



**BUS5000W**

**Social Influence of Siblings and Friends in Generation Y's  
development of Risk Preferences**

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Submitted in fulfillment towards the completion of a Masters in Business Science Degree  
Specializing in Marketing (BUS5000W) in the School of Management Studies, University  
of Cape Town

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Date submitted:  
14 February 2014

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## **ABSTRACT**

Social Influence can impact various characteristics of individuals, including their beliefs, attitudes and ultimately their behaviour. Social Marketing is an activity primarily concerned with identifying and modifying socially undesirable behaviours in a given population group. Adolescents typically receive the greatest amount of attention as they are highly prone to engaging in risky behaviour such as binge drinking, smoking and other dangerous activities. These groups are also typically found to be strongly influenced by their risk-seeking friends and siblings. Additionally, the adolescents of today form a subset of a large generation group (Generation Y). Generation Y is frequently discussed in popular media, however there is very little empirical evidence available regarding their traits, attitudes and behaviours towards risk-taking. Generation Y is often described in research to be more easily influenced by peers than prior generations, however this claim has not been studied empirically. In addition, there is a lack of knowledge available which describes how Generation Y risk characteristics are adopted and are developed throughout their lives. This study empirically evaluated prior claims about Generation Y individuals, regarding their ability to be easily influenced by peers and how their preference towards taking risks (which is a strong determinant of future risk taking) is developed over time. Making use of a large, nationally representative and longitudinally measured sample of 12072 Generation Y individuals in the United States - this study evaluated friends and siblings as potential sources for influencing Generation Y Risk Preferences. The study found that siblings and neighbourhood friends offered the only statistically significant influence on Risk Preferences in Generation Y individuals. Additionally, individuals in the sample most strongly influenced those with similar Risk Preferences, where those with neutral attitudes towards risk were most susceptible to Social Influence. Linear probability modelling estimated that each additional neutral friend made individuals 30% more likely to adopt a different Risk Preference in the following time period. This value was only 10% for that of risk averse and seeking individuals. These findings prompt social marketers to re-evaluate their understanding of Social Influence and illustrates that risky individuals might not be as prone to Social Influence as expected and could perhaps be more complacent to persuasion methods in Social Marketing efforts.

**Key words:** Social Marketing, Generation Y, Risk Preference, Attitudes, Social Influence

## **ACKNOWLEDGEMENTS**

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due to Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis. Specific financial assistance was, however, given by the University of Cape Town, South Africa, leading to the completion of this specific research project.

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# CHAPTER I

## INTRODUCTION

### 1. INTRODUCTION

Social Marketing is primarily concerned with modifying socially undesirable attitudes and behaviours within target populations (Evans, 2005). Adolescents receive the greatest amount of attention within Social Marketing plans because of their strong involvement (and propensity to engage in) risky behaviour, such as underage drinking, smoking and other dangerous activities (Grier & Bryant, 2005). The adolescents of today also form a larger generation group (the Generation Y cohort) which has been discussed extensively in popular media. There is, however, very little empirical evidence regarding Generation Y's traits, attitudes or behaviours (Partridge & Hallam, 2006; Brosdahl & Carpenter, 2011). As Social Marketing is also concerned with the dynamics of its target populations – and as the Generation Y cohort represents a strong focus in Social Marketing activity – understanding the dynamics of the Generation Y cohort is of vital importance for appropriate response by social agencies (Howe, 2005; Howe & Strauss, 2009; Blauth, McDaniel, Perrin & Perrin, 2010).

The Generation Y cohort is said to be more easily influenced by peers than prior generations (Howe, 2005; Howe & Strauss, 2000; Blauth, McDaniel, Perrin & Perrin, 2010; Brosdahl & Carpenter, 2011), but this claim has not been studied empirically. In addition, there is a lack of work assessing the risk characteristics of the Generation Y cohort and differences among Generation Y individuals across a spectrum of ages and other traditional demographic variables.

Recent focus in psychology and Social Marketing has been on the influence that social contacts have on encouraging individuals to engage in risky activities (Arnett, 1992; Friedman & Aral, 2001; Maxwell, 2002; Shoveller, Johnson, Savoy & Pietersma, 2006). The influence of peers in encouraging unhealthy diets, excessive drinking and the general use of tobacco products have long been studied in the area of Social Marketing (Walsh, Rudd, Moeykens & Moloney, 1993; Lynch & Jones, 2007) and Social Marketing efforts are often focused on reducing risky behaviour and combatting undesirable attitudes with respect to

risk (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Kotler, Roberto & Lee, 2002).

Social Marketing programs that are cognisant of the varying levels of riskiness and actual attitudes towards risky behaviour would undoubtedly result in better programs that would ultimately change behaviours. The understanding of risk and its various components is therefore an important component of modern Social Marketing (Walsh, Rudd, Moeykens & Moloney, 1993; Lynch & Jones, 2007). While marketers agree that the study of risk attitudes is important, it has not been done in a manner that takes into account all of the appropriate and strongly influential factors, especially in the Generation Y cohort where Social Influence is highly prominent (Howe & Strauss, 2000; Howe, 2005). Social Influence has been widely examined through its involvement with risk factors such as skin protection, under-age drinking and reckless driving (Walsh, Rudd, Moeykens & Moloney, 1993; Kotler, Roberto & Lee, 2002; Lynch & Jones, 2007). However, the use of robust predictive statistical models in describing Social Influence and the Generation Y cohort appears to be largely lacking and specific measures of the Generation Y cohort's preferences for engaging in risky activities is non-existent (Zardo & Geldens, 2009). This study therefore looked at the social dynamics surrounding Risk Preferences. The study of Risk Preferences is fundamental to Social Marketing activities and such work has not been conducted on the Generation Y cohort, which represents a substantial proportion of the global population. Against this backdrop, the purpose of this study was to answer the following research question:

*Does the Risk Preferences of friends and siblings affect the Risk Preferences for Generation Y individuals?*

In understanding the role that Social Influence place in the development of Risk Preferences for the Generation Y cohort, the remainder of this chapter presents the foundations required for interpreting this study and clarifies its scope and objectives. This chapter also presents this study in the context of Social Marketing and provide key pieces of background information upon which this study is based. The remainder of the chapter begins with a discussion of Social Marketing, the importance of Risk Preferences and the limitations of current knowledge of the Generation Y cohort. The chapter stresses the importance of Social Influence and suggests how Social Influence is commonly understood to act on risk

characteristics. Recent methodological developments are presented and their relevance in this study is made clear. This allows for the development of the methodology, where the specific research design, method, sampling, measures and analysis utilized by this study are reviewed. The specific justification for this study is given and then the general structure for the entire study is presented. This discussion begins with a background that describes this area of research and its place in current knowledge.

## **2. BACKGROUND TO THE RESEARCH**

This section introduces the primary theoretical base for this study. Social Marketing is first described and the lack of research into the Generation Y cohort is made clear. Finally, specific mentions of possible solutions to this are finally presented.

### **2.1. Social Marketing**

A concise definition of Social Marketing, which this study adopts, is given by Kotler and Lee (2008) who define Social Marketing as “the process that applies marketing principles and techniques to create, communicate and deliver value in order to influence target audience behaviour that benefit society as well as the target audience”. Social Marketing can therefore be seen to be an area best grounded in marketing principles and driven by behavioural change (Kotler, Roberto & Lee, 2002).

Similar to education, Social Marketing offers a mechanism for enhancing behaviour, but is often counteracted by environments in which there is strong affirmation to continue socially undesirable behaviour (Grier & Bryant, 2005). The purpose of Social Marketing is to encourage shifts in perceived (or actual) costs and payoffs for specific behaviours (socially desirable and undesirable), thereby influencing behaviour through adapting the revised consequences of behaviour (Grier & Bryant, 2005). The intractability of behaviour, specifically risk behaviour, means that major social problems such as the spread of disease, substance abuse, teenage pregnancy and violent injury are effectively addressed through a similar understanding of motivations, attitudes and, ultimately, methods for behavioural response (Walsh, Rudd, Moeykens & Moloney, 1993). This system can be effectively

influenced through broadly altering attitudes towards risk taking (Ajzen & Fishbein, 1980; Kollmuss & Agyeman, 2002; Weber *et al.*, 2002).

## **2.2. Risk Preferences**

Attitudes towards risk are synonymous in this study (and commonly) with the term “Risk Preferences”, which is defined as “risk-laden opportunities that are considered acceptable, or more desirable than other possible choices” (Ruhm, Atkins, Goldfarb, Kreps, Rogers, Schoolman & VanOpdorp, 2005:2). These attitudes describe the manner by which individuals would consider their choices to be optimal against threats and uncertainty (Ruhm, Atkins, Goldfarb, Kreps, Rogers, Schoolman & VanOpdorp, 2005). Previous literature has found that Risk Preferences are fairly stable and resistant to changes, but are often a requirement for some risk behaviour to take place (Ajzen & Fishbein, 1980; Weber *et al.*, 2002). Therefore, as a means of fostering socially desirable behaviour, risk attitudes are seen as a pertinent issue in the field of Social Marketing (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011) and as a common barrier that limits the effects of Social Marketing (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Blake, 1999; Kollmuss & Agyeman, 2002; Kotler, Roberto & Lee, 2002). Accurately perceiving risk attitudes as barriers, however, requires additional theory covering community-based Social Marketing, which attempts to overcome socially undesirable barriers, such as risk attitudes, and relies on Social Influence to enable this change (Ajzen & Fishbein, 1980; Weber *et al.*, 2002).

## **2.3. Community-based Social Marketing, and barriers to change**

Community-based Social Marketing is a specific type of Social Marketing which focuses on and describes socially unfavourable attitudes, values and beliefs as specific barriers which individuals need to overcome in order for behavioural change to happen (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011). Blake (1999) identifies barriers that hinder the ability of an individual to act on social concerns. These range from practical hindrances, like the lack of information required to behave in a favourable manner, to a simple lack of interest by the individual in altering his/her behaviour. This classification of individual, responsible and practical barriers helps to highlight the severity of the type of barrier and illustrate how

much effort would be required to overturn each. Where practical barriers might be overcome by simple information flyers or assistance in rescheduling activities, individual behaviours (like laziness) might require a substantial amount of involvement by social marketers. These barriers are listed below in table 1.1.

Table 1.1: Blake’s behavioural barriers

Type of barrier	Examples
<b>Individual barrier</b>	Laziness, lack of interest
<b>Responsibility barrier</b>	Lack of efficacy, lack of trust
<b>Practical barrier</b>	Lack of time, money, information, encouragement

Kollmuss and Agyeman (2002) further categorize these barriers (shown in table 1.2) to illustrate how each barrier affects specific routes governing behaviour. These include the lack of positive behavioural feedback, which might deter individuals from acting on their attitudes and values with appropriate behaviour as well as others, like the barrier of old behaviour, anchoring individuals to previous behaviour and demotivating behavioural change. Highlighting these barriers is important as social marketers might be met with a barrier like a lack of consciousness surrounding the issue, which would hinder the social marketer’s effectiveness. Within the internal factors of knowledge, feelings, values and attitudes, there are even barriers which limit their ability to influence one another and ultimately limit their ability to influence behavioural change (Kollmuss & Agyeman, 2002).

Table 1.2: Kollmuss and Agyeman’s behavioural barriers

Link	Type of barrier
<b>Internal factors and behaviour</b>	Internal incentives
	Consciousness
	Behavioural feedback
<b>External factors and behaviour</b>	Old behaviour
	Social potential

Community-based Social Marketing efforts focus on motivating social groups to overcome these barriers so as to allow for the development of social norms in a community (McKenzie-Mohr, 2011). Social norms are highly desirable, in Social Marketing programs, and when described under consumer behaviour, take the form of all Social Influences, such as family, peers and reference groups (Yates & Aronson, 1983; Costanzo, Archer, Aronson & Pettigrew, 1986; Aronson & Gonzales, 1990). Such behavioural changes can therefore be

inspired within groups because of attitudes and values held by peers who allow such barriers to be overturned (McKenzie-Mohr, 2011).

Substantial bodies of research exist that focus on behavioural change and various methods suggest how socially undesirable behaviour can be overturned (Kotler & Lee, 2008). Within certain age and generational groups, certain factors are stressed more strongly than others; the influence of socialization can play an even greater role than commonly expected in adolescents (Jessor, 1998; Bina, Graziano & Bonino, 2006). Developmental psychology additionally stresses that risky behaviour can have extensive involvement with a range of consumer characteristics, where understanding additional psychological components can be just as important as understanding the socially undesirable risk behaviour itself (Silbereisen and Noack, 1988; Silbereisen and Todt, 1994; Spruijt-Metz, 1999; Schulenberg & Maggs, 2002; Spruijt-Metz, Gallaher, Unger & Anderson-Johnson, 2004). While marketers agree that this is important, it has not been done in a manner that takes into account population-specific characteristics and the interaction between such relevant characteristics within populations and generational groups (Howe & Strauss, 2000; Howe, 2005).

Much of the current Social Marketing efforts focuses on deterring adolescents from engaging in risky behaviour as adolescents represent a particularly risk population group in society. This group exhibits many societal problems, including: underage drinking, reckless driving, tobacco, youth violence, gambling and adolescent pregnancy (Korn & Shaffer, 1999; Derevensky & Gypta, 2000; Jacobs, 2000; Messerlian, Derevensky & Gupta, 2005; McCreanor, Greenaway, Moewaka Barnes, Borell & Gregory, 2005; Hastings, Anderson, Cooke & Gordon, 2005; Meekers, Agha & Klein, 2005; Quinn, Bell-Ellison, Loomis & Tucci, 2007; Kotler & Lee, 2008). Additionally, the global population of adolescents simultaneously orientate themselves as members of the Generation Y (or Millennial) population, who are defined as individuals born since the early 1980s (Brosdahl & Carpenter, 2011). The distinction of generations in populations is useful, as specific timed global events (such as war or economic recession) are experienced by specific cohorts of individuals, which allows for specific characteristics to be developed across the cohort (Myers & Sadaghiani, 2010).

## **2.4. Current issues in Social Marketing research: a closer look at Generation Y**

The association of current adolescents with Generation Y means that there are specific differences between adolescents of past generations and adolescents of the current generation of which policy-makers and consumer behaviourists should be aware (Partridge & Hallam, 2006; Brosdahl & Carpenter, 2011). As Social Marketing mechanisms generate social programs that make it highly attractive to adopt socially desirable behaviours, few empirical studies exist that explain Generation Y and the specific consumer traits which make the population group particularly unique (Howe & Strauss, 2000; Howe, 2005; Blauth, McDaniel, Perrin & Perrin, 2010). Specifically unique to the population group (or cohort) is their strong affinity towards the opinions of their friends and peers, over that of traditional marketing persuasion activity in Social Marketing programs (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996; Beard, 2003). This affinity and its implications for understanding consumer behaviour are discussed in the following section.

Generational research relies on the study of cohorts within populations, where these cohorts focus around shared experiences or events which influence them in subtle ways (Sessa *et al.*, 2007). This theory offers alternative ways to evaluate differences between consumers instead of conventional groupings based on geography or social class. Most importantly, however, generational research provides justification for these differences (Bolton, Parasuraman, Hoefnagels, Migchels, Kabadayi, Gruber, Loureiro & Solnet, 2013).

Generational theory assumes that people born within a particular time period belong to a particular generational cohort which is distinctly different in terms of values or attitudes from other cohorts (Strauss & Howe, 1992). However, there are many problems in attempting to research generational characteristics. Many studies tend to generalise research that has been conducted at a cross-sectional level, and do not adequately rule out the effects of age versus actual generational differences (Rust & Yeung, 1995; Sessa *et al.*, 2007; Roberts & Mroczek, 2008).

Some studies claim that generational differences do not exist within the realm of risk behaviour, that differences only exist between demographics due to age effects, and that current generations differ in no way in terms of their attitudes towards engaging in risky

behaviour from those of prior generations (Zuckerman, 1994). Such studies simply find that individuals between the ages of 9 and 14 carry adventurous attitudes towards risk that diminish over time (Trimpop, Kerr & Kirkcaldy, 1998). Generation theorists propose that the macro-environment changes are responded to differently by generational groups, but such research is limited in that it has not been extended to the realm of the most recent generation group - Generation Y (Strauss & Howe, 1999). These discrepancies offer opportunities for further research into the development of risk behaviour across the Generation Y group, as the assessment of age differences within the Generation Y cohort has not yet been studied (Gardner & Laurence Steinberg, 2005).

Current research into the Generation Y cohort is largely lacking in quality, and further research into the group is desperately required (Twenge & Campbell, 2008; Myers & Sadaghiani, 2010; Appleton, 2012). The current generational research that does look at the Generation Y cohort is plagued by methodological issues. There are a limited number of generational studies that make use of longitudinal methods when evaluating behaviour and other characteristics of the Generation Y cohort (Twenge & Campbell, 2008). This means that there is a limited ability (when evaluating current research on the Generation Y cohort) to distinguish between age and generational effects, and researchers have only been able to identify a few enduring traits for the Generation Y consumer. This means that while previous research into generational effects has largely been frivolous, there is some evidence that generational differences do exist and that the Generation Y cohort does differ from other cohorts in terms of behaviour (Twenge & Campbell, 2008).

## **2.5. Influencers of Generation Y characteristics: social and demographic**

Research within consumer markets has found that Generation Y's comfort and increased access to highly technological services and standards has resulted in an increased demand for customizable products and highly personalised services (Peterson, Balasubramanian & Bronnenberg, 1997; Bitner, Brown & Meuter, 2000; Ansari & Mela, 2003; Berry, Bolton, Bridges, Meyer, Parasuraman & Seiders 2010).

Generation Y individuals are becoming more sociable with their peers than any prior generation. Generation Y individuals spend more time in the company of friends and

colleagues, and less time within the traditional family structure than prior generations (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996). However, much of the research regarding the type of influence that social groups exert on each other has focused on market behaviour and has not revealed much about the consumer characteristics of the Generation Y cohort (Berndt, 1982, 1989; Clasen & Brown, 1985; Hays, 1988; Ryan, 2001).

In addition, the types of relationships that individuals have with their peers are multidimensional, where there is often extensive influence by peers throughout one's psychological characteristics, affecting risk attitudes and beliefs as well as behaviour (Clasen & Brown, 1985; Berndt, 1999; Brown, 1999). Peer influence should be explained within a tight framework, so as to not generate overly complex findings in the context of generational traits (Fisher, Jackson & Villarruel, 1998). Current bodies of research that use empirical methods to examine the development of specific behaviours find that Social Influences are a substantial factor in influencing purchasing behaviour (Noble, Haytko, Phillips, 2009). There is a plethora of factors that can influence consumer decision making, including attitudes, personality, motivation and perception, and limited research is available that describes the processes whereby Social Influence affects the Generation Y cohort (Zardo & Geldens, 2009). As such, further research beyond mere behavioural responses by the Generation Y cohort is required.

Given that what is known about the cohort is that they are more sociable with their peers than any prior generation (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996) and more susceptible to influence the views of their peers (Noble, Haytko, Phillips, 2009; Beard, 2003), Social Influence is a pertinent topic in Generation Y discourse. However, the potential ways in which the Generation Y cohort is able to be influenced has not been studied, despite this being frequently measured in other population groups (Hill, Rand, Nowak & Christakis, 2010).

A lack of prior research on this topic means that research into the risk attitudes of Generation Y individuals is effectively non-existent. As previous literature has found that Risk Preferences (as attitudes) are known to be fairly stable and resilient to changes by most experiences (Ajzen & Fishbein, 1980; Weber *et al.*, 2002), it is important to understand the

progression of Risk Preferences for the Generation Y cohort and key influences of future Risk Preferences. Demographic variables, such as gender, typically offer an important distinction among consumers, and within certain categories there is a constant divide between marketing efforts across such variables (Mokhlis & Salleh, 2009). Even demographic differences within the Generation Y cohort, which have been studied extensively within other cohorts, might exist because of gender, (Booth & Nolen, 2012). This study measures differences between male and female Risk Preferences and respondents of different ages, so as to better understand the Generation Y cohort and the determinants of Risk Preference over time.

Additionally, it seems useful and appropriate to better understand the role that Social Influence has and the way in which Social Influence interacts with the important consumer characteristic of risk attitudes because Social Influence is an important part of the development of Generation Y individuals (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996).

As social norms, developed from Social Influence, represent the primary method of overturning certain attitudes, it is expected that a better understanding of Social Influence in the development of risk attitudes for the Generation Y cohort could assist in better understanding the social dynamics that encourage socially undesirable attitudes and those which allow for them to be overturned (McKenzie-Mohr, 2011). This relies on the understanding of various behavioural change theories that adequately explain behavioural change as a result of attitudes (Kollmuss & Agyeman, 2002) and have been most useful in the field of Social Marketing, where enabling positive behaviour within a society is the desired outcome (Kotler & Lee, 2008). The specific types of Social Influence and its important characteristics are discussed in the following section.

## **2.6. Social Influence and social measures**

Social Influence is defined as the effect that others have on an individual or group, in terms of attitudes or behaviour (Berkman, 2000). Social Influence itself can take many different forms and can be realised through interaction with a wide range of social groups (Glynn, 1981). This influence develops from social norms that are created within a group that

describe acceptable patterns of belief, attitude and behaviour (Axelrod, 1984; Kameda, Takezawa & Hastie 2005). Such influence is developed over time through interactions with family, allowing for family influence; school or work peers, allowing for peer influence; community members; religious institutions and other sources of prevailing social norms for an individual (Childers & Rao, 1992). The process of Social Influence arises from reciprocal relationships between social norms and the social structures that an individual occupies and is often realised through social mimicry (Prinstein & Dodge, 2008).

A substantial amount of prior research has described peer influence on risk characteristics, especially in the area of adolescent behaviour, where this influence is often equated with “peer pressure” and where such influence has historically carried a negative connotation (Arnett, 1992). Risk behaviours such as reckless driving, substance abuse, unsafe sex, and criminality have been studied at length and have been largely attributed to peer conformity (Coleman, 1961; Walsh, Ferrell & Tolone, 1976; Berndt, 1979; Jessor, 1991; Arnett, 1992; Irwin, Igra, Eyre & Millstein, 1997; Steinberg, 2004; Gardner & Steinberg, 2005). However, such influence is seen to decline for individuals entering adulthood, (Coleman, 1961; Brown, Eicher & Petrie, 1986; Steinberg, 2004).

The use of specific social interaction measures, such as the social distance measure can be helpful in evaluating the level of Social Influence that can exist within a group as the degree of friendship or relationship strength between individuals can result in varying Social Influence (Karakayali, 2009). As peers could potentially include a wide range of relationships, from parents, colleagues, siblings, friends or distant relatives, this raises the question as to the degree of social distance between social contacts and the individual. This study measured the influence of siblings and friends and evaluates their Social Influence within the Generation Y cohort. These specific social groups were chosen as past research suggests that these would be the most influential (Childers & Rao, 1992).

Physical distance also forms an important part of the discussion of Social Influence when evaluating Social Influence of risk attitudes for the Generation Y cohort. For example, within past studies, neighbors residing within a close proximity to each other and therefore having a low physical distance, often provide support and other peer influence because of a heightened level of social interaction (Ahlbrandt & Cunningham, 1979; Podolefsky & Dubow,

1981). This suggests that individuals' attitudes can be influenced by those around them (Barr, Gilg & Ford, 2005). Building on that research, this study evaluated the importance of physical distance in the process of Social Influence in order to determine whether proximity is an important factor in Social Influence for the Generation Y cohort.

In the specific case of adolescents, previous studies have focused on peer influence within a school or classroom setting, but studies involving in-school and out-of-school peers are rarer (Kiesner, Poulin & Nicotra, 2003). This has led to a hypothesis that out-of-school peers influence adolescents differently from in-school peers (Kiesner, Poulin & Nicotra, 2003). For instance, adolescents with a greater orientation towards out-of-school peers have been shown to exhibit higher rates of delinquency (Kiesner, Kerr & Stattin, 2004; Haynie & Osgood, 2005). This might be as a result of a form of selection bias which presents a major problem in current research into Social Influence, these suspicions prompted the development of additional methodologies to overcome this – these are further discussed in the following section (Dishion, Andrews & Crosby, 1995; Haynie & Osgood, 2005).

## **2.7. Recent developments in Social Influence methodology**

Scherer and Cho (2003) successfully assessed the spread of certain Risk Preferences through social groups, but they did not measure specific influence rates. Some recent studies have evaluated other individual characteristics and the subsequent diffusion within a large group, but this has required a different analysis, compared with classical techniques (Coleman, Katz & Menzel, 1966; Borgatti & Everett, 1992; Leenders, 2002). The advantage of these developments is that they allow for the effects of social relationships to become more apparent and allow for a better understanding of the specific degrees of influence, via an identification of influence measures and rates (Wasserman & Faust, 1994; Scott, 2000).

A prominent method of illustrating Social Influence is used by Hill *et al.* (2010), involving probabilistic estimations. These methods can be applied to the study of Social Influence on beliefs, attitudes or emotions and allows for the component of Social Influence to be easily identifiable and attributable (Hill *et al.*, 2010b). In the case of Risk Preferences (or risk attitudes), this method enables the proportion of Social Influence to be identified between two time periods, separate from random variation (Hill *et al.*, 2010b). However, these

methods are only applicable when evaluating the effect of Social Influence on measures that identify specific discrete population groups. Kahneman and Tversky (1970) as well as Kahneman and Diener (2003) classify individuals into the risk attitude groups of risk averse, risk neutral and risk seeking. Within this study, a longitudinal analysis of the risk attitudes for Generation Y was required so that the effects of Social Influence could actually be identified (Hill *et al.*, 2010b). This required an evaluation between how Generation Y individual Risk Preferences change over time, against that of Social Influence. As no prior measurements existed for the Risk Preferences of the Generation Y cohort over time, this study evaluated the individual Risk Preferences over time, against the Risk Preference of friends and siblings.

Prior studies have used these methods to better understand Social Influence in the development of emotions and specific behaviours (Hill *et al.*, 2010; 2010b). For example, it has been found that individuals with different emotional states (happy, sad, etc) affect the development of their peers' emotional state differently, depending on their own emotional state (Hill *et al.*, 2010).

Within peer influence, as peers could potentially include a wide range of relationships, from parents, colleagues, siblings, friends or distant relatives, this raised the question as to the degree of social distance between social contacts and the individual, as well as physical distance. This study makes a classification between friends and siblings, as these are the most prominent forms of Social Influence in previous literature, and offer the ability for this study to measure both and identify differences (if any) between the influence of the two. As there is no prior research investigating the influence of peers on the risk attitudes of Generation Y individuals, and how differences in social distance affect the relationship, this presented opportunity for this study to research these differences.

In explaining such Social Influence within the Generation Y cohort with respect to Risk Preference, the following section presents the specific research question and the objectives that dictate the direction of this study.

### 3. RESEARCH PROBLEM AND OBJECTIVES

This study's specific research question aims to fully explore the role that Social Influences play in the development of Risk Preferences for the Generation Y cohort, among common social groups of friends and siblings. As Risk Preferences are fundamental in understanding how desirable behavioural changes can be achieved through Social Marketing, this study presents the following research question, to guide further activity:

*Does the Risk Preferences of friends and siblings affect the Risk Preferences for Generation Y individuals?*

The objectives associated with the research question focus on the development of Risk Preferences in the Generation Y cohort. As there is a distinct lack of research into the Generation Y group, several objectives are established for better understanding Social Influence and the development of Risk Preferences generally in the Generation Y cohort.

As section 2.4 of Chapter I explains prior research, which aimed to evaluate the legitimacy of generational differences, such research has not yet explained the difference between age-based and generational-based difference in the Generation Y cohort (Rust & Yeung, 1995; Sessa *et al.*, 2007; Roberts & Mroczek, 2008). This forms an important part of this study, in evaluating if age contributes towards Risk Preference development in the Generation Y cohort.

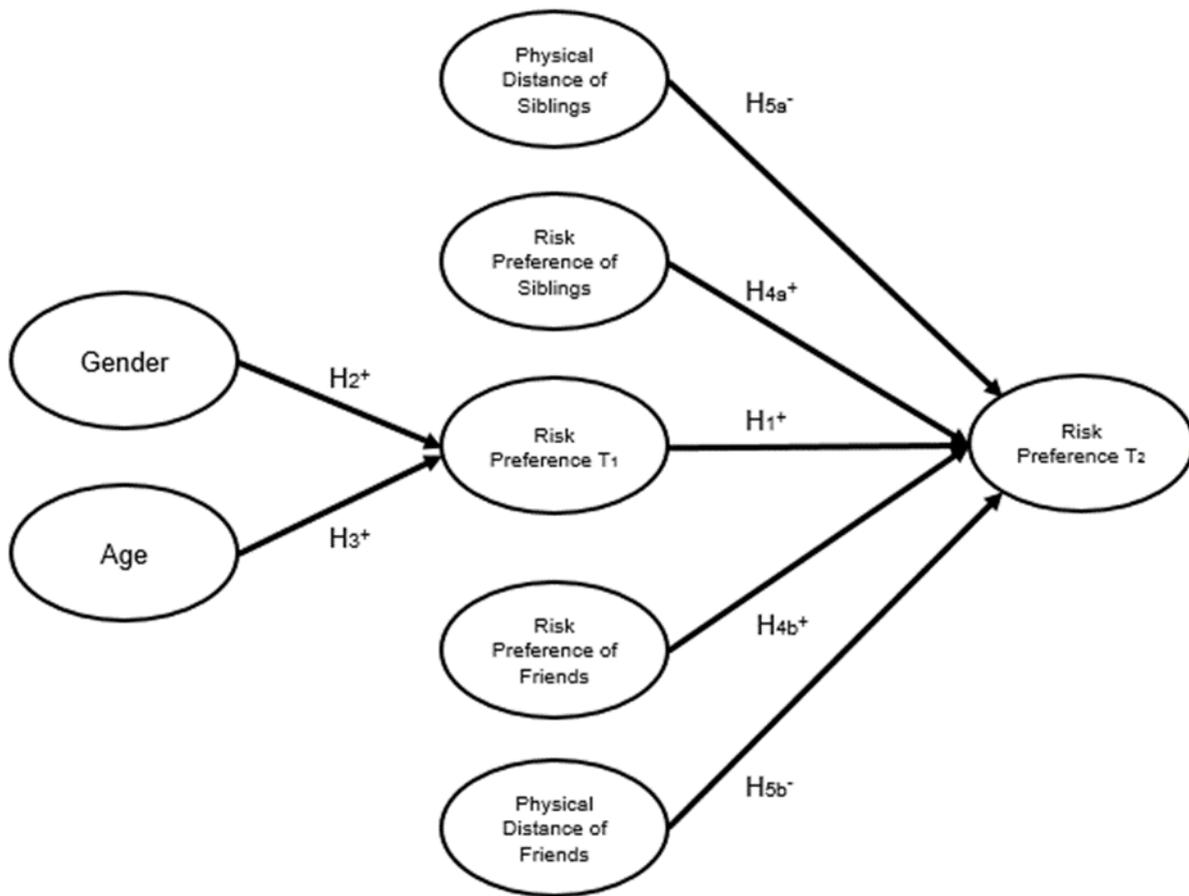
As described in section 2.5 of Chapter I, prior research extensively studied the gender-based differences in Risk Preferences, with no such research looking at the Generation Y cohort (Booth & Nolen, 2012). As age-based differences within the Generation Y cohort have not yet been studied, an investigation into these differences forms a part of this study (Gardner & Laurence Steinberg, 2005). While these factors do not represent the primary focus of this study, they are important in measuring, so that a complete evaluation can be made between the importance of gender in the discussion of Risk Preferences, along side that of the importance of influence by siblings and friends.

Pertaining to the exact dynamics of Social Influence - section 2.6 of Chapter I described the differences between physical and social distance and how attitudes can be influenced by those around them (Barr, Gilg & Ford, 2005). Physical distance forms an important part of the discussion of Social Influence when evaluating Social Influence of risk attitudes, as social groups that are not in frequent and close proximity to individuals are unlikely to influence the risk attitudes of those individuals (Ahlbrandt & Cunningham, 1979; Podolefsky & Dubow, 1981; Hill, *et al.*, 2010). Additionally, social distance measures explain how some individuals with different relationships can influence others differently (Karakayali, 2009). This study evaluated both siblings and friends as the most appropriate and proximate social contacts (Childers & Rao, 1992). From each of these major areas and theoretical discussions, the following primary objectives were formulated:

1. To determine the influence that previous Risk Preference have in the development of Risk Preferences for Generation Y individuals;
2. To determine the influence that gender plays in the development of Risk Preferences for Generation Y individuals;
3. To determine the influence that age plays in the development of Risk Preferences for Generation Y individuals;
4. To determine the influence that social distance plays in the Social Influence of Risk Preferences for Generation Y individuals; and
5. To determine the influence that physical distance plays in the Social Influence of Risk Preferences for Generation Y individuals.

To better illustrate these relationships and present how the specific hypotheses relating to the objectives will be explored, figure 1.1 proposes the conceptual model to aid in achieving findings for these objectives.

Figure 1.1: Conceptual model



*H<sub>1</sub><sup>+</sup>: There is a strong correlation between the Risk Preference in Generation Y individuals throughout their young adulthood*

*H<sub>2</sub>: Females Generation Y individuals have more averse attitudes towards risk-taking than male Generation Y individuals*

*H<sub>3</sub>: Older Generation Y individuals have more risk averse attitudes towards risk-taking than younger Generation Y individuals*

*H<sub>4</sub>: The association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals is stronger than the association between the Risk Preference of friends and the Risk Preference of Generation Y individuals*

*H<sub>4a</sub><sup>+</sup>: There is a positive association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals*

*H<sub>4b</sub><sup>+</sup>: There is a positive association between the Risk Preference of friends and the Risk Preference of Generation Y individuals*

*H<sub>5</sub>: There is a negative association between the physical distance of peers and amount of influence on the Risk Preference of Generation Y individuals*

*H<sub>5a</sub><sup>-</sup>: There is a negative association between the physical distance of siblings and amount of influence on the Risk Preference of Generation Y individuals*

*H<sub>5b</sub><sup>-</sup>: There is a negative association between the physical distance of friends and amount of influence on the Risk Preference of Generation Y individuals*

Additionally, as section 2.6 of Chapter I described how additional Social Influence measures and rates can be estimated using methods adopted by Hill *et al.* (2010), this adopts these methods (as described in the following section) and presents the final objective:

6. To determine if Generation Y consumers with different risk profiles (risk seeking, neutral and averse profiles) affect one another differently.

In order to investigate these research objectives, the following section describes specific measurement and research design.

## **4. METHODOLOGY**

This study adopted a conclusive research design with the primary purpose of testing pre-specified hypotheses, leading to findings in the form of relationships between constructs of interest and possibly some generalizability of the results (Malhotra, 2010). This study made use of descriptive research as it was most appropriate in evaluating the research hypotheses and describing characteristics in the sample. In addition, this study's quantitative method approach is appropriate as this study has a very specific research question and goals that require a large quantity of quantitative data (Rozina & Matveev, 2002).

### **4.1. Research design and method**

The specific research design for this study is that of a longitudinal, mixed method research design. The methods are based on the approach that Hill *et al.* (2010) took in their seminal paper regarding the spread of emotion through social interaction, as well as an approach that Lam, Marteleto and Ranchhod (2013) used in work involving similar probability techniques to predict peer influence on sexual behaviour. This study aimed to describe the development of Risk Preferences over time within the Generation Y cohort and the various influences of this development. The specifics of this are described below.

Longitudinal analysis is appropriate in this study as the development of risk attitudes can only be understood when assessed against attitudes during differing time periods. This involved two measurements. Secondary data analysis typically provides access to large

sample sizes, a wide array of measures, reduced financial expenditure, reduced data collection problems and most importantly – direct access to longitudinal data (Kiecolt & Nathan, 1985; Smith, Ayanian, Covinsky, Landon, McCarthy, Wee & Steinman, 2011). As secondary researchers are not involved in the design of the original study, it typically requires additional time during analysis for the researchers to become sufficiently acquainted with the datasets and their use (McCall & Appelbaum, 1991).

The data was collected using two waves, Wave III (2002) and Wave IV (2008), from 90 minute in-home interviews. As a result, all of the analysis in the study was conducted using secondary data from the Add Health study, with no use of incentives (Bearman, Jones & Udry, 1997; Boonstra, 2001). The two longitudinal measures provided means for analysis which would identify changes in their Risk Preferences, over time, attributable in part to that of Social Influence. This study therefore aimed to provide descriptive research into the discussion on the development of Risk Preferences, within the Generation Y cohort, and the influence of peers and siblings, as little research on the topic currently exists.

#### **4.2. Target population and sampling**

The target population for this study was defined as individuals who form part of the Generation Y cohort (born during or after the 1980s). This is because the cohort within the Add Health study includes only individuals born between 1977 and 1985 (although the Generation Y cohort continued until the late 1990s) (Brosdahl & Carpenter, 2011). In order to accurately represent this, the study took an entirely representative sample of this Generation Y cohort from the Add Health study (2013). The Add Health study (2013) offers longitudinal measures on 20 745 individuals, randomly sampled throughout the United States of America (Boonstra, 2001).

As this study attempted to replicate methods used by Hill *et al.* (2010), it meant that an extremely large sample was required, for which the Add Health (2013) dataset was useful. Several measurements were collected in the Add Health (2013) study, and this research project made use of Waves III and IV, where the cohort was aged 16 – 24 years old (Wave III) and 23 – 31 years old (Wave VI). These measures were useful because:

1. At this stage of development, adolescents are particularly vulnerable to the influence of their peers (Shoveller, Johnson, Savoy & Pietersma, 2006; Potard, Courtois & Rusch, 2008) and, in addition;
2. Large quantities of Social Marketing efforts are targeted towards individuals at this stage of development, to curb risky behaviour and help generate less favourable attitudes towards risk (Kotler, Roberto & Lee, 2002).

Additionally, the use of an entirely United States-based cohort is useful in that the United States is considered by some to be the most influential country in the world (Wiarda, 2007; Hao & Wang 2010) where the diffusion of American Culture is central in shaping international cultural values, norms and homogenising global capitalist culture (Anderson & Taylor, 2007). Through postmodern dissemination of “global” culture in the largely Western world, especially among adolescents (including Generation Y), many consumer attitudes and personality traits are being constantly disseminated across global generational culture. This is exacerbated through the use of internet and vast connectivity (Marsella, 1998; Nilan & Feixa, 2006). As a result, many conclusions which this study draws about the United States population of Generation Y individuals may have strong implications in local consumer markets (Van Elteren, 1996). Conclusions about this Generation Y cohort required a specific data analysis to test the relationships from the conceptual model in figure 1.1. The specific data analysis is described next.

#### **4.3. Data analysis**

Data for this study was cleaned, coded and finally analysed within the Partial Least Square (PLS) Structural Equation Modelling (SEM) software “SmartPLS” (Ringle, Wende & Will, 2005). This analysis of structural equations, is a multivariate analysis which evaluates the variance among a range of individual constructs (Chin, 1998).

The use of PLS-SEM has received vast usage in numerous areas of business management in recent years, including: strategic management (Hulland, 1999), information systems (Dibbern, Goles, Hirschheim & Jayatilaka, 2004), organizational psychology (Higgins, Duxbury & Irving, 1992), as well as marketing (Pavlou & Chai, 2002; Reinartz, Krafft & Hoyer, 2004).

PLS-SEM is a preferable method over other analysis methods, such as covariance-based (CB)-SEM, as PLS-SEM consistently achieves higher levels of statistical power, even with small sample sizes (Boomsma & Hoogland, 2001; Reinart, Haenlein & Henseler, 2009). As this study aims to predict future Risk Preference states, and makes use of rich data, relying on relatively weak theory, PLS-SEM is definitely the most appropriate data analysis method (Wold, 1985). Alternate SEM techniques, such as covariance-based ones, are more rigid in their requirements and model constraints, which frequently contradict theoretical considerations and severely limit the use of such studies (Bollen & Davies, 2009; Diamantopoulos & Riefler, 2011).

