future research should explore this topic further. All in all, the findings of this study point to the need to examine a comprehensive range of behavioural outcomes in greater depth.

### **Interaction between User Commitments to Predict Behaviour**

The findings of the present study indicate that the prediction of IS-related behaviour by ACC (IS) and CCC (IS) can be further improved by adding their combined moderating effect.

Except for CWB (I), Proposition 15 concerning the interaction of ACC (IS) and CCC (IS) in the prediction of behaviour was confirmed: ACC (IS) and CCC (IS) interacted significantly to predict mere compliance, compliance, cooperation, championing and CWB (O). Predictions of behaviour can thus be improved by adding the interactive effect of ACC (IS) and CCC (IS). This moderator effect means that the relationship between CCC (IS) and the behavioural outcomes also depends on the strength of ACC (IS). In other words, ACC (IS) intervenes in the relationship between CCC (IS) and the outcome variables.

Only two previous studies examined the interactions between components of C2C in the prediction of behaviour: Those of Herscovitch and Meyer (2002) and Meyer et al. (2007). Whereas Herscovitch and Meyer were able to find evidence for a significant two-way interaction between ACC and CCC in the prediction of compliance, Meyer et al. did not find such effects.

With regard to mere compliance and CWB (O), the nature of the interaction in the present study was as expected as a result of previous research (e.g., Herscovitch & Meyer, 2002): The relationship between CCC (IS) and mere compliance/CWB (O) was stronger when ACC (IS) was low. However, unexpectedly, the relationship between the other outcomes (compliance, cooperation and championing) and CCC (IS) was stronger when ACC (IS) was high. Although hardly any research has been done on the interactive effect of commitment dimensions on behaviour, this finding was unexpected within the wider context of commitment research. According to Meyer et al. (2001) – especially in the case of focal behaviour – the relationship between any dimension of commitment and behaviour should be stronger when the strength of the other dimensions is weak rather than strong.

The study demonstrated that the prediction of behaviour could be improved by considering the interactive effects of both ACC (IS) and CCC (IS), and these findings have implications for research in this field.

By showing that the relationship between CCC (IS) and mere compliance/CWB (O) was stronger when the other form of commitment, ACC (IS), was low, the nature of the interactions with regard to mere compliance and CWB (O) were consistent with

previous research. It could be speculated that mere compliance and CWB (O) might be more similar than initially thought. Mere compliance may therefore represent a form of passive counterproductive work behaviour similar to CWB (O). Accordingly, the correlation between CCC (IS) and these two outcomes will be stronger when ACC (IS) is low because users will be less likely to believe in the value of the information system change.

However, the nature of the other interactions in the prediction of compliance, cooperation and championing behaviour was the opposite. The relationship between CCC (IS) and behaviour was stronger when ACC (IS) was high. As indicated earlier, in this study, ACC (IS) and CCC (IS) were less differentiated in the prediction of behaviour than expected and compared to previous research. This lack of differentiation could therefore explain the unexpected result regarding these interactions.

### **Predictive Value of User and Organisational Commitment**

Compared to the corresponding dimensions of organisational commitment, ACC (IS) and CCC (IS) are also significantly better predictors of IS-change related behaviour, namely mere compliance, compliance, cooperation, championing and counterproductive work behaviour. Although information system users also develop a commitment profile towards an organisation, predictions of IS change-related behaviour will be more accurate when using the change-specific focus of commitment.

The finding of this study that C2C was superior to organisational commitment in predicting IS change-related behaviour was consistent with previous research findings (e.g., Herscovitch & Meyer, 2002; Meyer et al., 2007). Herscovitch and Meyer found that the three dimensions of C2C were superior to the dimensions of organisational commitment in the prediction of scores on a 101-point behavioural continuum measure ranging from active resistance to championing. Similarly, Meyer et al. found C2C to be a better predictor of mere compliance, compliance, cooperation, championing and the behavioural continuum.

The finding that C2C was as a better predictor of IS change-related behaviour than organisational commitment has an important implication for commitment research, namely the value of using a specific focus of commitment in the prediction of behaviour. In addition to other more established foci of commitment, C2C, with regard to an information system change, therefore represents a valuable focus of commitment warranting further study.

## **PRACTICAL IMPLICATIONS FOR INFORMATION SYSTEM CHANGE MANAGEMENT**

Apart from the theoretical implications for commitment research, this study also has practical implications for IS change management. Fortunately – for the first time and based on empirical evidence – a study is now available that can offer a framework of practical recommendations for the technical implementation, the change process and wider organisational factors influencing an information system change:

### **Importance of Affective User Commitment**

The study demonstrated that affective user commitment (ACC (IS)) had the strongest influence on discretionary behaviour. In the study, ACC (IS) also had an inverse correlation with harmful counterproductive work behaviour (Organisation) (CWB (O)) but was uncorrelated with counterproductive work behaviour (Individuals) (CWB (I)). The mixed findings in the study regarding CCC (IS) suggest that CCC (IS) does not add value in fostering positive behavioural outcomes in respect of an information system change. Although the role of commitment propensity (CP) remains unclear, its development is still less understood than that of ACC (IS) and CCC (IS). Consistent with Meyer and Herscovitch's (2001) general recommendation on fostering affective commitment, the message of this study for managers of information system change is to foster the development of affective user commitment towards information system change. This type of commitment has the greatest potential to influence positive behavioural support for the change.

The study showed that the perceived value of an information system change by the users – conceptualised as information quality and perceived usefulness – plays a major role in the prediction of ACC (IS). This finding is surprising as this construct was measured by two technical system factors. As mentioned earlier, previous

information system research criticised the emphasis on technical factors during an information system implementation. Many information system changes are thought to fail because of the neglect of softer user factors (Shum et al., 2008). Contrary to this view, the present study found that technical factors play a crucial role in information system change management. However, as previously discussed, this finding does not automatically imply the unimportance of IS change involvement and climate in the prediction of ACC (IS). In fact, individually, both factors predicted ACC (IS) when simple multiple regression equations were used. Furthermore, the underlying individual determinants of IS change involvement and IS change climate all correlated moderately to strongly with ACC (IS) (Table B10, Appendix B). Although the interrelationships between the individual and higher order determinants require further research, the results of this study may well imply that IS change value represents the minimum requirement for users to realise the value of an information system change. In the study, the positive relationship between both IS change value and involvement with ACC (IS) was mediated by IS change climate. IS change involvement and climate therefore still matter in the development of ACC (IS), but they represent drivers with a less powerful impact on ACC (IS) than IS change value. In sum, although this study confirms the importance of technical factors, the change management and wider organisational factors still do matter.

### **Information System Factors**

As a first practical lesson from this research, IS implementation managers should pay special attention to the information quality and usefulness of any new information system.

### **Importance of Information Quality in a New Information System**

IS implementation managers should ensure that any information uploaded to a new information system is error free. For example, master data, such as customer or product information, conditions, prices or inventory data, should be double if not quadruple checked.

In addition, a process for updating and maintaining master data should be implemented (e.g., for changes in master data such as customer information). This could be achieved by implementing the 'four-eye' principle for data updates – two staff members should be assigned to check and verify data uploaded to the new

system. Although this may be cumbersome and time consuming, it will ensure greater data accuracy. In the case of doubtful master data, change managers should insist on data cleaning before going live.

Apart from ensuring correct data, IS implementation managers should also ensure that the information provided to users is adequate and easily accessible. For example, all relevant information should be available at a glance. Unnecessary information should be eliminated, and users should have easy access to the functions they need for their work. This could be achieved by an appropriate and detailed access control procedure (e.g., robust user profiles).

### **Importance of Usefulness of a New Information System**

In addition to ensuring information quality, IS implementation managers should also pay attention to the perceived usefulness of the new information system to the work of the users. This could be achieved by identifying and demonstrating the advantages of the new system compared to the previous system.

For example, certain processes may now be more easily accessible, automated or faster. IS implementation managers should not assume that users will automatically detect the differences. In fact, the new system may at first represent a major learning curve for the users, especially as organisational tenure correlated negatively with ACC (IS) in this study. As discussed previously, users with a longer organisational tenure may be more used to the old system and therefore less likely to accept the value of the new system because it will require new learning. However, the more quickly users realise the advantages of the new system in terms of usefulness, the faster they will develop a strong ACC (IS) towards the information system change.

In some instances, the new system may even be less useful than the previous one. In such a case, IS implementation managers should clearly communicate the reasons for the less useful system. Increased usefulness could result in an increase in productivity and consequently allow users more time to do other work. IS implementation managers should be aware of this and emphasise that such time should be used for spending more time on quality work (e.g., spending more time with customers).

## **Information System Change Process**

As a second practical lesson from this research, IS implementation managers should gear themselves towards communicating and emphasising the value and importance of the information system change as well as the potentially positive impact of the change.

### **Importance of making Users Aware of the Benefits of a New Information System**

Similar to the importance of the 'P' (Perceived) in perceived organisational support (POS) (L. Porter, personal communication, Sunday, 7 November 2011 at the 2011 Conference on Commitment in Columbus, Ohio, USA), users should also be made aware of the value and importance of the information system change. Just as the IS implementation managers should emphasise the quality of information and the perceived usefulness by focusing on the technical aspects of the system, the change management plan should address the technical as well as the wider value of the system.

Common change management practices such as training, communication (intranet, newsletter and print media), events, road shows and workshops (Claßen, Alex, & Arnold, 2003) should all contain the consistent message of the value and significance of the change for the organisation. The possible negative aspects of the change should also be communicated honestly by management.

In user training, IS implementation managers should continuously emphasise and demonstrate the usefulness of the new system to user groups and individual users. This could be done by, for example, comparing the old and the new system. Differences should be explained and the advantages of the new system clearly illustrated (e.g., adoption of industry-wide best practice). In the event of function disadvantages in the new information system, trainers should be able to explain why a certain process is less useful (e.g., for procedural or security reasons).

## **Organisational Factors**

As a third practical lesson from this research, wider organisational factors and the higher level needs of users, especially leadership and fairness, should receive full attention.

### **Importance of Direction and Leadership**

In the planning of an information system change, IS implementation managers should pay particular attention to leadership by, for example, regularly and consistently clarifying the objectives of the change. These objectives should then be broken down and relayed to the smaller units of the organisation with regularly reviews. The objectives and the implications of the information system change for every unit should be clear and understood by all users. Departmental leaders should also regularly track the progress of the department-specific objectives and provide timely and honest feedback about the progress.

Leaders should also not lose sight of the bigger picture, or vision, of the information system change for the organisation (e.g., adopting industry-wide best practice). This will help users contextualise the change in terms of the broader organisation as well as their contribution to the change.

### **Importance of Change Fairness**

In addition to leadership, IS implementation managers should also pay close attention to the fair and equitable treatment of users during the IS change implementation. For example, fair treatment of users should extend to job security in cases where downsizing could occur as a result of the information system change.

Users should also be treated fairly with regard to access to IS-related resources such as training, access to trainers and the help desk. This recommendation also emerged in the focus group discussions with users who had recently experienced a new information system. One of the participants complained about not having the same access to training as colleagues at a location closer to head office: “When it comes to training, we are always the last group. Why do staff members of the other branch receive more training?”

