PLAGIARISM

DECLARATION

1. I know that plagiarism is wrong. Plagiarism is to use another's work and to pretend that it is one's own.

2. I have used the *American Psychological Association (APA)* convention for citation and referencing. Each significant contribution to, and quotation in, this essay / report / project / from the work, or works, of other people has been attributed, and has cited and referenced.

3. This essay /report /project / is my own work.

4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing if off as his or her own work.

5. I acknowledge that copying someone else's assignment or essay, or part of it, is wrong, and declare that this is my own work.

Signed by candidate

SIGNATURE:

A Systematic Review of Interventions for Teaching Empathy in Child and Adolescent Samples

Ashlee Blacher

BLCASH003

A dissertation submitted in *partial fulfilment* of the requirements for the award of the Degree of Master of Arts (Psychological Research)

Faculty of Humanities

University of Cape Town

2023

Supervisor: Dr Lea-Ann Pileggi

Co-Supervisor: Prof. Susan Malcolm-Smith

Acknowledgements

I would like to sincerely thank and express gratitude to the following people:

To my supervisor, Lea-Ann Pileggi, and my co-supervisor, Susan Malcolm-Smith, thank you for your help, guidance, and comprehensive feedback during the research process.

To Kim Rousseau, my co-reviewer, colleague, and dear friend. Thank you for the time and effort that you put into this dissertation. This project would not have been possible without your guidance, patience, and constant support.

To Gill Morgan, thank you for your expert advice and assistance in conducting the literature search.

Finally, to my parents, Ian and Mandy, and my partner, Nadav, thank you for your unconditional support throughout my master's degree.

Abstract

Introduction: Escalating levels of youth violence and aggression is today a major global concern and is notably apparent in South Africa. Despite the deleterious consequences associated with these acts, a long-term, efficacious intervention is still lacking. Furthermore, early onset aggression has repeatedly been linked to later aggression, which underscores the need for intervention in a younger cohort of the population. Various international studies have positioned empathy as a notable correlate of violence and aggression, associating increased empathy with a decreased risk of presenting with violent and aggressive behaviour. Research has also demonstrated the potential to enhance child and adolescent empathic behaviour using various interventions. These findings lend themselves to the possibility of using empathy enhancing interventions to counteract youth violent and aggressive behaviours. *Method:* To this end, a PRISMA-P compliant systematic review of randomised pre-/post-test experimental studies was conducted to assess the efficacy of interventions that have been used to enhance empathic behaviour among child and adolescent samples. Eight journal databases were searched, using key terms relating to teaching, empathy, children/adolescents, and interventions. *Results:* Of the 1,656 articles found, the authors reviewed the full texts of 161 articles. A total of 38 articles were included in the final analysis (ten randomised control trials, 18 cluster randomised control trials, one class randomised cross over design and nine pre-/post-test randomised experimental designs). Included interventions were classified according to eight categories: classroom-based social emotional learning (SEL) interventions (*N*=10), narrative/conversation-based interventions (*N*=8), game-based interventions (*N*=3), physical education (PE) interventions (*N*=2), mindfulness-based interventions (MBIs; *N*=3), home-based, caregiver-administered interventions (*N*=2), role play interventions (*N*=1) and other (*N*=9). *Conclusion:* Evidence from the review indicates that empathic behaviour can be enhanced in children and adolescents. Notably, this review is the first of its kind to assess the efficacy of these interventions in an all-inclusive, universally applicable manner and in neurotypical child and adolescent samples. However, the review also highlights the need for a concrete, unanimously accepted definition of empathy so that future research can make more definitive conclusions and more accurate comparisons.

Keywords: adolescents, aggression, children, empathy, intervention, prosocial behaviour, social emotional learning, Theory of Mind, violence.

List of Abbreviations

CASEL	The Collaborative for Academic, Social and Emotional Learning
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CPBQ	Child Prosocial Behavior Questionnaire
CPP	Coping Power Program
DPPG	Dramatic Pretend Play Games
EC	Empathic Concern
ERC	Emotion Regulation Checklist
ERIC	Education Resources Information Center
ICC	Intraclass Correlation Coefficient
IRI	Interpersonal Reactivity Index
MASCS	Multisource Assessment of Social Competence Scale
MBI	Mindfulness-Based Intervention
Mod-PBQ	Modified Professional Behavioural Questionnaire
OM-K	OpenMind-Korea
PE	Physical Education
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
PROSPERO	Prospective Register of Systematic Reviews
RCT	Randomised Control Trial
SAFE	Sequenced, Active, Focused, and Explicit
SDQ	Strengths and Difficulties Questionnaire
SEL	Social Emotional Learning
SES	Socio-Economic Status
SPARK	Speaking to the Potential, Ability, and Resilience Inside Every Kid
SWPBIS	School-Wide Positive Behavioural Interventions and Supports
TEPP	Toddlers Empathy Prosociality Program
TOCA-C	Teacher Observation of Classroom Adaptation
ToM	Theory of Mind
VR	Virtual Reality
WHO	World Health Organisation
YES	Youth Empowerment Solutions