This partial least squares form of SEM is appropriate for systems with many and complex relationships and require simultaneous analysis (Malhotra, 2007; Hair, Black, Babin & Anderson, 2010). This method also allows for prediction of future states (Hair, *et al.*, 2010), where this study correlates the Risk Preference of respondents with future Risk Preference, alongside that of other social and demographic influences, as illustrated in figure 1.1. Specifically the relationships tested were the relationships between: Risk Preferences over time ( $H_1$ ), gender and Risk Preference ( $H_2$ ), age and Risk Preference ( $H_3$ ), Risk Preference of siblings and Risk Preference of respondent ( $H_{4a}$ ), Risk Preference of friends and Risk Preference of respondent ( $H_{4b}$ ), finally if the control for distance of siblings ( $H_{5a}$ ) and distance of friends ( $H_{5b}$ ) were statistically significant. The inclusion of measures for the Risk Preferences of both siblings as well as friends allowed for direct comparison between the effect of each, which is further described in the methodology and results sections.

The validation of constructs and their legitimacy within the PLS-SEM model came in the form of reliability and validity testing. The internal consistency of the model was assessed using a measure of Cronbach's Alpha where indicators within the model are expected to correlate onto their respective construct with values greater than 0.7. Convergent validity was also required to be assessed, by confirming that all construct items loaded significantly on the appropriate latent construct, illustrated by AVE values being greater than 0.5. Discriminant validity requirements for models require that the square root of a construct's AVE is greater than the correlations between the construct and other constructs (Fornell & Larcker, 1981).

After the measurement model was assessed for validity, the structural model would then be assessed and specific hypotheses would either be rejected or accepted, based on the confirmation or denial of specific relationships within the PLS-SEM model, as described in the conceptual model. The R-square values would identify the proportion of variance successfully explained by the PLS-SEM model. These would be assessed according to Chin (2010) where 0.67 represents a substantial explanation of variation, 0.33 moderate and 0.19 weak. Additionally, path values between constructs would be deemed significant (at the 5% level) if path values were at above 0.2 or below -0.2. Lastly, the effect size for each of the relationships would be assessed, so as to determine the relative strength of constructs and their relevance in the model. Strong effect size are identified as being values higher than 0.35 and allow for further base for rejecting or accepting hypotheses.

As this study also tests additional group-specific relationships, which the PLS-SEM model cannot fully capture – various Linear Probability Models (LPM)s are created to evaluate the differences in Social Influence experienced by individuals along difference Risk Preference groups (as described by Bard & Barry's (2000) risk attitude scale). Such analysis was prompted by studies which assessed similar Social Influence; this study follows them by adopting similar to the methods to those used by Hill *et al.* (2010) and Lam, Marteleto and Ranchhod (2013).

In justifying the research which this study has conducted, several key points are required to be mentioned. The following section highlights the importance of this study and the justification for its existence.

## **5. POSSIBLE CONTRIBUTION OF THE STUDY**

The purpose of this study is to contribute to the current understanding of Social Influence within the Generation Y cohort and how this influence affects Risk Preferences. A better understanding of the risk attitudes of the Generation Y cohort is crucial for Social Marketing practitioners and policy-makers to craft appropriate responses. As the study of Social Marketing is primarily concerned with risk characteristics and behaviour, and little is known

about the risk characteristics of the Generation Y cohort, this is highly relevant to the development of Social Marketing.

The Generation Y cohort specifically is said to be more easily influenced by peers than prior generations, however this claim has not been adequately tested empirically, specifically in the realm of Risk Preferences. This study presents a means to evaluate Social Influence on Risk Preference and measures the specific manner and degree that this Social Influence is enacted. This study additionally examines the role that this and other demographic factors of age and gender play in the development of risk attitudes (or Risk Preferences) in the Generation Y cohort. This too is unknown within the Generation Y cohort and this study allows for further knowledge about these variables to be understood.

Prior research focuses strongly on the influence peers have in encouraging unhealthy diets, excessive drinking and the general use of tobacco products (Walsh, Rudd, Moeykens & Moloney, 1993; Lynch & Jones, 2007) with Social Marketing efforts often focusing on reducing risky behaviour and combatting the unfavourable attitudes fostered by socialization (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Kotler, Roberto & Lee, 2002). This presents sufficient grounding for an examination of Social Influence to be conducted on the Generation Y cohort as understanding and identifying the primary contributors of such influence would be valuable for Social Marketing managers. In addition, some recent studies have evaluated the adoption of specific behaviour and the subsequent diffusion of it within a large group, but this has required a different analysis, compared with classical techniques (Coleman *et al.*, 1966; Borgatti & Everett, 1992; Leenders, 2002). This has allowed for group-dynamics to be better modelled, in the study of Social Influence and has allowed for far greater insights into Social Influence and ease in its measurement (Hill *et al.*, 2010). This study follows similar methods in gaining insights about the Social Influence on risk attitudes within the Generation Y cohort and allows for a far richer understanding of Social Influence to be gained, over classical methods (Hill *et al.*, 2010b).

Specific understanding of the rates of Social Influence and the effects of variables such as physical and social distance are examined in this study and allow for an evaluation of peers and the extent to which peers and other social groups can influence Generation Y

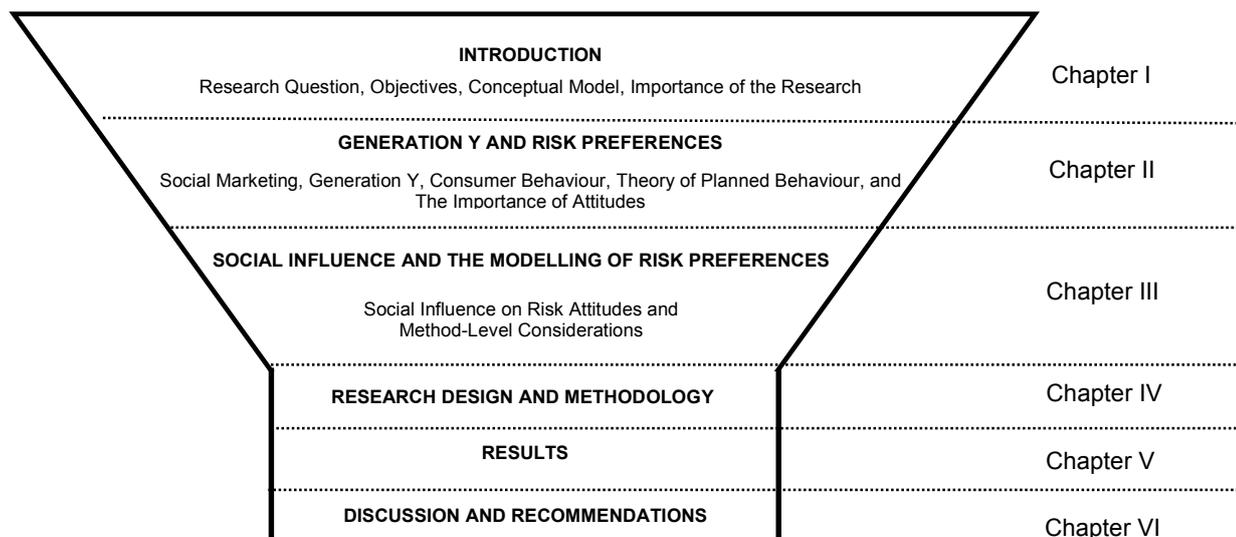
individuals. Additionally, the specific susceptibility of specific groups within the Generation Y cohort will be examined and will offer social marketers insight into the degree to which some individual groups can be influenced by undesirable attitudes towards risk. If these Social Influences exist, a better understanding of the Generation Y cohort and the ways in which peers can hinder or foster socially desirable attitudes will be highly beneficial for Social Marketing practitioners and those concerned with the development of the Generation Y cohort.

The following section presents the layout for the study and provides the context for each of the following chapters. The order of these chapters is led by current literature into Social Influence and the Generation Y cohort, followed by the methodology, results and finally the chapter concerned with discussing the realised results and implications of this study for Social Marketing managers.

## **6. STRUCTURE OF THE STUDY**

This study is comprised of six chapters with their structure focusing on broad marketing perspectives and ending with findings and observations that are unique to this study. The first chapter of this study intends to introduce the topic of interest, articulate the contribution of this study and outline key specifications regarding the methodology. This chapter includes a concise background to the research problem and appropriate theoretical texts. The determinants of consumer behaviour, the theory of planned behaviour and modelling techniques were briefly introduced. The following two chapters allow for the development of hypotheses and contextualize the study's objectives. Following from these theoretical chapters, the methodology for the study is discussed and the plan for its execution is made explicit. The results are then presented and then the recommendation, conclusion and limitations chapter ends the study and places the important findings back into context.

Figure 1.2: Outline of Chapters



Chapter II is largely focused on presenting Social Marketing and raising notice to the current lack of research surrounding Generation Y. The concept of risk-taking is also discussed and its importance in Social Marketing is illustrated through the consumer behaviour framework. This allows for the importance of Social Influence to be declared and stressed through Generation Y's strong disposition towards socialisation. The importance of attitudes towards risk are also discussed and the focus of the study is presented.

Chapter III defines Social Influence and the manner by which adolescents (which form a large proportion of the Generation Y cohort) are affected by Social Influence in the form of peer pressure and social norms. This chapter presents hypotheses pertaining to Social Influence and presents methods that have been used in prior studies to test Social Influence. The conceptual model, which better contextualises much of the relationships described in the chapter, is also presented.

Chapter IV of this study presents the methodology and describes the considerations that were made before collecting and analysing data. The specifics of the research design, method, sampling methods, and measurements used as well as the formulation, preparation and analysis of relevant data are described. As this study makes use of both the SEM form of partial least square modelling as well as linear probability modelling, each of these are discussed in detail.

Chapter V represents the penultimate chapter of this study and presents the results of the study. Within this, the descriptive and inferential statistics are presented. Numerous methods of reliability and validity testing are also conducted, which scrutinise the results. The chapter presents the findings from the PLS-SEM model and how the hypotheses relate to the findings. The objectives of this study are also referred to specific successes in this respect.

Finally, Chapter IV further elaborates upon the findings presented in Chapter V. The importance of the findings in this study is discussed, where the study's limitations are raised. The success in finding results to the research objectives is discussed, with specific recommendations being presented for further studies in this area. The various findings which have managerial importance are presented on their own and a summary of the study in general is therefore generated. This forms the end of the study.

## **7. CONCLUSION**

Despite a wide range of available literature that outlines the characteristics of the Generation Y cohort, little of this is based on empirical research (Twenge & Campbell, 2008; Myers & Sadaghiani, 2010; Appleton, 2012). What is known about the cohort is that Generation Y individuals have all experienced an early and consistent access to technology (Immordino-Yang, Christodoulou & Singh, 2012). Additionally, the cohort exhibits strong affinity towards the opinions of their friends and peers, over that of traditional marketing persuasion activity in Social Marketing programs (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996; Beard, 2003). Insights surrounding the susceptibility of the cohort towards influence and the views of their peers is something that has not been extensively examined and an understanding into how this cohort evaluates risk and understanding about their Risk Preferences are non-existent (Beard, 2003; Noble, Haytko, Phillips, 2009).

Previous literature has found that Risk Preferences are fairly stable and resilient to changes by most experiences but are often a requirement for some risk behaviour to take place (Ajzen & Fishbein, 1980; Weber *et al.*, 2002). As a means to foster socially desirable behaviour, risk attitudes are seen as a pertinent issue in the field of Social Marketing (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011) and as a common barrier which

limits the effects of Social Marketing (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Blake, 1999; Kollmuss & Agyeman, 2002; Kotler, Roberto & Lee, 2002). Acknowledging the importance of Risk Preferences in Social Marketing, the influence of peers on the Generation Y cohort and the fact that the Generation Y cohort is a primary target for much Social Marketing activity - this study posed the question of: *Does Social Influence affect the Risk Preferences for Generation Y individuals?*

The chapter presented the various objectives required in this study to answer the research question and gave a brief overview of the required theoretical background for a better understanding of how this study is constructed. In the following chapters, the influence of peers on the development of the Generation Y cohort's Risk Preference are discussed. The process of Social Influence is described and various modelling techniques suited to answering this research question are discussed. Following the current chapter, subsequent chapters will present the methods required to evaluate the hypotheses presented in this study, and then present the results and their implications.

## **CHAPTER II**

### **GENERATION Y AND RISK PREFERENCES**

#### **1. INTRODUCTION**

The previous chapter described the background to the study, which included the problem statement, objectives and the overall design of the study. In this chapter the most important constructs in the discussion of risk taking are explained and the discussion surrounding methods for inducing changes in risky behaviour is raised.

Society worldwide continues to face an ever increasing list of health challenges which limit its ability to live safely without risk of harm (Grier & Bryant, 2005). Social Marketing makes use of marketing concepts and activity so as to promote socially beneficial behavioural changes. Government and non-profit organizations are two prominent employers of Social Marketing to foster behaviour such as healthy dieting, regular physical exercise and other preventative health behaviour (Coreil, Bryant & Henderson, 2000). Additionally, local communities make use of Social Marketing to encourage public usage of products like healthcare (Bryant, Lindenberger, Brown, Kent, Schreiber, Bustillo & Canright, 2001), increased adherence to medicine guidelines (Marks & Greathead, 1994), and immunization usage (Donovan & Henley, 2003). Tying all of these behaviours together is the concept of risk reduction, whereby activities aimed at reducing the components of risky behaviour can help foster more socially desirable (less risky) behaviour (Evans, 2006). Pivotal to the reduction of risk behaviour is the influence of reference groups, which are defined within Social Marketing as an important tool for enhancing or hindering the effectiveness of behavioural change (McKenzie-Mohr, 2011).

Similarly, in typical consumer markets, risk taking is an important concept. This is often studied using a theoretical framework for analysing risk taking among consumers – referring to risk perception, risk attitudes and motivations towards risk taking (Bauer, 1960; Sheth, 1968). Numerous empirical studies consider risk-taking as a major approach to describing consumer behaviour and is commonly used in Social Marketing (Sheth, 1968, 1968b, 1973, 1974; Cox, 1963; Cunningham, 1965). Such risk-taking theory suggests that consumers decide to engage in behaviour when under a degree of uncertainty about the outcome

(Sheth, 1968) but can acquire an enhanced ability to engage in risk-taking when motivated to do so through information gathering or information sharing (Sheth, 1968).

Within traditional Social Marketing efforts, an overwhelming quantity of research and activities have been focused on deterring adolescents from engaging in risky behaviour as they represent a particularly risk-prone population group (Kotler & Lee, 2008). Social Marketing thrives in its ability to generate social programs that make it highly attractive to adopt socially desirable behaviours (Blauth, McDaniel, Perrin & Perrin, 2010). Additionally, the global population of adolescents currently orientate themselves as members of the Generation Y (or Millennial) population (Partridge & Hallam, 2006; Brodahl & Carpenter, 2011). However, there is a problem in that little empirical studies exist which explain the behaviour of Generation Y and the specific consumer traits which make the population group particularly unique (Howe & Strauss, 2000; Howe, 2005). What is known about the Generation Y population group (or cohort) is their strong affinity towards the opinions of their friends and peers, over that of traditional marketing persuasion activity in Social Marketing programs (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996; Beard, 2003). However, this claim has not been fully explored. This study therefore aims to better describe this Generation Y cohort in terms of the importance of peers. This is relevant because influencing key Social Marketing measures, like that of opinions or attitudes towards engaging in risky behaviour, can be severely hampered due to Social Influence (McKenzie-Mohr, 2011).

Community-based Social Marketing offers theory that suggests that attitudes should be represented as barriers towards favourable behaviour, which need to be understood before behavioural change can take place (Kollmuss & Agyeman, 2002; McKenzie-Mohr, 2011). This information is virtually non-existent when attempting to explain the Generation Y cohort. Therefore understanding how attitudes are developed and influence by social interaction is a highly relevant focus for this study. Attitudes gather strong focus in the discussion of consumer behaviour, where predisposition to engage in risk taking is dependent to on an understanding of how consumers perceive risk, their attitude towards it and motivation to engage in it (Kotler & Keller, 2006). This study explores the influence of risk attitudes by social means, however, being aware of the importance of perception and motivations in this discussion.

This chapter serves as to define the involvement of risk within consumer decision-making and to highlight the factors in consumer behaviour theory which encourage the development of risk taking behaviour throughout a range of environments. Risk perception serves as a backdrop for discussions regarding consumer behaviour in Social Marketing. The following sections describe the motivational requirements for altering risk attitudes. This is followed by a discussion of how the learning process allows for different Risk Preferences to be adopted. Following this, additional sections describe how specific lifestyles and concepts of risk influence risk taking. This is followed finally by relatively permanent factors affecting risk taking – these are cultural and demographic factors. In the following chapter, additional factors of Social Influence, which can overturn attitudes towards risk taking, are explored.

However, to begin this discussion, an introduction given which presents Social Marketing as an area where the alteration of risk behaviour is highly important and where the current understanding of the Generation Y cohort is highly limited.

## **2. SOCIAL MARKETING**

The study of favourable behavioural change is a popular market-led activity which has been termed “Social Marketing” and requires a high degree of behavioural analysis (Nicholson & Xiao, 2010). This activity often leads to the creation of learning mechanisms which facilitate individual-level adaption in undesirable behaviour and attract most interest in the market place and within bodies of research (Perese, Bellringer & Abbott, 2005).

Topics ranging from recycling, drug-use, employment support, road safety, personal care, crime prevention and general safety are often discussed (Bunck & Iwata, 1978; Roll, 2005; Wagner & Winett, 1979; Mayer, Butterworth, Nafpaktitis & Sulzer-Azaroff, 1983; Martella, Agran & Marchland-Martella, 1992; Mayer, 1995; Clayton, Helms & Simpson, 2006; Farrimond & Leland, 2006; Manuel, Sunseri, Olson & Scolari, 2007). However, there is often little theoretical discussion of the factors which facilitate Social Marketing objectives and allow for effective market activity (Perese, Bellringer & Abbott, 2005).

Kotler and Zaltman (1971:5) had originally defined Social Marketing as “the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution, and marketing research”. This served as the first formal definition of Social Marketing and allowed marketers to better describe their actions in influencing social behaviour, as opposed to the traditional marketing activities of exchanging products and services for financial gains. Kotler and Zaltman’s (1971) definition was so broad, that it allowed scholars to incorrectly associate non-marketing activities with Social Marketing (Malafarina & Loken, 1993; Andreasen, 1994). Kotler and Roberto’s (1989:6) Social Marketing definition, for example, allows for Social Marketing to be equated with social change, as they define Social Marketing as “an organized effort conducted by one group (the change agent) to accept, modify, or abandon certain ideas, attitudes, practices and behaviours”. This began to move Social Marketing away from its grounding in the marketing field and into a purely educational area (Andreasen, 1994).

Andreasen (1994) argued that these definitions left much to be desired in that the output of Social Marketing activities should adhere to similar requirements of regular marketing activities – a behavioural response. Andreasen (1994:5) therefore offered a definition of Social Marketing as being “the adaptation of commercial marketing technologies to programs, designed to influence the voluntary behaviour of target audiences, to improve their personal welfare and that of the society of which they are a part”. This definition focuses on the output of Social Marketing as being behavioural change, similar to that of sales in traditional marketing definitions, where development of favourable attitudes or values do not represent primary objectives. A more concise definition of Social Marketing, which this study adopts, is given by Kotler and Lee (2008) where Social Marketing is defined as “the process that applies marketing principles and techniques to create, communicate and deliver value in order to influence target audience behaviour that benefit society as well as the target audience”. Social Marketing is therefore an area best grounded in marketing principles and driven by behavioural change (Kotler, Roberto & Lee, 2002).

Similarly to that of education, Social Marketing offers information in an environment where there is freedom of choice; however, Social Marketing encourages shifts in perceived or actual costs and payoffs for specific behaviours, thereby influencing behaviour through

adapting the consequences of behaviour, when the target population is either unwilling or unknowingly behaving unsatisfactory (Grier & Bryant, 2005). The intractability of behaviour, specifically risk behaviour, means that major social problems such as the spread of disease, substance abuse, teenage pregnancy and violent injury are effectively addressed through a similar understanding of motivations, attitudes and ultimately methods for behavioural response (Walsh, Rudd, Moeykens & Moloney, 1993). In addition, substantial bodies of research exist into behavioural change and the various methods whereby negative behaviour can be overturned (Kotler & Lee, 2008). Within certain age and generational groups, certain factors are even stressed more strongly than others, where the influence of peer groups can play even greater roles than commonly expected in adolescents (Jessor, 1998; Bonino, Cattelino & Ciairano, 2005). Developmental psychology additionally stresses that such risky behaviour can have extensive involvement with a range of consumer characteristics, where understanding additional psychological components can be just as important as understanding the risky or negative behaviour itself (Silbereisen & Noack, 1988; Silbereisen & Todt, 1994; Schulenberg, Maggs & Hurrelmann, 1997; Spruijt-Metz, 1999; Spruijt-Metz, Gallaher, Unger & Anderson-Johnson, 2004).

Much of the current Social Marketing efforts focuses on deterring adolescents from engaging in risky behaviour, as adolescents represent a particularly risk population group in society, with underage drinking, reckless driving, tobacco, youth violence, gambling and adolescent pregnancy forming a bulk of societal problems (Korn & Shaffer, 1999; Derevensky & Gypta, 2000; Jacobs, 2000; Kotler & Lee, 2008; Messerlian, Derevensky & Gupta, 2005; Hastings, Anderson, Cooke & Gordon, 2005; McCreanor, Greenaway, Moewaka Barnes, Borell & Gregory, 2005; Meekers, Agha & Klein, 2005; Quinn, Bell-Ellison, Loomis & Tucci, 2007). The importance of risk behaviour in the study of Social Marketing is discussed in the following section.

### **3. RISK BEHAVIOUR AND RISK ATTITUDES**

Researchers differ in their chosen definition of risk behaviour and risk taking, but most refer to constructs such as perceptions, attitudes, goals, values, opinions and outcomes relating to risk (Lopes, 1987; Byrnes, 1998; Slovic, Lichtenstein, & Fischhoff, 1988; Furby & Beyth-Marom, 1992). Goals and values allow individuals to determine the kinds of outputs that

are expected and pursued in a particular situation. This can range from fairly harmless activities, to more dire ones. Therefore, according to Furby and Beyth-Marom (1992), individuals engage in risk when the following statements are being performed:

- a) When the behaviour could lead to more than one outcome (uncertainty) and;
- b) Some of the outcomes are undesirable or perhaps even dangerous.

During the act of evaluation, in choosing a certain risk-laden behaviour or even when making a purchase - the consumer's perception of the level of risk, is highly important and paves the way for an understanding of individual risk-taking in a market setting (Hollywood, Armstrong & Durkin, 2007; Schiffman & Kannuk, 2007;=). This is the essence of risk taking as it involves the evaluation of options that might result in negative outcomes. However, as risk is derived from various elements, the following sections describe motivations towards risk-taking and attitudes towards it. The importance and relevance of these factors are described in the following sections.

### **3.1. Perception of risk**

Wu and DeLong (2006) have stressed that the perception of consumers serves as an important backdrop against the understanding of consumers and individual behaviour, and is a necessary approach for differentiating consumer cultures. This perception has been generally accepted and defined as the process in which consumers select, organise and interpret stimuli into a response which is meaningful (a coherent thought) (Stanton, Etzel, Walker, Abbratt, Pitt & Staude, 1993; Assael, 1998; Lamb *et al.*, 2004). An alternative definition comes from Kotler and Armstrong (2008), where perception is explained through three stages: exposure, attention and the then a comprehensive stage. However, it seems that each of these definitions largely stress that the way in which consumers are aware of an experience, process it and respond to stimuli is important.

Individuals can interpret and process the information which they receive, through use of their five senses, which allows for greater organization (Strydom, Jooste & Cant, 2000). Other studies have found that initial market experience, atmosphere and equipment have a large and lasting impact on consumers, because of this being the first impression (Gagliano &

Hathcote, 1994). It has followed that this first impression perception of a market offering are a strong determinant of consumer loyalty and retail success (Birtwistle & Shearer, 2001).

An individual's perception of risk is referred to as "perceived risk" and has been referred to as perceived probability, likelihood, susceptibility, and vulnerability and is a central construct in health behaviour and technology acceptance within markets (Conner & Graham, 1993; Weinstein, 1993; Conner & Norman, 1994). Measures of perceived risk often come in the form of an evaluation of a real-life risk scenario (Brewer, Weinstein, Cuite & Herrington, 2004) and health behaviour theories suggest that when the perceived risk of harm is high, it encourages these individuals to take action so as to reduce their risk (Weinstein, 1993; Conner & Norman, 1994). Such actions lead to a reduced level of perceived risk, however risk reduction action commonly occurs only with those with substantially high levels of perceived risk (Gerrard, Gibbons & Bushman, 1996; van der Pligt, Zeelenberg, van Dijk, de Vries & Richard, 1997; Brewer, Weinstein, Cuite & Herrington, 2004). Attitudes offer a specific tendency that is used when evaluating a behaviour, entity, or situation with some level of either favour or disfavour (Dreezens, Martijn, Tenbult, Kok & de Vries, 2005). These form an important part of the discussion on risk, as they can allow means for Social Marketing efforts to overturn socially undesirable risk behaviour. This is studied through models such as the *theory of reasoned action* and the *theory of planned behaviour* (Fishbein & Ajzen, 1975). In better understanding the role that attitudes and values have in the development of risky behaviour and their importance in Social Marketing, attitudes towards risk are discussed next.

### **3.2. Risk attitudes**

Huang, Lee and Ho (2004) define an attitude as a predisposition which is a learned response which is consistently either favourable or unfavourable towards a specific behaviour, entity or situation. As it is difficult to directly observe attitudes within consumer behaviour, as it is the result of learning, this process requires strict observation, if a change in attitude is desired (Huang *et al.*, 2004). Therefore an understanding of the behavioural and cognitive learning processes is important in shaping attitudes of consumers within a market (Bovée, Houston & Thill, 1995).

Attitudes towards risk are synonymous in this study for “Risk Preferences”, which are defined in this study as “risk-laden opportunities that are considered acceptable, or more desirable than other possible choices” (Ruhm, Atkins, Goldfarb, Kreps, Rogers, Schoolman & VanOpdorp, 2005:2). These attitudes describe the manner by which individuals would consider their choices to be optimal. It is no surprise then that Risk Preferences are most often discussed in economic sciences (Neumann & Morgenstern, 1944), where individual Risk Preferences are often studied in a evaluative situation with various benefits and costs (Arrow, 1965).

Categorically, individuals are commonly separated into one of three categories, based on their Risk Preferences (Kahneman & Tversky, 1970; Kahneman & Diener, 2003). These three categories aim to describe how an individual can either be:

1. Risk-seeking: eager to engage in risky activities where a certain payoff is equal to an expected payoff;
2. Risk-neutral: Indifferent between activities where a certain payoff is equal to an expected payoff or;
3. Risk-averse: Deterred from engaging in risky activities where a certain payoff is equal to an expected payoff.

The basis of an attitude consists of a collection of several beliefs about a specific entity, behaviour or situation (Dreezens *et al.*, 2005). Attitudes have been described as explaining the connection between historic characteristics of a consumer, and the consumption of a product, service or involvement in a particular behaviour (Wu & DeLong, 2006). Empirical studies have revealed that the existence of a strong link between attitudes and behaviours will be explained by strong and favourable attitudes (Park, Macinnis & Priester, 2006). Additionally, salient beliefs regarding the consequences of performing a behaviour have been identified as the basis for a positive or negative evaluation of behaviour (Kim & Park, 2005). However, consumers are often faced in situations where their attitude towards a specific behaviour is affected by situational circumstances (Park, Macinnis & Priester, 2006).

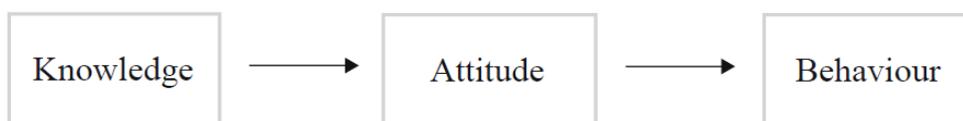
Specific cognitive, affective and conative components of consumer attitudes have been proposed as having important distinction, when assessing risk attitudes (Schiffman &

Kannuk, 2007). The cognitive aspect refers to knowledge and current perceptions acquired through direct experience. The affective component highlights the importance of emotional and feeling basis about a specific behaviour. The conative component is the actual acting component of attitudes, the likelihood or tendency of actual engaging in a specific behaviour. In further explaining the relationship between attitudes and behaviour, specific behavioural change theories are required.

There has been substantial development of various behavioural change theories, which attempt to adequately explain consumption and behavioural change as a result of attitudes (Kollmuss & Agyeman, 2002). These have been important in understanding the influences of purchasing behaviour, but have been most useful in the field of Social Marketing, where enabling positive behaviour within a society is the desired outcome (Kotler & Lee, 2008).

The oldest models, attempting to predict behavioural change, were based on a linear progression of knowledge and awareness which were theorised to result in the development of an appropriate attitude and would finally result in positive behavioural change (Kollmuss & Agyeman, 2002). These rationalist models, such as the *information deficit model* shown in figure 2.1, therefore proposed that Social Marketing programs need only consist of the educational initiatives that generated sufficient knowledge about a social issue which would therefore result in behavioural change in the target (Burgess, Harrison & Filius, 1998; Kollmuss & Agyeman, 2002).

Figure 2.1: The information deficit model



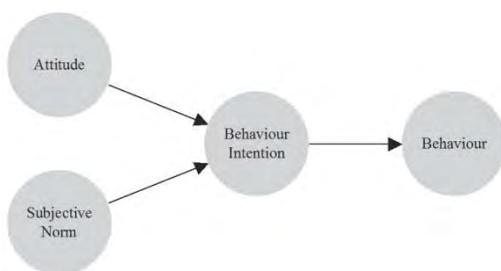
Adapted from Burgess, Harrison & Filius, 1998

These simple models were soon proved to be wrong (Kollmus, Agyeman, 2002), showing that in a diverse range of scenarios increased knowledge surrounding energy conservation (Midden, Meter, Weenig & Zieverink, 1983), increased awareness surrounding environmentalism (Jordan, Hungerford & Tomera, 1986) or even increased awareness

surrounding the effects of excessive water consumption (Geller, Erickson & Buttram, 1983) had no impact on altering associated behaviours.

Later developments in behavioural change theory brought about the theory of reasoned action and the associated *theory of planned behaviour* (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). These theories instead focused on the influence that attitudes (comprised of beliefs and values) as well as social (normative) pressures towards an action could result in behavioural intention and then (perhaps) behaviour. Additionally, the *theory of planned behaviour* incorporated the influence of perceived behavioural control (the idea that one's perceived degree of influence of one's own behaviour is also important in determining actual behavioural change (Ajzen & Fishbein, 1980).

Figure 2.2: Theory of reasoned action



Adapted from Fishbein & Ajzen, 1975

These theories have often been studied in the context of risky behaviour, where the influence of subjective social norms is consistently found to have a strong influence in determining behaviour, as individuals were said to base their actions predominantly on their belief that others were acting in a similar way (Dams-O'Connor, Martin & Martens, 2007; Potard, Courtois & Rusch, 2008). However, this process has been susceptible to more complex process; Perkins (1986:1) for example, studied the instances where individual's perceived view of social norms were skewed, which he referred to as the "reign of error", where undesirable activities like unhealthy diets or excessive drinking would be influenced by "imaginary peers" because the individual would incorrectly assess the social norms in his environment (Berkowitz, 1992:1). This pattern illustrates a common, and undesirable, self-fulfilling prophecy that can take place in the development of behaviours, where skewed ideas

of social norms can have a compounding effect in reinforcing behaviour over time (Perkins & Wechsler, 1996).

Despite this, these theories faced similar criticisms to those directed at the *information deficit model*, as empirical studies found that when Social Marketing programs focused on fostering energy conservation (Archer, Pettigrew, Costanzo, Iritani, Walker & White, 1987), recycling (Bickman, 1972; De Young, 1989) or even emission reduction (Siegfried, Tedeschi & Cann, 1982) – in all cases, the respondents who engaged in favourable behaviour had the same attitudes towards this behaviour as those who behaved unfavourably. This showed that (contrary to the *theory of reasoned action* and the *theory of planned behaviour*) an improvement in the attitudes of an individual, about a social issue, would not necessarily result in improved behaviour.

In settling this dispute over the influence of attitudes and knowledge on behaviour – general consensus was acquired when it was understood that broadly altering attitudes, beliefs and/or values is (at the very least) instrumental in altering behaviour (Kotler & Zaltman, 1971; Kotler & Roberto 1989; Malafarina & Loken, 1993; Andreasen, 1994; McKenzie-Mohr, 2011). This has implied that behavioural change cannot be achieved until the associated attitudes, values and beliefs have also been adapted.

Much of the current Social Marketing efforts focuses on deterring adolescents from engaging in risky behaviour, as adolescents represent a particularly risk population group in society. This group provides many societal problems, including: underage drinking, reckless driving, tobacco, youth violence, gambling and adolescent pregnancy (Korn & Shaffer, 1999; Derevensky & Gypta, 2000; Jacobs, 2000; Hastings, Anderson, Cooke & Gordon, 2005; McCreanor, Greenaway, Moewaka Barnes, Borell & Gregory, 2005; Meekers, Agha & Klein, 2005; Messerlian, Derevensky & Gupta, 2005; Quinn, Bell-Ellison, Loomis & Tucci, 2007; Kotler & Lee, 2008).

This global population of adolescents simultaneously orientate themselves as members of the Generation Y (or Millennial) population, who are defined as individuals born since the early 1980s (Brosdahl & Carpenter, 2011). As Social Marketing thrives in its ability to generate social programs that make is highly attractive to adopt socially desirable

behaviours, there is a problem in that little empirical studies exist which explain Generation Y and the specific consumer traits which make the population group particularly unique (Howe & Strauss, 2000; Howe, 2005; Blauth, McDaniel, Perrin & Perrin, 2010). Specifically unique to the population group (or cohort) is their strong affinity towards the opinions of their friends and peers, over that of traditional marketing persuasion activity in Social Marketing programs (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996; Beard, 2003). This is discussed in the following section and the implications in the understanding of consumer behaviour about this particular population group are presented.

### **3.3. The Generation Y cohort**

Generation Y has been referred to as Echo Boomers, Millennials and the Nexters (Partridge & Hallam, 2006:406). Brodahl and Carpenter's (2011) classification of generational groups individuals in generations based on their birth dates and highlights Generation Y individuals as those being most recently born. This classification method lists the Silent Generation (1920s – 1940s), Baby Boomers (1940s – 1960s), Generation X (1960s late 1970s) and lastly Generation Y (1980s onwards), however there is some disparity between the exact dates. In addition, there is some disagreement on which global events/life events actually prompt the distinction of a new generational cohort (Zemke, Raines & Filipczak, 2000). Because of this, there are vast quantities of research which produce generalised claims which could apply to any two or more generational cohorts; however, there are a few traits which generally regarded as true about generational cohorts (Bolton, Parasuraman, Hoefnagels, Migchels, Kabadayi, Gruber, Loureiro & Solnet, 2013).

Current research into the Generation Y cohort lacks in its empirical basis and in quality, with much of the current generational research being plagued by methodological issues (Twenge & Campbell, 2008; Myers & Sadaghiani, 2010; Appleton, 2012). There are a limited number of generational studies make use of longitudinal methods when evaluating the behaviour of the Generation Y cohort (Twenge & Campbell, 2008). This means that there is a limited ability (when evaluating current research on the Generation Y cohort) to distinguish between age and generational effects, and has only allowed researchers to identify a few enduring traits for the Generation Y consumer, meaning that while previous research into generational effects is largely frivolous, there is some evidence that the study of generational differences

can be acknowledged and that the Generation Y cohort does differ from other cohorts in terms of behaviour (Twenge & Campbell, 2008).

The comparative ease of cross-sectional research has led to a flurry of fervent assertions about Generation Y individuals, and has largely discredited the study of generational effects in a sociological setting (Blauth, McDaniel, Perrin & Perrin, 2010). In addition, a wide range of literature is available which outlines the characteristics of the Generation Y cohort, however little of this is empirical research; this has allowed popular press to become the primary influencer of the topic's development in generational discussions (Myers & Sadaghiani, 2010; Appleton, 2012). Further debate is even had over the relevance of Generation Y as a classifiable group, and distaste over the complete lack of research by sociologists on the matter (Zardo & Geldens, 2009).

Current knowledge surrounding the Generation Y cohort is described in the following section, where the importance of the cohort in a market-place setting is identified.

### **3.3.1. The importance of Generation Y**

Despite the difficulty in classification, the Generation Y cohort is important for several reasons in the social (and consumer) markets. Firstly, Generation Y individuals are comparatively powerful in terms of their aggregate spending (Dias, 2003:78). Generation Y consumers also have more money and carry more economic influence than previous generations (Grant & Stephen, 2005). This has allowed for a massive influx of development into every age-specific market which they have entered into (Morton, 2002; Engebretson, 2004) in general, as the Generation Y consumers have had access to more capital than prior generations, this has allowed for a largely consumption-driven generation (Morton, 2002). Apart from consumer markets, services industries are also interested in the development of Generation Y characteristics, this is because the service industry traditionally relies on younger workers to manage customer-facing positions, in recent years this has placed increased interest on the understanding of the Generation Y cohort and how their activities can be enhanced in a market setting (King, Funk & Wilkins, 2011; Solnet, Kralj & Baum, 2013).

The size of the Generation Y population is also comparatively large. The cohort is expected to reach over 95 million people within the US and is currently estimated to be 80 million people, which represents a third of the global population (Howe, Strauss & Matson, 2009; Schawbel, 2012). In terms of age, approximately 30 per cent are below 28 years old; 34 per cent of Generation Y is between 28 and 33 years old; while another 36 per cent is between 34 and 40 years old (Noble, Haytko & Phillips, 2009). Purchasing behaviour is also known about the Generation Y cohort: the highest purchased items for the cohort are that of entertainment, clothing and food (Martin & Turley, 2004). Lastly, Generation Y consumers are known to consume more action sport and lack aversion to risk in this context than have prior generations (Bennett & Lachowetz, 2004).

A meta-analysis of self-perception shows that Generation Y individuals have exaggerated views of self-intelligence and attractiveness, compared with those of any other generation (Twenge & Campbell, 2008). This generation represents the most recent generational classification and has many notable traits and is deemed important in commercial spaces (Brosdahl & Carpenter, 2011).

In the realm of Social Marketing – the Generation Y cohort is particularly interesting as they contain the entire population of adolescents, who receive much focus in Social Marketing. As Social Marketing thrives in its ability to generate social programs that make is highly attractive to adopt socially desirable behaviours, there is a problem in that little empirical studies exist which explain Generation Y and the specific consumer traits which make the population group particularly unique (Howe & Strauss, 2000; Howe, 2005; Blauth, McDaniel, Perrin & Perrin, 2010).

However, not much more is known about the cohort and this lack of knowledge surrounding the Generation Y cohort is problematic within the realm of Social Marketing for a number of reasons. The Generation Y cohort are said to be less susceptible to Social Marketing efforts than prior generations (Howe, 2005). In addition, not enough is known about the various consumer characteristics which exist in the Generation Y cohort, including that of risk motivations, attitudes and learning styles (Howe & Strauss, 2000). Therefore efforts into uncovering consumer characteristics of the Generation Y cohort would be highly beneficial to Social Marketing programs who wish to influence behaviour in this group.