Another important aspect of fair treatment is equitable access to the functions of a new information system. It should be made clear why certain staff members have greater access rights than others. The application of access rights (user profiles) should be consistent and fair. For example, a staff member with the same job and who is at the same organisational level should have the same access rights as a comparable staff member in another unit of the organisation.

## **SUGGESTIONS FOR FUTURE RESEARCH**

This study overcame some of the limitations of previous research pertaining to the nature of C2C, its determinants and outcomes. The study also represents the first attempt to refine and test Herscovitch and Meyer's (2002) model in Namibia. Any future research aimed at deepening understanding of user commitment in the context of an information system system change could well benefit from several suggestions (see below) regarding research design and further scale development.

### **Longitudinal Research Design**

First, future studies should apply a longitudinal research design. This study applied a cross-sectional research design recording a snapshot of a point in time during the information system implementation. Such a snapshot represents the participants' responses to the items in a survey questionnaire at a specific moment. In this study, the users had been familiar with the new system for roughly nine months, and their responses to the questions might not have been the same across the entire implementation period. Although the means and standard deviations of ACC, CCC and NCC remained relatively stable over time in the repeated cross-sectional survey study by Meyer et al. (2007), little is known about how commitment may vary over time. Furthermore, because commitment and its outcomes were measured at the same time in terms of the study's cross-sectional research design, inferences could not be drawn about causality with regard to the behavioural outcomes of commitment. To overcome this limitation, future research should use a longitudinal research design whereby change/or stability in commitment could be tracked over time and stronger evidence provided of the causality between commitment and user support. Such a design could also resolve the problem of the temporal and causal ordering between commitment propensity and ACC (IS). In fact, a true reconceptualisation of

commitment propensity as an individual propensity could be achieved only by a longitudinal design.

A longitudinal research design could also assist in examining the impact of the information system change on user commitment during the different phases of the implementation (e.g., planning, training, implementation, going-live, post-implementation, maintenance). The determinants of user commitment could vary during the different stages. For example, while change communication may be more important for the development of ACC (IS) during the planning phase of the information system change, information quality and perceived usefulness may play a more important role once the new system is used by the users. User support may, in turn, play a more important role after going-live with the new system. Because this study examined user perceptions after the users had become familiar with the new system, little is known about user commitment during the planning phase of an information system change. Future research should accordingly take into account the various phases of an information system change.

### **Multiple Sources of Data**

Second, in future research, data should be collected from multiple sources. Because the data collected in the present study were based exclusively on self-reported measures from a single source (except for the two indirect control variables, ERP system type and organisation), the problem of common-method variance arose. Common-method variance occurs when the variance in the measures can be attributed to the method (in this case the survey questionnaire) rather than to actual differences perceived by the participants (Podsakoff & Organ, 1986). Cross-sectional attitude behaviour studies are, in particular, subject to the inflation of correlations by common-method variance (Lindell & Whitney, 2001).

Harman's single-factor test (Podsakoff & Organ, 1986) was conducted to assess the influence of the method on the results. In Harman's single-factor test, a principal-axis factor analysis (without rotation) is conducted on the composite scales of a study. A resulting single factor would indicate the strong impact of single-method variance. In the present study, the results of the principal-axis factor analysis with the 20 core variables indicated the existence of four factors (see Appendix B, Table B26, for more

information). The scree plot also indicated the presence of more than one factor above the point of inflection (Appendix B, Figure B3). Although the first factor was large compared to the remaining three factors, the analysis revealed that common-method variance did not excessively influence the results of the study.

However, future researchers should be wary about collecting data from a single source, as, especially in the case of information system change, data are needed from more than one source. In order to establish commitment as a key mediator of change success, more research is needed linking it to the actual success of the transformation (Klein et al., 2009). These alternative data sources could represent factors of information system success other than information system use from the DeLone and McLean (1992) model: For example, on-budget and on-time completion of the information system implementation on the organisational level of analysis.

The exclusive use of self-report measures in the present study also led to the problem of social desirability bias (Podsakoff & Organ, 1986). This problem arose as a result of items in the survey questionnaire that prompted the respondents to appear in a more favourable light (e.g., positive affectivity, self-efficacy). The responses to some items could be more socially acceptable than others (e.g., supporting organisational change, not engaging in counterproductive work behaviour). Social desirability could accordingly explain the relatively high means of positive affect and self-efficacy in the study and, conversely, also the low means of CWB (O) and CWB (I). However, a resulting upward shift in the distribution of responses should not cause any concerns about the interpretation of correlations (Podsakoff & Organ).

Because of the self-reported data, the problem of self-selection bias also arose and limited the generalisability of the study. The relatively low response rate was consistent with previous commitment to change research (Table 2.1). However, the question arises whether the participants who completed the survey could have responded to the questionnaire differently compared to the users who did not participate in the research. After all, little is known about the non-participants

## **Multi-level Research**

Third, future research should be conducted from a multi-level perspective in order to better understand the complexity of commitment and its relationship to information system success. Such an approach could entail the measurement of variables on the individual, group and organisational level. As mentioned earlier, as an indicator of information system success, the organisational level (e.g., on-budget and on-time completion) should also be included.

## **Sample Diversity**

Fourth, future research should examine the effects of sub-sample diversity (J.W. Bishop, personal communication, Sunday, 7 November 2011 at the 2011 Conference on Commitment in Columbus, Ohio, USA). Although the present study did not mix organisational changes by examining a specific change, the variability of the measures across the participating organisations (e.g., public and private sector) and ERP system type was not examined because of the lack of large enough and comparable sub-samples. Some of the sub-samples were too small for factor analyses and inferential statistics. However, the insignificance of ERP system type and organisation in the hierarchical multiple regression analysis provides preliminary evidence that these variables do not matter in the prediction of ACC (IS).

The present study also did not explore the reasons for the differences across the samples with regard to the response rates. Some of the sub-samples were obtained with very high response rates while others were obtained with relatively low response rates. This variability in response rates across the sub-samples could also have affected the results of the study and contributed to some of the mixed findings (i.e. were the results of the study equally applicable to all the individual sub-samples?). The sub-samples were, however, generally too small for an individual comparison. Future research should learn from this limitation and examine the potential differences across samples, especially with regard to response rates, ERP system type and organisational setting.

## **Influence of Prior Change Commitment**

The study did not control for the influence of prior change commitment on current user commitment to mandatory information system change. As suggested by Ruhle and Breitsohl (2010), the commitment to former organisations could influence the current organisational commitment of employees. Likewise, prior change commitment could also influence current user commitment to a mandatory information system change. Future research should therefore include questions to examine this issue.

## **Future Scale Development**

Finally, on the basis of the findings of the present study, further scale development is recommended with regard to C2C, its determinants and outcomes.

## **Role of Commitment Propensity within Commitment to Change Model**

The inclusion of CP as a predictor of IS change-related behaviour in the multiple regression analysis did not significantly explain more of the variance in IS change-related behaviour than ACC (IS) and CCC (IS) thus indicating that IS change-related behaviour is minimally affected by CP.

The role of CP needs to be further explored in future research, especially with regard to its relationship with ACC (IS) and its role in the three-component model: The role of CP in the three-component model of C2C should be examined in terms of temporal ordering to verify the causal ordering between ACC (IS) and CP. Such research – ideally using a longitudinal design – on the nature of the relationship between CP and ACC (IS) would also help clarify the role of normative commitment in the three-component model of commitment to change.

Future research should also adapt and test CP items to reflect a true individual propensity.

For psychometric purposes (i.e. to establish construct validity), the present study treated CP in the context of the other two components of the three-component model. However, if CP is truly a determinant of ACC (IS), as suggested by Cohen (2007), it should also be distinguished from the other commitment mindsets in terms of time.

As discussed previously, the debate on the nature of commitment is ongoing, and, to date, it is still not clear whether commitment represents an attitude or some other form of mindset. To illustrate this debate, Meyer and Herscovitch (2001) regard commitment as more than an attitude while Solinger et al. (2008) redefined commitment as an attitude. The debate in the wider commitment literature can also be extended to the three individual dimensions of commitment to change. More specifically, it needs to be determined whether the three dimensions equally represent an attitude, individual difference, motive, driving force or mindset.

### **Nature of CCC (IS)**

Future research should further examine the dimensionality of CCC (IS). The failure to separate the original CCC (IS) items into perceived lack of alternatives and perceived high sacrifice may be considered a limitation of the present study. This limitation can, however, be explained by the lack of sufficient items per sub-scale. According to Costello and Osborne (2005), scales with fewer than three items per sub-scale can result in an unstable factor structure. Although three items per sub-scale were used, individual items can hardly be distinguished regarding perceived lack of alternatives and perceived high sacrifice. Consequently – in this study – the majority of these items may represent either perceived lack of alternatives or perceived high sacrifice. Psychometric factors may therefore explain the failure to separate the CCC (IS) scale into sub-dimensions. Future research should therefore not assume the one-dimensionality of this construct but continue to examine its nature closely.

The internal consistency of the CCC (IS) scale was also found to be poor. In the confirmatory factor analysis, some of the CCC (IS) items had poor factor loadings, and the internal consistency of the scale was below the accepted norm. Analyses using this construct should therefore be interpreted with caution as they resulted in some unexpected findings in the past. In particular, the inconsistent findings regarding the significant positive relationship between CCC (IS) and cooperation and championing could be explained by the poor reliability of this scale.

The underlying nature and drivers of CCC (IS) also warrant further exploration. Future research should refine the items to reflect high-perceived sacrifice and perceived lack of alternatives, and other items should also be added to the scale. The best items could be selected by means of factor analyses. The drivers of CCC (IS)

remain unexplored and accordingly represent an opportunity for future research. In particular, the perception of lack of alternatives in a mandatory change should be investigated, as the nature of such a change does not make provision for alternatives.

### **Higher level Nature of Determinants**

The higher-level nature of the determinants also requires further research. In this study, the determinants were classified by forming three theoretically meaningful higher order constructs. Although higher order factor analyses confirmed the structure of these three constructs, the initial analysis did not result in three but one higher order factor. Future higher order factor analyses should therefore replicate and examine whether the determinants can indeed be aggregated into three higher-level constructs.

### **Significance of IS Change Involvement and IS Change Climate**

The interrelationship between the determinants IS change value, involvement and climate warrants further research. The insignificance of IS change involvement and IS change climate in the multiple regression analysis can be explained by the combination of determinants added to the multiple regression equation: According to Tabachnick and Fidell (2001), the significance and strength of a predictor also depends on the other predictors in the equation. Individually, IS change involvement and IS change climate were both significant in the prediction of ACC (IS) when using a simple multiple regression analysis; however, adding commitment propensity and IS change value rendered them insignificant. This means that CP and IS change value are more powerful predictors of ACC (IS) than IS change involvement and climate.

More research is required to establish these constructs as significant drivers of ACC (IS). Although this study began to examine the relationships between the determinants of ACC (IS), the interrelationships between IS change value, IS change involvement and IS change climate remain unclear and call for further research to shed more light on their causal ordering.

### **Nature of Behavioural Outcomes**

The nature and definition of the behavioural outcomes of user commitment also warrant further research. The failure to aggregate the behavioural outcomes into task, citizenship and counterproductive work behaviour can be regarded as a limitation of this study. This failure can, however, be explained by the relatively small sample size as more complex confirmatory factor analysis models require larger samples (Hair et al., 2006). Further research is required to establish whether the individual behavioural outcomes could indeed be aggregated into the higher order factors task, citizenship and counterproductive behaviour. Alternatively, a behavioural outcomes spectrum ranging from active resistance, passive resistance, mere compliance, compliance, cooperation and championing could be tested. This would entail a further reconceptualisation of the existing items.