Contents

List of Figures

List of Tables

Introduction

Violence and aggression are undoubtedly a major international concern. This is notably apparent in South Africa, where the incidents of homicide, assault, intimate partner violence, and misconduct mirror the highest international levels (Statistics South Africa, 2018). In South Africa, and in various other countries, a significant percentage of this violent and aggressive conduct is perpetrated by children and adolescents (Foster, 2012; SACE, 2011; Seedat et al., 2009). Since early aggressive behaviour is predictive of later anti-social behaviour, the period between early childhood and adolescence is an ideal window for the exploration and implementation of violence prevention strategies (Kane-Berman & Cronjé, 2007; Pingault et al., 2013). However, despite various attempts to reduce violent offending among youth, a long term, efficacious intervention is still lacking (Lovett & Sheffield, 2007). Given the high costs associated with these acts, investigating the correlates of violence and aggression among young individuals is crucial for the overall reduction and prevention of these behaviours.

The plethora of international research that has emerged in recent years collectively identifies empathy as a notable correlate of violence and aggression. To elaborate, deficiencies in empathy have repeatedly been associated with a greater risk of presenting with violent, aggressive, criminal and/or antisocial behavioural tendencies (De Kemp et al., 2007; Gonzalez-Gadea et al., 2014; van Langen et al., 2014). Despite a paucity in research, a handful of studies have implicated empathy in explanations of violence and aggression within the South African context (Malcolm-Smith et al., 2019; Pileggi, 2018; Yazdi et al., 2006). These findings lend themselves to the possibility of using empathy enhancing techniques to counteract violent and aggressive behaviours.

A growing cadre of researchers have directed their enquiry and dedication to the development of interventions aimed at enhancing empathic behaviour. Research has also demonstrated the potential to enhance child and adolescent empathic behaviour via school-based intervention programs (Cheang et al., 2019; Ingram et al., 2019; O'Conner et al., 2017). It therefore seems logical to use these empathy-enhancing techniques to address escalating levels of violence and aggression in schools. However, since research on this topic in South Africa is both scarce and inconsistent, any intervention implemented in a young, South African, population can be best informed by international research. Given the urgent need for effective interventions for youth aggression, it becomes imperative to analyse the interventions that have been used to enhance empathic behaviour in child and adolescent samples to determine their efficacy and to inform future intervention strategies.

Defining Empathic Behaviour

By virtue of its inherent complexity and multidimensionality, the concept of empathy has been notoriously difficult to define. The literature features multiple, seldom agreed-upon conceptualisations of empathy, which are often accompanied by a host of disparate and inconsistent measurement techniques (Blair, 2005; Decety, 2011; Decety & Lamm, 2006). Although the literature acknowledges the various dissociable components of empathy (i.e., emotional contagion, affective mimicry, altruistic behaviour, sympathy, emotion recognition, perspective-taking, empathic arousal, and Theory of Mind), these components are often conflated with one another and are used interchangeably, further clouding and obscuring the definition of this construct (Blair, 2005). As a result, it has become increasingly difficult to draw accurate comparisons and meaningful conclusions from research within this field (Decety & Cowell, 2014). This conceptual and operational ambiguity is largely evident in the contemporary literature concerning the relationship between empathy and violence and aggression. As such, it becomes imperative to review the current definitions of empathy to provide some clarity in this regard and to ensure that this review upholds a comprehensive, well-informed, definition of empathy.

Despite the variable definition of this construct, most researchers agree that empathy encompasses the capacity to experience and comprehend another individual's emotional state, coupled with the capacity to differentiate between the self and the other (Decety & Lamm, 2006). Essentially, empathy involves emotion sharing, or experiencing emotions that are consistent with another's situation more than one's own, without ambiguity between oneself and others (Decety & Lamm, 2006). Importantly, empathy plays a crucial role in social interactions and interpersonal relationships and is deemed a fundamental component of prosocial behaviour, social cognition, and social cooperation (Warrier et al., 2018).

Many contemporary scholars regard empathy as a multidimensional construct, involving both cognitive and affective components, which operate collaboratively to give rise to empathic behaviour (Decety & Jackson, 2004). The cognitive component of empathy involves the capacity to detect or comprehend other peoples' emotional states and viewpoints, whilst the affective component of empathy concerns the subjective capacity to feel similar emotions or viscerally share the emotional states of others (Vachon et al., 2013; Warrier et al., 2018). Neurobiological evidence supports this distinction, demonstrating that cognitive empathy is subserved by top-down, higher-order neurobiological mechanisms, while affective empathy is subserved by bottom-up processes, with a reliance on more primitive neural structures (Decety, 2011; Vachon et al., 2013). Evidently, empathic

behaviour is mediated by a large array of cortical and sub-cortical structures, which, although separate, are profoundly interactive and partially convergent (Decety, 2011; Zaki & Ochsner, 2012).