From a comprehensive review of the available literature, there are few traits which robustly stand out as being characteristics of Generation Y individuals (Blauth, McDaniel, Perrin & Perrin, 2010). Firstly, Generation Y individuals have all experienced an early and consistent access to technology (Immordino-Yang, Christodoulou & Singh, 2012). As the generation has lived most of its life making use of technology, it has largely shaped the unique way in which this generation processes information, compared to previous generations and forms the bulk of the differences between Generation Y individuals and prior generation individuals (Martin, 2005; Patridge & Hallam, 2006). Secondly, there is a clear finding regarding Generation Y's growing devaluation of work – the weaker work ethic in Generation Y individual's lives (due to less pressing economics circumstances than prior generations) means that work is not as central to their lives as has been in previous generations and poses substantial challenges to policy-makers who wish to maintain the status-quo (Twenge, 2010). Thirdly, Generation Y individuals value leisure more highly than do those from previous generations allowing for more access to recreational time, which can be worrying for social marketers aimed at reducing risk behaviour (Blauth, McDaniel, Perrin & Perrin, 2010). Lastly, Generation Y individuals have been shown to be more aware of individuality than do those from previous generations, which again, from an altruistic perspective, is worrying to social marketers and those concerned about the needs of society (Blauth, McDaniel, Perrin & Perrin, 2010).

These fundamentals (regarding Generation Y individuals) prompts investigation into the exact way by which this cohort conducts itself and consumer behaviour relating to this group. Specific developments which build on the currently known facts surrounding the Generation Y cohort sets the grounding for a discussion of the cohort's consumer behaviour, which largely focus around how prominent Social Influence is for the Generation Y cohort. This study asserts that the social setting is therefore the logical first step into understanding the consumer characteristics of the Generation Y cohort. Therefore current research developments in the understanding of the Generation Y cohort are first discussed.

While the empirical information regarding the Generation Y cohort is largely incontestable, it is difficult to gain additional insights from past literature – due to much of the research working from sensationalized claims and with limited scientific rigor (Blauth, McDaniel,

Perrin & Perrin, 2010), it is thought that the Generation Y cohort (unlike previous generations) have lacked a significant emotional event which serves as a rallying point (Alch, 2000). Despite this, Generation Y consumers still described as carrying a range of specific features and are often stereotyped in academia and popular press. Shaw and Fairhurst (2008) specifically describe the generation as individualistic, optimistic, realistic, diverse, multi-tasking, forward thinking, technologically-savvy, while also being socially active, collaborative, team-orientated and comfortable with a structured lifestyle. In addition, Dias (2003:79) describes the generation as “happy, confident and upbeat”. Armour (1999) asserts that the generation is both smart and brash and therefore acquire specific behavioural and attitudinal traits effectively through a social interaction.

### **3.3.2. Generation Y as social learners**

Introspectively, Generation Y individuals typically consider themselves to be confident, achieving, team-orientated, well-educated and open-minded (Dias, 2003; Cummings, 2007). In terms of outputs, Generation Y individuals are most likely to develop sustainable commercial activities, even after retirement, to supplement their pension funds, learning strongly from the financial problems of previous generations and active in their means to avoid the same problems themselves (Leventhal, 1997).

In addition, Generation Y individuals may have not have always had access to complex digital equipment since their birth; however, they are of a generation that accepts that increased technology improves their quality of life (Martin, 2005). As the generation has become accustomed to making use of the internet for information gathering, this access has empowered them to be comfortable in making use of vast quantities of information and has resulted in strong independence but limited brand loyalty in the market place (Cummings, 2007).

A study by Patridge and Hallan (2006) found that Generation Y individuals are predominantly inspired by their parents and value education highly. This is because Generation Y individuals understand the economic empowerment that good education can bring and subsequently enjoy the teaching of older generations (Billings & Kowalski, 2004). Generation Y individuals see academic achievements as a means to accelerate their

careers (Patridge & Hallam, 2006). Generation Y students also make heavy use of online resources for use in their academic work, more so than students in older generations do (Holliday & Li, 2004).

Generation Y individuals carry different attitudes towards career development than predecessors, in that their requirements and expectations of learning environments differ (Shaw & Fairhurst, 2008). Generation Y individuals are acutely aware that they are considered consumers of education and thus seek appropriate customisation and a maximisation of choice when selecting tertiary education (Patridge & Hallam, 2006). Generation Y individuals have also been found to learn better when it is facilitated through social interaction or when looking at experiential learning (Patridge & Hallam, 2006).

Generation Y cohort's close proximity to technology has allowed for the rapid uptake of instant communication technologies, such as online social networking and has enhanced the prospects of globalization (Park & Gursoy, 2012). It has further allowed for the characteristics of the Generation Y cohort to be largely shaped from social interaction. The unique and specific influencers for Generation Y individuals is be discussed in the following section.

### **3.3.3. The influences of Generation Y risk characteristics**

Generation Y individuals are on aggregate more educated and have been more exposed to the results of globalization, which has led them to become the most culturally diverse generation, with exceedingly high tolerance and open-mindedness towards different lifestyles and cultures (Paul, 2001; Pokrywczynski & Wolburg, 2001; Morton, 2002). As Generation Y individuals have found strong affinity towards a diverse range of communication platforms, it is thought that the generation's attitude towards advertising within a market would be underappreciated in favour of the views and opinions of their own peers (Beard, 2003). Promotional methods such as celebrity endorsements, corporate sponsorship, promotion of ethical behaviours and the media in general have been found to receive a waning interest from Generation Y consumers within the market place (Shearer, 2002; Stevens, Lathrop & Bradish, 2003; Bennett & Lachowetz, 2004; Bush, Martin & Bush, 2004; Freestone & Mitchell, 2004;). The findings explain why Generation Y consumers have

been described as impervious to advertising tactics as a method of persuasion or influence (Noble, Haytko & Phillips, 2009).

Further research within consumer markets has found that Generation Y's comfort and increased access to highly technological services and standards has resulted in an increased demand for customizable products and highly personalised service (Peterson, Balasubramanian & Bronnenberg, 1997; Bitner, Brown & Meuter, 2000; Ansari & Mela, 2003; Berry, Bolton, Bridges, Meyer, Parasuraman & Seiders, 2010).

Generation Y individuals are becoming more sociable with their peers than any prior generation. Generation Y individuals spend more time in the company of friends and colleagues, and less time within the traditional family structure than prior generations have (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996). However, much of the research regarding the type of influence that peers exert on each other has focused on market behaviour and has not revealed much about the consumer characteristics of the Generation Y cohort (Berndt, 1982, 1989; Clasen & Brown, 1985; Hays, 1988; Ryan, 2001).

The types of relationships that individuals have with their peers are multidimensional and multicontextual, where there is often extensive influence by peers throughout one's psychological characteristics, affecting risk attitudes, beliefs as well as behaviour (Clasen & Brown, 1985; Berndt, 1999; Brown, 1999). Peer influence should be explained within a tight framework, so as to not generate overly-complex findings in the context of generational traits (Fisher, Jackson & Villarruel, 1998). Current bodies of research which narrow their focus to the development of specific behaviours, find that through empirical methods, peer influences is a substantial factor in influencing purchasing behaviour (Noble, Haytko, Phillips, 2009). However, acknowledging the plethora of factors that can influence consumer decision-making, including: attitudes, personality, motivation and perception – limited research is available which describes the processes whereby Social Influence affects the Generation Y cohort (Zardo & Geldens, 2009). As such, further research beyond mere behavioural responses by the Generation Y cohort is required, for a better understanding of them as a cohort.

As Social Influence is said to be an important part of the development of Generation Y individuals (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996) it would be useful to better understand the role that Social Influence has and the way in which it interacts on such an important consumer characteristic – risk attitudes. It might also be useful in understanding their role for the Generation Y cohort, in hope of improving undesirable attitudes, if they exist for social marketers (McKenzie-Mohr, 2011). Therefore, this study presents the following research question, which will guide further activity:

*Does the Risk Preferences of friends and siblings affect the Risk Preferences for Generation Y individuals?*

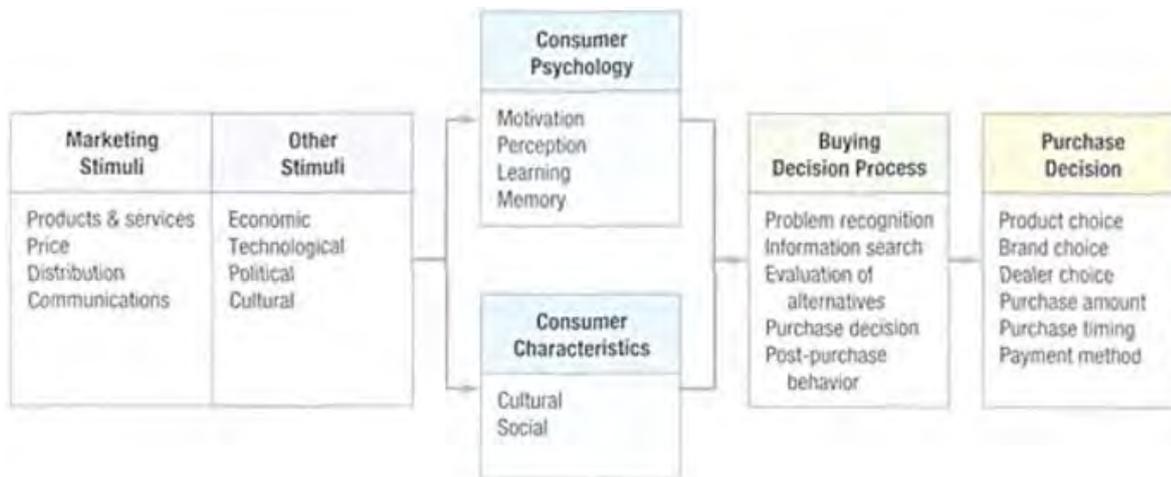
Given that what is known about the cohort is that they are more sociable with their peers than any prior generation (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996) and more susceptible to influence the views of their peers (Beard, 2003; Noble, Haytko, Phillips, 2009), peer influence is therefore a pertinent topic in Generation Y discourse. The potential ways in which the Generation Y cohort is able to be influenced have not been studied, however an expansive framework exists where possible consumer characteristics of Generation Y that might be able to be influenced, can be discussed. This is described in the following section.

### **3.4. Decision making and risk taking**

The study of individual behaviour introduces various behavioural tools which offer explanation of the decision-making process, including the identification of various factors which shape behavioural decisions (Schiffman & Kannuk, 2007). Variations in the literature regarding the exact means by which individuals are said to make behavioural decisions are vast, where numerous differing models attempt to holistically explain purchasing behaviour (for example), each placing differing amounts of importance on the various stages of the consumer decision-making process (Kotler & Keller, 2006). A review of the current literature which covers the decision-making process is required in order to understand which assumptions this study's research is based on. In doing so, a comparative discussion attempts to reach a common ground on past literature, present a generic decision-making process, as well as to raise important terminology required for later in this study.

An overview of the decision-making process (as given by Kotler & Keller, 2006) is shown in figure 2.3. This figure incorporates three major components: inputs (in the form of market stimuli), processes (commonly referred to as the buyer's 'black box') as well as output (comprised of buying decisions and purchasing decisions within that market). However, these buying decisions need not be confined to regular consumer markets, as they are similarly appropriate in the study of Social Marketing and behavioural decisions to engage in risky behaviour (Kotler & Lee, 2008). The model defining the decision-making model was originally created to explain buying behaviour in typical consumer markets, however it has similar use in the adoptions of behaviour within Social Marketing (Andreasen, 1994).

Figure 2.3: Decision-making process



Adapted from Kotler and Keller, 2006: 176.

The current study of consumer behaviour, and upon which the model in figure 2.3 is based, was developed from a view that consumer behaviour is essentially risk management (Kotler & Keller, 2006). Bauer (1960) was the first researcher to argue the widely held view that the study of consumer behaviour should be entirely centred on risk, as any action within a market setting will produce consequences which cannot be entirely anticipated by consumer which are of great concern to consumers. This is illustrated clearly from the output from the decision-making process (as can be seen in figure 2.3) – the purchasing activity, where consumers are met with decisions relating to the extensive number behavioural choices which involve prior attitudes, beliefs and values which enable choices regarding quantity,

timing and overall behaviour; however the importance of risk in consumer behaviour extends further than just the decision to engage in behaviour.

Bauer (1960) argues that consumer behaviour should be viewed instead as risk taking, as it is said to be founded upon the following three axioms:

1. Consumer behaviour is orientated towards identifying and attaining buying goals or inducing specific behaviours, and is not a random process.
2. Consumer decision-making is fun mentally a form of problem-solving behaviour. Consumers attempt to identify both performance and psychological goals (given external market factors) and to realise these goals using products, so that a degree of perceived risk experienced is considered acceptable by the consumer; this is the basis for evaluating all decisions.
3. Outcomes from the problem-solving activity include information generation, dissemination and processing, so that goals can be satisfied. The value and origin of such information is a function of its ability to reduce uncertainty and ultimately perceived risk by the consumer.

Under these axioms, the market conditions, including that of the Social Marketing efforts, economic influences, technological influence, political and general cultural factors should be represented as exogenous variables in the discussion of consumer behaviour and merely represent a setting, providing environmental context (Ross, 1975). In addition, consumer characteristics, such as cultural influence and Social Influence provide information which interacts with consumer psychology, with a result of modifying purchasing behaviour (Bauer, 1964).

Such risk-taking theory suggests that consumers decide to engage in behaviour when under a degree of uncertainty about the outcome (Sheth, 1968) but can attempt to change their uncertainty and enhance their ability to engage in risk-taking when influenced by some form of information, either through increasing their knowledge about a decision or from their specific consumer characteristics which influence their choices (Sheth, 1968).

The broad list of factors and outcome measurements (shown in figure 2.3) are described in this way such that it enhances the understanding of the stages which consumers experience in a market (Kotler & Keller, 2006). The each individual factor within model are next discussed, making use of various references to past empirical consumer-behaviour research.

Kotler and Keller (2006: 176) refer to consumer characteristics (as per figure 2.3) which include cultural, sub-cultural, social and family factors such as siblings, parents and friends, which are all external to the individual, but that influence consumers' buying behaviour, through modifying elements of consumer psychology. Similarly, consumer psychological factors include: perception, motivation, attitudes, personality, learning, the self-concept, lifestyle and demographics and are attributes which consumers largely determine behaviour.

Howard and Sheth (1969) state that the primary objective of consumers is to reduce perceived risk to levels which are tolerable, and this risk reduction action will be influenced by perception, motivation, attitudes, personality, learning, the self-concept, lifestyle and demographics relating to risk taking. Within analysing consumer behaviour (and subsequently risk taking) among consumers - risk perception, risk attitudes and motivations towards risk taking and other consumer psychological factors are at the forefront of decision-making (Bauer, 1960; Sheth, 1968). By focusing on risk taking in this way, numerous empirical studies consider risk-taking as a major approach to describing consumer behaviour (Cox & Rich, 1964; Cunningham, 1965; Arnd, 1966).

This model therefore represents a foundation for understanding Social Influence on the development of Risk Preferences in the Generation Y cohort. The relevance of each of the consumer psychology and consumer characteristics are described in the following sections and allow the influence of peers to be understood along-side the importance of demographics, which represent even a small amount of factors influencing individual decisions. Additional developments into consumer behaviour, within a Social Marketing setting, have come from a community-based view of behaviour, where attitudes, values and beliefs as viewed as barriers to behavioural change, which are described similarly to factors within consumer psychology, but are only influenced by Social Influence.

### 3.5. Community-based Social Marketing: attitudinal barriers to change

Community-based Social Marketing describes unfavourable attitudes, values and beliefs as specific barriers which individuals need to overcome, in order for behavioural change to happen (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011). Blake (1999) identifies barriers which hinder the ability of an individual to act on social concerns. These range from practical hindrances, like the lack of information required to behave in a favourable manner, to a simple lack of interest by the individual in altering his/her behaviour. This classification into individual, responsible and practical barriers help to highlight the severity of the type of barrier and illustrate how much effort would be required to overturn each. These barriers might be overcome by simple information distribution or assistance in rescheduling activities – individual behaviours (like laziness) might require a substantial amount of involvement by social marketers. These barriers are listed below in table 2.1.

Table 2.1: Blake's behavioural barriers

Type of barrier	Examples
<b>Individual barrier</b>	Laziness, lack of interest
<b>Responsibility barrier</b>	Lack of efficacy, lack of trust
<b>Practical barrier</b>	Lack of time, money, information, encouragement

Kollmuss and Agyeman (2002) further categorize these barriers (shown in table 2.2) to illustrate how each barrier affects specific routes governing behaviour. These include the lack of positive behavioural feedback, which might deter individuals from acting on their attitudes and values with appropriate behaviour as well as others. These might include barriers of old behaviour, anchoring individuals to previous behaviour and demotivating behavioural change. Highlighting these barriers is important as the actions of social marketers to make public aware of (for example) a social issue, might be met with a barrier limited consciousness surrounding the issue, which would hinder the social marketer's effectiveness. Within the internal factors of knowledge, feelings, values and attitudes, there are even barriers which limit their ability to influence one another and ultimately limit the ability to influence behavioural change (Kollmuss & Agyeman, 2002).

Table 2.2: Kollmuss and Agyeman's behavioural barriers

Link	Type of barrier
<b>Internal factors and behaviour</b>	Internal incentives
	Consciousness
	Behavioural feedback
<b>External factors and behaviour</b>	Old behaviour
	Social potential

Community-based Social Marketing focuses on motivating social groups to overcome these barriers so as to allow for the development of social norms in a community (McKenzie-Mohr, 2011). Social norms are highly desirable, in Social Marketing programs, and when described under consumer behaviour, take the form of all Social Influences, such as family, peers and reference groups (Yates & Aronson, 1983; Costanzo, Archer, Aronson & Pettigrew, 1986; Aronson & Gonzales, 1990). Such behavioural changes can therefore be inspired within groups because of attitudes and values held by peers who allow such barriers to be overturned (McKenzie-Mohr, 2011).

In addition, risk attitudes are pertinent issues in the field of Social Marketing (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011). They are frequently described as a barrier which limits the effects of Social Marketing programs which encourage favourable behaviour (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Blake, 1999; Kollmuss & Agyeman, 2002; Kotler, Roberto & Lee, 2002) this study offers means to improve the area of research surrounding.

In order to fully explore the topic and the role that Social Influences play in the development of Risk Preferences for the Generation Y cohort, the setting of risk and each of its domains first require discussion. Recalling the areas of consumer psychology and consumer characteristics within consumer behaviour – these and the components of these elaborated on, in following sections, focusing on the role of risk (risk perception, risk motivation, risk attitudes .etc) as this is the most widely stressed topic within Social Marketing, and can be applied to most topics of behavioural change in Social Marketing (Evans, 2006). This discussion began with a description of risk perception. Risk perception serves as a backdrop for discussions regarding consumer behaviour in Social Marketing. The following sections describe the motivational requirements for altering risk attitudes. This is followed by a discussion of how the learning process allows for different Risk Preferences to be adopted.

Following this, additional sections describe how specific lifestyles and concepts of risk influence risk taking. This is followed finally by relatively permanent factors affecting risk taking – these are cultural and demographic factors.

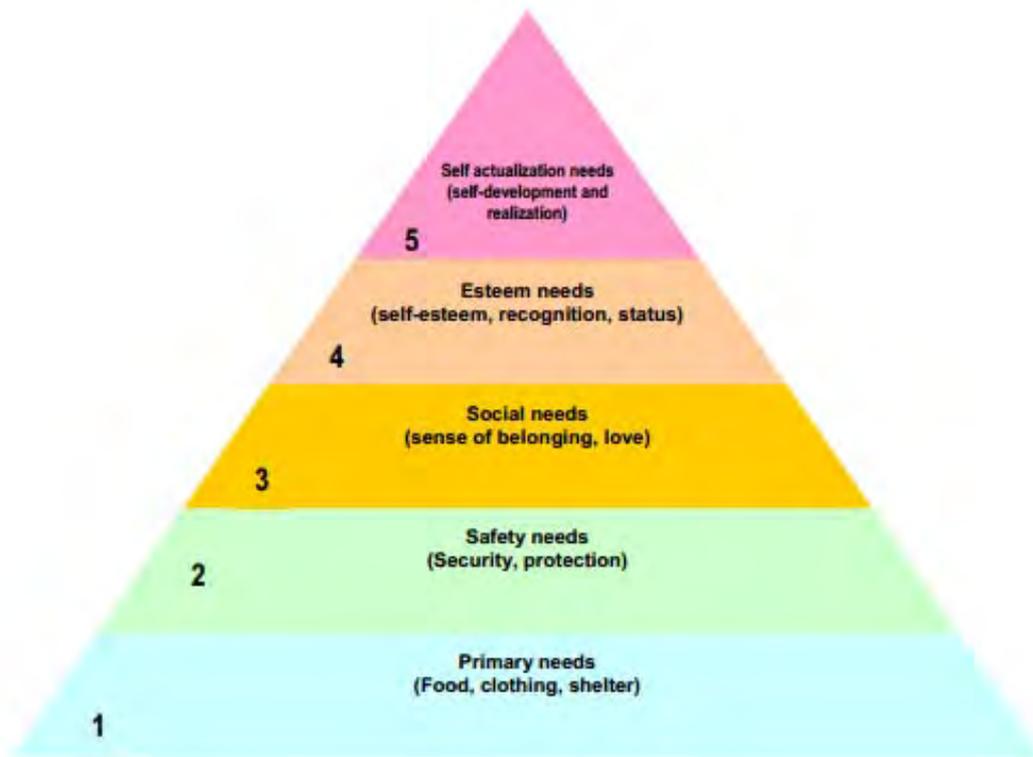
Some studies have also suggested that this elevated level of perceived risk, allows for appropriate motivation required in order to induce a behavioural change in risky behaviour, where moderate levels of perceived risk lack required motivation in order to induce behavioural change and these levels of perceived risk remain fairly consistent over time (Brewer, Weinstein, Cuite & Herrington, 2004). As such, the topic of motivation in prompting changes in risky behaviour will be discussed next.

### **3.6. Motivation to be risky**

Within the area of behavioural decisions, motivation can be defined as the thing that compels and induces individuals into performing an action (Hawkins, Best & Coney, 1998; De Klerk & Tselepis, 2007). Motivation has also been defined as the state where internal desires, needs and concerns encourage behaviour, with the aim of satisfaction (Mallalieu, 2000). Hollywood, Armstrong and Durkin (2007:692) further describes motivation as a tool which “guides” individuals throughout behavioural decisions and acts as a persuasion that a specific behaviour might indeed satisfy a need, where motivation can assist individuals in the development of criteria for the evaluation of behaviours, which affects the consumer’s perceptual, attitudinal and thought processes.

Mowen and Minor (1997) offer a differing understanding of motivation, where a motive can only exist if there is a corresponding need similarly exists. This raises the discussion about the hierarchical need pyramid, suggest by Maslow (1943), where physiological needs represent the most basic of needs and self-actualization needs represent the ultimate in the hierarchal classification of needs. Holistically, the hierarchy exerts that in order for a human to be happy, all of their needs throughout the pyramid, for the individual, should be met (Blood, 2007). However, within satisfying these needs, an ordered process from physiological, safety, love, esteem and self-actualization needs must be satisfied in that order. Maslow’s hierarchy is illustrated in figure 2.4.

Figure 2.4: Maslow's hierarchy of needs



Source: Schiffman and Kanuk (2008:99)

Despite Maslow's hierarchy, it has been observed that individuals can seem to make decisions based entirely on their own motivations which prompt specific behaviours and purchases within a market (De Klerk & Tselepis, 2007). In some cases, an individual might adopt a specific behaviour or purchase a product which satisfies esteem needs, rather than an alternative which promotes safety needs. This is because this individual might be focusing on satisfying a specific esteem objective by focusing on esteem-satisfying attributes of the behaviour or product over that of safety-promoting attributes (Zhang & Tang, 2006). In this instance, it would be inferred that an individual trusts that the behaviour or product satisfies all of the required needs already, alternatively, there would exist a tension between objective attributes and unfulfilled needs (Zhang & Tang, 2006).

Within consumer markets, alternative theories regarding the interplay between motivation and associated needs have been explained using specific shopping typology. Westbrook and Black (1985:87) presented motivations for the entire shopping process which corresponded to "functional and non-functional needs". Six hedonic shopping motivations

were presented, such as the being motivated to experience adventure shopping, social shopping, idea shopping, role shopping, value shopping and gratification shopping.

Park and Sullivan (2009) further distinguished shopping motivations into hedonic and utilitarian groupings, where hedonic motivations represented the entertainment value (potential or realised) of the shopping activity. In contrast, utilitarian motivations were defined as those which were goal orientated, stressing the efficient and timely act of purchasing, while minimizing irritating factors.

Another classification has made use of motivation being driven by either personal or social needs (Jamal, Davies, Chudry & Al-Marri, 2006). Personal motives are identified as being that of diversion, self-gratification, physical activity, role-playing as well as sensory stimulation. Diversion represents how shopping can present various opportunities to shoppers which allow for an escape from daily routines, this is synonymous with recreation and escapism. Self-gratification highlights how shopping can be used to alleviate depression and can be used to raise a shopper's mood. Physical activity reflects the simple need to engage in physical exercise, which could be elevated through time spent moving through a physical market and is a strong motive within urban environments. Role-playing as a motive is simply the motivation that certain learned and expected participation within a market can form motivation. Lastly, the understanding of sensory stimulation as a motivating factor refers to a desire by consumers to interact in a market environment which carries pleasant stimuli; this could be realised in the look and feel of products, packaging, staff, atmosphere and many others.

Apart from such personal needs and corresponding motivations, Jamal, Davies, Chudry and Al-Marri (2006) list social needs as the other branch of needs; this includes a need for social experiences as well as communications with other individuals, a need for social status and to be recognised as a peer attraction. The social and communication needs stem from a desire to engage with like-minded individuals. Needs such as peer attraction also exist, refers to the desire to be known as a reference group and the social status need is that of commanding attention and holding respect from other people.

Within health behaviour adoption, risk perceptions themselves can be considered as motivational influences (as described in the previous section) (Floyd, Prentice-Dunn & Rogers, 2000; Brewer, Weinstein, Cuite & Herrington, 2004), where worry and other affective states contribute motivation for positive behavioural change (McCaul, Schroeder & Reid, 1996; Loewenstein, Weber, Hsee & Welch, 2001). Atkinson (1957) proposed that the strength of motivation to adopt something is dependent on motive, expectancy and incentive. This requires all three to act similarly, for sufficient motivation to be developed.

Previous literature describes Risk Preferences as being fairly stable and resilient to changes by most external experiences (Ajzen & Fishbein, 1980; Weber *et al.*, 2002). As this study aims to describe the effects of Social Influence, it was necessary to determine if sufficient motivation exists to facilitate such changes. As no prior research has evaluated the Risk Preferences of Generation Y individuals over time, this was important to understand. Therefore, this study proposes:

*H<sub>1</sub>: There is a strong correlation between Risk Preferences in Generation Y individuals throughout their young adulthood*

Apart from having sufficient motivation required to change attitudes towards risk-taking, additional processes such as learning offer insight into how Risk Preferences are processed mentally and the most influential methods of inspiring alternative Risk Preferences in individuals.

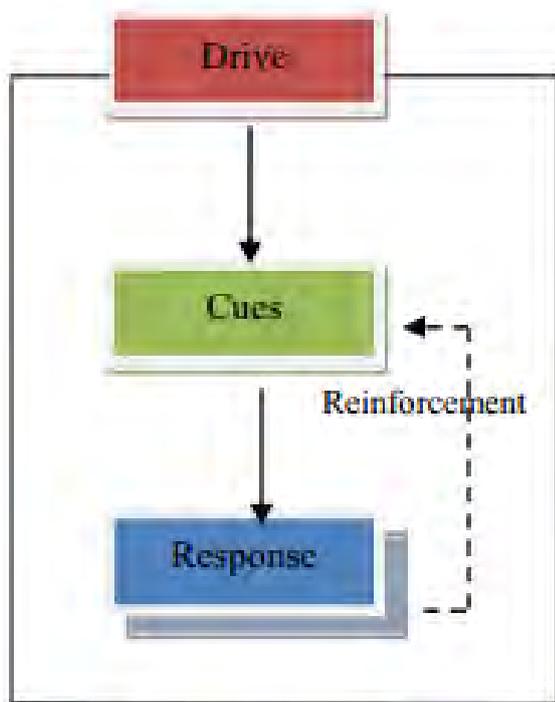
### **3.7. Learning and risk-taking**

Learning is broadly defined as the product of motivation, attention, experience as well as repetition (Van der Walt, Strydom, Marx & Jooste, 1996). Brassington and Pettitt (1997) have defined learning as a permanent change in behaviour, due to practice of a specific behaviour. Kinnear, Bernardt and Kotler (1990) mention that the outcomes of learning are that of personal values, attitudes, tastes as well as personalities.

Within the concept of learning, Bovée, Houston and Thill (1995) suggest that behavioural and cognitive learning be declared separately. Behavioural learning means to describe the

learning which is in response to external events which the learner is met with. Cognitive learning describes involves mental thought about a problem and exerting effort to solve it and reach a conclusion. In some cases, the reinforcement of learning can occur when followed by a pleasing stimulus (McCarthy & Perreault, 1993). This allows for a strengthening of the relationship between the learning cue and the response (learning). Repeating this process has been found to develop habit, allowing for the behaviour to become routine (McCarthy & Perreault, 1993). Figure 2.5 highlights the learning process and the relationship between key variables within this process. In simple cases, consumers might only learn how much they enjoy a product after using it or the quality of a product after its deterioration (Jobber, 1998; Villa-Boas, 2004).

Figure 2.5: The learning process



Source: McCarthy and Perreault (1993:28)

Schiffman and Kannuk (2007) argue that drives are determined by an individual's personal needs and goals and spurs learning. A drive has also been described as what is specifically responded to, within the learning process (McCarthy & Perreault 1993). Depending on the cue, this drive could result in specific responses, which depend on an individual's history as well as other factors.

Kotler and Armstrong (1996) assert that reinforcement is something that can only be acquired after experience and learning – where the reinforcement can be either positive or negative. Access to information is an important factor which can encourage positive or negative reinforcements and therefore is a strong predictor of future behaviour as well as the stance that individuals take during assessment (Boyatzis & Kolb, 1995).

The prevention of certain risky behaviour is addressed through similar strategies (Dryfoos, 2010). Within the United States of America, for instance, there is national support for coordinated learning programs which promote positive behaviour during youth development (Kolbe & Collins & Cortese, 1997; Marx, Wooley & Northrop, 1998). One such program is that of the Social and emotional learning (SEL), which through reinforcement, allows for responsible behaviours to be fostered (Elias, Zins, Weissberg, Frey, Greenberg & Haynes, 1997). Other programs such as the Collaborative to Advance Social and Emotional Learning (CASEL), which combat risky behaviour surrounding alcohol, tobacco, and other drug use; violence; sexual promiscuity, general health, and character education, through increased knowledge and understanding of risk perception, motivational to change behaviour, as well as encouraging positive attitudes and values, surrounding risky behaviour (Payton, Wardlaw, Graczyk, Bloodworth, Tompsett & Weissberg, 2000).

Following from the learning process specific patterns of risk behaviour can be developed. These can be realised through an individual's personality, lifestyle habits or risk persona. These areas begin the discussion of more concrete individual characteristics, such as demographics and cultural alignment. First a discussion of personalities and risk-taking is presented.

### **3.8. Risk persona**

Personality as a factor is defined as a pattern of traits that are influential in behavioural responses (Stanton *et al.*, 1993). Personality can be seen as inner psychological characteristics when responding to environment and personality is therefore useful in analysing and predicting product and behavioural choices by consumers (Kotler & Armstrong, 1997). Product choices can be based on their alignment with an individual's

appearance and can become a means to communicate and enhance their current personality as well as their social attractiveness and to some extent even adjust their social role (Akturan & Tezcan, 2007). The understanding of consumer personality is important also, as they are consistent and enduring within a consumer's lifetime (Assael, 1998). Such personality traits could be that of aggression, compulsive or even compliant personality, which could exist as a result of other predispositions from their personal history (Assael, 1998).

Freling and Forbes (2005) identified five personality traits within brand choice for consumers, which include wholesomeness in nature, imaginative and daring, intelligent and confident, sophistication and charm, as well as ruggedness and strength. Rajagopal (2006:59) identified five personality traits which were referred to as the "Big Five" dimensions of human personality. These are commonly known as extroversion, culture, agreeableness, emotional ability and consciousness. Extroversion can be described as heightened levels of sociability, excitability and emotional expressiveness; culture is defined as a societal characteristic which differentiates social groups; agreeableness is comprised of trust, kindness and altruism; the emotional ability relates to the ability to express feelings; lastly consciousness comprises of goal-orientated behaviour and impulse control (Alberts, 2007; Lamb, Joseph & McDaniel, 2011).

Personality allows for consumer preferences to be influenced when relevant attributes cues are stressed within a market place and have a greater role in determining product usage than that of lifestyle and demographic variables (Goldsmith, 2002).

Within the study of risky behaviour, two sub-dimensions of the human personality trait "consciousness" are commonly cited (Cooper, Wood, Orcutt & Albino, 2003). The first is that of Sensation Seeking, which refers to Sensation seeking refers to preferences for varied, novel and complex situations and experiences, which results in an increased willingness to engage in physical and social risk, in order to achieve such experiences (Zuckerman, 1979). As a result, individuals who exhibit high levels of sensation seeking personalities are thought to be more sensitive to reward than punishment cues, within processes that attempt to reinforce positive behaviour (Gray, 1990). In addition, individuals with low levels of sensation seeking personalities seek pleasure for other reasons and often attempt to instead conform

to peer behaviour (Sutker, Archer & Allain, 1978; Cooper *et al.*, 1998). The second personality trait which is commonly cited in literature regarding risk-prone personalities is that of Impulsivity (Cooper, Wood, Orcutt & Albino, 2003).

Impulsivity, which is defined as the lack of behavioural control, includes the tendency to submit to urges, impulses and desires, with very little contingency planning or prior reflection (Revelle, 1987). This trait is thought to stem from deficiencies in the self-regulation of affect, motivation and ability to learn (Barkley, 1997). Because of this, highly impulsive individuals are more likely to make decisions which maximise immediate gains and show limited understanding of perceived risks (Cooper, Wood, Orcutt & Albino, 2003).

As personalities are comprised of several dimensions, there are effective in distinguishing individual's differences (Assael, 1998), however, additional factors influencing risky behaviour exist, such as an individual's self-evaluation of their personality, this self-concept is discussed next.

### **3.9. Self concept and risk-taking**

An individual's concept of self describes the collection of that individual's thoughts and feelings where the self is identified as an object (Sirgy, 1982). The self-concept is significant to the study of consumer behaviour in that many behavioural choices and purchases are influenced by an the individual's self-image (Heath & Scott, 1998) and the effects of which have been assessed on the consumer's perception of market offerings as well as symbolic interactions within a market place (Mishra, 2008). An understanding of the concept of self is important in that risky behaviours would not be discarded if they reflect the intended individual's image of self (Heath & Scott, 1998).

Mishra (2008) has suggested that the self-concept can be understood using various psychological theories. Behavioural theory explains the self as a set of conditioned responses; Organismic theory simply identifies the self as the holistic consumer; cognitive theory explains the self as a conceptual system which processes information that is related to the self and finally symbolic interactions explains the self as a function, however of interpersonal activities.

It has been suggested that the self-concept should be identified as having four distinct dimensions and not merely one interpretation of self; this should include that of the social self, the actual self and an ideal of each (Schiffman & Kannuk, 1997). The social self-image represents how an individual thinks that others perceive that individual (where the ideal represents what is preferred), the actual self-image represents the way in which an individual perceives his/herself (where the ideal represents what is preferred).

Despite substantial theory highlighting the various aspects of the consumer behaviour which the self-concept influences, a thorough understanding of other social, cultural, involvement and environmental influences is required how the individual interacts, during the development of their risk behaviour (Ostgard-Ybrandt, 2004; Murcia, Gimeno, Vera-Lacarcel & Ruiz- Perez 2007). The primary method in the development of self-identity is that of people who closely surround the individual, including friends, family and peers (Smith, Tigen & Waller, 2004) and consumers promote their ideal self-image through engage in behaviour which promote their ideal self and social-image (Oh & Fiorito, 2002; Phau & Lo 2004).

Risk behaviour is derived partially from one's perceived social representation, which is described as the backdrop of identity development (Breakwell & Millward, 1997). This factor shapes one's self-concept to accept particular social representations, so that they are reflected in one's behaviour (Breakwell, 1993). These social representations can be in the form of orientation within a family, where younger individuals are considered to be more risky, or surrounding other demographics, such as gender, where males are considered to be more risky (Millward, 1995). The conformity of an individual's self-concept, to align with stereotypes surrounding their demographics, can therefore induce stereotyped behaviour as a result (Moscovici, 1988). The specifics of these demographics are discussed in section 3.12.

A summation of the aforementioned factors allows for personality traits to be developed and over a more holistic description of a consumer's buying style or behaviour, lifestyle as a factor will be discussed next.

### 3.10. Risk lifestyle

Similarly to that of personality, however more activity-specific – lifestyles can be defined as a pattern of living, which is expressed through opinion, interest and activity, which portrays the individual as a whole, interacting with the environment (Kotler & Keller, 2006). Lifestyle has also been defined as a “mode of living” which is identifiable through chosen activity, expressed interest and opinion of their environment (Assael, 1998:584). Todd, Lawson and Faris (1996) define lifestyle as the goals which people express and the means used to achieve them.

An individual’s lifestyle is influenced through that individual’s personality as well as their preferences (Oh & Fiorito, 2002) and this lifestyle is reflected by these consumers by their interactions within a market setting (Orth, McDaniel, Shellhammer & Lopetcharat, 2004; Sun, Horn & Merrit, 2004). The Value and Lifestyles (VALS) typology defines consumers into eight groups: actualisers, fulfillers, believers, achievers, strivers, experiencers, makers and strugglers (Kotler & Armstrong, 1996). Each of these groups relates to the levels of income, work ethic and resource abundance, which ultimately determines the degree to which these consumers can indulge in self-oriented purchases. Actualisers represent a social group with a large amount of income who can indulge in expensive purchases; Fulfillers are mature, well-educated and responsible; Believers are those who have modest incomes, are largely conservative and predictable consumers who purchase well-established products; Achievers are largely work-oriented and focus on family and career development; Strivers hold values similar to achievers, but have fewer resources (social, economic and psychological); Experiencers spend heavily on durables and are generally younger; Makers are focused on, and highly aware of, their impact on the environment; lastly Strugglers represent consumers with low incomes and are without adequate resources to engage in meaningful self-oriented purchases (Kotler & Armstrong, 1996).

This typology would agree that the lifestyle of a consumer is influenced by factors which are internal to the individual, as well as external environmental factors (Wu, 2003). Environmental influences such as the degree of individualism or collectivism within a culture influences lifestyle variables, such as travel orientation, brand usage, lifestyle satisfaction and financial optimism (Sun *et al.*, 2004). Lifestyle variables are also able to somewhat

determine differences in purchasing patterns as a consumer's lifestyle portrays their personality (Orth *et al.*, 2004).

Specific lifestyles can additionally be prone to engaging individuals to engage in risky behaviour. While the physical environment can constitute towards fostering a risk-prone lifestyle, such as socially disadvantaged individuals having less access to health information and resources, allowing for unhealthy eating, smoking, and heavy drinking (Nagorski, 1993; Cockerham, 1997; Wickrama, Conger, Wallace & Elder, Jr., 1999) however, such examples are exogenous to the study of consumer behaviour.