The spectrum of behavioural outcomes applied in this study requires replication. In particular, future research should confirm whether the refinement of cooperation and championing as organisational citizenship behaviour towards the organisation (OCB (O)) and organisational citizenship behaviour towards individuals (OCB (I)) still holds in other samples and with regard to other change types.

Finally, future research should give attention to the naming of IS-related counterproductive work behaviour. In contrast to mere compliance, compliance, cooperation and championing, the appellation CWB (O) and CWB (I) is more abstract. Representing counterproductive work behaviour, future research should propose and test specific tangible behaviour such as passive or active resistance. Alternatively, terms such as sabotaging or agitating could be used to illustrate CWB (O) and CWB (I).

### **Role of Organisational Support**

Future research should include aspects of organisational support when predicting ACC (IS). As a consequence of the construct overlap of facilitating conditions with some of the other individual determinants, this construct was not included as a determinant in IS change climate. As mentioned earlier, facilitating conditions was conceptualised as a proximal higher order need of employees conceptually related to the more generally perceived organisational support (POS) construct. However,

unfortunately, excluding this construct also resulted in the exclusion of a potentially important IS support mechanism. Given the importance of POS in the development of employee commitment in the wider commitment literature, future research should explore the impact of user support on the development of ACC (IS). However, as noted during a panel discussion at the 2011 Conference on Commitment, the 'P' (perceived) in POS is especially important in the development of affective commitment (L. Porter, personal communication, Sunday, 7 November 2011 at the 2011 Conference on Commitment in Columbus, Ohio, USA). With regard to information system support, this means that users should also be aware of the support offered to them. Control questions should accordingly be added to determine whether users are in fact aware of any user support (e.g., a user helpdesk).

### **Role of IS Change Identification**

In addition to perceived organisational support, future research should also include aspects of IS change identification. The study demonstrated that the determinants of user commitment to mandatory IS change could be grouped into two of the three areas contributing to the development of affective commitment in terms of Meyer and Herscovitch's (2001) general model of commitment: First, realising the value of continuing with a course of action (i.e. continuing with the mandatory IS change) and, second, being involved in the course of action of the information system change.

The third area contributing to the development of affective commitment – identification with an entity or a course of action (Meyer & Herscovitch, 2001) – was not included in the study. Identification with the information system change was intentionally excluded because no 'fitting' determinants from the wider information system or change management literature were found. Considering the nature of an information system change, it could be speculated that identification with the information system change, the new information system or both could most likely occur only with the IS implementation managers or the programmers. The programmers, in particular, might develop identification with the new information system because they were the people who developed it. Apart from the programmers, a further group that might identify with a new system would be the so-called 'super-users' – ordinary staff members with advanced training in the information system or

the ERP system. Super-users offer hands-on and practical training on site, and they may accordingly be closer to the system than ordinary users.

## **CONTRIBUTIONS TO NEW KNOWLEDGE**

So far, this final chapter has discussed the findings of the study in the light of previous research: Important implications for commitment research and the practice of IS change management were dealt with. As with any study, limitations of the research and directions for future research were also discussed. This part of the chapter deals with the contributions of the study to new knowledge. Despite a number of unexpected findings, the results generally support the propositions of the study. The study also made significant contributions to new knowledge in terms of context, method, commitment theory and practice.

### **Application to the Namibian Context**

This study represents the first attempt to extend Herscovitch and Meyer's (2002) model to a specific mandatory information system change in an *African* developing country. Although studies began to test the portability of the C2C construct to developing countries (Table 2.1), no such study has been conducted in an African context yet. As with any research, a major consideration is commitment research is measurement (Meyer & Herscovitch, 2001). The study contributes to new knowledge by demonstrating the portability of the commitment to change construct to the context of a mandatory information system change in a non-Western, more importantly African public sector environment. In the study, generally strong psychometric properties of the C2C construct were demonstrated across several Namibian organisations and ERP system types. In contrast to predominantly Western research (Table 2.1), the study contributes to new knowledge by showing that the construct can indeed be conceptualised and measured in Namibia, a developing country in Africa. The scales verified by the research can therefore be applied in future studies in Namibia. Furthermore, in contrast to previous research studies that tended to mix organisational changes in their analyses, this study revealed that an ERP system change can indeed be the focus of change commitment. This means that predictions of user commitment and associated behavioural outcomes can be more accurate. In sum, this study differs significantly from previous Western research in that it measures C2C in Namibia in terms of a mandatory information system change.

## **Application of a Mixed-methods Approach**

This study contributes to new knowledge by applying a mixed-methods (Creswell, 2003) approach to the study of C2C. Although the approach is predominantly quantitative, the qualitative part of the study adds a different dimension in examining the research problem. The results of the qualitative data analysis were used in the development stage of the explanatory model as well as in the discussion of the quantitative results. The study accordingly differs significantly from previous research on commitment to change research, which was based exclusively on quantitative survey studies (Table 2.1). Although C2C has previously been studied using a qualitative approach (e.g., Shum et al., 2008), mixed-methods studies are rare. As indicated above, in order to advance the field of commitment research, researchers should be more pragmatic in applying methods based on different research paradigms. The study represents one of the first attempts to apply a mixed-methods approach to the study of commitment to change based on a pragmatic epistemological stance.

## **Contributions to Commitment Theory**

The study contributes to commitment theory by developing an explanatory model of C2C in the context of a mandatory information system change. The model contributes to knowledge on the nature of commitment, its predictors and its behavioural outcomes.

## **Nature of User Commitment**

The study contributes to new knowledge by applying and testing recent conceptual advances within the wider commitment literature regarding unresolved issues pertaining to the relationship between normative and affective commitment (e.g., Cohen, 2007) as well as to the nature of continuance commitment. The study demonstrates that in the Namibian context of a mandatory IS change, (a) normative commitment to organisational change can be regarded as a commitment propensity, and (b) continuance commitment to organisational change can still best be regarded as one-dimensional. The study thereby contributes to commitment theory by shedding more light on the relationship between normative and affective commitment to organisational change as well as on the dimensionality of continuance commitment in the context of an ERP system change.

### **Determinants of User Commitment**

Previous C2C research largely neglected the general model of commitment by Meyer and Herscovitch (2001) in the selection of determinants. To avoid a 'laundry list' of determinants, this study demonstrated that Meyer and Herscovitch's general model of commitment can be applied to select and classify determinants from the wider change – and specific IS change – literature. The study thus moves away from previous research, which ignored the mechanisms underlying the development of commitment as described by the general model of commitment (Meyer & Herscovitch). By linking commitment theory with change and IS change literature, the study also contributes to the validation of assumptions on the organisational level that employee commitment is a key mediator in organisational change (Klein et al., 2009). In sum, the study showed affective user commitment to be an important driver of behavioural support.

The study also demonstrated, for the first time, that the determinants can be classified into IS change involvement, IS change value and IS change climate. IS specific system factors (information quality and perceived usefulness) were thus combined with change management (communication, participation and training) and wider organisational factors (overall change fairness and change leadership). By demonstrating the strong predictive power of the determinants, the study contributes to new knowledge by explaining 64% of the variance in affective user commitment. In fact, compared to previous research (Table 2.3), the determinants applied in this study explain, one of the largest portions in the variance of ACC.

The study also demonstrated that an overall change fairness scale could be developed and applied as a determinant of ACC (IS) in the context of an IS change. All in all, the study contributes to commitment theory by showing that the general model of commitment can be used to select powerful predictors of commitment systematically from fields other than commitment research.

### **Behavioural Outcomes of User Commitment**

The study showed, for the first time; that the outcomes of user commitment could be classified into the wider framework of work place behaviour, namely task performance, citizenship and counterproductive work behaviour. The study also provides strong support for distinguishing between IS-related citizenship behaviour

towards an organisation (cooperation) and towards individual employees (championing). For the first time, the study also demonstrated that IS-related counterproductive work behaviour could be measured as counterproductive behaviour towards an organisation or towards individuals. ACC (IS) and CCC (IS) and their interactive effect explained almost 50% of the variance in cooperation and championing and more than 30% of the variance in compliance and CWB (O). An examination of the relationships between ACC (IS), CCC (IS) and counterproductive work behaviour contributed to new knowledge by demonstrating the differing consequences of these commitment dimensions. All in all, the study thus contributes to commitment theory by advancing a systematic coverage of the outcomes of commitment to change.

### **Contributions to Change Management Practice**

The study also contributes to practical new knowledge: For the first time, critical change success factors from the field of information systems and change management were analysed for their impact on user commitment to a mandatory new information system. The results of the analysis may inform the practice of IS change management as the findings represent the first empirical evidence of the relative importance of system, change management and wider organisational factors. The findings of the study also support Meyer and Herscovitch's (2001) general recommendation regarding fostering affective commitment by demonstrating the importance of affective user commitment in the prediction of IS change-related behaviour.

### **FINAL NOTES**

As described in the introduction, change leaders must be able to initiate, manage and complete organisational transformations. To succeed, they must know how to win the commitment and support of the affected people. By adding to the knowledge on the nature, determinants and outcomes of user commitment to mandatory information system change, this thesis is my personal contribution to the commitment to change literature.

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# APPENDICES

## Appendix A: Measures

### Focus Group Questions

1. A new “Information System” was implemented at (the organisation) (name of the new system): Do you know about this change?
2. Explain what you know about the new information system?
3. Is the new system good for staff/ the organisation/ clients?
4. Will staff support the new system? Why?
5. Who will support the system? Who not?
6. What can (the organisation) do to increase support for the system?
7. What are the barriers to support?
8. Do these answers capture the key themes accurately?
9. Have we missed anything?

### Survey Scales

#### **Perceived Ease of Use (Adapted from Venkatesh & Davis, 2000)**

PEU1: My interaction with the new information system is clear and understandable

PEU2: Interacting with the new information system does not require a lot of my mental effort

PEU3: I find the new information system to be easy to use

PEU4: I find it easy to get the new information system to do what I want it to do

#### **Perceived Usefulness (Adapted from Venkatesh & Davis, 2000)**

PU1: Using the new information system improves my performance in my job

PU2: Using the new information system in my job increases my productivity

PU3: Using the new information system enhances my effectiveness in my job

PU4: I find the new information system to be useful in my job

#### **Information Quality (Adapted from Wang, 2008)**

IQ1: I feel the output of the information system is reliable

IQ2: The information system provides up-to-date information

IQ3: The information system provides the precise information I need

#### **Quality of Change Communication (Adapted from Bordia et al., 2008)**

The official information about the information system change...

COM1: Kept me informed throughout the information system change process, even after the official announcement

COM2: Included information about changes to the organisation’s structure

COM3: Addressed my personal concerns regarding the information system change

COM4: Was accurate

COM5: Gave me as much information as possible

COM6: Involved employees in the information system change process and decisions made

COM7: Communicated the reasons for the information system change

**Participation (Adapted from Lines, 2004)**

PART1: Steps were taken to involve me at an early stage in the information system change process

PART2: I became actively involved in the development of the information system change content

PART3: I was actively involved in the development of solutions to identified problems

PART4: Suggestions from me were considered seriously

**Training (Adapted from Amoako-Gyampah & Salam, 2004)**

T1: The kind of training provided to me was complete

T2: My level of understanding was substantially improved by going through the training programme

T3: The training gave me confidence in the new information system

T4: The training was of adequate length

T5: The training was of adequate detail

T6: The trainers were knowledgeable and aided me in my understanding of the new information system

**Facilitating Conditions (Venkatesh, Morris, Davis, & Davis, 2003)**

FC1: I have the necessary resources to use the new information system

FC2: I have the knowledge necessary to use the new information system

FC3: The new system is not compatible with other information systems I use

FC4: A specific person (or group) is available for assistance with difficulties on the new information system

**Overall Change Fairness (Adapted from Amrose & Schminke, 2009)**

CF1: Overall, I am treated fairly regarding the information system implementation

CF2: In general, I can count on being treated fairly regarding the information system implementation

CF3: In general, the treatment I receive regarding the information system implementation is fair

**Change Leadership (Adapted from Herold et al., 2008)**

My leader...

CL1: Developed a clear vision for what was going to be achieved by our work unit

CL 2: Made it clear up front to those in our unit why the information system change was necessary

CL 3: Made a case for the urgency of this information system change prior to implementation

CL 4: Built a broad coalition up front to support the information system change

CL 5: Empowered people to implement the information system change

CL 6: Carefully monitored and communicated progress of the information system change implementation

CL 7: Gave individual attention to those that had trouble with the information system change implementation

### **Perceived Skills Transferability (Adapted from Bagraim, 2004)**

PST1: My skills and experiences with the new information system would be useful to another organisation

PST2: I would have little difficulty obtaining a comparable job elsewhere

PST3: My training and education concerning the new information system would be useful to another organisation

### **Affective User Commitment to Mandatory Information System Change (Adapted from Herscovitch & Meyer, 2002)**

ACC1 (IS): I believe in the value of the information system change

ACC2 (IS): The information system change is a good strategy for this organisation

ACC3 (IS): I think that management is right about introducing the information system change

ACC4 (IS): The information system change serves an important purpose

ACC5 (IS): Things would be worse without the information system change

ACC6 (IS): The information system change is necessary

### **Continuance User Commitment to Mandatory Information System Change (Adapted from Herscovitch & Meyer, 2002)**

#### **Perceived High Sacrifice items:**

CCC1 (IS): It would be too costly for me to resist the information system change

CCC2 (IS): It would be risky to speak out against the information system change

CCC3 (IS): Resisting the information system change is not a viable option for me

#### **Perceived Lack of Alternatives items:**

PLA1: I have no choice but to go along with the information system change

PLA2: I feel under pressure to go along with the information system change

PLA3: I have too much to lose to resist the information system change

### **Commitment Propensity (Adapted from Herscovitch & Meyer, 2002)**

CP1: I feel a sense of duty to work toward the information system change

CP2: I do not think it would be right of me to oppose the information system change

CP3: I would feel bad about opposing the information system change

CP4: It would be irresponsible of me to resist the information system change

CP5: I would feel guilty about opposing the information system change

CP6: I feel an obligation to support the information system change

### **Information System related Task Performance (Adapted from Herscovitch & Meyer, 2002)**

My personal support of the information system: I...

TP1: ...will only work on information system change-related activities that are directly relevant to my job (Mere Compliance)

TP2: ...will do only what is specifically required of me when it comes to the information system change (Mere Compliance)

TP3: ...will do only what is absolutely necessary when it comes to the information system change (Mere Compliance)

TP4: ...will comply with management's directives regarding the information system change (Compliance)

TP5: ...will accept role changes required by the information system change (Compliance)

TP6: ...will adjust the way I do my job as required by the information system change (Compliance)

**Information System related Organisational Citizenship Behaviour (Adapted from Herscovitch & Meyer, 2002)**

**Cooperation (OCB (Organisation))**

OCB1: ...will work toward the change consistently

OCB2: ...will remain optimistic about the change, even if there are problems

OCB3: ...will avoid former practices, even if they seem easier

OCB4: ...will engage in change-related behaviour that seem difficult in the short-term but are likely to have long-term benefits

OCB5: ...will seek help concerning the change when needed

OCB6: ...will not complain about the change

OCB7: ...will try to keep myself informed about the change

OCB8: ...will be tolerant of temporary disruptions and/or ambiguities in my job

OCB9: ...will try to find ways to overcome change-related difficulties

OCB10: ...will persevere with the change to reach goals

**Championing (OCB (Individuals))**

OCB11: ...will encourage the participation of others in the change

OCB12: ...will speak positively about the change to co-workers

OCB13: ...will speak positively about the change to outsiders

OCB14: ...will try to overcome co-workers' resistance toward the change

**Information System related Counterproductive Behaviour (Adapted from Van Dyne et al., 1994)**

CWB1: I work slower on the new information system than I could

CWB2: I waste time when working on the new information system

CWB3: When working on the new information system, I produce less work than I am capable of

CWB4: I waste organisational resources related to the new information system

CWB5: I come late to training on the new information system

CWB6: I avoid extra duties and responsibilities concerning the new information system

CWB7: I don't volunteer for overtime work when needed for the information system change

CWB8: I have difficulties cooperating with others on working with the new information system

CWB9: I don't report wrongdoings by others on working with the new information system

CWB10: I don't let my supervisor know when things go wrong with the new information system

CWB11: When everybody agrees, I keep my doubts about the new information system to myself

CWB12: I discourage others from challenging the supervisor concerning the new information system

**Affective Organisational Commitment (Adapted from Bagraim, 2004)**

AOC1: I feel a strong sense of “belonging” to this organisation

AOC2: I feel “emotionally attached” to this organisation

AOC3: I feel like “part of the family” at this organisation

AOC4: This organisation has a great deal of personal meaning for me

**Continuance Organisational Commitment (Adapted from Bagraim, 2004)**

COC1: It would be very costly for me to leave this organisation right now

COC2: Too much of my life would be disrupted if I decided that I wanted to leave this organisation now

COC3: I would not leave this organisation right now because of what I would stand to lose

COC 4: For me personally, the cost of leaving this organisation would be far greater than the benefit

**Normative Organisational Commitment (Adapted from Bagraim, 2004)**

NOC1: Even if it were to my advantage, I do not feel it would be right to leave my organisation now

NOC2: I would feel guilty if I left my organisation now

NOC3: I would not leave this organisation right now because I have a sense of obligation to the people in it

NOC4: I would violate a trust if I quit my job with this organisation now

**Self-efficacy (Adapted from Chen et al., 2001)**

SE1: I will be able to achieve most of the goals that I have set for myself

SE2: When facing difficult tasks, I am certain that I will accomplish them

SE3: In general, I think I can obtain outcomes that are important to me

SE4: I believe I can succeed at most any endeavour to which I set my mind

SE5: I will be able to successfully overcome many challenges

SE6: I am confident that I can perform effectively on many different tasks

SE7: Compared to other people, I can do most tasks very well

SE8: Even when things are tough, I can perform quite well

**Positive and Negative Affect (Adapted from Watson, Clark, & Tellegen, 1988)**

In general, I feel:

PA1: Interested

PA2: Excited

PA3: Strong

PA4: Enthusiastic

PA5: Proud

PA6: Alert

PA7: Inspired

PA8: Determined

PA9: Attentive

PA10: Active

NA1: Distressed

NA2: Upset

NA3: Guilty

NA4: Scared

NA5: Hostile

NA6: Irritable  
NA7: Ashamed  
NA8: Nervous  
NA9: Worried  
NA10: Afraid

**Information System Change Significance (Adapted from Herscovitch & Meyer, 2002)**

CS: How significant is the information system change for your organisation?

**Information System Change Impact (Adapted from Herscovitch & Meyer, 2002)**

CI1: To what extent will the information system change impact on: The performance in your job?

CI2: To what extent will the information system change impact on: The climate in your organisation?

CI3: To what extent will the information system change impact on: Your non-work life?

**Information System Change Job Insecurity (Adapted from De Witte, 1999)**

How large, in your opinion, is the possibility that you become unemployed in the new future because of the new information system?

**Gender**

Your gender?

**Age**

Your age?

**Home Language**

Your home language?

**Education**

Your highest qualification?

**Organisational Tenure**

How long have you spent with your current employer?

**Organisational Level**

If your organisation had four (4) levels, what level would you be on?

**Information System Tenure**

For how many months have been working on the new information system?

## Appendix B: Statistical Tables and Figures

**Table B1: Fit Indexes of CFA: Original 18-item Commitment to Mandatory Information System Change Scale**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
3-factor model	500.80*	132	.80	.86	.10	.09	.11	2.42	2.15	2.72
4-factor model <sup>1</sup>	443.18*	129	.81	.88	.10	.09	.11	2.20	1.95	2.49

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval. <sup>1</sup>CCC (IS) items divided into CCC (IS) (Perceived High Sacrifice) (three items) and Perceived Lack of Alternatives (three items).

**Table B2: Fit Indexes of CFA: Dimensionality of CCC (IS)**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
2-factor model	46.03*	8	.93	.81	.14	.10	.18	.30	.22	.40
1-factor model	59.97*	9	.92	.75	.15	.11	.19	.34	.26	.46

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval.

**Table B3: Fit Indexes of CFA: Distinguishability of C2C and OC**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
6-factor model (ACC (IS), CCC (IS), CP, AOC, COC, NOC separate)	528.82*	284	.85	.94	.06	.05	.06	2.77	2.51	3.06
5-factor model (COC & CCC (IS) combined)	758.22*	290	.79	.89	.08	.07	.08	3.68	3.35	4.04
5-factor model (AOC & ACC (IS) combined)	1213.53*	289	.68	.78	.11	.10	.12	5.59	5.16	6.06
5-factor model (NOC and CP combined)	1234.73*	289	.67	.78	.11	.11	.12	5.68	5.24	6.15

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval. ACC (IS) = Affective Commitment to Mandatory IS Change; CCC (IS) = Continuance Commitment to Mandatory IS Change; CP = Normative Commitment Propensity; AOC = Affective Organisational Commitment; COC = Continuance Organisational Commitment; NOC = Normative Organisational Commitment.