Other developments, such as the Theory of Problem Behavior (Jessor, 1987; Jessor, Turbin, Costa, Dong, Zhang & Wang, 2003), proposed in the study of risk behaviour among adolescents, that specific risk behaviour should be studied within a more general context of adolescent development, where specific risk behaviour should be evaluated within individual's entire lifestyle. This stressed that risk behaviour, such as heavy drinking and reckless driving should be considered in a system which includes other risky behaviour (Behavior System); with respect to their peers, school and family context (Perceived Environment System); and also to their values, opinions and feelings (Personality System). Within each of the aforementioned systems, risk factors and protective factors produce a lifestyle (Jessor *et al.*, 2003). In the context of adolescent risk habits, driving under the influence of alcohol is associated with adolescents spending more time involved within social activities and less time studying (Beirness & Simpson, 1988). Adolescents who have been involved in car accidents, have been found to be more likely to engage in other health-endangering behaviour (Beirness & Simpson, 1988), where risky driving, alcohol and other illicit drug use have strong associations among adolescents (Donovan, 1993; Everett, Lowry, Cohen & Dellinger, 1999). However, these such lifestyles extend even further, showing associations with sports, music, political involvement (Gregersen & Berg, 1994). Further studies into the context of such behaviour, and under what conditions such risky behaviour occur, also seem to illustrate particular lifestyle factors.

In addition to different lifestyles, different cultural groups also result in differences in consumer behaviour. Demographic and cultural factors are especially important as they are generally form the first segmentation tool, for identifying differences within the market. As

limited research exists which look at the cultural factors and Risk Preferences of the Generation Y cohort, these are discussed first.

### **3.11. Cultural and sub-cultural factors influencing risk-taking**

Culture can be defined as a grouping of values, ideas and meaningful symbols which enable effective communication, interpretation among individuals and allow for identification with a society (Banerjee, 2008). Culture represents a dynamic process within groups, where a common understanding of beliefs, values, meaning as well as attitudes, develop a shared perception, reasoning, thought, or set of actions, responses and interactions (Luna & Gupta, 2001; Leo, Bennett & Hartel 2005). Because of this, cultures seem to include many aspects of life, such as the development and evaluation of knowledge, morals, belief, art, law, specific customs as well as habits, religion, education, dress codes and even the capabilities a society holds (Craig & Douglas, 2006).

Therefore as culture extensively influences an individual, cultural beliefs and values deeply influence economic decisions of consumers (Kamaruddin & Kamaruddin, 2009). Importantly, consumer needs and desires are shaped by their supported values which are generated by their society's culture (Kim, Forsythe, Gu & Moon, 2002). This development is due to learning within a culture, and can be similarly true for that of wants and behaviour (Livette, 2006).

Specific focus on subcultures happens within a market because of the oversaturation of different ethnic groups within even one culture, segmentation by subculture has allowed for distinct appeal by largely homogenous groups (Holt, 2002). Subcultures are often described as including specific ages, values, customs, racial groups, religions and sometimes nationalities and geographic regions (Kotler, 2000; Lamb, Hair & McDaniel, 2000). Sub cultures have been studied through various disciplines and well-established subcultures exist through musical, artistic, sociological, anthropological and other intellectual areas (Burgh-Woodman & Brace-Govan, 2002). The study of subcultures is also prominent within the study of markets (Lamb, Hair & McDonald, 2000).

Subcultures maintain a strong sense of identity as well as solidarity, as they are largely opposed to mainstream culture (Tocci, 2007). From this, lucrative market segments have established because of various subcultures in recent years (Schofield & Schmidt, 2005).

From the above section, it can be seen that culture symbolises values, ideas, beliefs and attitudes which form part of a particular society. Additionally, such attributes shape the behaviour within the society and the type of purchases which they make (Singh, 2006). Subculture, by contrast, is associated with distinct values, beliefs, attitudes and customs which are shared by a unique group of people.

In prior studies involving risk perception and risk attitudes among global cultures, distinct differences were found. Weber and Hsee (1988) found that Chinese consumers were significantly more risk-averse in their attitudes and having a different perception of risk than American consumers, with regards to product pricing. However Bontempo, Bottom and Weber (1997) found that when comparing university students among Hong Kong, Taiwan, the Netherlands, and from America – the Chinese students were found to be more sensitive to risky scenarios and were reported to be more risk averse in their attitudes surrounding monetary losses. Similarly to section 2.3.7 (lifestyles), results from such studies suggested that differences in either risk attitude or in the perception of risk allows for cross-cultural differences in risky choice behaviour.

While cultural factors represent differences between consumers which are largely chosen, demographic factors offer unique differences in behaviour, as they are not able to be chosen by individuals. As limited research exists which look at the demographic factors and Risk Preferences of the Generation Y cohort, these are discussed next.

### **3.12. Demographics and risk-taking**

Demographic factors which influence consumer behaviour include vital statistics, such as gender, age, income, race, ethnicity as well as location (Cant *et al.*, 2006). Within market segmentation, age is frequent and popular segmentation tool for a substantial proportion of marketable goods (Mokhlis & Salleh, 2009). This is largely because individuals change their consumption patterns as they age, but older consumers also become more committed to

define their interests and patterns, where younger consumers offer promise for new products as they are more open to try new things, engage in new ways and adopt to new technology (De Mooij & De Mooij, 2004). Gender also offers an important distinction among consumers, within certain categories even, there is a constant divide within certain product categories, due to gender, like that of toiletries (Mokhlis & Salleh, 2009). Even demographic differences within the Generation Y cohort might exist because of gender, which have been studied extensively within other cohorts (Booth & Nolen, 2012). Males and females have been previously found differ in their attitudes towards risk-taking, which allows for the management of Social Marketing programs to be aware of gender differences (Gardner & Steinberg, 2005). In order to examine this, within the Generation Y cohort, the following hypotheses is presented:

*H<sub>2</sub>: Females Generation Y individuals have a more averse attitude towards risk-taking than male Generation Y individuals*

Within their own decision-making, regarding risky behaviour, there is additionally robust research which details differences in shopping patterns, product judgement, product choice, information processing and responses to promotional messages (Cleveland, Babin, Laroche & Bergeron, 2003). Income tremendously affects behaviour, where higher-income consumers are more able to purchase expensive and are better able to purchase products which enhance the consumer's status in consumer markets and have better access to health care (De Mooij & De Mooij, 2004). Differences among education levels among consumers also alters the exposure to differing cultural perspectives, due to the ability to overcome certain trade barriers within consumer markets, in this case an increase in income could allow consumers to more readily experience foreign cultures, could bolster interest in foreign products and might even lessen interest in local products (Suh & Kwon, 2002).

Variables such as socio-economic status can have far reaching effects in determining store choice or brand usage, with higher quality and less-risky choices being more accessible for those individuals with a higher socio-economics status (Baltas & Papastathopoulou, 2003). An amalgamation of various demographic variables allows for better prediction of risk behaviour and responses to certain market offerings (Cant *et al.*, 2006:42). Studies have found differences in risk perception among individuals of different ages, where older

individuals are typically more cautious than younger individuals (Botwinick, 1966, 1984; Otani, Leonard, Ashford, Bushroe & Reeder, 1992). The youth face even greater interaction with risky behaviour, firstly through lifestyle settings, whereby the legal introduction to items like alcohol, cigarettes, driving and sex offers means from great misuse and problems to occur (Laapotti, Keskinen, Hatakka & Katila, 2001). Additional reliance on peers in making decisions under great uncertainty also means that peer influence within risky decision-making is prominent (Buccoliero, 1997).

Generational research relies on the study of cohorts within populations, where these cohorts focus around shared experiences or events which influence them in subtle ways (Sessa, Kabacoff, Deal & Brown, 2007). Awareness of this theory offers alternative ways to evaluate differences between consumers, instead of conventional groupings based on geography or social class; however, most importantly, generational research allows for justification for these differences (Bolton, Parasuraman, Hoefnagels, Migchels, Kabadayi, Gruber, Loureiro & Solnet, 2013).

Additional demographic differences can exist out of generational differences, upon which this study of the Generation Y cohort is based, where each generation is expected to share a common perspective (Simirenko, 1966; Mannheim, 2013). This perspective allows a generation to develop specific characteristics, which differentiate the generation from others, as they mature (Bolton *et al.*, 2013). These could include differences in attitudes, motivations, personality, values and other characteristics (Wey Smola & Sutton, 2002).

Generational theory assumes that people born within a particular time period belong to a particular generational cohort, which is distinctly different in terms of values or attitudes from other cohorts (Strauss & Howe, 1992). However, there are many problems in conducting research which attempts to research generational characteristics. A great many number of studies tend to generalise research which has been conducted at a cross-sectional level, and do not adequately rule-out the effects of age versus actual generational differences (Rust & Yeung, 1995; Sessa, Kabacoff, Deal & Brown, 2007; Roberts & Mroczek, 2008).

Some studies claim that generational differences do not exist in any way within the realm of risk behaviour and differences only exist between demographics due to age effects and that

current generations differ in no way in terms of their attitudes towards engaging in risky behaviour than those of prior generations (Zuckerman, 1994). Such studies simply find that individuals between the ages of 9 and 14 carry heightened levels of risk attitudes, which diminishes over time (Trimpop, Kerr & Kirkcaldy, 1998). However, generation theorists propose that as the macro-environment changes are responded to differently by generational groups, however such research is limited in that it has not been extended to the realm of the most recent generation group - Generation Y (Strauss & Howe, 1997). These discrepancies offer means for further research into the development of risk behaviour across the Generation Y group. As the assessment of age differences within the Generation Y cohort has not yet been studied (Gardner & Laurence Steinberg, 2005), this study additionally proposes that:

*H<sub>3</sub>: Older Generation Y individuals have more risk averse attitudes towards risk-taking than younger Generation Y individuals*

Studies conducted in different countries or involving different cultures, have also found that different behaviours are considered undesirable and considered to be part of a risky lifestyle in one society and might not be in other societies (Jessor *et al.*, 2003).

#### **4. CONCLUSION**

This chapter sought to explain the various factors which influence consumer decision making, as well as the various models which have been proposed to explain the formation of these factors or its interaction with other factors, while developing risk characteristics. This was described within the context of Social Marketing, where risk behaviour and the development of various risk attitudes, motivations and other consumer characteristics are important in understanding and inducing positive social change.

Generational research has appeared within the last decade as a means to further understand consumers (Mannheim, 2013). Generational research was presented in this chapter as a means to further classify consumers so as to allow for a better understanding generation groups as a consumer decision making factor. Such research relies on a specific assumption that generations within a population develop specific dispositions towards

perceptual, motivational, attitudinal, and other consumer decision factors. The Generation Y group, which form the most recent generation of consumers to be born and the importance of this group was made apparent in this chapter and the specific problems which Social Marketing and policy makers have in understanding specific behavioural characteristics of this cohort (Brosdahl & Carpenter, 2011). Generation Y is known to be an important cohort, having a high degree of economic usage, but carries limited academic research in defining it. Previous research defines the Generation Y consumers as having a high degree of involvement in technology and are more social than prior generations. Current research describes Social Influence in a market setting, but this has not been measured for Generation Y consumers. This study evaluates Social Influence in the Generation Y cohort, across the attitudinal measure of Risk Preferences, as these are important for effectively managing Social Marketing efforts. The following chapter presents specific routes of studying Social Influence and the impact of this study makes for knowledge about the Generation Y.

Various social factors were also mentioned as having strong means to change risk behaviour, specifically through community support and the creation of social norms. These are often utilized for enhancing Social Marketing programs. Social Influence derived from reference and other social groups offer a means to describe how consumers liken or distance their behaviour from specific influences within a market setting and most importantly how they derive specific risk behaviour and attitudes. As such, the importance of reference groups in influencing behaviours and attitudes. Chapter III therefore discusses Social Influence and the manner in which peer effects and Social Influence have been studied in prior research. Throughout the chapter, the various hypotheses relating to this study are also mentioned. Additionally, the chapter will present various methods used by recent studies to identify Social Influence. This study subsequently adopts the most appropriate method.

## **CHAPTER III**

### **SOCIAL INFLUENCE AND THE MODELLING OF RISK PREFERENCES**

#### **1. INTRODUCTION**

Chapter II described Social Marketing as being fundamentally concerned with risk behaviour and methods of reducing it. Using consumer behaviour theory, the importance of risk across a range of aspects, such as consumer motivation, learning and other predisposed factors were described. Attitudes and social norms towards risk behaviour were discussed through various behavioural change models as having great importance in encouraging or inhibit changes in risk behaviour.

Generation Y was presented as a particularly important group, with little research currently found surrounding their consumer behaviour, which makes actionable Social Marketing plans fundamentally stunted. As the previous chapter also discussed how Social Influence is so important within Social Marketing and how the Generation Y cohort is substantially vulnerable to Social Influence – this chapter will continue to discuss the specifics of Social Influence and how it is dispensed within adolescent groups. The measures of Social Influences is discussed in this chapter, where various hypotheses are be proposed. Additionally, surrounding the influence of social interaction, on that of Risk Preferences will be further explored, especially in the adolescent community, as this group represents a substantial proportion of the Generation Y cohort. Various mathematical tools and statistical methods exist, which have an extensive ability to measure Social Influence on risk and the primary methods of prior research will be discussed, while developing methods for this study itself.

This chapter follows to elaborate on the way in which Social Influence determines risk attitudes in the Generation Y group, paying careful attention to the manner by which adolescents respond to peer influence. This chapter will additionally propose various hypotheses relating to the sources of influence which are expected to be greatest for this group and under what conditions are required for this influence to take place. Specifically, differences in social distance and physical distance are discussed and their importance in the discussion of Social Influence is made apparent. A discussion is undertaken surrounding

the manner by which peer influences arises. Following this, the previous methods of measuring Social Influence are described and the model for this study is presented.

Kotler and Keller (2006) highlights in their work on consumer behaviour, that attitudes and behaviour are modified via social and family factors such as siblings, parents and friends, which are all external to the individual. These have an important role in the development of risk attitudes, which is of interest in the realm of Social Marketing. When focusing on the Generation Y cohort specifically, it is evident that they are more sociable with their peers than any prior generation (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996) and more susceptible to influence the views of their peers (Beard, 2003; Noble, Haytko, Phillips, 2009). Social factors therefore represent a pertinent topic in Generation Y discourse and will form the bulk of the discussion in this chapter. These influences are discussed next.

## **2. SOCIAL FACTORS INFLUENCING RISK-TAKING**

Within developing risk behaviour, socialization allows for negative behaviours to be easily internalised by individuals through some influence process (Nock & Prinstein, 2005; Stevens & Prinstein, 2005; Prinstein, 2007; Heilbron & Prinstein, 2008; Prinstein, Guerry, Browne & Rancourt, 2009; Van Zalk, Kerr, Branje, Stattin & Meeus, 2010). Negative body image attitudes in adolescent girls may be transmitted by peers (Hutchinson & Rapee, 2007) and this is a great concern for Social Marketing efforts. Peer influence can even arise because of held values, beliefs and motivations for risk behaviour (Ryan, 2001; Wentzel, Barry & Caldwell, 2004; Poteat, 2007; Poteat, Espelage & Green, 2007). Such Social Influence is particularly strong within adolescent groups and has far-reaching consequences in their development (Umberson, Crosnoe & Reczek, 2010). Additional work has also been conducted into areas where peer socialization processes may provide protection from negative behaviour, which is also of interest to Social Marketing efforts (Prinstein, Boergers & Spirito, 2001; Adamczyk-Robinette, Fletcher & Wright, 2002; Barry & Wentzel, 2006).

## 2.1. Reference groups and risk-taking

Influential groups in consumer buying decisions are termed reference groups and are formally defined as all groups of people who have fact-to-face or indirect influence on a person's attitudes or behaviour (Kotler *et al.*, 2009). Individuals compare themselves to these reference groups as means of guidance in the development of their own attitudes, beliefs, knowledge, and/or behaviours (Hoyer, MacInnis & Dasgupta, 2008). Three distinct types of reference groups exist, each having a different type of influence on individuals (Hoyer, MacInnis & Dasgupta, 2008; Lamb, Hair & McDaniel, 2011). Indirect reference groups refer those groups with which an individual does not directly interact, but is ultimately influenced by. This includes aspirational reference groups, which are the groups that an individual admires and desires to be like. Another type is that of dissociative reference groups, which are groups that an individual does not wish to emulate, and will subsequently attempt to avoid, related behaviour and attitudes. Associative reference groups refer to those which an individual is actively a member of (Kotler *et al.*, 2009).

Associative reference groups can be further categorised into primary or secondary groups, which helps explain the degree to which these reference groups influence the development on an individual's development (Kotler *et al.*, 2009). This classification groups family, friends, neighbours and co-workers in the primary category because of their fairly continuous interaction with a person. Secondary groups include things such as church members, trade union members and other infrequently interacted persons, with limited influence on an individual's development.

As part of primary reference groups, family members are said to be the most influential group in influencing an individual's buying behaviour, where even minimal interaction could result in affected behaviour (Kotler & Keller, 2006). With respect to the behaviour surrounding high-risk, for example, reference group appeal has been found to be the most preferred risk reliever, which encourages individuals to purchase high-risk products, in spite of the individual's prior Risk Preference (Venkatesan, 1966; Tan, 1999).

In Social Marketing, the influence of reference groups is a widely discussed topic, however, where opinion leaders are often studied and used (in practice) because of their potential to

influence/reduce risky behaviour in a target audience (French & Raven, 1959; Childers & Rao, 1992; Walsh, Rudd, Moeykens, Moloney, 1993; Perkins, 2002). From this, it can be seen that attitudes surrounding risk, for example, which do not align strongly with socially desirable reference groups, require substantial understanding, so that behavioural changes can be planned and effectively realised within a market context.

Specific types of Social Influence exist as a result of reference groups, as they offer predictable influence in the individual risk-taking and decision-making in general, they will be described in the following section.

## **2.2. Role models influencing risk-taking**

As an influencer of consumer behaviour, role models are defined as people to whom an individual aspires to, or sees as a source of personal standards (Lancaster & Reynolds, 1998:45). However, the term “role model” has been described broadly to be anyone who comes into contacts with an individual (either directly or indirectly) who might influence buying decisions or behaviour (Martin & Bush, 2000:443). This definition allows possible role models to include peers, siblings, entertainers, teachers, or even celebrities – who are mimicked by consumers through changes in self-image, lifestyle and ultimately consumption patterns (Martin & Bush, 2000).

However, with such a broad definition of role models, it is important to understand in what way role models influence each of the aforementioned activities. Makgosa and Mahube (2007) classify Social Influence under three groups: informational, value expressive and utilitarian. Informational influence refers to the perception of enhanced knowledge of the environment. Value expression influence relates to altering an individual’s self-concept. Lastly, Utilitarian influence describes how compliance with a specific role model could allow achievement awards or deter certain punishment.

Past research has identified that role models appear to aid retailers through various types of product associations are commonly used in marketing communications (Schiffman & Kannuk, 2008). Five types of possible role models make use of: expert, celebrity, executive, spokesperson, and common person appeals (Schiffman & Kannuk, 2008). Expert appeals

are appropriate when special or unique experience helps consumers evaluate products or services in marketing communications. Celebrity appeals involve the usage of widely recognised or notable person, such as movie actors, TV personalities, entertainers or sportsmen who command high degrees of media attention. The executive appeal involves senior management within a firm, promoting their own product. Spokesperson appeal involves a presentation of idealised images of promoted products. Finally, a common man appeal involves the use of supposedly satisfied customers, who have good experience in using the product.

When used to enhance marketing messages, role models offer a means for consumers to evaluate their own brand attitudes and purchasing behaviour against those of the role models used (Lancaster & Reynolds, 1998; Du Plessis & Rousseau, 2003; Sidin, Abdul-Rahman, Abdul-Rashid, Othman & Abu-Bakar, 2008). Such behavioural and attitudinal influences similarly take place in a family setting; this important context for influencing behaviour is discussed next.

### **2.3. Family and household factors influencing Risk-taking**

Within the decision-making process, a large proportion of behavioural choices in everyday life is strongly influenced by one's family (Shoham & Dalakas, 2005). Because of this, the family influence is important in understanding how decisions are made and risk is valued by the family unit.

The family is defined as a group of two or more people who are either related by blood, marriage, adoption or reside together in a household (Levy & Kwai-Choi Lee, 2004). A majority of past research looks at the influence of husbands and wives within decision-making; however the study has gradually expanded to also include the influence of children.

Within a child's own decision-making – family, peers and media appear to have the most impact on a child's decision-making in the market (Wimalasiri, 2004). Since the 1950s, children have come to be considered as consumers in their own right, as appose to mere extensions of their parents, in terms of purchasing power within a market (Wimalasiri, 2004). Such market offerings have thus expanded to offer child-friendly alternatives to major

brands, offering colourful alternatives, playful displays and even child credit cards (Caruana & Vasallo, 2008). It is apparent then that young consumers are eager to consume and are very conscious of their shopping experience and means to purchase (Bertha, 2005:2).

It has been proposed that different family members contribute different parts and have different roles within household decision-making (Sidin, Zawawi, Yee, Busu & Hamzah, 2004). These roles might differ due to who initiates demands, contributes market information, decides the place of purchase, makes branding and styling decisions, authorises methods of payment, or identifies user benefit for the family (Sidin *et al.*, 2004).

It has been identified that because the family is a crucial decision-making unit, the interactions between family members can be seen as more influential in purchasing decisions, than that of friends and work colleagues (Levy & Kwai-choi Lee, 2004).

Within different product categories, the influence of different family members might differ substantially (Martinez & Polo, 1999). This could mean that the needs of the children are more prominent when purchasing food, entertainment or transport; teenagers might be more influential when purchasing fashion apparel, or parents might be more influential in very costly purchases (McCarthy & Perreault, 1993; Martinex & Polo, 1999).

While each family member has his/her role in consumption decisions, a hierarchy of age and income decide the most important agents within a household where parents are more important and children are of less importance (Shoham & Dalakas 2006; Gram, 2007; Martensen & Grønholdt, 2008; Wut & Chou, 2009; Drake-Bridges & Burgess, 2010). However, the process of “consumer socialisation” is said to increase the influence of children in a household and reinforces future consumption behaviour (Caruana & Vasallo, 2003). Consumer socialisation is defined as the process whereby younger individuals acquire knowledge, skills and attitudes regarding their functions and interactions within a market place (Fan & Li, 2010). However as these individuals age and develop into having more importance in household consumption decisions, these children are increasingly more influenced by their peers and less by their parents social cues (Drake-Bridges & Burgess, 2010).

Apart from household consumption, the family influence can be important in the understanding of risk behaviour. Several studies have shown that the family makeup is important in determining risk behaviour, where adolescents with one parents are less likely to engage in risky behaviour (Jemmott & Jemmott, 1992; Metzler, Noell, Biglan, Ary & Smolkowski, 1994), however, parental divorce during early adolescence significantly increases the likelihood of risky behaviour (Devine, Long & Forehand, 1993). The quality of parental relationships similarly has an effect of risk behaviour, where low levels of parental support allow for an increase in the likelihood of risk behaviour in adolescents (Luster & Small, 1994; Scaramella, Conger & Goedert, 1994). Metzler *et al.* (1994) noted that an adolescent's level of perceived parental support, along with other family variables, peer influences, and academic performance were strong predictors of future risk behaviour. Additional factors influencing risk behaviour has been found to be the level of connectedness that adolescents have with other members of the family (Resnick, Bearman, Blaum, Bauman, Harris, Jones, Tabor, Beuhring, Sieving, Shew, Ireland, Bearinger & Udry, 1997). This relationship reflects the quality of communication, and most likely serves as a means for cautious information about risk behaviour to be communicated (Mueller & Powers, 1990; Leland & Barth, 1993, Luster & Small, 1994; Baumeister, Flores & Marín, 1995; Rodgers, 1999). However, it was found that when the actual topic of discussion between adolescents and family members was that of general communication, risk behaviour was greater influenced than when the topic of discussion was that of risk behaviour (Miller, Levin, Whitaker & Xu, 2000). In addition to such relationships providing means for parental monitoring, support and information generation – parents additionally serve as role models for their children, in terms of both risk behaviour and attitudes towards risky behaviour (Metzler *et al.*, 1994).

Modelling the acquisition of such behaviour and attitudes regarding risky behaviour, however, has received little empirical attention, and the actual effect of family members as role-models, influencing risk behaviour and attitudes towards risky behaviour is unclear (Bandura, 1977).

One study found that risk behaviour among family members significantly influenced the risk behaviour of adolescents within the household; however, when controlling for risk attitudes and occurrence of communication about risk behaviour among family members, the

significance of family risk behaviour was found to be insignificant (Kotchick, Dorsey, Miller & Forehand, 1999). However, studies have yet to model that the transmission of family attitudes towards risky behaviour and its influence (Kotchick, Shaffer, Miller & Forehand, 2001).

Despite previous findings exhibiting some family and household factors influencing risk behaviour and attitudes; more extensive examination would be desirable (Miller, 2002). In addition, factors such as the influence of sibling risk behaviour and attitudes are largely lacking from the discussion and have been hypothesised to exert influence on the development of risk attitudes within a family (Miller, 2002; Dohmen, Falk, Huffman, Sunde, 2006).

Much of the current Social Marketing efforts focuses on deterring adolescents from engaging in risky behaviour, as adolescents represent a particularly risk population group in society. This group provides many societal problems, including: underage drinking, reckless driving, tobacco, youth violence, gambling and adolescent pregnancy (Korn & Shaffer, 1999; Derevensky & Gypta, 2000; Jacobs, 2000; Hastings, Anderson, Cooke & Gordon, 2005; McCreanor, Greenaway, Moewaka Barnes, Borell & Gregory, 2005; Meekers, Agha & Klein, 2005; Messerlian, Derevensky & Gupta, 2005; Quinn, Bell-Ellison, Loomis & Tucci, 2007; Kotler & Lee, 2008). Additionally, this global population of adolescents simultaneously orientate themselves as members of the Generation Y (or Millennial) population, who are defined as individuals born since the early 1980s (Brosdahl & Carpenter, 2011). An understanding of the influence that peers have on this cohort is given in the following section. Additionally, definitions of the Social Influence construct and details into the importance of social distance and physical distance are made explicit.

### **3. SOCIAL INFLUENCE AND ADOLESCENT RESEARCH**

Social Influence is defined as the effect that others have on an individual or group, in terms of attitudes or behaviour (Berkman, 2000). This influence can be multidimensional, in that the social mimicry can either allow for an increase in the degree of either socially desirable or undesirable characteristics (Prinstein & Dodge, 2008). This influence develops from social norms which are created within a social group, which describe acceptable patterns of belief,

attitude and behaviour, such as risk attitudes (Axelrod, 1984; Kameda, Takezawa & Hastie, 2005). Such influence is developed over time through interactions with: family, allowing for family influence; school or work peers, allowing for peer influence; community members; religious institutions and other sources of prevailing social norms for an individual (Childers & Rao, 1992). The process of Social Influence arises from reciprocal relationships between social norms and the social structures which an individual occupies and is often practiced through social mimicry (Prinstein & Dodge, 2008).

The opportunity for social interaction is determined through the social context, which maps all of the relevant ties, for individuals (Mouttapa, Valente, Gallaher, Rohrbach & Unger, 2004). An individual's social network consists of the people and groups with whom the individual has contact with and is largely determined by physical context, where an individual's neighbourhood, school, church, or family largely dictate this network (Wilcox & Keselman, 2003). This forms social networks, which are important in allowing individuals to share information, shape perceptions and develop social norms (Mouttapa *et al.*, 2004). These relationships are not dependent on time involvement alone though, but the closeness, reciprocity and frequency about which these individuals interact largely determines the type of Social Influence which is generated (Mouttapa *et al.*, 2004).

Group membership through schools, peer groups and even one's own family offer an extremely powerful social experience where opinions, perceptions, behaviour and (most importantly for this study) attitudes can be shaped and adjusted to follow the expectations and norms of the group (Forgas & Williams, 2001; Kameda, Takezawa & Hastie, 2005).

The peer group association during adolescence is particularly important and strong, where being part of a friendship group which is based on classroom interaction, club affiliation, clothing or interests allows for easy acceptance and conformity (Brown 1989). Groups allow for common attitudes and behaviours to be shared (Eiser, Morgan, Gammage, Brooks & Kirby, 1991; Eckhardt, Woodruff & Edler, 1994; Hoffman, Monge, Chou & Valente, 2007; Steinberg & Monahan, 2007).

A substantial amount of prior research has described peer influence on risk characteristics, especially in the area of adolescent behaviour, where this influence is often equated with that of "peer pressure", and where such influence has historically carried a negative

connotation (Arnett, 1992). Risk behaviour such as reckless driving, substance abuse, unsafe sex, and criminality have been studied at length and have been largely attributed to peer conformity (Coleman, 1961; Walsh, Ferrell & Tolone, 1976; Berndt, 1979; Jessor, 1991; Arnett, 1992; Irwin, Igra, Eyre & Millstein, 1997; Steinberg, 2004; Gardner & Steinberg, 2005). However, such influence is seen to decline for individuals entering adulthood (Coleman, 1961; Brown, Eicher & Petrie, 1986b; Steinberg, 2004).

The influence of peers is also not often confined to one specific behaviour, and the influence of peers often results in conformity in a whole range of risky behaviours simultaneously (Jessor & Jessor, 1975; 1977; Jessor, Chase & Donovan, 1980; Jessor, Costa, Jessor & Donovan, 1983; Donovan & Jessor, 1985; Donovan, Jessor & Costa, 1988; Irwin, Igra, Eyre & Millstein, 1997; Pearson & Michell, 2000). Irwin *et al.* (1997) for example, found that when individuals are encouraged to engage in sexual behaviour at a young age, they too are more likely to start engaging in substance abuse. In such cases, both parents and peers are seen to be a strong influence of risky behaviour, and this truer in each generation group, with the strongest influence expected to show within the Generation Y cohort (Bowerman & Kinch, 1959; Mirande, 1968; Sherif, 1968; Teevan, 1972; Jessor & Jessor, 1977; Shah & Zelnik, 1981; Aseltine, 1995; Irwin *et al.*, 1997; Giordano, 2003). However, most notable of all is the abundant amount of literature which describes positive associations between risk behaviour of individual adolescents and the risk behaviour of their peers and far less so for older groups. This has been studied through both risky sexual behaviour (Mirande, 1968; Teevan, 1972; Kandel, 1978; Shah & Zelnik, 1981; Billy & Udry, 1985; Billy & Udry, 1985b; Brown, Clasen & Eicher, 1986; Jessor *et al.*, 1983; Romer, Black, Ricardo, Feigelman, Kaljee, Galbraith, Nesbit, Homil & Stanton, 1994; Maxwell, 2002; Miller-Johnson, Costanzo, Coie, Rose, Browne & Johnson, 2003; Jaccard, Blanton & Dodge, 2005; Sieving, Eisenberg, Pettingell & Skay, 2006) and substance abuse (Kandel, 1978; Jessor *et al.*, 1980; Brown *et al.*, 1986; Morgan & Grube, 1991; Urberg, Cheng & Shyu, 1991; Aseltine, 1995; Iannotti, Bush & Weinfurt, 1996; Sieving, Perry & Williams, 2000; Maxwell, 2002; Miller-Johnson *et al.*, 2003; Rice, Donohew & Clayton, 2003; Kirke, 2004; Jaccard *et al.*, 2005). Unfortunately such research does not adequately attribute peer influence to these correlations, and such studies are often at risk of selection bias, which has been thought to largely discredited such research (Kandel, 1978; 1996; Aseltine, 1995). This selection bias has been suggested as there is a tendency among individuals where friends are chosen because they are more

alike to themselves in terms of opinions, attitudes and behaviour (Aseltine, 1995; Kandel, 1996). However, it has been thought that a reciprocal relationship actually exists (Kandel, 1978; Aseltine, 1995). In these cases, the study of the various mechanisms which allow for Social Influence are vitally important to decipher and can be in the form of simple conformity to specific group norms, but can also extend to coercion and competition (Festinger, 1954).

Adolescents specifically orientate themselves in society where there are often conflicting norms and values and peers are the most important reference group during this period (Sherif, 1968; Teevan, 1972). Past research makes the clear distinction between “peers” and “friends”, where friends illustrate voluntary associations, forming a clique or other cohesive group, where peers are defined as a larger group from which these friends are chosen (Jessor & Jessor, 1977).

In the case of adolescents specifically, previous studies also focus on peer influence within a school or classroom setting, where studies involving in-school and out-of-school peers are less often found (Kiesner, Poulin & Nicotra, 2003). This has led to a hypothesis that out-of-school peers influence adolescents differently from in-school peers (Kiesner, Poulin & Nicotra, 2003). For instance, adolescents with a greater orientation towards out-of-school peers has been shown to result in higher rates of delinquency (Kiesner, Kerr & Stattin, 2004; Haynie & Osgood, 2005). This is possibly due to the ability of these adolescents to interact in an unstructured and unsupervised setting, which could encourage risky behaviour, but might also be as a result of another form of selection bias (Dishion, Andrews & Crosby, 1995; Haynie & Osgood, 2005).

### **3.1. Social Influence and social distance**

The use of social distance measures can be helpful in evaluating the level of Social Influence that can exist within a group as the degree of friendship or relationship strength between individuals can result in varying Social Influence (Karakayali, 2009). This type of thinking was first developed to measure differences in affective influence between individuals (Bogardus, 1947). The social distance measure refers to the degree of sympathy felt towards another individual, where a greater degree of sympathy could allow for a heightened transfer of affectivity. The measure is that of interactive social distance, which uses the

frequency and intensity of interactions between individuals as an estimate for their social distance (Karakayali, 2009). Such a method would yield a low social distance for family members who frequently interact, over that of a distant friend who no longer keeps in contact with the same individual.

The theoretical models which describe the influence of peers comes in the form of social learning theory (Bandura, 1977) as well as Ajzen and Fishbein's (1980) theory of planned behaviour, which are described in section 3.2 of Chapter II. These theories speak of the importance of a broad peer influence, however most research studying such influence has traditionally studied such influence within the context of friendships and within schooling environments (Giordano, 1995). Within this research, much information currently known about risk behaviour and the influence from adolescent best friends (Giordano, 1995). Additionally, such studies typically measure peer influence when there is a clear relationship established between the two peers. This is usually through the use of questionnaires which enquire into the perceived behaviour of their peers (Mirande, 1968; Teevan, 1972; Jessor *et al.*, 1980; 1983; Shah & Zelnik, 1981; Brown *et al.*, 1986; Morgan & Grube, 1991; Urberg *et al.*, 1991; Iannotti & Bush, 1992; Romer *et al.*, 1994; Sieving *et al.*, 2000), however, more useful observational or sociometric data is sometimes collected (Mirande, 1968; Kandel, 1978; Billy & Udry, 1985; 1985b; Urberg *et al.*, 1991; Urberg, 1992; Aseltine, 1995; Maxwell, 2002; Miller-Johnson *et al.*, 2003; Rice *et al.*, 2003; Kirke, 2004; Jaccard *et al.*, 2005; Sieving *et al.*, 2006).

The former approach of using perceived peer behaviour is criticized in academic literature because such measures are often found to be inflated (Bauman & Fisher, 1986; Bauman & Ennett, 1996; Urberg, Degirmencioglu & Pilgrim, 1997; Maxwell, 2002). What is most often neglected in such studies is that peers often compare themselves with groups with which they do not actually belong to (Merton & Rossi, 1968; Giordano, 1995; Jaccard *et al.*, 2005; Payne & Cornwell, 2007). In most instances, adolescents define their friendships in terms of reputation, rather than the degree of social interaction, where friends are often chosen who hold similar attitudes or behaviour, even if there is infrequent interaction between them (Brown *et al.*, 1986).

It has been argued that the influence of close friends might be less important than generally thought, however this has not been attributed to all behaviour (Jaccard *et al.*, 2005). In studies involving the influence of peers in substance abuse, both peers and best friend influence have been found to be influential, with best friends contributing the most influence (Hussong, 2002). Other studies have found that peer influence has no significant importance in influencing risky behaviour, with only best friends contributing influence (Urberg, 1992). Payne & Cornwell (2007) for example, found that no significant peer influence was derived from friends within three or more connections beyond the adolescent, where a friend of a friend could profoundly affect behaviour, however best friends were found to be the strongest influences. This highlights the importance of indirect peer influence, suggesting that those who are not directly related to individuals, can still influence risk behaviour.

Two examples help illustrate this point, using social contagion studies - two previous studies looked at the transmissive nature of obesity and the transmissive nature of happiness and reported substantial differences in the nature of interaction required for successful transmission (Christakis & Fowler, 2007; Fowler & Christakis, 2008). Despite that of physical distances, the transmission of obesity was found to be effectively distributed among individuals with a very low social distance, which meant that immediate neighbours and friends of the opposite sex represented an unacceptable social distance (Fowler & Christakis, 2008). For the transmission of happiness, the model found that the social distance required for effectively distributing happiness was not limiting. This meant that friends, family as well as loosely connected neighbours also had the ability to influence happiness in individuals (Christakis & Fowler, 2007). This study makes a classification between friends and siblings, as these are the most prominent forms of Social Influence in previous literature, and offer the ability for this study to measure both and identify differences (if any) between the influence of the two.

As there is no prior research investigating the influence of peers on the risk attitudes of Generation Y individuals, and how differences in social distance affect the relationship (specifically friends and siblings, who offer different social distance from individuals) this study proposes:

*H<sub>4</sub>: The association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals is stronger than the association between the Risk Preference of friends and the Risk Preference of Generation Y individuals*

As described in section 2.1, (Merton & Rossi, 1968), reference groups allow for individuals to compare themselves and be influenced by individuals who might not be directly connected to the individual. Acknowledging this, it is seen that Social Influence is not simply restricted to the limits of face-to-face interaction (Giordano, 1995). The only requirement for Social Influence to occur is therefore a mere availability of information about the behaviour of other individuals (the reference group) (Bandura, 1977; Marsden & Friedkin, 1993; Leenders, 2002). Few studies compare the influence of both close peers, to that of the influence of distant peers (Morgan & Grube, 1991; Urberg, 1992; Urberg *et al.*, 1997; Hussong, 2002; Payne & Cornwell, 2007). The importance of physical distance in the influencing of risk attitudes is described in the following section.

### **3.2. Social Influence and physical distance**

Within peer influence, as peers could potentially include a wide range of relationships, from parents, colleagues, siblings, friends or distant relatives, this raised the question as to the degree of social distance between social contacts and the individual, as well as physical distance. Within past studies, neighbours for example, residing within a close proximity to each other and therefore having a low physical distance, often provide support and other peer influence because of a heightened level of social interaction (Ahlbrandt & Cunningham, 1979; Podolefsky & Dubow, 1981). In this context, physical distance can therefore be described as the level of physical proximity (distance) that social groups have from a specific individual's homestead (Barr, Gilg & Ford, 2005).

Individuals can be affected by those social contacts who reside within a close proximity, as such contacts can often provide support yield a heightened level of social interaction for individuals (Ahlbrandt & Cunningham, 1979; Podolefsky & Dubow, 1981). However, as individuals are actually part of extensive social networks which reach a far wider urban community than neighbours (Perlman, 1978; Rich, 1979; Boyte, 1980; Warren, 1981), the

relevance of neighbours in influencing attitudinal change has since been questioned (Unger & Wandersman, 1985).

In specific activities (such as banking choices) neighbours seem to exert strong influence (Tan & Chua, 1986). Trusted neighbours can initiate energy-saving behaviour (Nyborg, Howarth & Brekke, 2006; Jørgensen, 2009) This frequent communication which often takes place between neighbours certainly has an influence in altering attitudes (Ek & Söderholm, 2010) and ultimately implies that a high degree of social interaction with trusted neighbours can alter behaviour (Barr, Gilg & Ford, 2005).