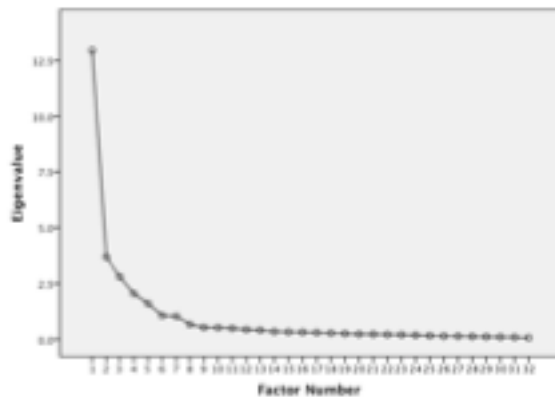
**Table B4: Initial EFA of the Proposed Determinants ACC (IS)**

Item	Factor								Communalities
	I	II	III	IV	V	VI	VII	VIII	
COM5_1	<b>0.71</b>	-0.03	0.11	0.02	0.06	-0.09	-0.09	0.08	0.70
COM3_1	<b>0.66</b>	0.09	0.08	0.10	-0.04	-0.04	-0.08	0.02	0.66
COM2_1	<b>0.63</b>	0.16	0.01	-0.09	0.01	0.00	0.00	0.07	0.51
COM4_1	<b>0.60</b>	0.03	0.12	-0.01	0.12	-0.03	-0.10	0.09	0.64
COM6_1	<b>0.58</b>	0.02	0.06	0.23	-0.02	0.05	0.01	-0.05	0.54
COM7_1	<b>0.55</b>	0.06	-0.06	0.07	0.06	0.20	-0.07	-0.12	0.52
COM1_1	<b>0.53</b>	-0.09	0.02	-0.02	0.00	0.16	-0.12	-0.05	0.42
CL6_1	-0.03	<b>0.88</b>	-0.04	-0.03	-0.02	0.11	0.04	0.04	0.76
CL3_1	0.01	<b>0.84</b>	0.06	0.10	0.06	-0.16	-0.03	0.00	0.79
CL2_1	0.03	<b>0.82</b>	-0.04	0.04	0.12	-0.05	-0.01	0.11	0.77
CL5_1	-0.01	<b>0.78</b>	-0.02	0.08	-0.05	0.04	-0.09	-0.13	0.66
CL1_1	0.07	<b>0.77</b>	-0.01	-0.06	0.09	0.00	0.09	0.11	0.64
CL4_1	0.02	<b>0.76</b>	0.07	0.01	0.05	0.00	-0.13	-0.22	0.74
CL7_1	0.04	<b>0.73</b>	0.06	0.03	-0.06	0.05	-0.10	0.01	0.66
T2_1	-0.05	-0.03	<b>0.94</b>	0.01	0.02	0.02	-0.02	-0.06	0.84
T5_1	0.03	0.06	<b>0.88</b>	0.02	0.00	-0.03	0.04	0.02	0.81
T4_1	0.09	-0.01	<b>0.83</b>	0.04	-0.02	-0.05	0.08	0.02	0.72
T3_1	-0.04	0.02	<b>0.82</b>	0.00	0.14	-0.04	-0.13	-0.08	0.77
T1_1	0.06	-0.03	<b>0.81</b>	0.03	-0.06	0.03	0.02	0.00	0.70
T6_1	0.03	0.03	<b>0.76</b>	-0.01	0.00	0.09	-0.02	0.01	0.70
FC2_1	-0.09	0.02	<b>0.42</b>	0.11	0.00	0.14	-0.20	0.33	0.63
PART2_1	0.05	0.08	0.06	<b>0.89</b>	0.02	-0.11	0.03	0.04	0.86
PART3_1	-0.07	0.08	-0.01	<b>0.85</b>	-0.03	0.02	-0.01	0.03	0.72
PART1_1	0.14	-0.02	0.03	<b>0.68</b>	-0.07	0.09	0.13	-0.02	0.57
PART4_1	-0.05	-0.02	0.06	<b>0.67</b>	0.06	0.16	-0.09	-0.07	0.61
IQ1_1	0.03	0.05	0.09	-0.02	<b>0.85</b>	0.03	0.02	-0.04	0.79
IQ2_1	0.02	0.10	0.00	0.00	<b>0.85</b>	0.11	0.02	0.01	0.81
IQ3_1	0.04	0.06	0.03	-0.04	<b>0.79</b>	0.09	-0.07	0.03	0.80
CF1_1	0.12	-0.02	0.10	0.13	0.09	<b>0.68</b>	-0.02	-0.06	0.77
CF2_1	0.06	0.01	-0.02	0.08	0.13	<b>0.68</b>	-0.17	0.00	0.74
CF3_1	0.03	0.06	0.06	0.12	0.12	<b>0.63</b>	-0.07	0.06	0.71
FC4_1	0.02	0.05	0.21	0.07	0.17	<b>0.38</b>	0.02	0.14	0.48
PU3_1	0.04	0.07	0.04	-0.02	-0.02	0.03	<b>-0.90</b>	-0.06	0.89
PU2_1	0.08	0.06	-0.03	-0.01	0.02	0.04	<b>-0.89</b>	-0.08	0.89
PU1_1	0.16	0.08	0.02	-0.06	-0.01	0.04	<b>-0.78</b>	0.07	0.85
PU4_1	0.02	0.03	0.08	-0.02	0.05	0.08	<b>-0.77</b>	0.05	0.79
PEU4_1	0.15	0.05	0.02	0.07	0.16	-0.02	<b>-0.45</b>	0.24	0.61
PEU3_1	0.08	0.03	0.08	0.09	0.19	-0.10	<b>-0.39</b>	0.35	0.60
PEU1_1	0.06	-0.03	0.08	0.17	0.03	0.08	<b>-0.35</b>	0.45	0.65
PEU2_1	0.23	-0.11	-0.03	0.17	0.19	0.02	<b>-0.07</b>	0.37	0.41
FC1_1	0.06	0.08	0.28	0.01	0.12	0.11	-0.14	<b>0.32</b>	0.55
FC3_1	0.09	0.11	0.11	-0.04	-0.20	0.16	0.07	<b>0.27</b>	0.63
<b>Initial Eigenvalue</b>	<b>16.45</b>	<b>3.89</b>	<b>3.09</b>	<b>2.12</b>	<b>1.88</b>	<b>1.26</b>	<b>1.15</b>	<b>1.12</b>	
<b>Initial Variance Explained %</b>	<b>39.16</b>	<b>9.25</b>	<b>7.36</b>	<b>5.05</b>	<b>4.46</b>	<b>2.99</b>	<b>2.73</b>	<b>2.66</b>	
<b>Cum. Variance Explained %</b>	<b>39.16</b>	<b>48.41</b>	<b>55.77</b>	<b>60.82</b>	<b>65.28</b>	<b>68.27</b>	<b>71.00</b>	<b>73.66</b>	

Note. N = 240; Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.

Each item's highest loading is presented in boldface.

**Figure B1: Scree Plot of EFA of Determinants of ACC (IS)**

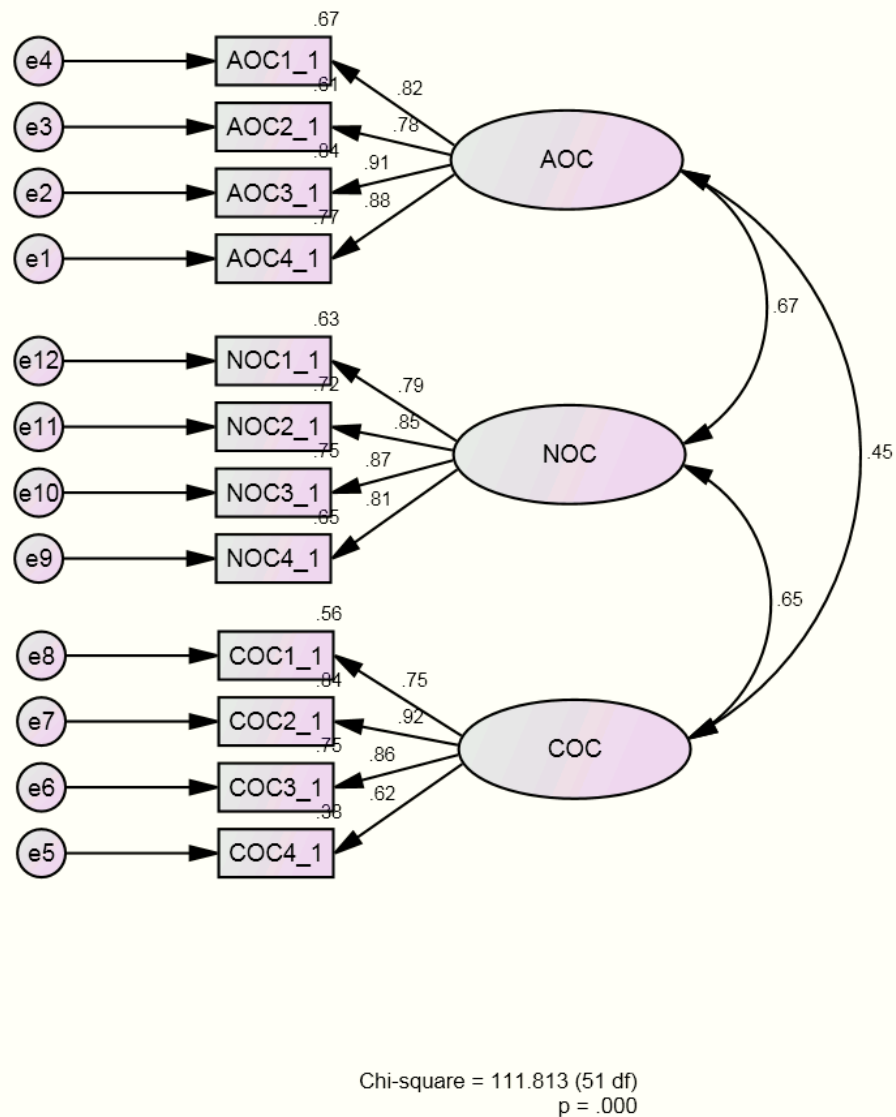


**Table B5: Fit Indexes of CFA: Organisational Commitment**

Model	$\chi^2$	df	GFI	CFI	RMSEA	90 % CI		ECVI	90 % CI	
						Low	High		Low	High
3-factor model	111.81*	51	.93	.96	.07	.05	.08	.69	.58	.83
2-factor model <sup>1</sup>	548.02*	53	.67	.75	.19	.18	.21	2.50	2.20	2.83
2-factor model <sup>2</sup>	415.01*	53	.70	.81	.16	.15	.18	1.94	1.69	2.23
2-factor model <sup>3</sup>	371.39*	53	.76	.84	.15	.14	.17	1.76	1.52	2.03
1-factor model	712.43*	54	.60	.67	.22	.21	.24	3.18	2.83	3.55

Note.  $N = 240$ ; \* $p < .001$ ;  $df$  = Degrees of freedom; GFI = Goodness-of-fit index; CFI = Comparative fit index; RMSEA = Root-mean-square error of approximation; ECVI = Expected cross-validation index; CI = Confidence interval; <sup>1</sup>Affective and Continuance Organisational Commitment combined; <sup>2</sup>Affective and Normative Organisational Commitment combined; <sup>3</sup>Normative and Continuance Organisational Commitment combined.

**Figure B2: CFA of Organisational Commitment**



Note.  $N = 240$ ; AOC = Affective Organisational Commitment; COC = Continuance Organisational Commitment; NOC = Normative Organisational Commitment.

**Table B6: EFA of Self-Efficacy**

Item	Factor	
	I	Communalities
SE5	0.92	0.84
SE4	0.90	0.82
SE6	0.89	0.79
SE3	0.88	0.77
SE2	0.85	0.72
SE8	0.81	0.65
SE7	0.79	0.62
SE1	0.74	0.54
<b>Eigenvalue</b>	<b>6.01</b>	
<b>Variance Explained %</b>	<b>75.14</b>	
<b>Cum. Variance Explained %</b>	<b>75.14</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: None. Each item's highest loading is presented in boldface.

**Table B7: EFA of Positive and Negative Affect**

Item	Factor		Communalities
	I	II	
PA4	<b>0.84</b>	0.02	0.69
PA3	<b>0.84</b>	-0.01	0.71
PA2	<b>0.83</b>	-0.01	0.70
PA5	<b>0.81</b>	0.03	0.65
PA1	<b>0.75</b>	-0.03	0.58
NA8	0.06	<b>0.89</b>	0.77
NA10	0.00	<b>0.89</b>	0.79
NA9	-0.05	<b>0.80</b>	0.67
NA7	0.05	<b>0.73</b>	0.51
NA6	-0.06	<b>0.65</b>	0.45
<b>Eigenvalue</b>	<b>4.58</b>	<b>2.59</b>	
<b>Variance Explained %</b>	<b>45.87</b>	<b>25.90</b>	
<b>Cum. Variance Explained %</b>	<b>45.87</b>	<b>71.77</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization. Each item's highest loading is presented in boldface.

**Table B8: EFA of Change Impact**

Item	Factor	
	I	Communalities
CI1	0.89	0.79
CI2	0.82	0.67
CI3	0.52	0.27
<b>Eigenvalue</b>	<b>2.08</b>	
<b>Variance Explained %</b>	<b>69.39</b>	
<b>Cum. Variance Explained %</b>	<b>69.39</b>	

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring.  
Rotation Method: None. Each item's highest loading is presented in boldface.

**Table B9: Descriptive and Distribution Statistics after Variable Transformations**

Variable	$N$	Mean	<i>S.E.</i> Mean	<i>SD</i>	Skewness	Standard Error of Skewness	Kurtosis	Standard Error of Kurtosis
x3Compliance <sup>4</sup>	240	62.35	1.73	26.86	0.58	0.16	0.96	0.31
x3Cooperation <sup>4</sup>	240	60.65	1.60	24.78	0.57	0.16	0.91	0.31
x3Championing <sup>4</sup>	240	63.31	2.13	33.09	0.39	0.16	-0.43	0.31
lgCounterproductive Work Behaviour (Individuals) <sup>1</sup>	240	0.48	0.01	0.10	-0.09	0.16	0.04	0.31
lgOrganisational Tenure <sup>1</sup>	231	0.81	0.02	0.32	0.15	0.16	-0.69	0.32
lgIS Tenure <sup>1</sup>	226	0.85	0.03	0.39	-0.46	0.16	-0.22	0.32
x2Change Significance <sup>3</sup>	240	16.94	0.51	7.93	-0.48	0.16	-1.00	0.31
sqrtIS Job Insecurity <sup>2</sup>	240	1.35	0.03	0.43	0.82	0.16	-0.73	0.31
x2Self Efficacy <sup>3</sup>	240	17.43	0.33	5.04	-0.54	0.16	0.69	0.31
x2Positive Affect <sup>3</sup>	240	15.75	0.41	6.34	-0.41	0.16	-0.51	0.31

Note. Transformation type: <sup>1</sup>Logarithmic; <sup>2</sup>Square Root; <sup>3</sup>Square; <sup>4</sup>Cubed.

$N$  = Sample Size;  $S.D.$  = Standard Deviation;  $S.E.$  Mean = Standard Error of the Mean.

**Table B10. Intercorrelations and Reliabilities of User Commitment and Individual Determinants**

	1	2	3	4	5	6	7	8	9	10
1. ACC (IS)	(.93)									
2. CCC (IS)	.12	(.59)								
3. CP	.31**	.59**	(.90)							
4. Communication	.51**	.04	.19**	(.87)						
5. Participation	.32**	.05	.10	.49**	(.88)					
6. Training	.32**	.04	.10	.54**	.47**	(.94)				
7. Perceived Usefulness	.59**	-.00	.24**	.62**	.25**	.41**	(.95)			
8. Information Quality	.59**	.01	.23**	.41**	.24**	.32**	.56**	(.92)		
9. Overall Change Fairness	.48**	.07	.14*	.59**	.52**	.52**	.52**	.47**	(.89)	
10. Change Leadership	.39**	.01	.16*	.43**	.29**	.34**	.45**	.38**	.33**	(.93)

Note.  $N = 240$ ; \* Correlation is significant at the .05 level; \*\* Correlation is significant at the .01 level. Values are Pearson correlation coefficients. Scale internal consistencies (Cronbach alpha) in parentheses on the diagonal.

**Table B11: Multiple Regression Analysis predicting ACC (IS) (Individual Determinants)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
Commitment Propensity	.13	.05	.13	.006
Communication	.14	.08	.12	.083
Participation	.07	.06	.08	.179
Training	-.06	.06	-.07	.252
Perceived Usefulness	.20	.06	.23	.001
Information Quality	.24	.05	.31	.000
Overall Change Fairness	.10	.07	.10	.152
Change Leadership	.07	.06	.07	.214

Note.  $N = 240$ ; *B* = Unstandardised Coefficient; *B S.E.* = *B* Standard Error;

*Beta* = Standardised Coefficient; *p* = Significance Level.

$R = .71$ ;  $R^2 = .50$ ; Adjusted  $R^2 = .49$  ( $p < .001$ ). Post-hoc power of this model: 100%.

**Table B12: Hierarchical Multiple Regression Analysis predicting ACC (IS) (Individual Determinants)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Individual Differences</b>				
Gender	-.16	.10	-.08	.139
Age	.00	.00	.06	.416
Language	.01	.03	.03	.610
Qualification	.02	.05	.02	.689
Organisational Tenure	-.02	.01	-.17	.020
Organisational Level	-.06	.05	-.05	.316
Self Efficacy	.22	.08	.16	.009
Positive Affect	.37	.06	.37	.000
Commitment Propensity	.20	.05	.21	.000
<b>Step 2: Control Questions</b>				
Gender	-.12	.09	-.06	.180
Age	-.00	.00	-.04	.503
Language	.01	.03	.02	.599
Qualification	-.03	.04	-.04	.402
Organisational Tenure	-.01	.00	-.06	.307
Organisational Level	-.04	.05	-.04	.377
Self Efficacy	.18	.07	.13	.010
Positive Affect	.22	.05	.21	.000
Commitment Propensity	.12	.04	.12	.009
Change Significance	.28	.04	.35	.000
Change Impact	.14	.05	.14	.013
IS Tenure	.00	.00	.02	.644
IS Job Insecurity	-.06	.03	-.09	.068
<b>Step 3: Proposed Determinants</b>				
Gender	-.06	.08	-.03	.447
Age	.00	.00	-.01	.827
Language	.02	.02	.04	.370
Qualification	-.02	.04	-.02	.605
Organisational Tenure	.00	.00	-.02	.736
Organisational Level	-.03	.04	-.03	.476
Self Efficacy	.12	.06	.09	.077
Positive Affect	.15	.05	.15	.007
Commitment Propensity	.09	.04	.10	.032
Change Significance	.22	.04	.27	.000
Change Impact	.05	.05	.06	.324
IS Tenure	.00	.00	.01	.790
IS Job Insecurity	-.05	.03	-.07	.152
Communication	.09	.07	.08	.213
Participation	.04	.05	.04	.398
Training	-.05	.05	-.05	.315
Perceived Usefulness	.12	.05	.14	.031
Information Quality	.11	.04	.14	.017
Overall Change Fairness	.06	.07	.05	.377
Change Leadership	-.01	.05	-.01	.734

Note. Sample size ranging from  $N = 226$  to  $N = 240$  (pairwise deletion of demographic variables);  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

After Step 1:  $R = .62$ ;  $R^2 = .38$ ; Adjusted  $R^2 = .36$ ;  $\Delta R^2 = .38$  ( $p < .001$ )

After Step 2:  $R = .75$ ;  $R^2 = .57$ ; Adjusted  $R^2 = .54$ ;  $\Delta R^2 = .18$  ( $p < .001$ )

After Step 3:  $R = .79$ ;  $R^2 = .63$ ; Adjusted  $R^2 = .60$ ;  $\Delta R^2 = .06$  ( $p < .001$ );

Post-hoc power of this model: 100%.

**Table B13: Hierarchical Multiple Regression Analysis predicting ACC (IS) (Transformed Variables)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1: Individual Differences</b>				
Gender	-.17	.11	-.09	.111
Age	.00	.00	-.00	.929
Language	.01	.03	.02	.672
Qualification	.02	.05	.03	.567
lgOrganisational Tenure	-.30	.21	-.10	.145
Organisational Level	-.07	.06	-.07	.219
x2Self Efficacy	.02	.01	.15	.013
x2Positive Affect	.05	.00	.36	.000
Commitment Propensity	.22	.05	.22	.000
<b>Step 2: Control Questions</b>				
Gender	-.13	.09	-.07	.147
Age	-.01	.00	-.08	.174
Language	.00	.03	.01	.797
Qualification	-.02	.04	-.03	.529
lgOrganisational Tenure	-.05	.18	-.01	.774
Organisational Level	-.05	.05	-.05	.278
x2Self Efficacy	.02	.01	.13	.014
x2Positive Affect	.03	.00	.22	.000
Commitment Propensity	.12	.04	.12	.011
x2Change Significance	.03	.00	.33	.000
Change Impact	.17	.15	.18	.003
lgIS Tenure	-.04	.11	-.02	.680
sqrtIS Job Insecurity	-.19	.11	-.08	.090
<b>Step 3: Proposed Determinants</b>				
Gender	-.05	.08	-.03	.505
Age	-.00	.00	-.04	.427
Language	.01	.02	.02	.569
Qualification	.00	.04	-.00	.851
lgOrganisational Tenure	.10	.17	.03	.546
Organisational Level	-.04	.04	-.04	.339
x2Self Efficacy	.01	.00	.09	.075
x2Positive Affect	.02	.00	.13	.015
Commitment Propensity	.09	.04	.09	.035
x2Change Significance	.03	.00	.26	.000
Change Impact	.06	.05	.06	.277
lgIS Tenure	-.09	.11	-.04	.389
sqrtIS Job Insecurity	-.18	.10	-.08	.080
IS Change Involvement	.08	.07	.07	.222
IS Change Value	.29	.06	.30	.000
IS Change Climate	.05	.07	.04	.520

Note. Sample size ranging from  $N = 226$  to  $N = 240$  (pairwise deletion of demographic variables);  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

After Step 1:  $R = .59$ ;  $R^2 = .35$ ; Adjusted  $R^2 = .32$ ;  $\Delta R^2 = .35$  ( $p < .001$ )

After Step 2:  $R = .73$ ;  $R^2 = .54$ ; Adjusted  $R^2 = .51$ ;  $\Delta R^2 = .19$  ( $p < .001$ )

After Step 3:  $R = .78$ ;  $R^2 = .61$ ; Adjusted  $R^2 = .58$ ;  $\Delta R^2 = .07$  ( $p < .001$ );

Post-hoc power of this model: 100%.

**Table B14: Multiple Regression Analysis predicting Mere Compliance**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	-.04	.06	-.04	.467
CCC (IS)	.34	.08	.25	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  
 $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .25$ ;  $R^2 = .06$ ; Adjusted  $R^2 = .05$  ( $p < .001$ );  
 Post-hoc power of this model: 94.57%.

**Table B15: Multiple Regression Analysis predicting Compliance**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	.29	.04	.41	.000
CCC (IS)	.27	.05	.29	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  
 $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .53$ ;  $R^2 = .28$ ; Adjusted  $R^2 = .27$  ( $p < .001$ );  
 Post-hoc power of this model: 100%.