With respect to the spread of certain emotions, it has been suggested that social contacts who reside more than 3.2kms (2 miles) from the individual are not significantly associated with the spread of emotions (Fowler & Christakis, 2008). This represents a (transmission) boundary, from where contacts residing farther than this distance do not have the ability to influence an individual's emotional state. From this, it was suggested that face-to-face contact is important for emotional transmission, where friends, family, as well as coworkers were capable of effectively spreading emotions (Larson & Richards, 1994; Hill *et al.*, 2010).

When acknowledging the physical distance as a factor, in the context of emotions, it has been suggested that social contacts who reside more than 3.2kms (2 miles) from the individual are not significantly associated with influencing the emotions of the individual (Larson & Richards, 1994; Fowler & Christakis, 2008; Hill *et al.*, 2010). This suggested that the further the distance of social contacts, the less influential they were. In better understanding these dynamics in the influence of Risk Preference within the Generation Y cohort, this study proposes that:

*H<sub>5</sub>: There is a negative association between the physical distance of peers and amount of influence on the Risk Preference of Generation Y individuals*

The following section presents different methods of studying Social Influence and how they can be applied to this study. These methods extend from exploratory research into the study of behaviour as components of social epidemics as well as descriptive research which stochastically models behaviour against well-defined and parameterized models. Additional

methods of understanding specific group dynamics in this process of Social Influence is described as they offer means to explore the sixth objective in this study.

#### **4. RECENT DEVELOPMENTS IN SOCIAL INFLUENCE METHODOLOGY**

Recent studies have evaluated the adoption of specific behaviour and the subsequent diffusion of it within a large group, but this has required a different analysis, compared with classical techniques (Coleman *et al.*, 1966; Borgatti & Everett, 1992; Leenders, 2002). An evaluation of these such methods is given in the following section, where peer effects and the idea of social epidemics are explained.

These developments this has allowed for further advancement into creating a more structured approach to the study of Social Influence, in contrast to the traditional methods focussing on social relations, where individuals pay attention to other people who are similar to themselves (Festinger, 1954; Michaelson & Contractor, 1992).

In the case of developments of emotions and specific behaviours, it has been found that specific dynamics exist between members of different groups and have required unusual methods of analysis and frames of reference (Hill *et al.*, 2010). For example, it has been found that individuals with different emotional states (happy, sad .etc) affect the development of their peers' emotional state differently, depending on their own state (Hill *et al.*, 2010). Other studies have similarly shown that engaging in specific behaviours can predispose such individuals to affect their peers in various ways in perusing the same behaviour (Lam, Marteleto & Ranchhod, 2013). The following sections present different ways that previous studies have framed the understanding of peer effects and Social Influence. This discussion begins with the idea of social epidemics, followed by disease modelling and further methods of describing Social Influence using specific group definitions.

##### **4.1. Social epidemics**

One method of understanding Social Influence, is from the perspective of Social Epidemics, where Social Influence is propagated by "social contagions" (Polansky, Lippitt & Redl,

1950:322) which are aptly defined as “an event in which a recipient's behaviour has changed to become ‘more like’ that of the actor or initiator.” These social epidemics can expressed themselves in a variety of ways, including the stigma which people place on sufferers of a deadly biological disease (Herek, 1988), behaviour surrounding film piracy (Yar, 2005) as well as through exchange of belief surrounding the stock-exchange, affecting buying and selling behaviour (Lynch, 2000). A comparison of some of the contexts where social epidemics have been studied is shown in table 3.1 below.

Table 3.1: Comparison of the types of social epidemics

Context	Types of social epidemics	Source
<b>Behavioural</b>	Stigma	(Herek, 1988)
	Piracy	(Yar, 2005)
	Market beliefs	(Lynch, 2000)
<b>Emotional</b>	Content and discontent	(Fowler & Christakis 2010)
	Anger and negative emotions	(Reed, Larson & Almeida 1999)
	Depression	(Howes, Hokanson & Loewenstein, 1985; Joiner & Katz 1999; Barsade, 2002)
	Clinical depression	(Hill <i>et al.</i> , 2010; Ueno 2005)

Specific developments in the study of social epidemics have resulted in a better understanding of another human exchange via Social Influence - “emotional contagions” (Hatfield, Cacioppo & Rapson, 1994:3). These describe the emotional influence within a group and measure the spread of positive and negative emotions within groups of people, who are in frequent close contact with each other. The contagion-like qualities of these emotions has been successfully studied in experimentation situations (Fowler & Christakis 2010) and at an empirical level within groups of families (Reed, Larson & Almeida 1999), room-mates (Howes, Hokanson & Loewenstein, 1985) and compatriots in a team (Barsade, 2002).

Depressive moods and symptoms are considered contagious through personal contact with strangers or even with acquaintances (Joiner & Katz, 1999). More so than depressive moods, over longer timescales, clinically relevant depression has been found to spread between social groups and better methods of combatting these issues have been discussed as a result (Ueno, 2005; Hill *et al.*, 2010).

There is also support of the idea that emotions are another method of transferring individuals' Risk Preferences within a group, where emotions are considered a contagion which carry Risk Preferences (Loewenstein, Webber, Hsee & Welch, 2001; Lewis, Haviland-Jones & Barret, 2010; Michl, Koellinger & Picot, 2012). However, there has been little development of this idea and there is also limited research on measuring the spread of risk-perception, Risk Preferences and other attitudes surrounding risk among social groups (Wärneryd, 1996; Scherer & Cho, 2003). Further discussion into the actual models utilized in these previous studies, offers better insight into how disease modelling could benefit the study of Risk Preferences, its social dissemination and general Social Influence.

#### **4.2. Mathematical models of disease and Social Influence**

Many mathematical models exist which can help study the spreading of disease within a network and have been used in following Social Influence within groups of people (Keeling & Eames, 2005). This is done to identify mechanisms by which “diseases” spread, with a focus on predicting the outcomes of an outbreak and to evaluate strategies to manage these diseases (Daley & Gani, 2001). A thorough understanding of contagions and network topology is therefore required in order to adequately analyse the spreading of disease (Newman, 2002). However, as a vast array of mathematical models exist, an understanding of the specific assumptions and parameters associated with their use is also of importance.

Various metrics are used in determining the exact nature of a disease in modern epidemiology, including that of the basic reproductive number ( $R_0$ ) (MacDonald, 1952).  $R_0$  represents a ratio which describes the number of secondary infectious cases which can propagate from each infectious case. The  $R_0$  helps evaluate the degree to which a disease can cause further infection within a population, within an infectious period.  $R_0$  also has applicable applications to the study of Social Influence, where specific types of influence could be said to have a reproduction rate and a specific lifetime – such as ideas or period-specific opinions (Fowler & Christakis, 2010).

#### **4.2.1. Stochastic models**

Stochastic modelling presents itself as a natural way of describing the spread of disease or Social Influence, among groups of people, as it involves working with probabilities (Andersson & Britton, 2000). This allows for modelling which is not restricted to prescribed examples (like that of deterministic modelling). Stochastic models specifically have advantages over deterministic models in situations where data does not appear to satisfy the law of large numbers, where the spread of infection may only be in specific clusters (Bartholomew & Bartholomew, 1967). As a result such populations cannot be adequately described when modelled onto a deterministic techniques.

In contrast to stochastic modelling, deterministic modelling is used to study aggregated happenings, where variable states are uniquely determined by parameters within the model, this allows for a simplified method of building epidemic models, but also allows for results to be distorted due to unexplained variation being ignored (Gustafsson & Sternad, 2013). It is therefore important to understand the assumptions and requirements for the deterministic model being utilized, so as to minimize the proportion of unexplained variation (Bailey, 1975; Nisbet & Gurney, 1982; Vynnycky & White, 2010). Specific applications of stochastic modelling comes in the form of probabilistic models, of which the SISa model of infection is a recently developed and successful method for understanding Social Influence (Hill *et al.*, 2010)

- **The SISa model of infection and Social Influence**

Hill *et al.* (2010) adapted this SIS model by creating a theoretical framework for studying the interpersonal spread of any state which also which might arise spontaneously within the model. This allows for the influence of external factors, to be measured within this model (Coleman, 1988). This SISa model therefore has the ability to be applied to things such as emotions, attitudes, behaviours, ideas as well as certain health states (Hill *et al.*, 2010) and will therefore be appropriate in the studying of Risk Preference. The corresponding differential equations are shown in equation (3.1).

$$\begin{aligned}
\text{(a)} \quad & \frac{dS}{dt} = -\beta SI + gI - aS \\
\text{(b)} \quad & \frac{dI}{dt} = \beta SI - gI + aS \\
\text{(c)} \quad & S(t) + I(t) = N
\end{aligned} \tag{3.1}$$

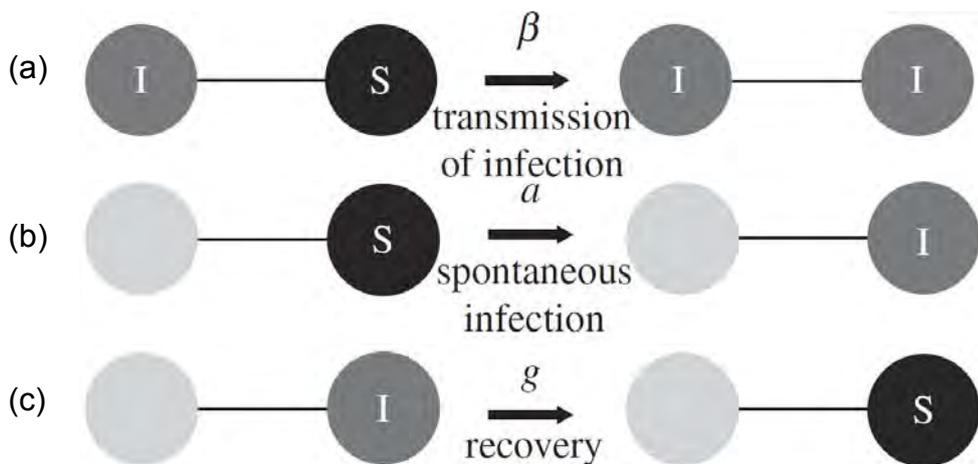
Under this modified SIS model (the SISa model) figure 3.1, below, illustrates the three processes whereby an individual's state of being can change as a result of Social Influence or otherwise. Similarly to the SIS model, the SISa shows in figure 3.1 (a) Infected individuals transmit infection to their contacts, who are susceptible, with a rate of  $\beta$ . (b) Susceptible individuals become spontaneously infected at a rate of  $a$ , independent of the states their contacts. (c) Infected individuals recover at a rate of  $g$  and return to the susceptible state, independent of the states of their contacts.

An additional feature of the SISa model is that there is no thresholding behaviour (unlike that of traditional models) because of the inclusion of the spontaneous infection term (a). This implies that even if there are no individuals who have a positive initial state of infection in the model ( $\beta = 0$ ), the appearance of spontaneous infection ( $a > 0$ ) will nonetheless lead to a basic reproductive level of infection which is non-zero ( $R_0 \neq 0$ ). In the absence of spontaneous infection ( $a = 0$ ), the effective  $R_0$  is estimated in accordance with the SIS model (Hill *et al.*, 2010; 2010b). The SISa steady-state fraction of infected individuals is given below (equation 3.2).

$$\frac{I}{N} = \frac{1}{2} \left( 1 - \frac{a+g}{\beta N} + \sqrt{\left( 1 - \frac{a+g}{\beta N} \right)^2 + \frac{4a}{\beta N}} \right) \tag{3.2}$$

Equation 3.1 is further illustrated by figure 3.1, showing infected individuals transmitting infection to their contacts, who are susceptible, with a rate of  $\beta$ . (b) Susceptible individuals becoming spontaneously infected at a rate of  $a$ , independent of the states their contacts. (c) Infected individuals recovering at a rate of  $g$  and return to the susceptible state, independent of the states of their contacts.

Figure 3.1: The SISa model's processes of infection and recovery



Adapted from Hill *et al.*, 2010

Hill *et al.* (2010) utilized this SISa model in modelling the spread of happiness as an emotional state of being, rather than an actual biological disease, where respondents were classified as being either contempt, neutral or discontent. Making use of these methods, in the context of Risk Preferences, prompts the use of Kahneman and Tversky (1970) as well as Kahneman, Diener and Schwarz (2003) classification of individuals into the risk groups of risk averse, risk neutral and risk seeking. The use of these and the discussion of a group-specific Social Influence hypotheses is given in the following section.

- **Group association and dynamics for Risk Preferences**

Kahneman, Diener and Schwarz's (2003) method of categorisation has been adopted in various studies looking at the spread of risk-preferences. Dohmen, Falk, Huffman and Sunde (2008) have studied how such Risk Preferences can specifically disseminate into the attitudes others, within a family environment. Additionally, some studies have discussed the potential of studying Risk Preferences into the context of a real-life large social network (Earl & Potts, 2004; Pujol, Flache, Delgado & Sangüesa, 2005; Ambrus, Mobius & Szeidl, 2010). Scherer and Cho (2003) successfully discovered the contagion-like effects of certain Risk Preferences, however, it made use of an experimental social network environment while using hypothetical risk-assessment scenarios. Gardner and Steinberg (2005) found that social contacts who are averse to risk, can limit the likely-hood of individuals engaging in risky behaviour.

In the case of developments of emotions and specific behaviours, it has been found that specific dynamics exist between members of different groups. For example, it has been found that individuals with different emotional states (happy, sad .etc) affect the development of their peers' emotional state differently, depending on their own state (Hill *et al.*, 2010). In order to improve this area of research, this study made use of real-life social networks to study the peer effects of Risk Preference, as it is proposed that this method of illustrating Risk Preferences as a function of different social group would better explain the dynamics surrounding the diffusion of attitudes which could affect a Social Marketing program (Hill *et al.*, 2010). This use of social network allows for patterns within social relationships to appear more apparent and would allow for a better understanding of the specific attitudes being measured (Wasserman & Faust, 1994; Scott, 2000).

Methods such as Hill *et al.* (2010) and Lam, Marteleto and Ranchhod (2013) provide examples of how stochastic models can allow for various group dynamics to be explored and easily understood. When being aware of group-specific dynamics that could exist in the exchange of Risk Preferences in the Generation Y cohort, as have in prior studies focusing on peer effects and Social Influences, this study proposes:

*H<sub>6</sub>: Deferring levels of influence exist within the Generation Y cohort's influence of Risk Preferences, across the Risk Preference among risk seeking, neutral and averse profiles.*

With the recent developments arising from social learning theory (Coleman, Katz & Menzel, 1966), reference group theory (Rogers, 1995), diffusion of innovation theory (Valente, 1996) social capital theory (Burt, 1987; Coleman, 1988), and the structural theory of Social Influence (Marsden & Friedkin, 1993), the above hypothesis incorporates contemporary methods in identifying social dynamics that are only identifiable using cross-disciplinary methods (Festinger, 1954; Coleman *et al.*, 1966; Borgatti & Everett, 1992; Michaelson & Contractor, 1992; Leenders, 2002).

With current research into the Generation Y cohort largely lacking in quality, this study presents areas which are of most concern and has proposed various hypotheses regarding their expected development (Twenge & Campbell, 2008; Myers & Sadaghiani, 2010; Appleton, 2012). Given that what is known about the Generation Y cohort is that they are

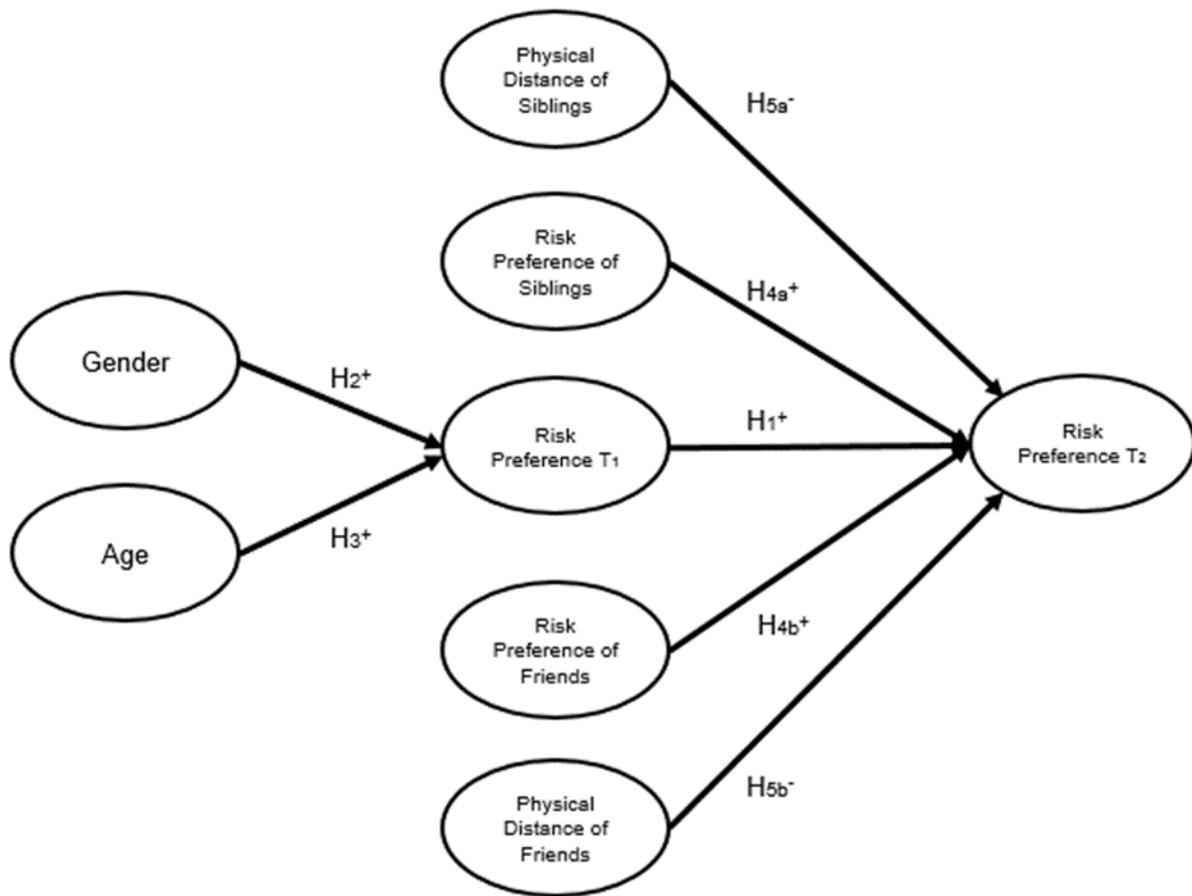
more sociable with their peers than any prior generation (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996) and more susceptible to influence the views of their peers (Beard, 2003; Noble, Haytko, Phillips, 2009), peer influence is therefore a pertinent topic in Generation Y discourse. In addition, as risk attitudes is a pertinent issue in the field of Social Marketing (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011) and is a common barrier which limits the effects of Social Marketing programs which encourage favourable behaviour (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Blake, 1999; Kollmuss & Agyeman, 2002; Kotler, Roberto & Lee, 2002) this study offers means to improve the area of research surrounding.

In structuring the hypotheses discussed thus far in the literature review, this study next presents a conceptual model where many of the hypotheses can be illustrated. The first five hypotheses of the study focused on demographic or social that is hypothesised to have an influence on the development of Risk Preferences in the Generation Y cohort. Therefore the following section summarizes these hypotheses and how each of them can be related and tested.

## **5. CONCEPTUAL MODEL FOR HYPOTHESES 1 TO 5**

From the first five hypotheses discussed in this study, focus was given to specific factors and their potential influence on the development of Risk Preferences in the Generation Y cohort. These came in the form of gender, age, previous Risk Preference, social distance and physical distance. As each of these were described as having a linear relation to Risk Preferences – these can be easily described through the use of a conceptual model. Previous sections described that this study made use of siblings and friends as two social groups with different social distance, these are included as independent (or latent) variables in the conceptual model. Additionally, physical distances for each of these groups are given illustrated as control variables which are hypothesised to limit the amount of Social Influence experienced by individuals. Furthermore, the inclusion of longitudinal measures means that a relationship between Risk Preferences over time can be estimated. In order to better understand the conceptual relationships and the context that each are analysed in this study – the following conceptual model is presented.

Figure 3.2: Conceptual model



*H<sub>1</sub><sup>+</sup>: There is a strong correlation between the Risk Preference in Generation Y individuals throughout their young adulthood*

*H<sub>2</sub>: Females Generation Y individuals have more averse attitudes towards risk-taking than male Generation Y individuals*

*H<sub>3</sub>: Older Generation Y individuals have more risk averse attitudes towards risk-taking than younger Generation Y individuals*

*H<sub>4</sub>: The association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals is stronger than the association between the Risk Preference of friends and the Risk Preference of Generation Y individuals*

*H<sub>4a</sub><sup>+</sup>: There is a positive association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals*

*H<sub>4b</sub><sup>+</sup>: There is a positive association between the Risk Preference of friends and the Risk Preference of Generation Y individuals*

*H<sub>5</sub>: There is a negative association between the physical distance of peers and amount of influence on the Risk Preference of Generation Y individuals*

*H<sub>5a</sub><sup>-</sup>: There is a negative association between the physical distance of siblings and amount of influence on the Risk Preference of Generation Y individuals*

*H<sub>5b</sub><sup>-</sup>: There is a negative association between the physical distance of friends and amount of influence on the Risk Preference of Generation Y individuals*

This model is used to test the first five hypotheses, where the focus of the study assumes the classical understanding of Social Influence, using a combination of social learning theory (Coleman, Katz & Menzel, 1966), reference group theory (Rogers, 1995), diffusion of innovation theory (Valente, 1995) social capital theory (Burt, 1987b; Coleman, 1988), and the structural theory of Social Influence (Marsden & Friedkin, 1993; Friedkin, 1998). As the sixth hypotheses required understanding into particular methods, this was subsequently not included in the conceptual model.

## **6. CONCLUSION**

Social factors were presented in this chapter as being fundamental in influencing the risk attitudes of adolescents, with strong focus being given to the Generation Y cohort (which contains the entire adolescent population). As consumer characteristics can be influenced by social opinion and influence (Kotler & Keller, 2006), pivotal influences in the development of risk characteristics therefore come in the form of friends, reference groups, and family (Sheth, 1968). Social Influence was defined as the effect that others have on an individual or group, in terms of attitudes or behaviour (Berkman, 2000). This influence was described as being multidimensional, in that the social mimicry can either allow for an increase in the degree of either socially desirable or undesirable characteristics (Prinstein & Dodge, 2008).

This chapter also introduced mathematical methods for group dynamics, using disease modelling within a social network. Specific focus was made to recent studies which have adapted the use of disease modelling in order to identify Social Influence and peer effects. It is expected that this study could produce similar results for a better understanding of how risk-attitudes are spread, the parameters surrounding their transmission which would allow for a better understanding of risk-attitudes as a potential barrier in achieving behavioural change through Social Marketing.

The following section presents the methodology for this study and the particular measures that are pertinent for the study's hypotheses to be tested. Secondary data analysis provides sufficient data for the models which this study is required to estimate and a comprehensive sample of Generation Y individuals is utilised. Following from that chapter – Chapter V will

continue in dispensing the results from analysis, with Chapter VI devising recommendations and describing this study's limitations.

## **CHAPTER IV**

### **METHODOLOGY**

#### **1. INTRODUCTION**

Previous chapters have described how Social Influence derived from reference and other social groups. This offers a means to describe how individuals liken or distance their attitudes from to specific social groups and most importantly how they derive specific risk behaviour and attitudes from each other. As such, the importance of reference groups, peer groups and other social groups in influencing behaviours and attitudes was explained. Generational research acknowledges that specific consumer groups, such as adolescent Generation Y consumers represent a particularly risk-prone group as their ability to be influenced by peers is greater than any prior generation (Mannheim, 1952; Howe & Strauss, 2000; Howe, 2005; Blauth, McDaniel, Perrin & Perrin, 2010; Brosdahl & Carpenter, 2011). Chapter III also described the measures of Social Influences and the various hypotheses surrounding the influence of social interaction, on that of Risk Preferences, which formed the focus of this study. Various mathematical tools and statistical methods were also described, which have an extensive ability to measure the influence of peers on risk development. This discussion is continued in this chapter.

The motivation for this study was a need for exploration into the development of Risk Preference and Social Influence within the context of the Generation Y cohort. This study aimed to improve the knowledge about the way social factors influence risk attitudes in the Generation Y cohort through providing empirical measures of its occurrence and explanation into its dynamics. This chapter presents the specific objectives of this study and describes the research design, the target population, a description of the chosen sample and sampling method chosen, the measurement instruments, as well as the associated justifications for their usage and methods of analysis. The study made use of data from the Add Health Longitudinal Study because it offered extensive data surrounding social ties and because of its extensive sampling from throughout an influential Generation Y population, both of which are required for this proposed methods. In moving away from the theoretical background, upon which this study is based, this section explores the various methods and measures required for achieving the proposed research objectives.

This chapter begins with a summary of the study's research question and objectives.

## **2. SUMMARY OF RESEARCH QUESTION AND OBJECTIVES**

With current research into the Generation Y cohort largely lacking in quality, further research into the group was required (Twenge & Campbell, 2008; Myers & Sadaghiani, 2010; Appleton, 2012). It is known that the cohort are more sociable with peers than have any prior generation (Csikszentmihalyi & Larson, 1984; Elliott & Feldman, 1993; Berndt, 1996). As a result, this generation are said to be more susceptible to influence the views of their peers (Beard, 2003; Noble, Haytko, Phillips, 2009). Social and peer influence is therefore a pertinent topic in Generation Y discourse. In addition, as risk attitudes is a pertinent issue in the field of Social Marketing (McKenzie-Mohr & Smith, 1999; McKenzie-Mohr, 2011) and is a common barrier which limits the effects of Social Marketing programs which encourage favourable behaviour (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Blake, 1999; Kollmuss & Agyeman, 2002; Kotler, Roberto & Lee, 2002). This study offers a means to improve the area of research surrounding Social Influence on the Risk Preferences of the Generation Y cohort. In looking at the development of Risk Preferences within the Generation Y cohort, paying specific attention to the influence of peers in this process - this study was guided by the following research question:

*Does the Risk Preferences of friends and siblings affect the Risk Preferences for Generation Y individuals?*

The objectives associated with the research question are focused on the development of Risk Preferences in the Generation Y cohort. As there is a distinct lack of research into the group, numerous objectives pertaining to simple demographic differences are presented, along with further objectives pertaining to the type and way in which Social Influence of risk attitudes might be attained.

This study proposed the following research objectives so as to better understand the effects of peers on the development of Risk Preferences. Also as previous literature has found that Risk Preferences (as attitudes) are known to be fairly stable and resilient to changes by

most experiences (Ajzen & Fishbein, 1980; Weber *et al.*, 2002), it was important to reaffirm this claim, so this study aimed:

1. To determine the influence that previous Risk Preference has in the development of Risk Preferences for Generation Y individuals.

Findings explained in section 3.12 of Chapter II, detailed that previous studies looking at the development of Risk Preference have shown that in adolescent populations (like much of the Generation Y population) - males and females differ in their levels of risk taking and Risk Preference, with peers also contributing strongly in influencing Risk Preference (Gardner & Steinberg, 2005); from there, it was proposed that this could extend to Risk Preferences in general, so this study sought:

2. To determine the influence that gender plays in the development of Risk Preferences for Generation Y individuals.

Additionally, age has been found to be an important factor in the development of risk behaviour but this information is unknown in the context of Risk Preferences and for Generation Y (Gardner & Steinberg, 2005), therefore this study additionally sought:

3. To determine the influence that age plays in the development of Risk Preferences for Generation Y individuals.

Within peer influence, as peers could potentially include a wide range of relationships, from parents, colleagues, siblings, friends or distant relatives, this raised the question as to the degree of social distance between social contacts and the individual, as well as physical distance. Within past studies, neighbours for example, residing within a close proximity to each other and therefore having a low physical distance, often provide support and other peer influence because of a heightened level of social interaction (Ahlbrandt & Cunningham, 1979; Podolefsky & Dubow, 1981). This suggests that attitudes can be influenced by those around them (Barr, Gilg & Ford, 2005).

When acknowledging the physical distance as a factor, in the context of emotions, it has been suggested that social contacts who reside more than 3.2kms (2 miles) from the individual are not significantly associated with influencing the emotions of the individual (Fowler & Christakis, 2008). This led to discussions which suggested that peers with a similarly low social distance (friends and family) were the only peers able to influence the development of certain emotions (Larson & Richards, 1994; Hill *et al.*, 2010). In extending this understanding of social and physical distances as moderators further, this study aimed:

4. To determine the influence that social distance plays in the Social Influence of Risk Preferences for Generation Y individuals and;
5. To determine the influence that physical distance plays in the Social Influence of Risk Preferences for Generation Y individuals.

Lastly, in the case of developments of emotions and specific behaviours, it has been found that specific dynamics exist between members of different groups. For example, it has been found that individuals with different emotional states (happy, sad .etc) affect the development of their peers' emotional state differently, depending on their own state (Hill *et al.*, 2010). Other studies have similarly shown that engaging in specific behaviours can predispose such individuals to affect their peers in various ways in perusing the same behaviour (Lam, Marteleto & Ranchhod, 2013). In testing to see whether or not similar dynamics exist during peer influence of attitudes, the following research objective is formulated:

6. To determine if Generation Y consumers with different risk profiles (risk seeking, neutral and averse profiles) affect one another differently.

These objectives were achieved using an overarching structural equation model, using PLS regression. From there, the final objective was tested using, a longitudinal analysis technique involving linear probability modelling. These identified specific dynamics including: specific relationships and rates which such peer influence would arise within the sample. However, before these results can be discussed further, means to achieving the study's objectives will be explained by explaining the research design and further elaboration on the study's methods and design.

### **3. RESEARCH DESIGN**

The specific research design for this study is that of a longitudinal, mixed method research design, to evaluate peer effects on the development of Risk Preferences in the Generation Y cohort. Longitudinal analysis was appropriate in this study as the development of risk attitudes can only be understood when assessed against attitudes during differing time periods. This would enable a position where the risk preferences of friends and siblings in one time period could be compared with changes in the risk preferences for respondents in the second time period. This, when applied data pertaining to Risk Preferences and social interactions between Generation Y individuals, this allows the research question to be answered. Specifically the study made use of secondary data from the the Add Health study, which describes Risk Preferences over time, within the Generation Y cohort and the various influences of this development. The specifics of this are described next and the specific methods applied to to answer the research question.

### **4. RESEARCH METHOD**

The methods are based on the approach that Hill *et al.* (2010) took in their seminal paper regarding the spread of emotion through social interaction, as well as an approach that Lam, Marteleto and Ranchhod (2013) used in work involving similar probability techniques to predict peer influence on sexual behaviour. The data was collected using two waves, Wave III (2002) and Wave IV (2008), during 90 minute in-home interview surveys. This form of survey represents the “gold standard” in identifying health and risk characteristics (Beckett, Weinstein, Goldman & Yu-Hsuan, 2000). The advantage of this method is its ability to collect a large representative sample of the population. This, however, requires respondents to be very aware of their own characteristics in terms of risk attitudes and is more costly than online survey methods (Beckett, Weinstein, Goldman & Yu-Hsuan, 2000). As a result, this study made use of secondary data from the Add Health study; collection of this data was done without incentives (Uldry, Bearman & Bearman, 1997; Boonstra, 2001). This study aimed to provide descriptive research into the discussion on the development of Risk Preferences, within the Generation Y cohort, as little research on the topic currently exists.

The study made use of the data pertaining to the cohort from the Add Health study which follows an all American cohort which incorporated individuals born within half of the possible years that the Generation Y cohort has been defined in (Boonstra, 2001; Uldry, Bearman & Bearman, 1997). The Add Health study is performed in waves, with four waves having been completed thus far. This study, however, focused on specific measurements during Wave III and Wave VI of the Add Health study where the sample sizes were 14738 and 15193 respectively. Justification for these waves specifically is based on reliability of the specific measures utilized, which will be described in section 4.8 of the methodology. Secondary data analysis typically provide access to large sample sizes, a wide array of measures, reduced financial expenditure, reduced data collection problems and most importantly – direct access to longitudinal data (Kiecolt & Nathan, 1985; Smith, Ayanian, Covinsky, Landon, McCarthy, Wee & Steinman, 2011).

As this study made use of secondary data analysis, there is the potential for inhibiting research creativity, over time, as analysing the same data can begin to lessen scientific progress in the field (Kiecolt & Nathan, 1985). Also, as secondary researchers are not involved in the design of the original study, it typically requires additional time during analysis for the researchers to become sufficiently acquainted with the datasets and their use (McCall & Appelbaum, 1991). This required a thorough understanding of the dataset for sufficient data analysis.

In summary, as there is a limited number of longitudinal studies which monitor the development of Generation Y individuals, especially during their adolescent years, and these studies have all been undertaken in other developed countries (Potterton, 2006) the National Longitudinal Study of Adolescent Health (Add Health) dataset was therefore utilised in this study, as it contained substantial sample size and utilised measures which were appropriate for this study (Add Health, 2013). The various influencing factors of Risk Preferences would be modelled (the first five hypotheses) using PLS modelling, within a structural equation model, with additional modelling derived from Hill *et al.* (2010) being used to evaluate the final hypotheses. The specific target population and sampling methods required from this study and employed in the Add Health (2013) study, are described next.

## 5. TARGET POPULATION

The target population and sampling methods used in this study is that of the Generation Y cohort, during their adolescent years. The initial target population for the Add Health study was the national population of adolescents within the United States of America, and is being measured through the course of the respondents' life-time. The study made use of the cohort from the Add Health study, which incorporated individuals born within half of the possible years that the Generation Y cohort has been defined in, the Add Health study also follows an all American cohort (Bearman, Jones & Uldry, 1997; Boonstra, 2001).

This study makes use of the Add Health dataset which is claimed to be “the largest and most extensive longitudinal survey of adolescents ever undertaken” (Add Health, 2013). The specification of adolescents is important because the Add Health study coincides exactly with the induction of the Generation Y cohort. This is because, like that of the Generation Y cohort, the cohort within the Add Health study includes only individuals born between 1977 and 1985 (although the Generation Y cohort continued until the late 1990s) (Brosdahl & Carpenter, 2011). Meaning that a cross-sectional sample of the Add-Health cohort yields approximately half of the possible date of births where individuals could be considered of Generation Y. However, the geographic location of the Add Health respondents is confined to the United States which brings constraints into the generalizability of results in this study.

Considering that the United States is considered by some to be the most influential country in the world (Wiarda, 2007; Hao & Wang, 2010), there is a substantial amount of diffusion of American Culture which is central in shaping international cultural values, norms and homogenises global capitalist culture (Anderson & Taylor, 2007). Therefore any conclusions which this study draws about the United States population may have strong implications in local consumer markets. As the Add Health dataset is considered to be the largest and most extensive study of this type, lesser datasets would only induce more bias through a less than representative sample, when making claims about the Generation Y cohort at large (Add Health, 2013). This means that this study can be seen to offer a thorough understanding of the development of Risk Preferences among Generation Y individuals, albeit through use of one geographically similar sample.

## **5.1. Sampling**

The Add Health study made use of a multi-stage, stratified, school-based, cluster sampling design (Harris, Florey, Tabor, Bearman, Jones & Udry, 2003). So as to create a nationally representative sample of the age group, the study utilized a sample frame consisting of a stratified list of the 26666 high schools, having at least: an 11<sup>th</sup> grade (penultimate year to high-school graduation), more than 30 students and are located within The United States of America (United States). This utilized probability sampling which allowed for strong generalizability of the sample (Malhotra, 2007). The resulting sample was taken from 132 schools throughout the United States. This resulted in a cohort sample of 20745 adolescent (at Wave I) who were between grades 7 and 12 in the United States between 1994 and 1995 and who were born between January 1974 and December 1983.

This study specifically made use Wave III and Wave VI of the Add Health study as they represented waves which contained data from a cohort transitioning between adolescence and becoming an entirely adult cohort (Wave III: 16 – 24 years old and Wave VI: 23 – 31 years old). This was useful because:

1. At this stage of development, adolescents are particularly vulnerable to the influence of their peers (Shoveller, Johnson, Savoy & Pietersma, 2006; Potard, Courtois & Rusch, 2008) and, in addition;
2. Large quantities of Social Marketing efforts and targeted towards individuals at this stage of development, to curb risky behaviour and help generate less favourable attitudes towards risk (Kotler, Roberto & Lee, 2002).

Additionally Wave I of the Add Health study could not be utilized as the dataset did not contain data pertaining to the Risk Preference of respondents. Further demographics of the all-American Generation Y sample will be presented in the following section.

## **5.2. Demographic profile of respondents**

In further describing the respondents in the Add Health study, table 4.1 provides a socio-demographic profile of the respondents who participated in the Add Health study, from Wave

I (which is representative of Waves III and IV). The sample contained a reprehensively equal spread of male (49%) and female (51%) respondents. Sixty-two per cent of the respondents were white in race and eighty-nine per cent of the respondents reported to having English as their home language. Ninety-one per cent of the respondents were also found to have been living in the United States since birth. These important demographics means that the sample could be described as strongly representative of the American Generation Y population at the time, further insights are given below.

Table 4.1: Social-demographic profile of Add Health respondents of Wave I

<b>Demographics</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Male	10266	49,49
Female	10479	50,51

<b>Race</b>		
White	12888	62,13
Black	4777	23,03
Asian	1448	6,98
Native American	250	1,21
Other/Refused	1382	6,66

<b>Home Language</b>		
English	18364	88,52
Spanish	1652	7,96
Other/Refused	729	3,51

<b>Birth Country</b>		
United States	18842	90,83
Other/Refused	1903	9,17

The social-demographic profile of Add Health respondents appeared to be representative of the general United States population in the composition of gender, ethnicity, home language and nationality when the sample was collected (U.S. Census Bureau, 1980; Waggoner, 1995). The profile of the average Add Health respondent could therefore be said to be English, a local citizen and white in ethnicity. From the aforementioned discussion, data collected in the Add Health study can be said to be nationally representative; a nationally representative sample of Generation Y individuals in the United States of America. The methods required in acquiring such a sample are described in the following section.

## 6. DATA COLLECTION

Data about the sample is taken during 90 minute in-home interviews, with each respondent, during each of the waves. Each wave varies in response rate and therefore realise different sized samples, with each subsequent wave having fewer respondents than the initial sample of 20745 in Wave I. The field work of Wave I and Wave II was conducted by the National Opinion Research Center of the University of Chicago following this, the field work of Wave III and Wave IV was conducted by the Research Triangle Institute (Harris *et al.*, 2013). Each of the fieldworkers and researchers were made to maintain strict control of the identity of the respondents, through signing security pledges, contracts and worked within an environment with strict processes of data control and no access to the real identities of respondents (Harris, 2005). Due to privacy concerns, special data pertaining to a proxy of Global Positioning System (GPS) coordinate data and relationship information would only be made available to researchers with a security contract explaining the precise use and misuse of the data. The remaining data is made publicly available to researchers. During the data collection process of Wave III of the Add Health study specifically, respondents also received monetary incentives for participation.

During the data collection for Wave III, all of the original 20745 Wave I in-home adolescent respondents were re-contacted and re-interviewed between 2001 and 2002, when the cohort was aged 16 to 24 years, with a response rate of seventy-seven per cent. The following wave (Wave IV) took place between during 2008, when the cohort was between 23 and 31 years old. This measurement had a response rate of eighty-eight per cent and captured data from the Add Health cohort during the beginning of their adulthood (when they were aged 23 to 31 years).