**Table B16: Multiple Regression Analysis predicting Cooperation**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	.41	.03	.62	.000
CCC (IS)	.16	.04	.19	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  
 $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$  ( $p < .001$ );  
 Post-hoc power of this model: 100%.

**Table B17: Multiple Regression Analysis predicting Championing**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	.58	.04	.65	.000
CCC (IS)	.11	.05	.10	.037

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  
 $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$  ( $p < .001$ );  
 Post-hoc power of this model: 100%.

**Table B18: Multiple Regression Analysis predicting Counterproductive Work Behaviour (Organisation)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	-.45	.06	-.39	.000
CCC (IS)	.61	.08	.40	.000

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .52$ ;  $R^2 = .28$ ; Adjusted  $R^2 = .27$  ( $p < .001$ );  
Post-hoc power of this model: 100%.

**Table 5.19: Multiple Regression Analysis Predicting Counterproductive Work Behaviour (Individuals)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
ACC (IS)	-.05	.05	-.07	.253
CCC (IS)	.19	.06	.18	.004

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.  
 $R = .19$ ;  $R^2 = .03$ ; Adjusted  $R^2 = .02$  ( $p < .05$ )  
Post hoc power of this model: 67.69%

**Table B20: Hierarchical Regression Analysis predicting Mere Compliance**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	-.04	.06	-.04	.467
CCC (IS)	.34	.08	.25	.000
<b>Step 2</b>				
ACC (IS)	-.05	.07	-.05	.477
CCC (IS)	.33	.09	.24	.000
AOC	-.01	.08	-.01	.855
COC	.09	.07	.09	.218

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;

$Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 93.92%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .25$ ;  $R^2 = .06$ ; Adjusted  $R^2 = .05$ ;  $\Delta R^2 = .06$  ( $p < .001$ );

After Step 2:  $R = .26$ ;  $R^2 = .07$ ; Adjusted  $R^2 = .05$ ;  $\Delta R^2 = .00$  (*ns*).

Entering AOC and COC first:

After Step 1:  $R = .12$ ;  $R^2 = .01$ ; Adjusted  $R^2 = .00$ ;  $\Delta R^2 = .01$  (*ns*);

After Step 2:  $R = .26$ ;  $R^2 = .07$ ; Adjusted  $R^2 = .05$ ;  $\Delta R^2 = .05$  ( $p < .01$ ).

**Table B21: Hierarchical Regression Analysis predicting Compliance**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	.29	.04	.41	.000
CCC (IS)	.27	.05	.29	.000
<b>Step 2</b>				
ACC (IS)	.27	.04	.38	.000
CCC (IS)	.27	.05	.29	.000
AOC	.07	.05	.10	.120
COC	.01	.04	.01	.896

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;

$Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 100%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .53$ ;  $R^2 = .28$ ; Adjusted  $R^2 = .27$ ;  $\Delta R^2 = .28$  ( $p < .001$ );

After Step 2:  $R = .54$ ;  $R^2 = .29$ ; Adjusted  $R^2 = .28$ ;  $\Delta R^2 = .00$  (*ns*).

Entering AOC and COC first:

After Step 1:  $R = .25$ ;  $R^2 = .06$ ; Adjusted  $R^2 = .05$ ;  $\Delta R^2 = .06$  ( $p < .001$ );

After Step 2:  $R = .54$ ;  $R^2 = .29$ ; Adjusted  $R^2 = .28$ ;  $\Delta R^2 = .22$  ( $p < .001$ ).

**Table B22: Hierarchical Regression Analysis predicting Cooperation**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	.41	.03	.62	.000
CCC (IS)	.16	.04	.19	.000
<b>Step 2</b>				
ACC (IS)	.39	.03	.59	.000
CCC (IS)	.16	.04	.19	.000
AOC	.08	.04	.12	.037
COC	.00	.03	.00	.983

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 100%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$ ;  $\Delta R^2 = .46$  ( $p < .001$ );

After Step 2:  $R = .68$ ;  $R^2 = .47$ ; Adjusted  $R^2 = .46$ ;  $\Delta R^2 = .01$  (*ns*).

Entering AOC and COC first:

After Step 1:  $R = .32$ ;  $R^2 = .10$ ; Adjusted  $R^2 = .09$ ;  $\Delta R^2 = .10$  ( $p < .001$ );

After Step 2:  $R = .68$ ;  $R^2 = .47$ ; Adjusted  $R^2 = .46$ ;  $\Delta R^2 = .36$  ( $p < .001$ ).

**Table B23: Hierarchical Regression Analysis predicting Championing**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	.58	.04	.65	.000
CCC (IS)	.11	.05	.10	.037
<b>Step 2</b>				
ACC (IS)	.54	.04	.61	.000
CCC (IS)	.10	.06	.08	.079
AOC	.14	.05	.15	.005
COC	.03	.05	.04	.444

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 100%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .67$ ;  $R^2 = .46$ ; Adjusted  $R^2 = .45$ ;  $\Delta R^2 = .46$  ( $p < .001$ );

After Step 2:  $R = .69$ ;  $R^2 = .48$ ; Adjusted  $R^2 = .48$ ;  $\Delta R^2 = .02$  ( $p < .01$ ).

Entering AOC and COC first:

After Step 1:  $R = .37$ ;  $R^2 = .14$ ; Adjusted  $R^2 = .13$ ;  $\Delta R^2 = .14$  ( $p < .001$ );

After Step 2:  $R = .69$ ;  $R^2 = .48$ ; Adjusted  $R^2 = .48$ ;  $\Delta R^2 = .34$  ( $p < .001$ ).

**Table B24: Hierarchical Regression Analysis predicting CWB (O)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	-.45	.06	-.39	.000
CCC (IS)	.61	.08	.40	.000
<b>Step 2</b>				
ACC (IS)	-.46	.07	-.40	.000
CCC (IS)	.57	.08	.38	.000
AOC	-.01	.07	-.01	.846
COC	.16	.07	.14	.023

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 100%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .52$ ;  $R^2 = .28$ ; Adjusted  $R^2 = .27$ ;  $\Delta R^2 = .28$  ( $p < .001$ );

After Step 2:  $R = .54$ ;  $R^2 = .29$ ; Adjusted  $R^2 = .28$ ;  $\Delta R^2 = .01$  (*ns*).

Entering AOC and COC first:

After Step 1:  $R = .21$ ;  $R^2 = .04$ ; Adjusted  $R^2 = .03$ ;  $\Delta R^2 = .04$  ( $p < .01$ );

After Step 2:  $R = .54$ ;  $R^2 = .29$ ; Adjusted  $R^2 = .28$ ;  $\Delta R^2 = .25$  ( $p < .001$ ).

**Table B25: Hierarchical Regression Analysis predicting CWB (I)**

	<i>B</i>	<i>B S.E.</i>	<i>Beta</i>	<i>p</i>
<b>Step 1</b>				
ACC (IS)	-.05	.05	-.07	.253
CCC (IS)	.19	.06	.18	.004
<b>Step 2</b>				
ACC (IS)	-.03	.05	-.04	.515
CCC (IS)	.17	.07	.17	.009
AOC	-.09	.06	-.12	.110
COC	.09	.05	.12	.086

Note.  $N = 240$ ;  $B$  = Unstandardised Coefficient;  $B S.E.$  =  $B$  Standard Error;  $Beta$  = Standardised Coefficient;  $p$  = Significance Level.

Post-hoc power of this model: 81.61%.

Entering ACC (IS) and CCC (IS) first:

After Step 1:  $R = .19$ ;  $R^2 = .03$ ; Adjusted  $R^2 = .02$ ;  $\Delta R^2 = .03$  ( $p < .05$ );

After Step 2:  $R = .23$ ;  $R^2 = .05$ ; Adjusted  $R^2 = .03$ ;  $\Delta R^2 = .01$  (*ns*).

Entering AOC and COC first:

After Step 1:  $R = .15$ ;  $R^2 = .02$ ; Adjusted  $R^2 = .01$ ;  $\Delta R^2 = .02$  (*ns*);

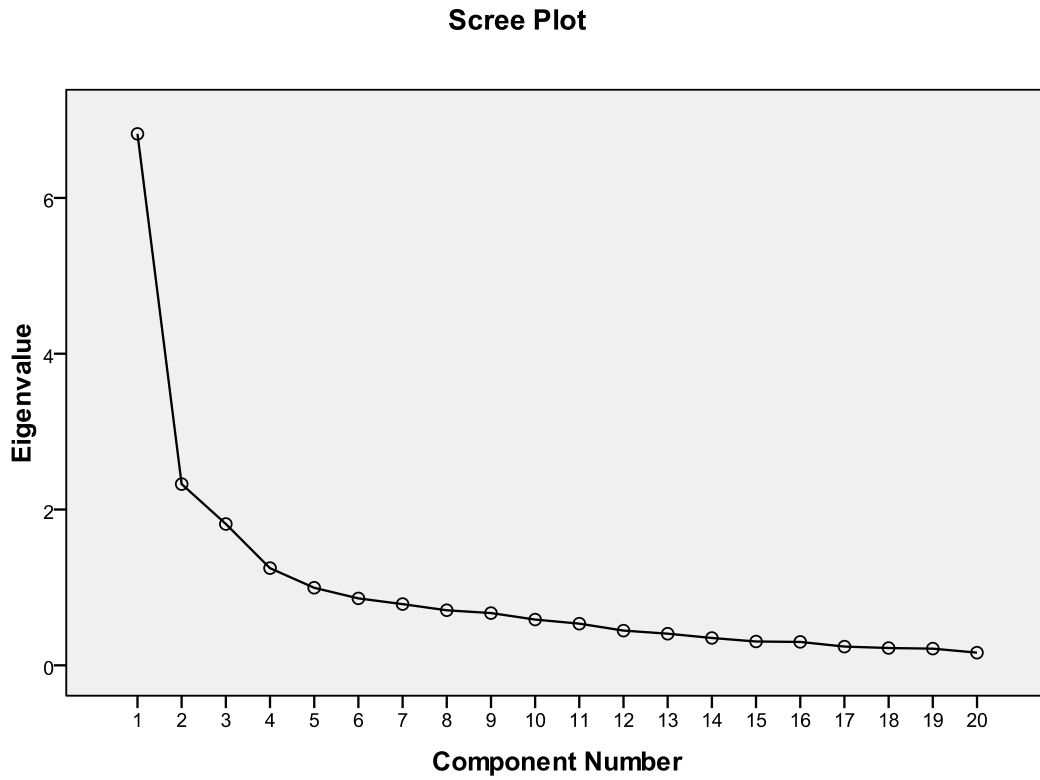
After Step 2:  $R = .23$ ;  $R^2 = .05$ ; Adjusted  $R^2 = .03$ ;  $\Delta R^2 = .02$  ( $p < .05$ ).