This study chooses only to look at specific social and demographic characteristics (including gender, age, and a measure of Risk Preference), as well as nominated friendships and sibling relationships within the sample, so as to determine the impact of peer influence on the development of Risk Preferences in this study. The following data from public as well as restricted-use datasets for Wave III and IV of the Add Health study was therefore required:

1. Wave I In-school & Wave II In-home friendship nomination data (ICPSR Restricted-Use Study 27022-0003 & 27022-0002)
2. Wave III Sibling ID data (ICPSR Restricted-Use Study 27023-0002)
3. Wave I Global Positioning System (GPS) Spatial Analysis data (ICPSR Restricted-Use Study 27024-0004)
4. Wave III & IV Risk Preference In-home Interview data (Wave III - Section 18: Personality and Family & Wave IV - Section 12: Social Psychology and Mental Health)

These specific waves captured the data that was required for the data analysis of this study. Within these waves, specific measures were obtainable which allowed for the establishment of sibling and friendship ties and the physical distance between each individual's homestead. Additionally, the Risk Preference for the entire cohort during Wave III and IV could be identified. The following section describes the exact specifications of these measures and how they enable a systematic understanding of the development of Risk Preferences in the Generation Y cohort to be established.

## **7. MEASURES**

In order to test the theoretical model, as described in section 5 of Chapter III, which sought to explain the determinants of future Risk Preference, this study proposed that gender, age, Risk Preference of friends, Risk Preference of siblings as well as their respective physical distances from respondents were required. This data was recorded within the Add Health dataset and specified the types of social relationships that exist between respondents, their proximity, as well as the Risk Preference states that each respondent could be categorised under, during each measurement period in the longitudinal study. This meant that various sections of data from the publically accessible components of the Add Health study were accessed, as well as several restricted-use datasets which were contained within separate ICPSR studies, beneath the broad title of the Add Health study. During each wave of the Add Health study, measurements in the following areas are taken:

- Social and demographic characteristics
- Education and occupation of parents
- Household structure
- Risk behaviours
- Expectations for the future
- Self-esteem
- Health status
- Friendships (restricted data)
- School-year extracurricular activities
- Biomedical data (restricted data)

These measures are gathered primarily during a 2819 item in-home questionnaire which is readministered every wave. Due to the excessive length of the complete survey, only the items and sections which are relevant to this study are discussed in this section. The complete descriptions for each section of the survey and replications of the questionnaire can be found at the following addresses:

<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/21600/datasets> and;  
<http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/datasets>

Several survey items contained within these Add Health study databases offered an opportunity to capture respondent Risk Preferences, and evaluate social relationships during Wave III and Wave IV of the Add Health study. This enabled a social network analysis to be performed which analysed the effects of social contacts on respondents' Risk Preferences. The exact methods of measuring these variables are now discussed in the following section. The first survey item for discussion is that of the Risk Preference measurement within publically accessible Wave III and Wave IV components of the Add Health study, following this, measures of social contacts and finally a tool for establishing their proximity.

## 7.1. Risk Preferences

A five point likert-type scale item was recorded at both Wave III (2002) and Wave IV (2008) through 90 minute in-home interviews. These scales are accessible via section 12 (Social Psychology and Mental Health) from Wave III and IV of the Add Health study. These scales were used in determining respondents' preferences towards risk at both Wave III (2002) and Wave IV (2008). This study's one-item risk scale measured the respondent's general Risk Preference, from Wills, Vaccaro and McNamara's (1994) risk taking scale. The scale was formatted with 1 to represent "strongly agree" and 5 to represent "strongly disagree" in response to the statement: "Do you agree or disagree that you like to take risks?"

In understanding the type of peer influence which exists within the sample, additional methods by Hill, Rand, Nowak and Christakis (2010) were employed within this study. These methods help express the peer influence, however they require that the sample be segmented into specific groups to simplify group dynamics. Using similar classification as Bard & Barry's (2000) risk attitude scale, where responses which tend towards agreement (1: "strongly agree" and 2: "agree"), were pooled so as to group respondents into a category (risk-seeking) where there is positive sentiment towards engaging in risk. The two negative responses to these scales, tending towards disagreement (5: "strongly disagree" and 4: "disagree"), were pooled so as to group respondents into a category (risk-averse) where there is positive sentiment towards engaging in risk. The remaining response (3: "neutral") was renamed the risk-neutral category.

This classification followed Kahneman and Tversky's (1972) general classification of an individual's Risk Preference and would make it easier to analyse the interaction between these groups (Hill *et al.*, 2010). However, as this scale employed a single item to directly probe the respondent's Risk Preference, an evaluation of the scales reliability was required (Ajzen & Fishbein, 1980). A statically significant positive relationship was expected from the correlation between the each wave of the dataset, in order for the data to be appropriate for analysis (Hill, Rand, Nowak & Christakis, 2010). As can be seen below in table 4.2 - the highest correlation is between Wave III and IV of the datasets, therefore an analysis using this data would be most reliable.

Table 4.2: Correlation matrix for Risk Preference groups

	Averse			Neutral			Seeking		
	Wave II	Wave III	Wave IV	Wave II	Wave III	Wave IV	Wave II	Wave III	Wave IV
<b>Wave II</b>	1			1			1		
<b>Wave III</b>	0.229	1		0.072	1		0.203	1	
<b>Wave IV</b>	0.168	0.310	1	0.057	0.087	1	0.151	0.318	1

All values significant at the 1% level

As the correlation coefficients between Wave III and IV were highest for all Risk Preference states, with moderately positive, statistically significant, correlations between respondent's Risk Preference states for risk averse and risk seeking states, with risk neutral being a weak, but still significant correlation. This was important as measuring the effect of external forces (the effects of Social Influence) would be most explicit when there is a highly reliable dataset (Ajzen & Fishbein, 1980; Weber *et al.*, 2002).

It was expected that a substantial proportion of the variation between the waves would be due to personal development, where the effects of maturity would have a strong influence on the development of an individual's Risk Preference (Dohmen, Falk, Huffman, Sunde, Schup & Wgner, 2005). Alternatively, this variation could have been due to the Social Influence that this study aims to measure. This study required additional measurements regarding the social ties that respondents had, which is described next.

## 7.2. Social ties and physical distance

In order to successfully model the influence of peers on the development of Risk Preferences, it was important to classify which respondents had the potential to spread Risk Preferences. Consequently, data surrounding relationships within the entire closed social network of respondents was required. This was proposed in the Chapter III, section 3 to take the form of friendship data and sibling data.

Considering that individuals come in frequent contact with their respective friends (Larson & Richards, 1994), friends were considered to be suitable social contacts that can be considered candidates for spreading Risk Preferences, similarly to that of siblings.

### **7.2.1. Friends**

Friendship data was required, so that each respondent's friendship network could be established. Data collected during Wave III of the Add Health study, from respondents who were in the 7th or 8th grade during Wave I and would have graduated within the last one to four years was available for analysis. These respondents from within this dataset were asked to identify, from a list of 10 computer-generated names of peers within their respective high schools, which ones were current friends or which ones were their friends when they were in school together. This was captured in the dataset as a list of altered identification numbers (unique respondent numbers) for the 10 computer-generated names and each respondent's response to the survey (Harris *et al.*, 2003).

When analysing this data pertaining to social contacts, it was assumed that relationships could only be regarded as directed, meaning that if a respondent A is a friend of individual B, then B is not necessarily a friend of A. The justification for this assumption was so that as the percentage of respondents requiring the full use of nominating 10 friends was only 2.5 per cent of the sample. Because of this, a normal assumption of two-way (undirected) friendships would not be imposed on the dataset, as it was thought that a true representation of respondent's friendships were illustrated in the dataset. Additional data surrounding sibling ties was also required, however, in this case undirected measures were imposed, these are described next.

### **7.2.2. Siblings**

Data identifying sibling ties was collected during the Wave III of the Add Health study. Respondents were required to list all siblings who formed part of the cohort, as well as the nature of their sibling relationship (be it a step-sibling or sibling by blood) (Harris *et al.*, 2003). As relationships among siblings is fundamentally two-way, this assumption was imposed on the dataset for any respondents who were listed as having siblings, but did not list siblings themselves.

Additionally, as the literature proposed that physical distance would be an important factor in determining the degree of influence that peers would have on the development of Risk Preferences, this data is discussed next.

### **7.2.3. Physical distance**

Data from the Add Health study provided GPS coordinate data of the residential addresses of respondents during Wave I. This was in the form of X and Y coordinate data which was used to calculate the geodesic distance between respondents.

This was important to determine because in certain instances, an individual's friend or sibling might not live in close proximity to the individual or might not even reside within a reasonably accessible distance from the individual. Additionally as section 3.2 in Chapter III described physical distance as being an important factor in determining peer effects in the context of risk characteristics, this measure was deemed important for this study's analysis too.

Given that GPS coordinate data would not be able to determine the actual distance between respondents, as the earth is not situated on a flat plan, accounting for natural contours in estimating the distance between respondents required the use of the Haversine formula (Robusto, 1957). The formula was used to calculate the geodesic distances between respondents in the sample, using the longitude and latitude GPS coordinates of respondent's residential addresses at Wave I in the Add Health study (Robusto, 1957). The haversine equation is shown in 4.1 (a), with the derived distance formula shown below (d).

$$\begin{aligned}
\text{(a)} \quad & \text{hav} \sin \left( \frac{d}{r} \right) = \text{hav} \sin(\phi_2 - \phi_1) + \cos(\phi_1) \cos(\phi_2) \text{hav} \sin(\lambda_2 - \lambda_1) \\
\text{(b)} \quad & h = \text{hav} \sin \left( \frac{d}{r} \right) = \sin^2 \left( \frac{d}{2r} \right) = \frac{1 - \cos \left( \frac{d}{r} \right)}{2} \\
\text{(c)} \quad & d = r \text{hav} \sin^{-1}(h) = 2r \arcsin(\sqrt{h}) \\
\text{(d)} \quad & d = 2r \arcsin \left( \sqrt{\sin^2 \left( \frac{\phi_2 - \phi_1}{2} \right) + \cos(\phi_1) \cos(\phi_2) \sin^2 \left( \frac{\lambda_2 - \lambda_1}{2} \right)} \right)
\end{aligned}
\tag{4.1}$$

$d$  : the distance between two points along a sphere

$r$  : the radius of the sphere (earth)

$\phi_1$  and  $\phi_2$  : the latitude of point 1 and the latitude of point 2

$\lambda_1$  and  $\lambda_2$  : the longitude of point 1 and the longitude of point 2

The haversine formula was used to process data from the derived GPS coordinate datasets, which would detail the latitude and longitude for each respondent.

GPS data from the Add Health study however, only contained the latitude and longitude of the residential addresses of respondents at Wave I. The use of Wave I data instead of Wave III data was done because of a lack of available GPS coordinate data available from Wave III. However, as the data-collection of the Wave I and III of the Add Health study differed by six years, this would mean that only families, who relocated into different residences during this time, would be incorrectly analysed. Additionally, neighbourhood data within the ICPSR restricted-use study 27024-0005 and 27024-0006 (in supplement to our Add Health study's GPS data) grouped respondents into pseudo states, tracts and neighbourhood blocks (so as to somewhat describe their geographic orientation and relation to other respondents), this data was available for both Wave I and III. This grouping allowed for a correlation between the residential neighbourhood for respondents to be computed between respondent's geographic blocks in Wave I and III, so as to detect any residential relocation. The correlation revealed that the percentage of respondents who inhabited the same neighbourhood was 95.3 per cent, which meant that a very small amount of respondents had residential GPS coordinates which differed from those captured in Wave I. Additionally, as this realised to a small amount respondents (713 respondents) having incorrect GPS coordinates, they were safely removed from analysis, without any detrimental bias expected

to be introduced to the sample. Therefore the Wave I GPS coordinate data was deemed to be a valid measure to estimate the distance between respondents.

The way in which this data was used in this study, and how results were drawn from analysis, are explained in the following section. This distance data, friendship data, sibling data and other demographic variables are presented and modelled, where their influences on each other are made explicit. The specific analysis methods are described in the following section.

## **8. DATA ANALYSIS**

This study made use of and evaluates a non-parametric predictive PLS-SEM, to identify the salient influences in the development of Risk Preferences in the Generation Y cohort over time. Following from this, linear probability modelling was performed, so as to identify finer dynamics in the peer influence process (Hill *et al.*, 2010). Although many models exist which can aid in explaining social communicable influences (Hethcote & Yorke, 1984; Garnett & Anderson, 1996; Pastor-Satorras & Vespignani, 2001; Christakis & Fowler, 2007; Cohen-Cole & Fletcher, 2008; Hill *et al.*, 2010), this study instead made use of the most basic LPMS as used by Hill *et al.* (2010) in their research on the spread of emotions within a similar cohort.

The PLS model was concerned with the Risk Preference measure for each respondent's list of friends, as well as their siblings, while controlling for physical distance (which was discussed in section 3.2 of the Chapter III literature review as an important factor). The model also incorporated demographic variables such as age and gender, as they were described in the literature review section 3.12 of Chapter II as being influential in predicting changes in the Risk Preference of respondents.

The second method in the study incorporate linear probability modelling which measured the changes in Risk Preference group association, for the Risk Preference groups of "risk-averse", "risk-neutral" and "risk-seeking". This was with respect to the number of social ties that respondents had in each of those three Risk Preference groups, similar to the methods used by Hill *et al.* (2010) and Lam, Marteleto and Ranchhod (2013).

In order to perform the initial analysis on this Add Health data, the model was tested using the PLS approach to SEM, using the SmartPLS software (Ringle, Christian, Wende & Will, 2005). The various relationships between the constructs are described in the following sections and the conceptual model.

### **8.1. Data analysis: H<sub>1</sub> – H<sub>5</sub>**

Hypothesis one through five were tested using PLS-SEM, which is a popular multivariate statistical technique as it has the ability to estimate multiple dependence relationships at once, supporting multiple itemed constructs (Farell, 2010). This method of analysis can evaluate a system of hypotheses, and thus was highly relevant in this study (Malhotra, 2007; Farell, 2010; Hair, Black, Babin & Anderson, 2010). It is relevant due to the multiple hypotheses in this study create a system of several dependant and independent variables.

PLS-SEM makes use of variance within the system, to measure corresponding changes between variables (Malhotra, 2007). Similarly to the use of multiple regressions, the systematic and statistically significant variation between constructs can be test for and subsequently identified (Hair *et al.*, 2010). This is done by evaluating estimated path values, within the model (Hair *et al.*, 2010). Alternate methods exist to SEM – Covariance Based (CB) SEM one of which makes use of covariance in identifying statistically significant path values. Additional differences between these two methods are summarised below.

Table 4.3: Comparison between PLS-SEM and CB-SEM techniques

<b>Basis of Comparison</b>	<b>PLS-SEM</b>	<b>CB-SEM</b>
Objective:	Prediction-oriented	Parameter oriented
Approach:	Variance-based	Covariance-based
Assumptions:	Non-parametric	Normal distribution
Relationship between latent variables and measures:	Can be modelled in either formative or reflective mode	Typically only reflective indicators
Implications:	Optimal for prediction accuracy	Optimal for parameter accuracy
Model complexity:	High complexity (e.g. 100 constructs, 1000 indicators)	Low to moderate complexity (e.g. <100 indicators)
Sample size:	Minimum observations range from 30 to 100 cases.	Minimum number of observations ranges from 200 to 800.

Adapted from Hubona, 2010.

The above table provides insight into why each technique might be adopted over the other. PLS-SEM is used to model predicted behaviour or processes, unlike CB-SEM, which is merely used to evaluate theory (Chin, 2010; Hubona, 2010). PLS-SEM is also variance-based, unlike the covariance method adopted by CB-SEM, variance-based modelling has the advantage of identifying changes throughout several constructs within a model, unlike covariance-based modelling which only identifies relationships between paired constructs (Hubona, 2010). Additionally, the PLS-SEM is independent of some parametric distribution, which means the models can either be formative or reflective in nature (Chin, 2010; Hubona, 2010). The advantage of this is that there is a heightened level of prediction, within PLS-SEM models, even when vast constructs and relationships are declared (Chin, 2010; Hubona, 2010).

Within this study, as the primary objective was to test the predictive properties of specific variables within the system of Risk Preference development, PLS-SEM was identified as being the most appropriate method. These variables represent previous Risk Preference as well as previous Risk Preference of peers on future Risk Preference. The system also

includes 8 constructs and 30 indicator variables which is most appropriately evaluated by PLS-SEM using variance measures, as oppose to CB-SEM, as PLS-SEM lacks the dependency on covariance between paired constructs, allowing for several constructs to be evaluated dynamically (Chin, 2010; Malhotra, 2007; Hubona, 2010).

The use of PLS-SEM has predominantly been employed in recent studies, through the use of the software packages PLS Graph (Chin & Frye, 2003), SmartPLS (Ringle *et al.*, 2005) as well as LVPLS (Lohmöller, 1987; Ringle, Sarstedt & Straub, 2012). This study made use of the SmartPLS statistical software package (Ringle *et al.*, 2005), which offers the ability to graphically formulate models to be tested using the PLS-SEM technique. Using this software, one can easily test a model and assess the reliability and validity of measurements used. The internal consistency and indicator reliability assessments, as well as the convergent and discriminant validity assessments are first made, using the measurement model within the SEM technique.

The internal consistency of the model is first assessed with the use of the Cronbach's Alpha measure, where indicators within the model are expected to correlate onto their respective construct with values greater than 0.7. The composite reliability assessment suggests that the composite reliability measures should be greater than 0.7 for exploratory research and 0.8 for testing models.

The indicator reliability is required to have item loadings which are higher than 0.7 (or higher than 0.5 for squared negative values). The items within the model are also expected to load onto their specific latent construct with AVE values of greater than 0.5. Discriminant validity requirements for models require that the square root of a construct's AVE is greater than the correlations between the construct and other constructs (Fornell & Larcker, 1981). Following an assessment of the reliability and validity of the measurement model – the structural model can then be assessed. This assessment allows for the various hypotheses to be assessed, which relies strongly on path values and the coefficient of determination (R-square).

The R-square values indicate the structural fit of the various constructs within the model. These values are assessed along Chin's (1998) guidelines, where 0.67 is substantial; 0.33

is moderate; 0.19 is small and below that is very small. Following from this structural fit measure, the path values of the inner model are then assessed, according to their t-values. Lastly, the effect sizes of the various relationships are assessed. Effect sizes can either be weak (between 0.02 and 0.15); moderate (between 0.15 and 0.35); as well as strong (greater than 0.35). This leads to a rejection or acceptance of the associated hypotheses.

In achieving the first five research objectives, the PLS-SEM model was appropriate and used. The conceptual model for this included measures for the Risk Preference for each respondent in the dataset at both Wave III (T<sub>1</sub>) and Wave IV (T<sub>2</sub>); the respondent's chosen gender; the respondent's age at T<sub>1</sub>; a variable which aggregates the individual's nominated friend's Risk Preference; an aggregation of the physical distance of these friends from the respondent; as well as the same measures of Risk Preference and an aggregation of the physical distance of the siblings from the respondent. This required measures from various sections and waves of the Add Health study. The table below illustrates the exact measures used within the model.

Table 4.4: PLS-SEM constructs and measures

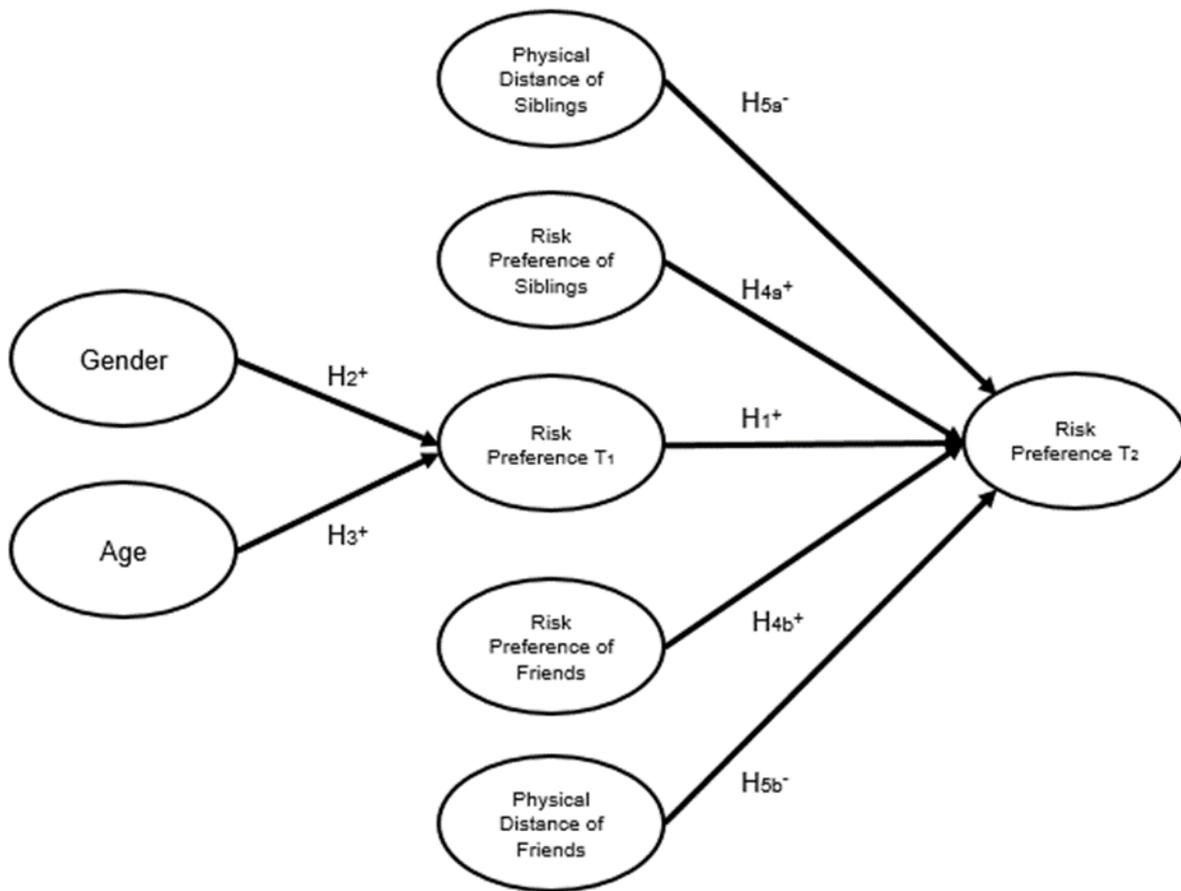
<b>Construct</b>	<b>Measure</b>	<b>Add Health Wave</b>
Risk Preference T <sub>1</sub>	Self-evaluated Risk Preference Scale	III
Risk Preference T <sub>2</sub>	Self-evaluated Risk Preference Scale	IV
Gender	Self-evaluated binary gender scale	III
Age	Self-evaluated date of birth	III
Distance of Friends	Interviewer measured GPS coordinates	I
Distance of Siblings	Interviewer measured GPS coordinates	I
Risk Preference of Friends	Self-evaluated Risk Preference Scale	III
Risk Preference of Siblings	Self-evaluated Risk Preference Scale	III

The analysis required exactly five measures, to analyse Social Influence and hypothesised demographics on that of Risk Preference development for the Generation Y cohort. These measures included the self-evaluated Risk Preference scale at Wave III and IV. This scale was used for siblings, friends and the individuals themselves. These were included as individual items, 10 of which were included under the Risk Preference of friends construct (as respondents could identify up to 10 friendships). Five Risk Preference measures were

included under siblings, as respondents were allowed to identify five sibling ties. These would form two examples of constructs with difference social distances (friends and siblings). Lastly, two constructs were included containing the Risk Preference of respondents themselves, so that the model could capture Social Influence on the Risk Preferences over time. The distance of these same friends and siblings from each respondent were measured and included as individual items in the latent variables of *Distance of Friends* and *Distance of Siblings*. These were used as controls within the model, so as to identify the moderating effects of physical distance in the Social Influence process. Lastly, single-item gender and age constructs were included, which would predict the Risk Preference of each respondent in the initial time period.

As the PLS-SEM model aimed to compare the relationships between latent variables, the evaluation of the path values and effect sizes was important in determining if statistically significant relationships existed within the model. The following conceptual model describes the relationships, their direction and the hypothesised coefficient (positive or negative, indicated above the hypothesis symbol).

Figure 4.1: Conceptual model



$H_1^+$ : There is a strong correlation between the Risk Preference in Generation Y individuals throughout their young adulthood

$H_2$ : Females Generation Y individuals have more averse attitudes towards risk-taking than male Generation Y individuals

$H_3$ : Older Generation Y individuals have more risk averse attitudes towards risk-taking than younger Generation Y individuals

$H_4$ : The association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals is stronger than the association between the Risk Preference of friends and the Risk Preference of Generation Y individuals

$H_{4a}^+$ : There is a positive association between the Risk Preference of siblings and the Risk Preference of Generation Y individuals

$H_{4b}^+$ : There is a positive association between the Risk Preference of friends and the Risk Preference of Generation Y individuals

$H_5$ : There is a negative association between the physical distance of peers and amount of influence on the Risk Preference of Generation Y individuals

$H_{5a}^-$ : There is a negative association between the physical distance of siblings and amount of influence on the Risk Preference of Generation Y individuals

$H_{5b}^-$ : There is a negative association between the physical distance of friends and amount of influence on the Risk Preference of Generation Y individuals

The PLS algorithm was used to estimate the path values of the relationships between the constructs, as illustrated in the conceptual model. Following this, the bootstrapping

technique (Efron & Tibshirani, 1986; Davison, Hinkley & Young, 2003) was used to test coefficients for their statistical significance. The bootstrapping method was used to estimate the significance of each relationship, through multiple estimations of a PLS-SEM model (Davison, Hinkley & Young, 2003). However, as these often produced inflated measures of significance, an additional holdout sample was selected which would be compared to the findings of the bootstrapping estimates (Kim, 2009).

The bootstrapping included two samples, one which would estimate the statistical significance of the coefficients, and another holdout sample to confirm this. Both of these samples for the bootstrapping were randomly selected from the overall sample, after cleaning and coding the data and constructing the various variables of physical distance, friendships and sibling ties. Pairwise replacement for missing values was implemented where responses which had missing data for 25% or more of the constructs used, this is thought to be a less bias method as oppose to case wise or other missing value management methods (Acock, 2005). The sample size for these was also 300 respondents each, as 300 represents the smallest sample able to produce a robust estimate of the Cronbach's Alpha. Larger samples were not included in the PLS-SEM analysis as there would only deflate the standard error and thus produce inaccurate levels of significance (Yurdugul, 2008). The bootstrapping utilized 300 cases, as per the sample size, and a minimum value for the number of resampling's (1000), as per Peng and Lai's (2012) guidelines, so as not to deflate the standard error. Measures of the Cronbach's alpha would evaluate the reliability and internal consistency of the measurement instruments, the constructs would be assessed on their convergent validity and discriminant validity using the degrees to which the average variances explained of their items loaded onto the correct construct. From there, specific conclusions were drawn as to the usefulness of the values estimated by the PLS path model, and further conclusions were drawn.

## **8.2. Data analysis: H<sub>6</sub>**

After this, additional methods were employed to better estimate the relationships between each of the constructs. Specifically, student's t-test were used to estimate exact differences between groups such as gender and age as well as Ordinary Least Square (OLS) regressions.

The final research objective was achieved using OLS (in the form of LPMs). This was used so as to better explain interaction between respondents of different Risk Preference states, as used by Hill *et al.* (2010). Regressions were performed using the number of friendship or sibling ties that a respondent has, against a binary output measuring the respondent's changes between specific Risk Preference states. This was needed to be repeated for all possible transitions that a respondent might engage in, between the two time periods (eg. Risk Averse in T<sub>1</sub> and Risk Seeking in T<sub>2</sub>). This determined if specific Risk Preference states offer any specific dynamics in the peer effects which they induce (Hill *et al.*, 2010). This analysis was performed using the STATA statistical software package which is a popular statistical package.

As this study sought to explain the development of Risk Preference due to peer effect, when using methods based on the studies by Lam, Marteleto and Ranchhod (2013) and Hill *et al.* (2010) – this meant that specific requirements were required from the dataset for an adequate reuse of their methods in this study. Making use of the linear probability modelling techniques used by Hill *et al.* (2010) required an extremely large sample for purposes of reliability and validity, and also required data pertaining to the social ties (friendship or family) among respondents within the dataset.

The Add Health dataset can also be described as being sufficiently large, in line with Hill *et al.* (2010) where they used a large sample size of 1880 in their study. The Add Health dataset offers a sample of 20745 respondents (Add Health, 2013), sufficiently large for the methods of Hill *et al.* (2010). The consequences of this are that the study's results are confined to the Generation Y cohort residing in the United States of America (where the Add Health data is collected).

Augmented datasets have been proposed as an alternative solution to this, incorporating datasets from through the world, however because social ties are required for each respondent, such a method would introduce unnecessary bias over that of instead merely confining this study's results to the Generation Y cohort residing in the United States of America.

## 9. CONCLUSION

As can be seen from the previous sections, this chapter described the particular methods whereby this study's research objectives were investigated. This study was conducted in order to better explain the determinants in the development of Risk Preferences over time, using peer effects and other influences. This was tested using a PLS model and further tests were incorporated, so as to enhance the understanding of the PLS output. The additional analysis was in the form of Student t-tests and LPMs using OLS regression.

This chapter also discussed the benefits of utilizing a large cohort, specifically the Add Health dataset, so as to better understand a large and influential group of Generation Y individuals. Specific parameters relating to the sample's friendship ties, sibling ties, Global Positioning System (GPS) coordinate data as well as Risk Preference data were discussed and the justification for their decisions was stated. This analysis generated results, is discussed in the following chapter, where the PLS model is examined (using various reliability and validity diagnostic tools) the significance of the paths are assessed and further analysis and insights are gained using OLS modelling.

## **CHAPTER V**

### **RESULTS**

#### **1. INTRODUCTION**

The previous chapter provided an overview of this study's methodology, including the research design, research method and sampling techniques. This described the use of the longitudinal secondary interview survey data in the PLS-SEM analysis, to produce findings in line with the first 5 hypotheses. The previous chapter also described the requirements of validity and reliability within the model. Additionally, linear probability modelling was described as a means to acquire findings for research objective 6.

This chapter focuses on the findings of this empirical study, from these quantitative data analyses. The first part of this chapter focuses on describing the specific variables utilized in the study. After these descriptive statistics are presented, the chapter presents an analysis of the PLS-SEM model, so as to test relationships from the conceptual model, described in section 8.1 of the previous chapter. The specific reliability and validity statistics are also described. Additional longitudinal data analysis techniques are then illustrated, using linear probability modelling, as described in section 8.2 of the previous chapter. A brief discussion of the descriptive statistics, regarding the measures used during the data analysis is first be presented.

#### **2. DESCRIPTIVE STATISTICS**

In understanding if the sample drawn from the Add Health study could be seen as representative of the overall target population, various descriptive statistics are first presented, so as to evaluate this. Further descriptive statistics are presented for the individual measures of Risk Preferences, siblings, friends and their respective Risk Preferences, as they are important components of the PLS-SEM model. These are evaluated for any outliers and so that an understanding of the direction of the scales, their mean, range and variability can be gained. In understanding the social-demographic components of the overall sample, table 5.1 presents a review of the final sample used in this study.

Table 5.1: Social-demographic profile of Add Health respondents

Demographics Variables	Population n	Population %	Sample n	Sample %
<b>Gender</b>				
Male	7521	49,49	5511	45.65
Female	7676	50,51	6561	54.34
<b>Race</b>				
White	9442	62,13	7039	63.64
Black	3500	23,03	2693	22.31
Asian	1061	6,98	864	7.16
Native American	184	1,21	429	3.55
Other/Refused	1012	6,66	1047	8.67
<b>Home Language</b>				
English	13452	88,52	10913	90.38
Spanish	1210	7,96	832	6.89
Other/Refused	533	3,51	327	2.71
<b>Birth Country</b>				
United States	13803	90,83	11186	92.66
Other/Refused	1394	9,17	886	7.34
<b>Total</b>	<b>15197</b>	<b>100</b>	<b>12072</b>	<b>100</b>

In comparing the overall population and the final utilized sample, it can be seen in table 5.1, that sample appears generally consistent with that of the overall population, from the Add Health dataset. This is important as missing values and the process of data cleaning and coding can allow for irregularities to emerge in the dataset. The study's final realised sample (n = 12 072), is slightly skewed towards females, however this is not thought to be a concern, as gender has already been hypothesised as an influencing factor and is controlled for in this study's model.

The final valid sample constituted 79.42% of the 15197 participants sampled during Wave III and IV of the cohort, the figure is smaller than that of the total respondents sampled, due to incomplete survey measurements for the Risk Preferences. This was because only complete measures from Wave III and IV would allow for valid estimation of the Social Influence on their Risk Preferences over time. Within the following sections, Wave III (2001) and IV (2008) will be referred to as T<sub>1</sub> and T<sub>2</sub>.

## 2.1. Social interaction data

In this study, respondents were identified as having social interaction to from an assessment of their self-nominated friendships as well as their self-nominated siblings. The respondent's degree is here defined as a measure of the number of social contacts. The sample had an average degree of 2.98 for self-nominated friendships and an average degree of 0.25 for siblings. This consisted of 3262 respondents having siblings, each of which had an average degree of 1.65 siblings.

## 2.2. Risk Preference data

This study's one-item risk scale measured the respondent's Risk Preference, as described in Wills, Vaccaro and McNamara's (1994) risk taking scale. Descriptive statistics for the Risk Preference data, for both T<sub>1</sub> and T<sub>2</sub> is shown below in table 5.2.

Table 5.2: Risk Preferences means and standard deviations for T<sub>1</sub> and T<sub>2</sub>

Variable	Mean	Standard Deviation
Risk Preference at T <sub>1</sub>	2.46	0.97
Risk Preference at T <sub>2</sub>	2.90	0.91

As can be seen in the table, the mean Risk Preference score increased from a value of 2.46 at T<sub>1</sub> to a value of 2.90 at T<sub>2</sub>, with little change in variation within each of the samples (standard deviation 0.97 at T<sub>1</sub> and 0.91 at T<sub>2</sub>). It can be inferred that the sample, on average, is tending towards risk aversion, by tending towards disagreement to the statement asking "Do you enjoy taking risks?" However, such affects cannot be attributable to either age or maturation, which requires additional analysis (Arnett, 2007).

When grouping respondents into Risk Preference states, as described in section 8.2 of the methodology chapter, which is an effective way for analysing peer influence (Hill *et al.*, 2010), it appears that the sample is specifically becoming more neutral towards the statement of "Do you enjoy taking risks?" where Risk Neutral appears to be the only group that has increased in size between T<sub>1</sub> (2416) and at T<sub>2</sub> (3440). This classification was

important for understanding the group dynamics of the various Risk Preference groups, within the Generation Y cohort, as objective 6 required.

Table 5.3: Risk Preferences states for T<sub>1</sub> and T<sub>2</sub>

<b>Variable</b>	<b>n at T<sub>1</sub></b>	<b>% at T<sub>1</sub></b>	<b>% at T<sub>1</sub></b>	<b>n at T<sub>2</sub></b>
Risk Averse	2884	23.88	2141	17.73
Risk Neutral	2416	20.03	3440	28.50
Risk Seeking	6772	56.09	6491	53.77

The exact migrations between respondent's Risk Preference between T<sub>1</sub> and T<sub>2</sub> are depicted in figure 5.1 below. This allows for an easy understanding of where individuals were in both time periods.

Figure 5.1: Changes between Risk Preference states between T<sub>1</sub> and T<sub>2</sub>

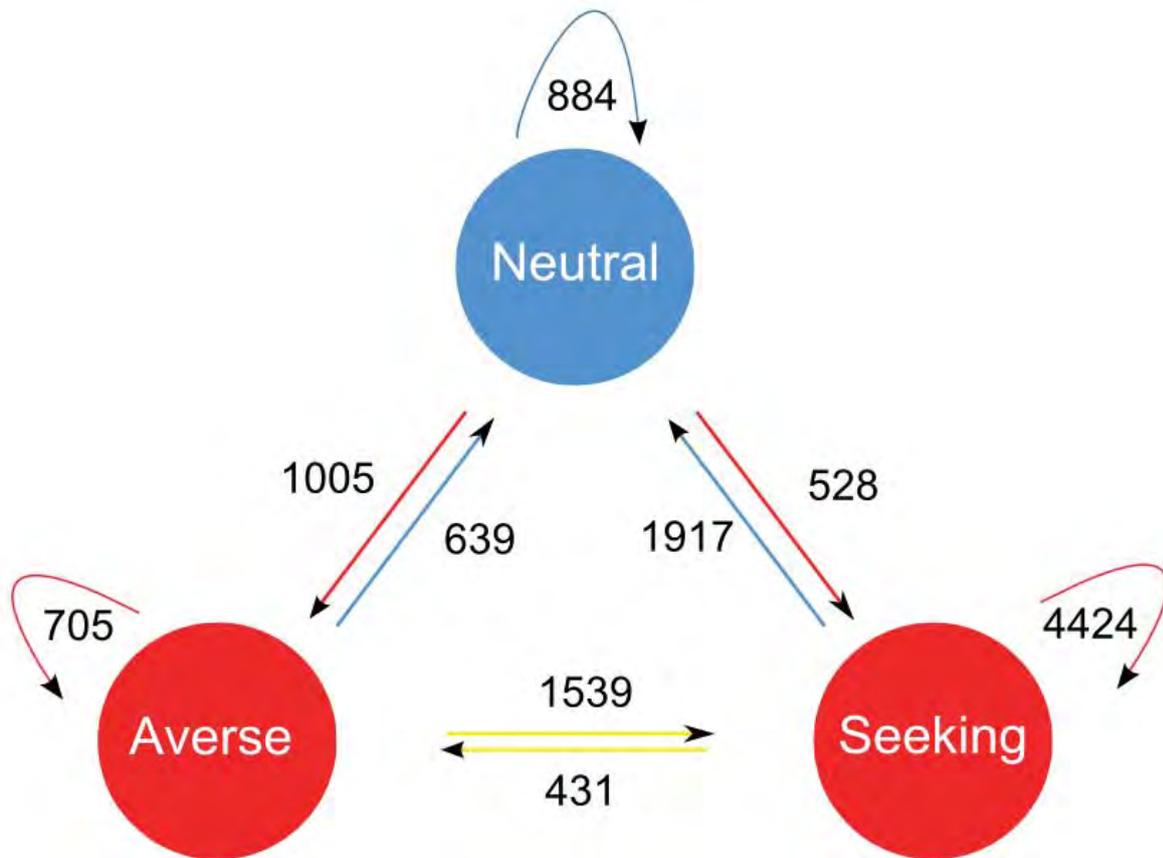


Figure 5.1 shows that a substantial proportion of the sample could be described as risk seeking, at both T<sub>1</sub> and T<sub>2</sub>. However the largest amount of the sample migrated from a risk seeking state, towards a risk neutral state by T<sub>2</sub>.

With the data required for the study's analysis broadly described for both the PLS-SEM modelling and the OLS modelling - the following section is devoted to testing the PLS-SEM model, as described conceptually in section 8.1 of the methodology chapter. Further sections explore findings drawn from the output from the PLS-SEM model through the use of OLS modelling, to identify group dynamics.

### 3. INFERENCE STATISTICS

Research objectives 1, 2, 3, 4 and 5 were each tested using the PLS-SEM, which evaluates several factors in the development of Risk Preferences over time. Research objective 6 was

discussed using additional OLS modelling to produce the LPMs, these are described in a later section.

### 3.1. Results for research objective 1 to 5: PLS-SEM model

The analysis of the PLS-SEM model involves an evaluation of various estimates within the measurement model, which allow for an evaluation of the model’s reliability and validity. The reliability measures include internal consistency and individual indicator reliability, while the validity measures include an interpretation of the convergent and discriminant validity. The factor loadings for each item of each latent variable are also reviewed.

The PLS-SEM model made use of several factors which were determined to be salient variables, when discussed in the literature review. The specific variables included in the following model are that of the Risk Preference for each respondent in the dataset at both T<sub>1</sub> and T<sub>2</sub>; the respondent’s chosen gender; the respondent’s age at T<sub>1</sub>; a variable which aggregates the individual’s nominated friend’s Risk Preference; the aggregate distance of these friends; as well as the same measures of Risk Preference and distance for the aggregation of their siblings. The various scales used are presented in table 5.4 below.

Table 5.4: Scales used within the PLS-SEM model

Latent Variable	Items	Range	Increments
Risk Preference T <sub>1</sub>	1	1 - 5	1
Risk Preference T <sub>2</sub>	1	1 - 5	1
Gender	1	1 - 2	1
Age	1	18 - 26	1
Distance of Friends	10	0 - 30 000	0.0001
Distance of Siblings	3	0 – 30 000	0.0001
Risk Preference of Friends	10	1 - 5	1
Risk Preference of Siblings	3	1 - 5	1

As can be seen from the above table, the majority of the constructs within the PLS-SEM model were evaluated using single-item scales. Various items were available from the various siblings and friendship ties and each formed part of their overall friendship or sibling

construct. The dataset contained respondents aging from between 18 and 26 years old and allowed for distances between siblings and friends to range between 0 meters, to a maximum of 30 kilometres. The interplay of these constructs and their relationships are evaluated in the following section.

### **3.1.1. Measurement model**

Both the PLS-SEM algorithm and bootstrapping with 300 cases were performed using 1000 samples. These parameters were chosen in line with specifications by Hair, Black, Babin and Anderson (2005); Peng and Lai (2012) and Yurdugul (2008). The bootstrapping method was used to estimate the significance of each relationship, through multiple estimations of a PLS-SEM model (Davison, Hinkley & Young, 2003). The reliability output statistics are shown in table 5.5 below.

Table 5.5 lists the reliability statistics for the PLS-SEM model, which are all values between 0 and 1. The Average Variance Extracted (AVE), is a measure of the average percentage of variation within a construct; this represents a summary measure for all of the appropriate item's convergence on a given latent variable (Malhotra, 2007; Hair *et al.*, 2010). The composite reliability measure describes the degree of similarity between items (Hair *et al.*, 2010). R-squared values represent the correlation coefficient squared (coefficient of determination) which yields the percentage of total variation explained by the model (Shiu, Hair, Bush & Ortinau, 2009; Hair *et al.*, 2010). These values are only shown for the two Risk Preference measures, in the PLS-SEM model, as these are the only dependent variables. Lastly, the Cronbach Alpha measures the reliability of the model, with values above 0.6 deemed to be acceptable (Malhotra, 2007; Shiu *et al.*, 2009; Hair *et al.*, 2010).

Table 5.5: PLS-SEM reliability statistics

Latent Variable	AVE	Composite Reliability	R Square	Cronbach's Alpha
Risk Preference T <sub>1</sub>	-	-	0.066	-
Risk Preference T <sub>2</sub>	-	-	0.229	-
Gender	-	-	-	-
Age	-	-	-	-
Distance of Friends	0.110	0.173	-	0.745
Distance of Siblings	0.604	0.807	-	0.594
Risk Preference of Friends	0.109	0.098	-	0.563
Risk Preference of Siblings	0.403	0.650	-	0.282

In order to assess reliability and validity of the constructs, the statistical significance of relationships between constructs and the prediction power of the model – several steps are followed in the analysis of this PLS-SEM model. The measurement model allows for an understanding of the items and their relations to their specific constructs in the model. These are analysed with use of the reliability measures (using the Cronbach's alpha and the item loadings, to evaluate the internal consistency and composite reliability of the model (Tabachnick & Fidell, 2007). Additionally, AVE measures are then evaluated, so as to understand the convergent validity and discriminant validity within the model. Lastly, the structural model is evaluated, using t-tests and the overall predictive power of the model is assessed through the R-square values and effect sizes for individual constructs (Bollen, 1989). The following section begins this evaluation with an assessment of the PLS-SEM model's reliability diagnostics.

### 3.1.2. Reliability

In order to assess the reliability of the research model, both the internal consistency and indicator reliabilities of the model were analysed. The Cronbach's alpha and composite reliability values determine if a model is internally consistent (Tabachnick & Fidell, 2007).

In terms of internal consistency, seven of the eight of the latent variables in the research model were measured as reliable, with each variable achieving a Cronbach's alpha of

greater than or approaching the 0.6 threshold recommended by Nunnally, Bernstein and Berge (1967) for social science studies. Risk Preference of Siblings did not meet this threshold. However, only one of the four latent variables also achieved composite reliabilities of greater than 0.7. This figure is above the 0.7 threshold recommended by Dillon and Goldstein (1984) for new models, which was justified due to this model having limited research available for comparisons.

In terms of indicator reliability, an analysis of the item loadings showed that, with the exception of 3 indicators, all the indicators in the model had item loading greater than or close to 0.7, as suggested by Hubona (2010). It was noted that all three of these items came from the measure of Risk Preference of Friends, which aggregated the Risk Preference from self-nominated friendships within the population. These items were removed from the analysis.

Based on the aforementioned results regarding the internal consistency and indicator reliability, the research model was considered to be sufficiently reliable.

### **3.1.3. Validity**

In order to assess the validity of the research model shown, both the convergent validity and discriminant validity were analysed (Tabachnick & Fidell, 2007). This required an assessment of the indicators and their specific convergence on their specific construct; the proportion of variance in common is measured to evaluate the convergent validity – with AVE values of 0.5 representing adequate convergence of the items (Malhotra, 2007; Hair *et al.*, 2010). Discriminant validity measures the extent to which each construct is truly distinct from the other constructs in the model. This is important to determine as constructs would each be expected to measure some phenomena which is not measured by other constructs (Malhotra, 2007; Hair *et al.*, 2010). This is evaluated using the Fornell-Lacker Criterion (1981) where the AVE values for each construct should be higher than the square correlation between itself and the other constructs.

In terms of convergent validity, all 30 items loaded significantly on their respective latent constructs at the 5% significance level (Hubona, 2010). The average variances explained

(AVE's) of one of the latent variables was above the 0.5 threshold suggested by Fornell and Larcker (1981).

In order to determine the discriminant validity of the model, a construct cross-correlation matrix was calculated, with the output shown in table 5.6 below. The square root of the AVE's for all latent variables were all greater than any of the correlations with the other latent variables, satisfying Fornell and Larcker's (1981) criterion for discriminant validity. Following this, the factor loading and cross-loading matrix was analysed, with each item having the greatest loading on its associated latent variable, which further confirmed the discriminant validity of the model (Hubona, 2010).

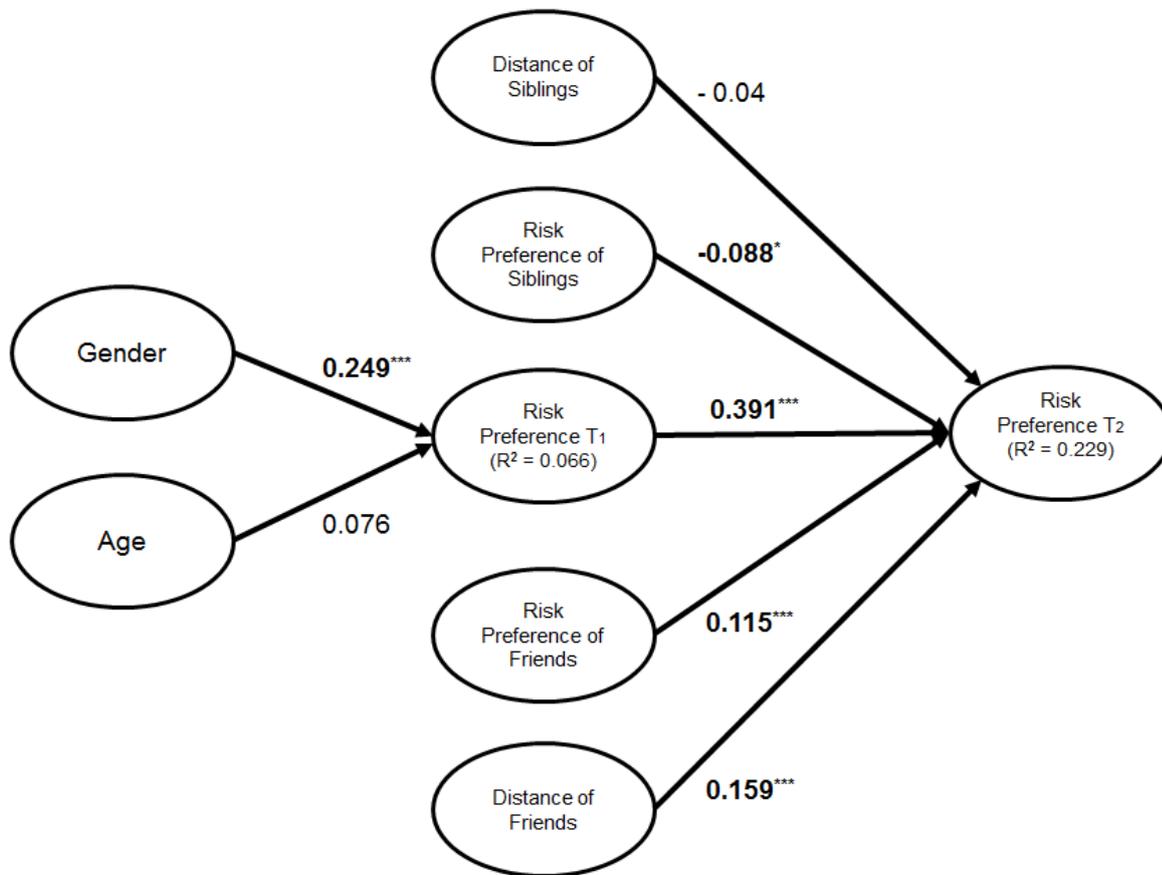
Table 5.6: Cross-correlation matrix for constructs

	Var1	Var2	Var3	Var4	Var5	Var6	Var7	Var8
Var1	-							
Var2	0.407	-						
Var3	0.245	0.261	-					
Var4	0.064	0.023	-0.050	-				
Var5	0.059	0.219	0.155	-0.072	<b>0.332</b>			
Var6	-0.018	-0.077	-0.061	0.069	-0.047	<b>0.777</b>		
Var7	0.116	0.214	0.173	-0.060	0.280	-0.013	<b>0.330</b>	
Var8	0.085	-0.092	0.042	0.058	-0.095	0.245	-0.110	<b>0.635</b>

Var1: Risk Preference T<sub>1</sub>  
 Var2: Risk Preference T<sub>2</sub>  
 Var3: Gender  
 Var4: Age  
 Var5: Distance of Friends  
 Var6: Distance of Siblings  
 Var7: Risk Preference of Friends  
 Var8: Risk Preference of Siblings

Based on the aforementioned results regarding the convergent and discriminant validity, the research model was therefore considered to be valid. This allowed for the interpretation of the structural model, which will now be discussed.

Figure 5.2: Structural model for influencers of future Risk Preference



- \* Significant at 10% level of significance
- \*\* Significant at 5% level of significance
- \*\*\* Significant at 1% level of significance

Two random samples of 300 were drawn from the overall sample, to assess the structural model. One of these samples was used to estimate the structural model (shown in figure 5.2), while the other sample was used as a holdout sample used to validate the estimated model. The holdout sample confirmed the same relationships from the structural model, through similar path values. The interpretation of the structural model is now presented.

In assessing the path values of the inner model, it was determined that Risk Preference T<sub>1</sub> (H<sub>1</sub>), Risk Preference of friends T<sub>1</sub> (H<sub>4b</sub>) and distance of friends T<sub>1</sub> (H<sub>5b</sub>) all had positive associations with Risk Preference T<sub>2</sub>. Gender also positively influenced Risk Preference T<sub>1</sub> (H<sub>2</sub>). Risk Preference at T<sub>1</sub> had the greatest influence on Risk Preference at T<sub>2</sub> (0.391),

compared to Risk Preference of friends at T<sub>1</sub> (0.115), distance of friends at T<sub>1</sub> (0.159). Furthermore gender also had a positive influence on Risk Preference at T<sub>1</sub> (0.249). However, the p-values for the relationship between Risk Preference of siblings at T<sub>1</sub> and Risk Preference at T<sub>2</sub> (H<sub>4a</sub>), and distance of siblings at T<sub>1</sub> and Risk Preference at T<sub>2</sub> (H<sub>5a</sub>) as well as age and Risk Preference T<sub>1</sub> (H<sub>3</sub>) were greater than 0.05. This study therefore failed to reject the null hypotheses at the 5% significance level, and concluded that no positive associations existed between these pairs of latent variables. In previous studies surrounding peers and Risk Preference development have typically found to correlation between preferences of individuals and their peers, where this included the influence by siblings (Von Bothmer, Mattsson & Fridlund, 2002; Byrnes, Miller & Schafer, 1999; Gardner & Steinberg, 2005). Further research is therefore required, to fully understand the influence of peers and how the controls for distance are realised.

The effect size of individual constructs offers a means for evaluating the individual contribution that a latent variable has on explaining the dependent variable within the model (Trinchera & Russolillo, 2010). In calculating the effect size of the latent variables, the R<sup>2</sup> values were compared for models which included and then ignored certain latent variables. However, as this study only aimed to explain the effects of the Risk Preference of peers on the future Risk Preference of Generation Y individuals – there is only one effect size that can be reported on. Also, as many of the latent variables, such as the distance of siblings and the distance of friends are considered control variables, therefore an adequate interpretation of these such variables would not be possible (Chin, 1998). The effect size of Risk Preference of friends at T<sub>1</sub> was found to be very weak, with an effect size of less than 0.02. According to the criteria set out by Cohen (1988), where very weak latent variables are not substantially important in explaining variation in the model. This could be due to the limited reliability and validity within the latent variable measuring the Risk Preference of friends (Chin, 1998). However, other authors claim that a low effect size does not mean that an effect is to be considered negligible and such a decision would require further assessment of the coefficients and significance of them in the structural model (Trinchera & Russolillo, 2010).

In building on the findings from the PLS-SEM model, the following section further explores the interesting relationships found in the PLS-SEM model. These include gender's

relationship with Risk Preferences, the surprising insignificant relationship between age and Risk Preference. The following section also covers results which aid in the discussion of research objective 6 – the appearance of group dynamics in the Social Influence process.

### **3.2. Individual t-tests and results for research objective 6**

The PLS-SEM model identified that Gender offered a small but significant influence on the Risk Preference at T<sub>1</sub>, Risk Preference of friends at T<sub>1</sub> and distance of friends at T<sub>1</sub> offered a small but significant influence of Risk Preference at T<sub>2</sub>, and finally, Risk Preference at T<sub>1</sub> offered a medium and significant influence of Risk Preference at T<sub>2</sub>. Further analysis into the influence of each of these relationships will now be given, so to enhance the usefulness of the PLS-SEM model in understanding the coefficients of the relationships without interference from other latent variables. As this requires the student's t-test as well as OLS regression requires knowledge of the normality of the data, this evaluation of normality will first be presented (Diehr & Lumley, 2002).

#### **3.2.1. Normality of the data**

In determining if the data required for the analysis followed a normal distribution, a D'Agostino Test for Normality was performed for all of the variables required for data analysis, excluding the binary dependent variables (D'Agostino, Belanger & D'Agostino, 1990; Royston, 1991). This normality test was performed, as all of the data relied on aggregated measures (Gould & Rogers, 1991; Royston, 1991). None of the variables exhibited a kurtosis of a normal distribution at the 5% significance level ( $p < 0.05$ ). Similarly, all of the data was significantly skewed ( $p < 0.05$ ). D'Agostino Test for Normality makes use of a summation of the deviation in the sample's skewness and kurtosis from that of the skewness and kurtosis of a Gaussian (normal) the distribution, to compute a powerful measure of normality. For all of the variables – the joint probability of both skewness and kurtosis was determined to be statistically significant ( $p < 0.05$ ), therefore the data can be described as non-normal data. The first analysis into gender influences, as highlighted from the PLS-SEM model, will now be presented.

### 3.2.2. Gender and Risk Preferences

The gender variable was used as a means to describe differences in the Risk Preference the measures of respondent at T<sub>1</sub> and T<sub>2</sub>. This allows us to comfortably confirm our findings from the PLS-SEM model by validating these findings across both time periods. As can be seen for both time periods, females have means; females appear to have a mean of roughly 0.4 units higher than males, suggesting that females are more risk averse. The two-sample Wilcoxon rank-sum (Mann-Whitney) test was performed to further assess the hypothesis that males and females do differ in their Risk Preference. The tests were repeated for males and females across both time periods (T<sub>1</sub> and T<sub>2</sub>), so as to remove the possible effect that age might have had on the data and the subsequent PLS-SEM model (Arnett, 2007).

Table 5.7: Risk Preferences means and standard deviations by gender

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>
Risk Preference at T <sub>1</sub>		
<b>Male</b>	2.26	0.92
<b>Female</b>	2.66	0.97
Risk Preference at T <sub>2</sub>		
<b>Male</b>	2.80	0.98
<b>Female</b>	3.19	1.00

For respondents' Risk Preference at T<sub>1</sub>, the results showed that males and females do differ significantly in their Risk Preferences ( $z = 25.055$ ;  $p > 0.0001$ ), and the results were consistent with the hypothesis that males exhibit higher risk seeking attitudes (mean = 2.26; standard deviation = 0.92) than females (mean = 2.66; standard deviation = 0.97). For respondents' Risk Preference at T<sub>2</sub> – similarly, the test was significant ( $z = 22.611$ ;  $p > 0.0001$ ), and the results were consistent with the hypothesis that males exhibit higher risk seeking attitudes (mean = 2.80; standard deviation = 0.98) than females (mean = 3.19; standard deviation = 1.00).

As the PLS-SEM model similarly found that peer influence (in the form of the Risk Preference of their friends) did have a significant relationship with that of the respondent's Risk

Preference at T<sub>2</sub>, the following section will analyse the influence of friends, while incorporating the control for distance, which was found to be a significant control variable in the PLS-SEM model.

### **3.2.3. Peer Influence on Risk Preference**

So as to further examine this importance of distance in this process of developing Risk Preferences, further analysis was performed for the influence of friends' Risk Preference on the variable of Risk Preference of the respondent. This required the use of various LPMs, to estimate the Social Influence of peers.

- **Controlling for distance**

Using similar methods to those used by Fowler and Christakis (2008), which have been used to measure the Social Influence of peers, colleagues, friends and siblings - several correlations were performed, using only samples of friends who fell between specific distance parameters from respondents.

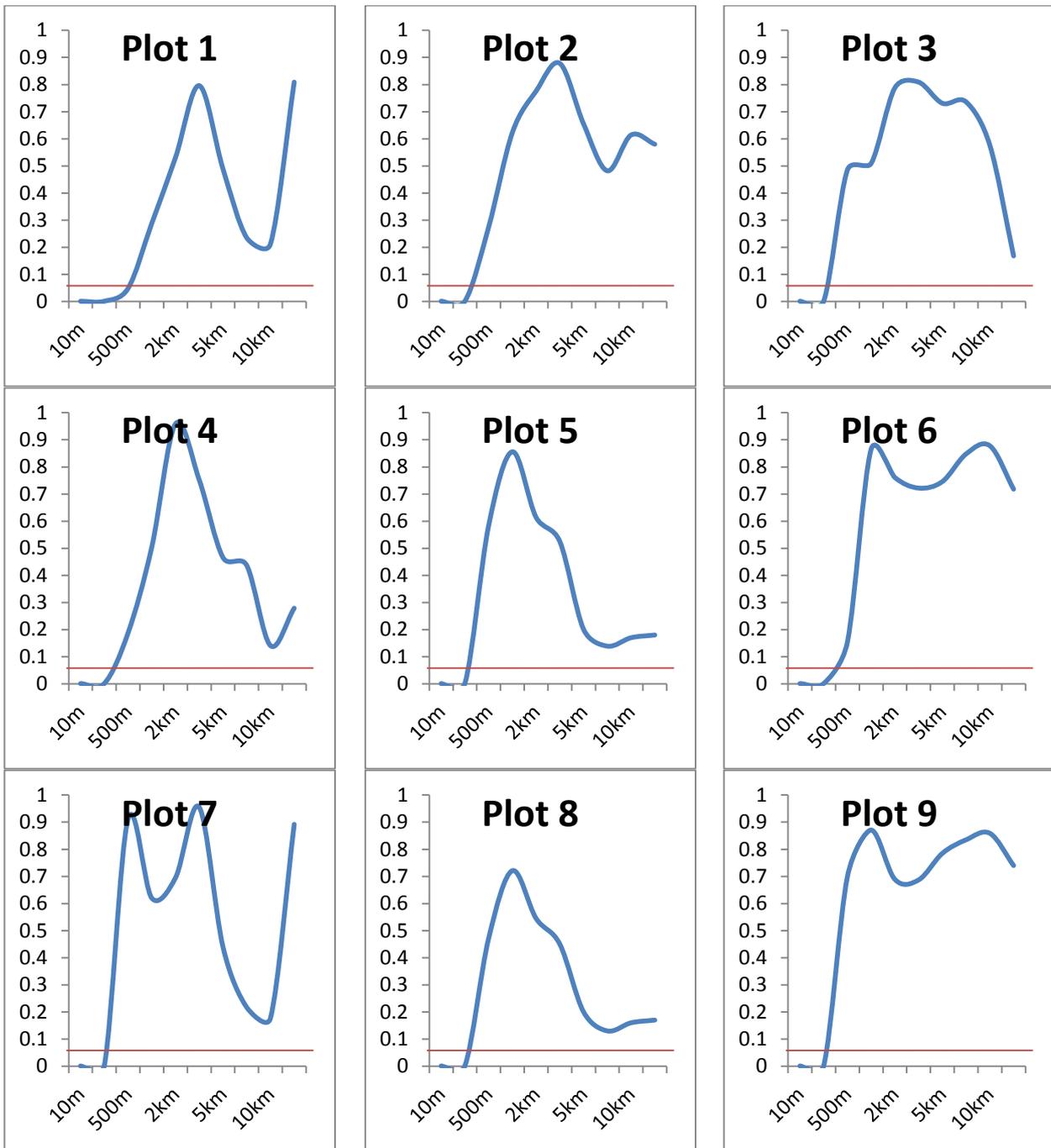
This method required respondents to be classified in specific categorical Risk Preference states. As previously mentioned in the methodology, these were risk averse, risk neutral and risk seeking. The analysis would correlate variables indicating if a respondent had changed to occupy a specific Risk Preference state, against a variable which indicated the number of friends within specific Risk Preference states. This would be repeated for all combinations.

In accordance with theory, it was expected that Social Influence on the Risk Preference of individuals would likely take place when friends lived near respondents (Fowler & Christakis; 2008b), the distance parameters therefore ranged from a very small distance (approximately 10 meters) and was increased for further regressions, to encompass a greater proportion of the individual's friendship group with a final regression including friends within 20 kilometres of the respondent. Results from this analysis would highlight the exact distances whereby friends would be able to influence the Risk Preferences of respondents.

Figure 5.3, below shows the significance plots of number of friends in specific Risk Preference states on changes in Risk Preference states by respondents, within specific

distances. The x axis represents the maximum distance of friends in the regression, the y axis represents the p-value of the corresponding correlation. This produces the 12 possible correlations.

Figure 5.3: Correlation plots of p-values of Social Influence within specific distances



- Plot1:           Transitioning to Risk Averse correlated with Number of Risk Averse Friends
- Plot2:           Transitioning to Risk Neutral correlated with Number of Risk Averse Friends
- Plot3:           Transitioning to Risk Seeking correlated with Number of Risk Averse Friends
- Plot4:           Transitioning to Risk Averse correlated with Number of Risk Neutral Friends
- Plot5:           Transitioning to Risk Neutral correlated with Number of Risk Neutral Friends
- Plot6:           Transitioning to Risk Seeking correlated with Number of Risk Neutral Friends
- Plot7:           Transitioning to Risk Averse correlated with Number of Risk Seeking Friends
- Plot8:           Transitioning to Risk Neutral correlated with Number of Risk Seeking Friends
- Plot9:           Transitioning to Risk Seeking correlated with Number of Risk Seeking Friends

As can be seen in figure 5.3 above, from a starting distance of approximately 0 meters, each correlation plot rapidly increases, with some fluctuation, until the maximum distance of 20 kilometres. For the majority of the correlation plot, the line is shown to be largely above the 5% level of significance (as shown by the red line along the bottom of each plot). The correlations appear to be significant only for friends who live within approximately 300 meters (approx. 1000 ft) from the respondent. This means that for each case, only friends who live within approximately 300 meters (approx. 1000 ft) from the respondent exert influence on their peer's Risk Preference. This narrows the potential friends that can influence Risk Preferences to only include friends who are either siblings and nearby neighbours.

- **Peer Influence by Risk Preference state**

In further understanding the type of peer influence that exists within the sample, additional methods by Hill *et al.* (2010) were employed. These methods help express the peer influence by segmenting the sample into specific groups (Risk Preference states of risk averse, risk neutral and risk seeking, as described in the study's methodology) and the interaction between the number of friends that an individual has, in a specific Risk Preference state, is used to predict the state that an respondent moves into, between  $T_1$  and  $T_2$  of the respondent's Risk Preference. As the OLS regressions would have an output with either a value of 0 or 1, the coefficients can instead be illustrated using probabilities. This represents a specific form of ordinary OLS – linear probability regression (Aldrich & Nelson, 1984). Each linear probability regression makes use of the count of the number of neutral friends that reside within 300 meters of the respondent.

Table 5.8 presents the results of our linear probability regression analyses that measure the impact of our increased friend exposure, on transition to other Risk Preference states. The dependent variable is equal to 1 if the respondent changed to a specific state between 2001 and 2009, using the sample that had not acquired that specific state by 2001. The marginal effects are presented evaluated at the sample mean for all variables. Columns 1 and 2 represent two LPMs which look at the changes from neutral to averse (column 1) and from neutral to seeking (column 2). For the change from neutral to averse, a positive and

statistically significant effect is estimated from the number of neutral friends that the respondent has, on the likelihood of becoming either risk averse or risk seeking in the second time period. The estimated marginal effect of neutral friends implies that a respondent with one additional neutral friend in 2001 would be 29.0 percentage points more likely to become risk averse by 2008. Evaluated at the mean number of neutral friends that neutral respondents have (0.26 friends), this is a 7.54 per cent increase in the probability of changing to risk neutral by 2008. The estimated marginal effect of both risk seeking and risk averse friends implies that a respondent with one additional risk seeking or risk averse friend in 2001 would be 5.9 and 5.5 percentage points less likely to become risk averse by 2008. Evaluated at the mean number of risk seeking and risk averse friends that neutral respondents have (0.02 risk seeking friends and 0.01 risk averse friends), this is a negligible decrease of 0.118 and 0.055 per cent in the probability of changing to risk neutral by 2008.

Table 5.8: Marginal effects from linear probability regressions for transitions between Risk Preference states between T<sub>1</sub> and T<sub>2</sub>

Original State Variable	Neutral		Averse		Seeking	
	Averse (1)	Seeking (2)	Neutral (3)	Seeking (4)	Averse (5)	Neutral (6)
Risk Neutral Friends	0.290* (0.017)	0.172* (0.05)	-0.045* (0.004)	-0.035* (0.002)	-0.110* (0.005)	-0.137* (0.006)
Risk Averse Friends	-0.055* (0.005)	-0.033* (0.003)	0.114* (0.011)	0.083* (0.009)	-0.113* (0.006)	-0.140* (0.006)
Risk Seeking Friends	-0.059* (0.005)	-0.032* (0.003)	-0.050* (0.003)	-0.035* (0.002)	0.090* (0.008)	0.107* (0.009)
Constant	0.080* (0.003)	0.042* (0.002)	0.055* (0.002)	0.037* (0.002)	0.128* (0.003)	0.160* (0.004)
R <sup>2</sup>	0.075	0.047	0.029	0.022	0.026	0.032

\* >0.001

All models significant at the 1% level  
10110 Observations

The effect for changing to a risk seeking state is similar (column 2) —17.2 percentage points per neutral friend. Evaluated at the mean, the probability of becoming risk seeking is increased by approximately 4.472. Additionally, negative but statistically significant estimates of the number of risk seeking and risk averse friends on becoming risk seeking by 2008. Marginal effects of 0.032 and 0.033 for risk seeking and risk neutral respectively means that when evaluated at the mean, the probability of becoming risk seeking is decreased by negligible values < 1 per cent.

Within column 3, it can be seen that the number of risk neutral friends and risk seeking friends decreases the probability of changing from risk averse to risk neutral by 2008. The marginal effect is 4.5 per cent 5.0 per cent respectively. When evaluated at the mean number of risk neutral friends (0.009) and risk seeking friends (0.024) the influence on becoming risk neutral by 2008 is decreased by negligible values < 1 per cent. The marginal effect of an increase in the probability of becoming risk neutral by 2008, due to the number of risk averse friends is 11.4 per cent. When evaluated at the mean (0.270 risk averse friends) there is a 3.078 per cent increase in becoming risk neutral by 2008.

For column 4, this effect is similar —3.5 percentage point decrease in probability of becoming risk averse by 2008, per risk neutral and risk seeking friend. Evaluated at the mean, the probability of becoming risk seeking is decreased by approximately negligible amounts < 1 per cent. Additionally, a positive marginal effect (8.3 per cent) is experienced from an increase in the number of risk averse friends. When evaluated at the mean, this results in a 2.241 per cent increase in becoming risk seeking by 2008.

For column 5, it is visible that the number of risk neutral friends and risk averse friends decreases the probability of changing from risk seeking to risk neutral by 2008 and the number of risk seeking friends increases the probability. The marginal effect is 11.0 per cent 11.3 per cent and 9.0 per cent respectively. When evaluated at the mean number of risk neutral friends (0.007), risk averse friends (0.011) and risk seeking friends (0.270), the influence on becoming risk averse by 2008 is decreased by negligible amounts for risk neutral and risk averse friends (values < 1 per cent) and increases by 2.43 per cent due to risk seeking friends.

Finally, for column 6 this effect is similar —13.7 percentage point and 14.0 percentage point decrease in probability of becoming risk averse by 2008, per risk neutral and risk averse friend. Evaluated at the mean, the probability of becoming risk seeking is decreased by approximately negligible amounts < 1 per cent. Additionally, a positive marginal effect (10.7 per cent) is experienced from an increase in the number of risk seeking friends. When evaluated at the mean, this results in a 2.889 per cent increase in becoming risk neutral by 2008.

When assessing the fit of the linear regression models, it appears that each of the regression estimates poorly model the data, where the  $R^2$  values are shown to explain between 2.2 per cent and 7.5 per cent of the variation in the data. However, as these models are estimated using a method of linear probability regression, the inherent problems with heteroscedasticity and the non-normality of the data ensures that the coefficient of determination value ( $R^2$ ) are much lower than normally acceptable (Goldberger, 1964; Aldrich & Nelson, 1984). Despite the inclusion of a robust regression these low  $R^2$  are a feature of linear probability modelling (Goldberger, 1964; Aldrich & Nelson, 1984). Subsequently, a valid assessment of model fit for LPMs is not available.

Despite of this, important findings can be drawn from the LPMs when comparing the distribution of friends from different Risk Preference states. Within the sample, it can be seen that the largest percentage of a respondent’s friends occupy the same Risk Preference state, as shown in table 5.9 below.

Table 5.9: Friend Risk Preference vs. respondent Risk Preference

Composition of Friends	Risk Preference State		
	Risk Averse	Risk Neutral	Risk Seeking
% Risk Averse	91.81	3.75	2.80
% Risk Neutral	2.89	92.80	2.68
% Risk Seeking	5.30	3.46	94.52

The table illustrates that the composition of respondent’s friends is predominantly similar to that of the individual’s own Risk Preference. Risk averse respondents had predominantly

risk averse friends, risk neutral had predominantly risk neutral friends and risk seeking individuals had largely risk seeking friends. This highlights an important finding within the analysis of the LPMs, about the dynamics of the peer effects. The only noticeable peer effect in influencing changes between Risk Preference states (on average) would therefore appear to be individuals with the same Risk Preference as the respondent, during the initial time period (2001).

Another important finding is that the peer influence in this case is always positive, meaning that a higher number of friends that an individual has in a Risk Preference state  $x$ , the more likely that the individual would transition to another risk state  $y$ , in the second time period. This finding opposes the “contagion effect” hypothesis which states that interacting with peers who have a specific Risk Preference  $x$ , will encourage the individual to transition to the same Risk Preference state  $x$  by the second time period (Hill *et al.*, 2010).

Following from the regressions, additional estimations of the duration of these peer effects can be explored. This allows for knowledge about how developments within the Generation Y cohort might evolve, the longevity of Social Influence is therefore discussed next.

- **Longevity of influence**

The average duration that a respondent will spend in a Risk Preference state (average lifetime) can be estimated. This is measured using the average duration until the respondent changes their Risk Preference state due to peer or other influence (Hill, Rand, Nowak & Christakis 2010). This is important to determine because certain states may be longer lasting than others and can be used to supplement the predictive LPMs that have been generated. The average lifetime is calculated by using the mean effects from the LPMs (Hill, Rand, Nowak & Christakis 2010; Lam, Marteleto & Ranchhod, 2013) The mean effect of the overall peer effects as well as other external influence (as captured by the constant term) is calculated and summarized in the table below.

Table 5.10: Mean effects (in percentages) from linear probability regressions for transitions between Risk Preference states between T<sub>1</sub> and T<sub>2</sub>

Variable	Averse (1)	Seeking (2)	Neutral (3)	Seeking (4)	Averse (5)	Neutral (6)
Risk Neutral Mean Effect	7.54	4.472	-	-	-	-
Risk Averse Mean Effect	-	-	3.078	2.241	-	-
Risk Seeking Mean Effect	-	-	-	-	2.43	2.889
Constant	8.0	4.2	5.5	3.7	12.8	16.0
Net effect	15.5	8.7	8.6	5.9	15.2	18.9

The average lifetime of a specific Risk Preference state is determined by the inverse of the probability that an individual will change exit this Risk Preference state between the two time periods, divided by the time period in years ( $1/\text{net effect}/\Delta t$ ) (Hill *et al.*, 2010). This is calculated to be 28.93 years for the risk neutral state, 48.28 years for the risk averse state and 20.53 years for the risk seeking state. This means that most individuals would change from a risk seeking state or risk neutral state to another Risk Preference state, sometime within their lifetime, and might even fluctuate in and out of this Risk Preference stat. It is expected that an individual would change Risk Preference states from a risk seeking or risk neutral state at least once in their lifetime. Individuals would be unlikely to change from a risk averse state. However, without further information regarding reproductive numbers, the long-term effects of peer influence cannot be considered valid. Reproductive numbers offer a means to understand if this cycle of moving in and out of specific Risk Preference states is actually sustainable in the long-run (MacDonald, 1952). A discussion of the reproductive numbers is given in the following section to aid this discussion of peer effects.

- **Sustainability of Risk Preference states**

Measuring the basic reproductive number ( $R_0$ ) (a measure often used in epidemiological modelling) is useful in evaluating the likelihood that specific states (in this case, Risk Preference states) will be each be able to be sustained in the long-run (MacDonald, 1952).

Alternatively, it can identify if specific factors (Social Influence or some other effect) might reduce the number of people in a specific Risk Preference state to tend towards 0 (MacDonald, 1952; Hill, *et al.*, 2010).

Instances when  $R_0 < 1$ , for example, would describe a specific Risk Preference state that will die out in the long run (MacDonald, 1952; Hill, *et al.*, 2010). Conversely,  $R_0 > 1$  would describe a Risk Preference state which would be able to sustain itself within a population). The larger the  $R_0$ , the more persistent the Risk Preference state would be (Dietz, 1993).

The  $R_0$  for the risk seeking, risk neutral and risk averse states can be measured using the net effects from the LPMs.  $R_0$  is estimated to be the net effects of a respondent adopting a specific state  $x$ , divided by the net effects of a respondent adopting a different state  $y$ . For example, the  $R_0$  for the risk averse state would roughly be equal to the net effect of adopting a risk averse state from the risk neutral or risk seeking state, divided by the net effect of adopting a risk neutral or risk seeking state, from the a risk averse state (MacDonald, 1952).

When estimated for risk averse,  $R_0$  is 2.11; for risk neutral,  $R_0$  is 1.14 and for risk seeking,  $R_0$  is 0.43. This means that risk aversion, as a Risk Preference state, as well as risk neutral would both be expected to be able to sustain themselves within the population in the long-run. Risk seeking as a Risk Preference state, however, has an  $R_0 < 1$ , therefore it would be expected that individuals would be changing to other Risk Preference states at a higher rate than the individuals who are adopting the risk seeking state.

#### **4. CONCLUSION**

This chapter presented the findings of this empirical study, using PLS-SEM modelling and additional analyses using LPMs. The final realised sample from the Add Health dataset was found to be consistent with that of the overall Generation Y population from which the sample drew from. Additionally, individuals were seen to be predominantly neutral in their preferences towards risk.

The results from the various analyses showed that within the Generation Y cohort, gender, previous Risk Preference and the Risk Preference of friends (controlling for their physical distance from individuals) were all significant determinants of Risk Preference development. While it was found that significant friends' Risk Preferences were only influential between 300 meters of respondents, this allowed for a focus to be given to siblings and close neighbours, who offered the only statistically significant influence on Risk Preferences. In achieving the required objectives of this study, it was concluded that gender does represent a differentiating factor, when evaluating Risk Preferences. However, it was found that Generation Y individuals did not differ in Risk Preferences according to their age. Within the PLS-SEM model, it was found that Social Influence did not behave as expected, as the friends provided the only statistically significant influence on Risk Preferences, and siblings did not. However, when the importance of physical distance was factored into the LPMs, it was found that friends and siblings alike who reside within 300 meters, could provide some Social Influence.

Further insights were gained from the finding that an overwhelming percentage of friends who live within the 300 meter proximity of respondents, occupied the same Risk Preference states as the individual. Non-trivial influences of Risk Preferences came in the form of friends influencing individuals in the same Risk Preference state to move to occupy one of the other two Risk Preference states. This was found to be consistent for each of the influence on risk neutral, risk averse and risk seeking friends, on the Risk Preference of risk neutral, risk averse and risk seeking individuals respectively. The magnitude of such influence ranged from between a 2.41 to 7.54 per cent increase in the probability of changing Risk Preference states between 2001 and 2008. Finally, the reproductive numbers of each Risk Preference state was calculated in the system, in an attempt to predict the pervasiveness of each Risk Preference state, in the future. It was found that both risk neutral and risk averse risk attitudes could be sustainable in the long-run. It was also found that the number of people with risk seeking attitudes was expected (using current rates) to approach a very low value (0) in the long-run.

These results offer insights into the manner by which Social Influence affects the Risk Preference among Generation Y individuals. While Social Influence was similar in size to the component of random change that occurred in the LPMs, when they were analysed

jointly, they exhibited very consistent dynamics surrounding generic Social Influence between Risk Preference states. From here, the following chapter will describe the implications of this study's results, the recommendations for future research into generational research and specific generation cohorts, limitations of this specific study and other concluding remarks regarding Risk Preferences and the Generation Y consumer.

## **CHAPTER VI**

### **RECOMMENDATIONS AND CONCLUSIONS**

#### **1. INTRODUCTION**

The prior chapter presented the results from the PLS-SEM and the LPMs. This allowed for an understanding into the various demographic factors which affect Risk Preference (including age and gender) as well as Social Influence on Risk Preferences over time, using various LPMs. This chapter discusses the implications of the study's findings in both the context of current research and as discourse for future discussions within the area of Risk Preferences and in Social Marketing. This chapter focuses on the findings as they relate to the study's six objectives, mentioned in section 2 of Chapter IV and will relate them to the theoretical base, as described within Chapters II and III.