**Table B26: Harman's Single-Factor Test on Composite Scales in the Study**

Item	Factor			
	I	II	III	IV
Affective User Commitment	.82	-.18	-.17	.16
Continuance User Commitment	.24	.71	-.35	.05
Commitment Propensity	.44	.50	-.19	.33
IS Change Involvement	.65	-.06	.16	-.18
IS Change Value	.79	-.24	.02	.14
IS Change Climate	.70	-.05	.38	.02
Mere Compliance	.08	.44	-.14	-.34
Compliance	.63	.24	-.35	-.22
Cooperation	.78	.10	-.31	-.10
Championing	.80	.02	-.21	-.12
CWB (Organisation)	-.30	.73	-.07	.05
CWB (Individuals)	-.13	.48	.05	.53
Change Significance	.61	-.28	-.22	.40
Change Impact	.62	-.18	-.06	.46
Self-efficacy	.55	.16	.00	-.38
Positive Affect	.64	-.18	-.01	-.14
Affective Organisational Commitment	.55	.18	.53	-.13
Continuance Organisational Commitment	.33	.46	.57	.01
Normative Organisational Commitment	.49	.18	.70	.11
Perceived Skills Transferability	.69	-.03	-.13	-.14
<b>Initial Eigenvalue</b>	<b>6.82</b>	<b>2.32</b>	<b>1.81</b>	<b>1.24</b>
<b>Initial Variance Explained %</b>	<b>34.11</b>	<b>11.63</b>	<b>9.07</b>	<b>6.23</b>
<b>Cum. Variance Explained %</b>	<b>34.11</b>	<b>45.74</b>	<b>54.81</b>	<b>61.04</b>

Note.  $N = 240$ ; Extraction Method: Principal-Axis Factoring. Rotation Method: None. The analysis was conducted with the composite scales.

**Figure B3: Scree Plot of Harman's Single Factor Test**



### **Appendix C: Removed Cases**

Case number: 68, 84, 86, 87, 116-122 (6), 124, 125, 128, 130, 166, 226, 232-243 (12), 246, 252, 253, 259, 260, 271-273 (3), 277 (total 39 cases removed).

## Appendix D: Survey Materials

### First Data Collection Period

#### Advance note to all IS users

**Dear All,**

This note serves to inform you that Matthias Schneider, a Namibian PhD from the University of Cape Town approached the (the organisation) to conduct a survey with the users of the (ERP system) system. Our ERP Projects Board approved the survey and a questionnaire will be distributed to you soon.

You are kindly invited to participate in this research and your response matters! The purpose is to develop a Namibian change management guide for managers implementing a new information system.

All information collected for this study will be private and confidential. Your response is thus completely anonymous.

The benefits for participating for the (the organisation) and you are threefold: First, you can voice your views and opinions about the (ERP system) system in a private and confidential way. Second, by means of a summary (no individual answers will be revealed), the IT department would receive feedback on the most important issues regarding the (ERP system) system implementation. This information may then be used to further improve our systems. Third, a donation to a charity of your choice of N\$ 5.-per fully completed questionnaire will also be made by the researcher.

The process is as follows: During the week of the 10<sup>th</sup> of August 2009, the questionnaire will be distributed. Once completed, please return the questionnaire anytime to one of the return boxes and don't forget to select your charity of choice.

The final due date for participation is Friday, the 21<sup>st</sup> of August 2009.

Boxes are located at the following places:

Your cooperation is highly appreciated!

Kind regards,

ERP Manager

## First reminder to all IS users

**Dear Colleagues,**

By now you should have received the survey questionnaire on the ERP system from Matthias Schneider!

This note serves as a friendly reminder to complete this survey. Once completed please put it into one of the collection boxes.

Please remember that a donation of N\$ 5.00. - to a charity of your choice will be made for **every fully completed** questionnaire. Sometimes questions may seem repetitive, but every question counts. Therefore, please don't leave any questions out! Your answer matters! The summarised results will be used to develop a Namibian change management framework and will also benefit the (the organisation) in similar projects in the future.

Please contact the student via email ([matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za)) if you have not yet received a questionnaire, or should you have any questions.

The due date for completion is **Friday, the 21<sup>st</sup> of August 2009** and survey collection boxes have been set up at the various sites. Your cooperation is greatly appreciated!

Thank you in advance and kind regards,

ERP Manager

## Second/ third reminder

**Dear Colleagues,**

During the past week a survey questionnaire concerning the ERP system was distributed to all of you. You are kindly invited to complete this survey!

Please remember that a donation of N\$ 5.00.- to a charity of your choice will be made for **every fully completed** questionnaire.

Your answer matters! The summarised results will be used to develop a Namibian change management framework and will also benefit the (the organisation) in similar projects in the future.

Please contact the student via email ([matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za)) if you have not yet received a questionnaire, or should you have any questions.

The due date for completion is **Friday, the 21<sup>st</sup> of August 2009** and survey collection boxes have been set up at the various sites. Your response is greatly appreciated!

Thank you in advance and kind regards,

ERP Manager

## Final reminder and online survey link

### ERP Information System Survey

Last week, an online link to a questionnaire concerning the ERP information system was emailed to you.

If you have already completed the survey please accept my sincere thanks. If not, please do so today. Your response matters! Only if you respond will this survey have any impact. Please follow the link below to access the questionnaire:

<http://www.commerce.uct.ac.za/Services/SelectSurveyASP/TakeSurvey.asp?SurveyID=73K3p7412p3MG>

The above survey will be private and confidential. No email, or IP addresses will be stored that could ever identify you.

Please contact me should you have any questions. I will be very happy to discuss any one of your concerns regarding the survey. Thank you in advance and kind regards,  
Matthias Schneider

Email: [matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za)

# Second Data Collection Period

## Confidentiality agreement

### INFORMATION SYSTEM CHANGE SURVEY

#### CONFIDENTIALITY AGREEMENT

I, Matthias Schneider, hereby declare that any information used and/or collected for my doctoral dissertation will be for study purposes only. Answers to the questionnaire will be strictly private and confidential. No responses will be identified.

Names and email contact details of information system users will be used strictly for study purposes. This entails contacting users by email concerning the survey questionnaire:

- One personalised advance email notifying the users of the questionnaire.
- The survey itself, either via a safe online link to the survey at the webpage of the University of Cape Town, or in hard copy (12-page A5 booklet).
- Three to five follow-up emails after survey distribution.

Any communication with the users will first be available for approval to the organisation. Upon completion of the survey (usually a 4-week period), name and email lists will be returned to the organisation.

Attached please find confirmation of registration with the University of Cape Town as a PhD student and the Ethical Clearance Certificate issued from the Research Ethics Board at the Faculty of Commerce.

With kind regards and thank you for supporting my study!

21. October 2009

#### Attachments:

Registration confirmation

Confirmation of Ethical Clearance for the study

## Personalised advance note

**Dear...,**

How well is (the new system) meeting your needs? I hope you will soon take the opportunity to let us know!

In a few days you will receive a survey on information systems concerning (the new system). This survey is part of a doctoral study at the University of Cape Town study examining user commitment to new information systems. By responding to the survey, you will also provide essential information for us to find out where we are on track and where we need to focus our efforts for improvements in the future.

In appreciation for your time (fifteen minutes on average), we will also be offering you the chance to win a N\$ 500.- cash prize that will be drawn amongst participating organisations!

If you have any questions about the survey, please contact me at [matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za) or telephone me on 061-290 9271/ 081-127 3278.

The survey is one of the best ways to listen to the users—anonously, but in a systematic way. Please use it to tell us what you think!

Sincerely,

Matthias Schneider

PhD Student in Organisational Psychology at the University of Cape Town

## First personalised reminder

**Dear...,**

Thank you very much if you have already responded to the information system survey concerning (the system).

If you have not yet had a chance to complete the survey questionnaire, I hope you will take a few minutes and do so today.

This survey is part of a doctoral study at the University of Cape Town examining user commitment to new information systems and was approved by the (the organisation). To enhance the implementation of new information systems, it is especially important that we hear about your priorities concerning (the new system).

Your answers will be kept completely confidential, as your individual responses cannot be linked to your name or email address.

And remember at the end of the survey you can enter the draw for the N\$ 500.- cash prize.

If you have any difficulty with the survey, or have any questions about it, please contact me at [matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za) or telephone me at 061-290 9271/ 081-127 3278.

I look forward to analysing the survey results and writing a report to further enhance the (the system) implementation.

Sincerely,

Matthias Schneider

## Second/ third personalised reminder

Dear...,

Thank you very much if you have already responded to the information system survey concerning (the system).

If you have not yet had a chance to complete the survey questionnaire, I hope you will take a few minutes and do so today.

This survey is part of a doctoral study at the University of Cape Town examining user commitment to new information systems. To enhance the implementation of new information systems, it is especially important that we hear about your priorities concerning (the system).

Your answers will be kept completely confidential, as your individual responses cannot be linked to your name or email address.

And remember to provide us with your email address at the end of the survey if you want to enter the draw for the N\$ 500.- cash prize.

If you have not received the survey, or have any questions about it, please contact me at [matthias.schneider@uct.ac.za](mailto:matthias.schneider@uct.ac.za) or telephone me at 061-290 9271/ 081-127 3278.

Sincerely,

**Signed by candidate**

Namibian PhD Student in Organisational Psychology

**Appendix E: Ethical Clearance Certificates**  
**Ethical Clearance Certificate for Focus Group Discussions**

University of Cape Town  
ETHICS COMMITTEE

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**Commerce Faculty**  
2.21 Leslie Commerce Building Upper Campus  
Postal address: UCT Private Bag Rondebosch 7701  
Telephone: (021) 650 2558  
Fax: (021) 650 4369  
Email: [nomonde.matomela@uct.ac.za](mailto:nomonde.matomela@uct.ac.za)

28 May 2008

Matthias Schneider  
Dear Matthias

**PROJECT TITLE: AN EXPLANATORY MODEL OF THE DETERMINANTS AND OUTCOMES OF COMMITMENT TO MANDATORY INFORMATION SYSTEM CHANGE**

Having received your documentation associated with your project titled “*An Explanatory Model of the Determinants and Outcomes of Commitment to Mandatory Information System Change*”, the Chairperson, Prof. Jeff Bagraim hereby gives your project provisional approval (subject to ratification) on behalf of the Commerce Faculty Ethics in Research Committee.

Please note that if you make any substantial change in your research procedure as it impacts upon the experiences of your subjects, you must re-apply to the Committee for approval.

I wish you good success with your research.

Regards,

NOMONDE MATOMELA

For Prof Jeff Bagraim  
Chair, Ethics in Research Committee

# Ethical Clearance Certificate for Survey Questionnaire

UNIVERSITY OF CAPE TOWN



## Faculty of Commerce Ethics in Research Committee

Courier: Room 2.21 Leslie Commerce Building Upper Campus University of Cape Town  
Post: University of Cape Town • Private Bag • Rondebosch 7701  
Email: jeffrey.bagraim@uct.ac.za  
Telephone: +27 21 650-2311  
Fax No.: +27 21 689-7570

3 August 2009

Mr Matthias Schneider  
Department of Information Systems  
University of Cape Town  
matthias.schneider@uct.ac.za

Dear Matthias

**Project title: An explanatory model of the determinants and outcomes of user commitment to mandatory information system change.**

This letter serves to confirm that the project entitled **An explanatory model of the determinants and outcomes of user commitment to mandatory information system change**, as described in your final submitted protocol dated 19 June 2009, has been approved subject to final confirmation by the Commerce Faculty Ethics in Research Committee. You may proceed with the research.

Please note that if you make any substantial change in your research procedure that could affect the experiences of the participants, you must submit a revised protocol to the Committee for approval.

Best wishes for great success with your research.

Regards,

*JJ BAGRAIM*

A/Prof Jeff Bagraim  
Chair: Commerce Faculty Ethics in Research Committee