To place the discussion of this study's recommendation and conclusions alongside the relevant theoretical base, a brief summary of the chapters is first given. In Chapter II – Social Marketing was described as a field of marketing focused on positive behavioural change (McKenzie-Mohr, 2011). The predominant concern within Social Marketing activity is that of risk characteristics (Marks & Greathead, 1994; Bryant, Brown, Bustillo & Blair, 1998; Bryant & Henderson, 2000; Donovan & Henley, 2003; Evans, 2005). Consumer behaviour was discussed generally in the chapter, as the understanding of perception, belief, learning styles, motivations and attitudes towards risk enables an enhanced understanding of consumer risk taking (Bauer, 1960; Sheth, 1968). Related theory was presented which suggested that the psychological components of consumer behaviour could be considered to be barriers against Social Marketing efforts (Kollmuss & Agyeman, 2002; McKenzie-Mohr, 2011). These psychological components were described as limiting the adoption of favourable risk behaviour, and required better understanding before effective behavioural change programs could be implemented (Kollmuss & Agyeman, 2002; McKenzie-Mohr, 2011).

Specifically, attitudinal barriers were stressed as (following from behavioural change theories) broadly altering attitudes, beliefs and/or values is (at the very least) instrumental in altering behaviour (Kotler & Zaltman, 1971; Kotler & Roberto 1989; Malafarina & Loken,

1993; Andreasen, 1994; McKenzie-Mohr, 2011). This implies that behavioural change could not be achieved until the associated attitudes, values and beliefs have also been adapted. Attitudes towards risk formed the focus of this study as it is highly relevant in the area of Social Marketing (Bryant & Henderson, 2000).

Generation Y was also described as being an important cohort because it constitutes substantial amounts of economic activity within markets and is the focus of most Social Marketing activity. Despite this centrality, limited academic research has been conducted to define the characteristics of the cohort (Myers & Sadaghiani, 2010). Previous research defines the Generation Y consumers as having a high degree of involvement in technology and are more social than prior generations. Current research describes Social Influence in a market setting, but this has not been measured for Generation Y consumers; this information could be useful for future Social Marketing efforts (Twenge & Campbell, 2008; Appleton, 2012). This study responded by evaluating the Social Influence in the Generation Y cohort across the attitudinal measure of Risk Preferences, as these are important for effectively managing Social Marketing efforts. Continuing from this discussion, Chapter III discussed specific methods of studying Social Influence and the impact of this study on knowledge of Generation Y.

Theory describing Social Influence suggests that social norms are highly desirable in overturning negative behaviours, with such norms being derived from all Social Influences, such as family, peers and reference groups (Aronson & Gonzales, 1990; Yates & Aronson, 1983; Costanzo, Archer, Aronson & Pettigrew, 1986). Such norms are inspired within groups because attitudes and values held by peers are viewed as favourable within social groups (Aronson & Gonzales, 1990; McKenzie-Mohr, 2011).

Chapter III further described the actual influence of peers and other social groups, especially in the development of risk characteristics in adolescent groups. As the Generation Y cohort contains the global population of adolescents, this discussion was particularly important (Appleton, 2012).

A conceptual model was subsequently created, which included the following hypotheses looking at Social Influence and other theoretical relevant factors (from Chapter III) in the

study of Risk Preferences. As previous literature found that Risk Preferences (as attitudes) are fairly stable and resilient to changes by most experiences (Ajzen & Fishbein, 1980; Weber et al., 2002), it was important to reaffirm this claim, so H<sub>1</sub> proposed that there is a significant association between Risk Preferences over time. The second hypothesis (H<sub>2</sub>) proposed that females are more risk averse than males, as previous research had found this to generally be true but it had not been assessed for the Generation Y cohort (Gardner & Steinberg, 2005). Additionally (H<sub>3</sub>), the attitude of younger individuals was hypothesised to be less risk averse, compared to the risk attitude of older individuals, as this is commonly thought to happen during the aging process (Gardner & Steinberg, 2005).

Social Influence was also hypothesised to have influence in the risk attitude of Generation Y individuals, with closer peers in terms of physical and social distance influencing Generation Y individuals more strongly than those who are further removed. This was because attitudes have generally been found to be affected by socially proximate peers (Barr, Gilg & Ford, 2005). Hypothesis 4 stated that there is a negative association between the social distance of peers and amount of influence on the Risk Preference of Generation Y individuals, as this has been the case for other forms of Social Influence (Fowler & Christakis, 2008). Hypothesis 5 tested this relationship, except with physical distance.

Additional theoretical models which allow for Social Influence to be easily identified were also discussed in Chapter III. One of these methods was applied to this study in measuring the effect of peer (or social) influence on developing specific Risk Preferences in a large group (Hill *et al.*, 2010; 2010b). As Social Influence in encouraging risky behaviour has been a popular topic in Social Marketing as well as social psychology (Arnett, 1992; Walsh, Rudd, Moeykens & Moloney, 1993; Friedman & Aral, 2001; Maxwell, 2001; Shoveller & Johnson, 2006; Lynch & Jones, 2007) this study aims to contribute quantifiable estimates of such influence on an aggregated level, which these methods provided.

Kahneman and Tversky (1970) as well as Kahneman and Diener (2003) offer a measure of classification for individuals into the risk attitude groups of risk averse, risk neutral and risk seeking, which the method by Hill *et al.* (2010b) required. As no prior measurements existed for the Risk Preferences of the Generation Y cohort over time, this study evaluated individual Risk Preferences over time, against the Risk Preference of friends and siblings. Hypothesis

6 stated that differing influence exists in peers' influence of Risk Preference among risk seeking, neutral and averse profiles. This specifics of this were further expanded on in Chapter IV.

Chapter IV presented the methodology for this study. The study made use of secondary data analysis, due to substantial data requirements within this study (section 3 & 4), where the Add Health dataset provided extensive insights into the Generation Y population of the United States, throughout the past 20 years. The Add Health dataset provided measures from multiple time periods, as required by this study's methodology, and was conducted via interview survey. Sampling was random within the dataset, which provided for a strong representation of the actual population to be realised (Malhotra, 2010).

The data analysis required for this study was discussed in section 8 of the methodology chapter which provided theoretical justification for the use of SEM and the subsequent LPMs within the study. The use of SEM was predominantly inspired due to the ability of SEM-PLS to test multiple contractual relationships within one method, making it highly efficient (Hair, Black, Babin & Anderson, 2010; Shiu, Hair, Bush & Ortinau, 2009). SmartPLS software was used to evaluate the PLS-SEM and STATA was used to test further LPMs required in this study.

Chapter V discussed the results of the study, which included the description of the final realised sample (n=12072) and also justified that this was an acceptable sample of the overall population (section 2). The various descriptive statistics (table 5.1), the scale measuring Risk Preference data (tables 5.2 and 5.3) as well as the scales relating to the study's conceptual model (table 5.4) were discussed. The conceptual model's fit was then evaluated (tables 5.5 and 5.6) as well as the path coefficients within the model (figure 5.2), which lead to findings for research objectives 1 – 7, using PLS-SEM; all of the hypotheses were accepted, except H<sub>2</sub>. Additional modelling was conducted, using LPMs, which lead to findings for research objective 8 and the acceptance of H<sub>8</sub>.

The specific conclusions that can be drawn from this study's objectives are provided in the following sections. These will serve as to explain the major findings, limitations and implications of the study's results.

## **2. CONCLUSIONS**

As the study followed six objectives, so as to answer the research question, an evaluation of the relative success of the study is given next. The PLS-SEM model that this study utilized drew several conclusions about the sample from the dataset. The relationships among the various measures of Risk Preference over time, gender, age, distance of peers and their Risk Preference all generated valuable results and specific conclusions about Social Influence in the Generation Y cohort. The discussion of this study's research objectives begins with a discussion surrounding the effect of age and period effects within the PLS-SEM model, followed by further illustration of Social Influence through the study's LPMs.

### **2.1. Conclusions regarding Objectives 1 to 5**

The PLS-SEM provided findings which enabled the first five objectives to be explored. These objectives explored the importance of age and gender on Risk Preferences for the Generation Y cohort, how stable Risk Preferences are over time and the importance of various peers (when controlling for their proximity). This produced insights into demographics affecting Risk Preferences, the Risk Preferences themselves, the social distance of peers and the impact of physical distance in the process of Social Influence.

#### **2.1.1. Objective 1: stability of Risk Preferences**

As previous literature has found that Risk Preferences (as attitudes) are known to be fairly stable and resilient to changes by most experiences (Weber *et al.*, 2002; Ajzen & Fishbein, 1980), it was important to understand the progression of Risk Preferences, for the Generation Y cohort.

There was indeed a strong correlation between Risk Preferences in Wave III and IV. The inclusion of this link in the PLS-SEM model captured the majority of the captured variation. This offers exact quantifiable measures of the consistency of Risk Preferences for the Generation Y cohort, where a change in the Risk Preference of one unit at Wave III, would lead to a 0.391 unit change in Risk Preference at Wave III.

The development of these Risk Preferences over time, with respect to age and other factors are further discussed with objective 3. Additional conclusions can be drawn from other relationships within the PLS-SEM model, such as the involvement of gender in the development of Risk Preferences.

### **2.1.2. Objective 2: gender effects on Risk Preference development**

The findings surrounding gender in the PLS-SEM model showed that there was a statistically significant difference between the Risk Preferences of males and females. This was illustrated by the means of males and females modelled to differ by 0.249 units on the risk attitude scale. When the means of the risk attitude scales were further evaluated across the gender variable, it was found that in both time periods, females (Wave III: 2.66; Wave IV: 3.19) had a significantly more averse attitude towards risk taking than males (Wave III: 2.26; Wave IV: 2.80).

In line with the findings of previous studies - males were therefore found to be less risk averse than females (Siegrist, Cvetkovich & Gutscher, 2002; Powell & Ansic, 1997). While this finding was expected, its conformity to previous studies suggests that the dataset is somewhat reliable.

Further findings were gathered about the effect of age in the development of Risk Preference for the Generation Y cohort. The effect of age was not found to be significant in the model, however period effects did explain differences in Risk Preferences over time. These are explained in the following section.

### **2.1.3. Objective 3: age, cohort and period effects on Risk Preference development**

When evaluating the path coefficients within the PLS-SEM model and the Risk Preference means of different groups within the sample, it was found that no difference in Risk Preference was attributable to age. Over time, however, it was found that the Risk Preferences of the sample tended towards risk aversion. From this, it appears that older and younger Generation Y individuals do not differ in their Risk Preferences, but the Generation

Y cohort became more risk averse over time. This result is surprising, given that many prior studies (Harbaugh, Krause & Vesterlund, 2002; Dohmen, Falk, Huffman, Schupp & Wagner, 2005; Dohmen, Falk, Huffman, Sunde, Schupp & Wagner, 2011) list age as a strong determinant of attitudes towards risk (Risk Preferences). This represents either a cohort or period, which instead of being strictly dependant on aging can either be a strict external environmental change (period effect), or is common throughout the Generation Y cohort (cohort effect) (Blanchard, Bunker & Wachs, 1976).

An environmental change (or period effect) would generally have been a one-time (or annual) event, which would influence the effects of aging and other cohort effects within the sample (Blanchard, Bunker & Wachs, 1977). Alternatively, if compared to other generational cohorts, it might be found that this change is unique to that of the Generation Y cohort (cohort effect). Despite the uncertainty surrounding the measurement of period effects or cohort effects – the conclusion is influential in that our current understanding of Risk Preference development is that Risk Preferences change with (and due to) age (Dohmen, Falk, Huffman, Sunde & Wagner, 2005). Whereas this study recognises either some period effect or cohort effect, it is interesting that common expected effect of aging has no appearance in the study's models (Dohmen, Falk, Huffman, Sunde, Schupp & Wagner, 2011).

This period or cohort effect was captured through examining a strong shift over time, towards higher degrees of risk aversion (mean Risk Preference at  $T_1=2.46$ ; mean Risk Preference at  $T_2=2.90$ ). No differences between the Risk Preferences of differently-aged respondents was found; this is a prominent finding within the PLS-SEM model. Additionally, the importance of Social Influence in the development of Risk Preference was further explored within the PLS-SEM model. As different social groups, including friends and siblings, were hypothesized to offer varying levels of influence on the Risk Preferences within the Generation Y cohort, the conclusions of such influence are presented in the following section.

#### **2.1.4. Objective 4 and 5: social and physical distance**

The PLS-SEM model described peers (specifically friends) as having some influence on the Risk Preference of the Generation Y cohort. There was a significant association between the Risk Preferences of the individual and those of his/her friends. This influence could be described in that every unit change in the Risk Preference scale of a friend would result in a 0.115 unit change in the Risk Preference value of the individual. This finding is in line with previous studies, but builds upon previous findings that merely show that Risk Preference are higher when accompanied by peers (Gardner & Steinberg, 2005). When the PLS-SEM model controlled for the physical distance of peers, additional findings were made and conclusions were drawn. The distance of the friends made an impact when influencing the Risk Preferences of Generation Y individuals. The distance variable was found to be statistically significant and controlled for the Social Influence in the model. This is further explored in the following section.

However, there was not a statistically significant association between the Risk Preference of siblings and the individuals within the Generation Y cohort. This could have been due to several reasons. Firstly, as most sibling relationships within the dataset were also denoted as a friendship relationship, this means that the two measures were not mutually exclusive. Additionally, as the section 8.2 of Chapter VI describes further modelling efforts were able to reliably identify Social Influence among siblings, the reliability statistics within the PLS-SEM model (which were not strong) were most probably at fault.

Further insights were gained from an analysis of the Social Influence within the LPMs through a better understanding of how peers influence certain types of peers as well as important parameters for the physical distance measure. These are discussed next.

#### **2.2. Conclusion regarding objective 6: group dynamics and Social Influence**

The LPMs estimated the Social Influence due to additional peers in certain groups. This analysis only looked at friends and siblings who resided within 300 meters from the individual, as these were the only social groups found to offer statistically significant influence. The study's sample of 12 072 respondents only had an average of 0.25 peers

each who resided within 300 meters from the individual (siblings and neighbours) who could influence the individual's Risk Preferences.

When evaluating the average peer group, as per the suggestions of Hill *et al.* (2010), it was found that movement from one Risk Preference state to another was approximately 98 per cent more likely due to the presence of a risk neutral peer. Similarly for risk aversion, peer influence resulted in individuals being 58 per cent more likely to change from a risk averse state to another state. The bulk of this shift in Risk Preference (60%) was where individuals adopted a risk neutral Risk Preference. Finally with respect to risk seeking, the Social Influence resulted in individuals being 18 per cent more likely to change from a risk seeking state to another state. The bulk of this shift in Risk Preference states (55%) was in moving towards having a neutral attitude towards risk.

When comparing the distribution of siblings from different Risk Preference states, it can be seen that the largest percentage of a siblings within the Generation Y cohort occupy the same Risk Preference state as each other. This was as peers and siblings were found to be predominantly similar in their Risk Preferences. Further findings explored the duration that individuals would hold a specific Risk Preference and the sustainability of each Risk Preference. These further conclusions about the cohort are detailed in the following section.

### **2.3. Average lifetime and sustainability of a Risk Preference**

This study provided estimates of the average time that an individual would hold a specific Risk Preference. As expected, it detailed risk-seeking attitudes as having the shortest longevity, where a risk-seeking individual would sooner change state (20 years after becoming risk seeking, on average) than any other individuals (29 years for risk neutral; 48 years for risk averse).

Prior studies have defined risk-seeking attitudes and behaviours as things which exist because of age differences and the attendant degree of impulse control (Steinberg & Cauffman, 1996). Consistent with this, prior studies have found that as individuals age and they develop psychosocial maturity, risky decision making reduces (Cauffman & Steinberg, 2000). The findings in this study instead argue that individuals who define themselves as

risk seeking (at any age between 16 and 31 years old) are expected to shift their attitude to a more risk averse one within approximately 20 years. Therefore this study presents the average process of moving away from a risk-seeking attitude as a simple 20-year process, most applicable within the sample age.

Additionally, when directly influencing peers risk aversion and risk neutral Risk Preferences were found to have reproductive numbers greater than 1 (2.11 and 1.14 respectively) while risk seeking had a value less than 1 (0.43). The reproductive rates measure the likelihood of sustainability in the long run (MacDonald, 1952; Fowler & Christakis 2010). This means that if the results from this study were to be extrapolated to the long run, the number of risk seeking individuals would probably diminish (approaching zero), and the groups of risk aversion and risk neutral Risk Preferences would continue to be maintained. This is in line with theory regarding age-based risk developments in Risk Preferences and the study's findings regarding period effects, where the Risk Preferences in the cohort are steadily approaching risk aversion (Dohmen, Falk, Huffman, Sunde & Wagner, 2005). This information is important to highlight, as the study's findings about Social Influence on Risk Preferences are only relevant if they can actually describe the long-term dynamics for the Generation Y cohort.

Through discussing the specific research objectives for this study, an understanding into the various components of Risk Preference development for the Generation Y cohort was gained. The following section comments on the findings' overall ability to answer this study's research question.

#### **2.4. Overall conclusion regarding the research question of this study: Social Influence and Risk Preferences**

This study presented findings that cover various aspects of the process of Risk Preference development in the Generation Y cohort. The Generation Y cohort is considered to be more social than prior generations and exist in an era where Social Influence is becoming a strong addition to the understanding of modern Social Marketing. This study subsequently focused on measuring the importance that Social Influence plays in the development of Risk Preferences (risk attitudes) in the Generation Y cohort.

Making use of a large, representative and longitudinally measured sample of 12 072 Generation Y individuals, this study evaluated multiple potential Social Influences of Risk Preferences coming from multiple types of social groups. By evaluating the findings against the research question, this study concludes that Social Influence does exist within the Generation Y cohort and does affect the Risk Preferences of individuals in the cohort. Additionally, such Social Influence is only apparent when controlling for the physical distance between the individual and such social groups. This allowed for the conclusion that siblings and neighbours were the only groups which offered statistically significant Social Influence. Siblings were additionally found to largely hold similar Risk Preferences. Those with neutral attitudes towards risk taking were found to be most susceptible to influence by their siblings and encouraged the adoption of different Risk Preferences. With Social Marketing being concerned with peer pressure and Social Influence allowing for the adoption of socially undesirable Risk Preference – this study additionally examined how Risk Preference groups compare to one another. Within this, risk-seeking siblings appeared to be largely inactive in the process of influencing risk attitudes, posing a lesser threat to Social Marketing efforts than prior research would describe (Walsh, Rudd, Moeykens & Moloney, 1993; Lynch & Jones, 2007). In using these conclusions to better develop Social Marketing activity, the various managerial implications of such findings are presented in the following section, with applications to real social markets.

### **3. MANAGERIAL IMPLICATIONS**

As the study's sample required respondents to define their friendship network in terms of pre-existing social ties (friends), this study potentially lacked the ability to identify or counter the selection bias which might have been generated during the formation of their social groups. This would have meant that the peer effects measured from the interaction with friends could not enable a causal link to be formed between peer interaction and changes in Risk Preferences (peer influence/effects) (Arnett, 2007). However, when measuring the peer effects of siblings, no such selection bias exists, as siblings are not chosen by the individual and thus no self-selection was taking place. As such, significant relations between sibling interaction and changes in Risk Preferences (sibling influence) could establish a causal link. This allows for findings in this study to improve on prior studies, in that prior

studies do carry this selection bias (Christakis & Fowler, 2007; Hill *et al.*, 2010; Lam, Marteleto & Ranchhod, 2013). Being aware of this advantage, the various managerial implications of this study can be further discussed.

### **3.1. Neutrality of risk attitudes and susceptibility**

A substantial proportion of respondents' peers were of the same Risk Preference as themselves. The results from the LPMs showed that an increase in the number of peers in the same Risk Preference state, substantially increased the likelihood that Generation Y individuals would change their Risk Preference state in the next time period. This influence was greatest for those who were risk neutral, followed by risk averse and seeking individuals. The importance of this is that risk neutral Generation Y individuals were therefore most susceptible to peer influence and were most influenced by other peers in the risk neutral state. This group also represented approximately 29 per cent of the sample, which makes them a substantial group in terms of size.

The development of group norms, people compare themselves with others when they are uncertain about themselves and can subsequently be drawn to definite and established behaviour in specific social groups (Festinger, 1954). With regards to the risk neutral group in this study, their high degree of susceptibility could be due to risk seeking and risk averse attitudes being predominantly stable attitudes, with risk neutrality being a somewhat awkward middle ground. Because of this, risk neutral individuals may be more able to express themselves and acquire attitudes from their peers, without explicitly expressing attitudes which are strictly against those with different attitudes (Oshagan, 1996).

Risk neutral individuals may also have a heightened level of susceptibility from other sources, apart from just nearby peers. This influence may be in the form of traditional market activity, such as product or brand communications which motivate risky attitudes. The awareness of this is important in Social Marketing, where encouraging risk averse attitudes towards various forms of risk behaviour, like that of underage drinking or smoking, is desirable. The susceptibility of risk neutral individuals could be beneficial, if Social Marketing programs targeted socially desirable communications at this group. This influence could be effective if it is established upon social motives, such as the desire to accommodate the

attitudes of peer, which this study's findings are centred on (Chen, Schechter & Chaiken, 1996, Lundgren & Prislín, 1998). Alternatively, encouraging further interactions among peers, but instead through public discourse (as oppose to private), as such attitudes and beliefs are more easily developed in a public setting (Lambert, Cronen, Chasteen & Lickel, 1996).

### **3.2. Community of siblings and nearby friends**

This study found the influence of peers who reside within 300 meters (friends and neighbours) to be the only individuals with statistically significant influence among individual risk attitudes. This reinforces the idea of community-based Social Marketing, in highlighting that community-based social norms and interactions are severely important in the development of behaviour (McKenzie-Mohr & Smith, 1999).

The implications of this is that the ability of individuals to influence their peers, in the direction of either acquiring risk averse or risk seeking attitudes is confined to a small group of individuals in a close proximity. This requirement limits the range of Social Influence that can occur within social groups, when observing Risk Preferences. The importance of this is that prior studies focus on the effects of friends and siblings in general, who have strong ties with each other; this study instead argues that physical distance is the overriding factor in Social Influence. This can be advantageous as the effects of other peers need not be a concern, so Social Marketing efforts could focus resources exclusively in areas that aim to further the understanding family/sibling dynamics and that of neighbours.

Moving the focus away from general friendship groups (such as those found in school or work-place environments) and instead focusing on Generation Y's siblings and neighbourhood friends would require far less intervention efforts, for the same amount of yield in terms of effective behavioural changes (Rutter, 1985; American Dietetic Association, 2006). This is evident as this study that identified interactions with general friends has an insignificant effect on risk attitudes in the Generation Y cohort and could be deemed unimportant. This is because a limited amount of socially undesirable interaction between peers would be expected (Rutter, 1985). Additionally, as the study found that peer influence

encourages risk seeking attitudes had limited potency, this additionally assists in the primary objective of many Social Marketing plans – discouraging risk-taking (Kotler & Lee, 2008).

### **3.3. Ageless and perhaps cohort-specific Risk Preferences**

The study found that over the over the six-year time period, the Generation Y cohort became more risk averse, while being homogenous the entire eight year age range. This presented differences that could only be attributable to some period effect or as a result of a cohort-specific effect (Blanchard, Bunker & Wachs, 1977). In both cases, age-based differences are not observable within the Generation Y cohort.

This presents both a threat and an opportunity towards Social Marketing efforts, which discriminate by age. Firstly, this study found that age was no basis for differentiating Generation Y individuals on their Risk Preferences. This is important as age-based segmentation is a commonly used tool in the construction of Social Marketing programs. While age-based differences might still arise due to responses to various Social Marketing appeals – on the basis of Risk Preferences alone, this segmentation tool should not be pursued. Secondly, this presents a threat in that it is commonly assumed that individuals become more risk averse as they age. This might in fact be due to specific external environmental events (Blanchard, Bunker & Wachs, 1977). In this such case, observing changes in the collective attitude towards risk would be vital in understanding which external events require attention.

As this study's sample was measured surrounding (and then several years after) the 9/11 terror attacks – this could be an example of one event that might have affected risk attitudes (Hillson & Murray-Webster, 2007). Numerous persuasive responses in the consumer market have taken advantage of this collective shift in risk attitudes and has resulted in higher levels of conscription and better affirmation towards national goals than without (Rutherford, 2004).

If, however, the cohort effect was identified by the PLS-SEM model (and not a period effect), then attention would need to be raised, so as to effectively understand the types of responses that the entire generation would have to specific events, such as 9/11. Being aware of these such events (and the manner by-which generational cohorts would differ in

response) would require a stronger understanding of the characteristics of specific cohorts and how these characteristics would interact with the trauma or development of the external events (Partridge & Hallam, 2006; Brosdahl & Carpenter, 2011). In the case of the Generation Y cohort, as the susceptibility of risk neutral individuals was found to be substantially higher than other groups, this could allow for specific outcomes in the social market place.

These and other findings in this study contribute towards the understanding of the Generation Y cohort in the market place, their influences and the dynamics of their social groups. The following section explains how this study, which looked at Social Influence on the development of Risk Preferences for the Generation Y cohort, contributes towards Social Marketing and knowledge about Social Influence.

#### **4. CONTRIBUTIONS FROM THIS STUDY**

This study broadly explored Risk Preferences of the Generation Y cohort. The study established knowledge surrounding gender differences, with females being more risk averse than males. The study also refuted commonly held assertions about age-based differences; this study instead presented period or cohort-based differences in Risk Preferences as a justification for Risk Preferences collectively shifting over time. This study presents a case of where age effects do not influence the development of Risk Preferences and can be used to be compared to other generational cohorts.

As the Generation Y cohort is considered to be more social than prior generations and with Social Influence becoming a recent and strong addition to the understanding of modern Social Marketing - this study measured the importance that Social Influence plays in the development of Risk Preferences (risk attitudes). The study contributed understanding into the role that social distance and physical distance have in the Social Influence process for risk attitudes. This specifically explored the instances of social mimicry in the sample and generated specific parameters surrounding which groups of Generation Y individuals are more susceptible to Social Influence and which groups are broadly resistant to any Social Influence.

This study also explored modern methods which enable Social Influence to be easily identified and its effect sizes to be easily understood (Hill *et al.*, 2010). In following additional methodological approaches to understanding Social Influence, specific group dynamics were examined in this study and the scenarios under which they operate were described. A discussion was had which explored each Risk Preference's respective method of influence and of the proportion of the Generation Y cohort holding such risk attitudes over time. This allowed for the potency (or reproductive rate and influence) to be estimated and presented. However, this study faced certain difficulties in producing these findings. These limitations broadly came in the form of difficulties with data analysis and the quality of the data in general. These are further discussed in the following section.

## **5. LIMITATIONS OF THE STUDY**

Within this study, the testing of the PLS-SEM, as well as the various LPMs, there were several limitations which allowed for constraints on generalizability and utility of findings. These limitations come in the form of limitations in the method of analysis and limitations related to the available data used in analysis. These are each described next.

### **5.1. Analysis limitations**

Both the PLS-SEM and the LPMs faced challenges in terms of reliability and validity measures, which affected the quality of output for each. The PLS-SEM is first discussed below.

#### **5.1.1. Reliability and validity measures in the PLS-SEM model**

The reliability and validity of the model were not acceptable for the PLS-SEM model, for the measures of Risk Preferences for friends and the distance measures for these friends. The reliability and validity of the measures for sibling Risk Preference, their distance measures as well as the other demographic variables were acceptable.

This would be problematic in that the reliability variables of the Cronbach's Alpha determine if the model is internally consistent and the validity measure of the AVE evaluates the

model's convergent validity. Poor results in either of these cases results in a model which is unable to be legitimately used for predictive purposes (Hair, Black, Babin & Anderson, 2010).

However, as this study only made use of the PLS-SEM model for exploratory purposes, so as to test multiple hypotheses and then conduct additional research into the valid and reliable areas of the model – an entirely reliable and valid model were not required.

The analysis of the LPMs also faced several limitations within the study, specifically regarding their R-square values. This is discussed next.

### **5.1.2. Regression diagnostics for the linear probability models**

When assessing the fit of the linear regression models, it was discovered that each of the regression diagnostics indicated that the models had a poor fit of the underlying relationship. The  $R^2$  values identified that the LPMs explained between 2.2 per cent and 7.5 per cent of the variation in the data.

However, as the models were estimated using a method of linear probability regression and not an OLS regression, it meant that despite the inclusion of a robust regression – the inherent problems with heteroscedasticity and the non-normality of the data ensured that the coefficient of determination value ( $R^2$ ) were much lower than normally acceptable, and thus, the  $R^2$  values are not a valid measure of model fit (Goldberger, 1964; Aldrich & Nelson, 1984). Subsequently, a valid assessment of model fit for LPMs models is not available and makes it difficult to evaluate the actual fit of the LPMs or possible improvement over prior models. However, as the models were each found to be significantly different from zero and each had highly significant coefficients for the explanatory variables – it was assumed that there would be adequate explanatory power within the models.

Additional limitations existed in the study, with regards to the quality and quantity of data which was available for analysis. These limitations are discussed next.

## **5.2. Data limitations**

Several limitations in the available data made it difficult to make generalizable claims about the sample and their behaviour, about which this study aimed to determine. These limitations came in the form of an only somewhat complete measure of distance between peers, a limited measure of risk attitudes and a lack of data available which explained the type of interactions between respondents within the sample. Each of these is discussed next.

### **5.2.1. Inaccurate distance measures**

Within this study, GPS coordinate data that was made available to estimate the distance between individuals within the dataset. However, as this coordinate data was only measured at Wave I, it meant that there was incomplete data available to describe the actual location of respondents at Wave III and IV.

However (as described in 7.2.3 of Chapter IV), it was possible to determine that 95.3 per cent of the respondents lived in the same location between Wave I and IV. This meant that for the majority of the sample, the Wave I GPS coordinate data was deemed to be a valid measure to estimate the distance between respondents. Despite of this, as the distance of peers was found to be a significant factor in determining the amount of influence that peers exerted on each other within the dataset – this study was limited in that it did not have a complete measure for the entire sample.

Additional limitations were placed on the output of this study, due to the Risk Preference measure used during analysis.

### **5.2.2. Single-item construct for Risk Preference**

The measurement of the respondents' Risk Preference came from the single-item Risk Preference measure, which was derived from Wills, Vaccaro and McNamara's (1994) risk taking scale.

An evaluation of each scale's reliability was required, before constructs could be included in the PLS-SEM model of this study. As the Risk Preference item was employed to directly probe the respondent's Risk Preference, this could largely be seen as an unreliable measure of risk the respondent's Risk Preference attitude (Ajzen, 1988). However, a method of test-retest form of reliability evaluation was used; the measure was found to be reliable.

However, the measure might have lacked the ability to generate a comprehensive understanding of risk attitude, like has been hypothesised with numerous single-item measures before (Baumgartner & Homburg, 1996). This greater understanding of the Risk Preference construct might have allowed for better validity statistics within this study's PLS-SEM, when focusing on specific dimensions of the Risk Preference construct.

The lack of understanding into the various components of the Risk Preference construct allows for the same question to be raised against other measures, specifically: the way by which this study assumed that the number of friends with differing Risk Preference might result on some influence. The limitations of this assumption are discussed next.

### **5.2.3. Lack of prior knowledge into the types of interactions between peers**

This study made use of the PLS-SEM and the various LPMs in estimating the peer effects that would come from an individual's friends and siblings, on his or her Risk Preference. In the case of the PLS-SEM, the study estimated the respondent's future Risk Preference as a function of the Risk Preference of their friends and siblings, controlling for their distance. In the case of the LPMs, the study estimated the likelihood that respondents would change their Risk Preference state as a function of the number of peers who resided within 300 meters of the respondent (and was split for each of the Risk Preference groups).

In both cases, the study assumed that the type of interaction among individuals was homogeneous, such as in the LPMs it was assumed that each additional peer that a respondent had (within a specific Risk Preference group) would influence the individual's Risk Preference in the direction and in the same magnitude. In reality, this might have not been the interaction that was taking place. As the study did not measure the actual type of interaction that existed between respondents, the true dynamics in the development of Risk

Preference might have not been accurately understood. There may have been different types of friends which the friendship measure failed to capture, such as best friend or close friend distinctions. These classifications might have resulted in the better understanding of the primary generators of Social Influence in Risk Preference development.

This presents opportunities for future studies to build on these limitations. The recommendations for future studies is next presented.

## **6. FUTURE RESEARCH**

As this study made use of data which was collected prior to the design of the study, several limitations limited the desired structure of the study, which focus on the degree of control within further studies relying on secondary data analysis (Law, 2005). This section discusses the improvements that future studies could employ, and various recommendations for future researchers to explore. As this study faced problems in deciphering the friendship measures and lacked a means to determine various aspects of influence, the following recommendations are suggested.

### **6.1. More extensive understanding of the friendship measure**

Respondents within the Add Health dataset confirmed an average of three friendships, which could seem fewer than expected (see Utz, 2010). Further research would benefit from a wider definition of friends, perhaps employing multiple scales that inquired into the type of friendships that respondents had. This would require several aspects to be better developed: a better understanding into friendship, in terms of their quantity measure and also in terms of their relationship quality.

As the definition of friendships requires high levels of sociable behaviour, intimacy, and other positive features, with low levels of conflict, rivalry and other negative features – the combination of these can result in a wide range of different friendships with differing quality (Berndt, 2002). Additionally, the background or basis upon which friendships are developed is largely variable; it can be through infrequent basis, such as members of an individual's church or trade union members, or frequent basis, such as with neighbours, school friends

or family friends (Wilcox & Keselman, 2003). As this study did not probe into the nature of friendships, there is a great opportunity for future studies to measure the differences among different groups of friends, in hope that generalisations could be drawn. One alternate method could require respondents to list different tiers of friends as they perceive them (e.g., best friends). This would allow for a more extensive measure of the strength of the friendship as perceived by the individual where specific groups might be either greater or weaker generators of peer influence. Additionally, the types of interactions would also need to be examined and the reasons why respondents were friends, also the types of interaction among friends and if any of this could be used to better classify groups on the degree of peer influence that they create. Further recommendations exist in the extent to which future studies should link this research to behaviour.

## **6.2. Attitudinal link to behaviour**

As Social Marketing efforts are often focused on reducing risky behaviour and combatting the unfavourable attitudes associated with them (Kotler & Zaltman, 1971; Lefebvre & Flora, 1988; Walsh, Rudd, Moeykens & Moloney, 1993; Kotler, Roberto & Lee, 2002) it is important to be aware of the various applications in which risk attitudes are relevant and to explore these simultaneously.

Social Marketing is often concerned with behaviour such as healthy dieting, regular physical exercise and other preventative health behaviour (Coreil, Bryant & Henderson, 2000). As measures for these exist within the Add Health study, future research using similar methods that extend this study into the realm of behaviour, can make use of the same Add Health dataset for analysis (Add Health, 2013). This is useful as the Add Health dataset yields a comprehensive understanding of adolescents and the Generation Y group within the United States, over time (Add Health, 2013).

Alternative methods also exist for analysis, which might be beneficial for future studies in this area to adopt.

### **6.3. Probit regression in analysis**

This study made use of LPMs for analysing the effects of specific Risk Preference groups that might exist within the dataset. While the results were promising, the proportion of variance explained in each case did not appear to be satisfactory. While it has been explained that R-square values do not adequately evaluate the proportion of variance explained for LPMs – alternative modelling might be beneficial in future studies.

One such technique is that of probit regression (Bliss, 1934). Similar to that of LPMs, the probit regression also provides a binary response model which means that probabilistic results are generated, but it overcomes the problems of low R-square values (as experienced using LPMs) through use of logistical regression (Goldberger, 1964). While the use of probit regression is relatively easy, however, interpreting regression outputs with more than one predictor far is more difficult than it is with LPM (Aldrich & Nelson, 1984). As this study made use of three predictors during the analysis, it was decided that LPM would be preferable.

Moving beyond the study of Risk Preferences, the methods employed in this study also have wider-reaching applications in other marketing-related areas.

### **6.4. Applying similar modelling techniques in other areas**

Prior researchers have used LPMs to evaluate many different types of peer effects, with recent studies being conducted in the areas of obesity (Christakis & Fowler, 2007), happiness (Hill *et al.*, 2010) and sexual behaviour (Lam, Marteleto & Ranchhod, 2013). However, further opportunities exist for research into peer effects using the same or somewhat modified methods. As the Add Health dataset (2013) offers data on a wide variety of product use within the sample, such as the use of sunscreen (existing Wave V data), videogame usage (existing Wave I – IV data) and a wide range of risk behaviour – there exist many areas which have strong real-life market importance. The use of such research could benefit those in consumer markets, service markets and offer further benefit into Social Marketing. The extensiveness of the Add Health dataset is exemplified in the fact that

each respondent answers 2819 questions during in-home surveys. For a complete review of the reliability, nature and dependability of the data, further information is available at:

<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/21600/datasets> and;

<http://www.cpc.unc.edu/projects/addhealth/data/restricteduse/datasets>

Finally, additional recommendations exist for the duration of future studies which could benefit the quality of results, using such data from the Add Health dataset.

### **6.5. Analyse time-series data**

This study made use of two time periods for its measurement, but a total of four time periods were available for analysis. However, as this study was directly following the methods of prior studies which used LPMs, the use of multiple-point time series data was expected to generate too complex results.

This did mean, however, that certain measures, such as the average lifetime of a Risk Preference, would only have access to data over a 7-year time period, with 15 different ages being assessed. This was problematic in that some Risk Preference states were estimated to last as long as 48 years, without actual data to confirm this. Future studies could overcome this using lifetime measures of risk attitudes. These studies could continue to make use of the Add Health dataset as it continually produces data about the sample in subsequent waves every 6 – 8 years.

The results from the PLS-SEM model described the time period between  $T_1$  and  $T_2$  (2002 and 2008) as being a notable period for the Risk Preference of respondents. This could be due to confounding global events which placed risk attitudes in the forefront of society's mind. One possible event could be the aftermath of the September 11<sup>th</sup> acts of terrorism in the United States and the subsequent mobilisation of military forces (Floyd, Gibson, Pennington-Gray & Thapa, 2004). However, further research linking exact timing and events would be required for an adequate understanding of the true reasoning for the increase in risk averse attitudes between the measurement periods.

Overall, this study highlighted specific instances of period and peer effects within the cohort, which prompt social marketers to re-evaluate their understanding of Social Influence and illustrates that risky individuals might not be as prone to Social Influence, as expected. Specific methods explored how Social Influence is involved in the development of Risk Preferences (risk attitudes) which highlighted the instances of social mimicry in the sample. This allowed for the establishment of specific parameters describing how specific groups of Generation Y individuals are more susceptible to Social Influence and which groups are broadly resistant to any Social Influence. This improves the current body of research covering Social Influence, Risk Preferences and the interplay between siblings and friends.

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**APPENDIX A – COMMERCE FACULTY ETHICS COMMITTEE APPROVAL**



**Faculty of Commerce  
Ethics in Research Committee**

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UCT/COM/131/2013

7<sup>th</sup> May 2013

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Dear Researcher,

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**Project title: SOCIAL INFLUENCE IN GENERATION Y'S DEVELOPMENT OF RISK PREFERENCES**

This letter serves to confirm that the project entitled, "**SOCIAL INFLUENCE IN GENERATION Y'S DEVELOPMENT OF RISK PREFERENCES**" as described in your final submitted protocol 2013, has been approved. 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,

*Harold Kincaid*

Professor Harold Kincaid  
Commerce Faculty Ethics in Research Committee