Despite its ubiquity in the literature, the abovementioned conceptualisation of empathy has emerged alongside many other neurobiological and psychological theories. For example, the perception of another individual's affective state (i.e., his/her subjective experience of emotion) is said to provoke motor empathy; the propensity to emulate the motor responses, such as postures and facial expressions, of other individuals (Van der Graaf et al., 2016). Stemming from this neurobiological explanation, the Perception Action Model of empathy asserts that the perception of another's affective state or behaviour elicits one's own representations of this affective state which, consequently, activates automatic and somatic processes (Preston, 2007). This is consistent with a simulation theory of empathy, and the function of mirror neurons, which suggests that the observation and comprehension of another's affective state involves the internal simulation and activation of one's own representations of that state (Rameson & Lieberman, 2009). Evidently, these theories uphold a neurobiological standpoint, suggesting that perception and action rely on the same neural networks.

In contrast, the highly contentious psychological approaches advocate for a performance definition of empathy, where behavioural response patterns are assumed to reflect an individual's capacity for empathy. To elaborate, psychological theories are based on the underlying assumption that our behaviours reflect our abilities to behave in certain ways, and thereby behavioural response patterns can be used to understand empathic processes. Although these theories are largely discredited as an adequate explanation for empathic behaviour, Zaki and Ochsner (2012) argue that, to gain a more comprehensive understanding of literature within this field, behaviour needs to be assimilated into the neuroscientific understanding of empathy.

A Framework for Empathic Behaviour

A more contemporary conceptualisation of empathy is presented by Decety and colleagues who have laid the groundwork for a more nuanced and advanced understanding of empathic behaviour (Decety, 2011; Decety & Jackson, 2004; Decety & Meyer, 2008; Decety & Moriguchi, 2007). In their social-developmental framework, Decety and colleagues posit that empathic behaviour is facilitated by the exchange between bottom-up mechanisms involved in emotion sharing (i.e., affective empathy), top-down mechanisms involved in emotional awareness and comprehension (i.e., cognitive empathy), and top-down self-

regulatory mechanisms, particularly those involved in affect regulation, that determine actual responses (Decety, 2011). Built into this framework is the concept of self-other awareness, or the ability to differentiate between the self and the other. This is a vital mechanism in empathy-driven behaviour as it acts as a safeguard against heightened levels of personal distress, thereby allowing one to fully attend to the other individual and engage in empathy-driven behaviours.

To summarize, empathy is a complex, multidimensional term, underpinned by interacting, yet dissociable neurobiological processes. For a more thorough understanding of empathy, a catchall definition of this construct will not suffice (Mar, 2011). Instead, empathic behaviour is better understood as emerging from cognitive, affective, and self-regulatory processes of affect regulation (Decety & Cowell, 2014). This deconstructed model of empathy, comprised of a cognitive and affective component, is particularly pertinent to research investigating children and adolescents, as these interdependent components are subserved by different developmental trajectories (Rakoczy, 2022). The conceptualisation of empathy utilised in the proposed research is thus consistent with this deconstructed, heterogenous paradigm, one that is embedded in the scientific literature and that is clearly most pertinent to the population under investigation (children and adolescents).

The Development of Empathy

Empathy-driven behaviours appear to emerge early on in ontogeny, with infants exhibiting various forms of distress in response to the discomfort of others (Rakoczy, 2022). These initial displays of empathy are regarded as manifestations of affective empathy, and are automatic, evolutionary, and biological responses that are facilitated by bottom-up neurobiological processes. Affective empathy can therefore be regarded as a phylogenetically ancient mechanism, one that is shared with many other mammals (Decety, 2011; De Waal, 2008). However, humans have evolved by developing more sophisticated cognitive capacities and higher order functions. With increased brain maturation, an extended life history and the development of the prefrontal cortex, children are able to engage in the cognitive component of empathy, becoming increasingly advanced in their ability to regulate their responses and comprehend the emotional states and perspectives of others (Rakoczy, 2022). For example, Theory of Mind (ToM), the ability to infer or reason about the beliefs, thoughts, or emotional states of others, begins to develop at around the age of 2 years. By the age of 3-5 years, children are capable of recognizing false beliefs in themselves and others and can distinguish appearance from reality (Bibby & McDonald, 2005). Of course, children also develop the capacity for affect regulation, allowing them to avoid personal distress while responding to

the emotional states of others (Williams et al., 2014). These skills continue to progress into late adolescence. This underscores the various social cognitive components involved in the development of empathic behaviour, positioning cognitive empathy as a socially adaptive, high-level, cognitive phenomenon that is predominantly reserved for humans (Decety, 2011).

The conceptualisation of empathy utilised in the proposed research is consistent with an evolutionary understanding of this construct. Consequently, typically developing children and adolescents are expected to display an innate capacity for affective empathy. However, the higher-order cognitive component of empathy relies on brain maturation and is subject to learning, which is largely influenced by context. According to Social Learning Theory, children's behaviour is influenced by observing and emulating certain models of behaviour, specifically those that exist within their daily environments (Bandura, 1977). As such, cognitive empathy is expected to be the most receptive to strategies aimed at enhancing and teaching empathic skills or behaviours, while, affective empathy, due to its innate nature, is not expected to be as amenable to interventions aimed at its enhancement.

Aggressive Behaviour in South Africa

As previously mentioned, in South Africa and worldwide, a significant percentage of the violent and aggressive acts are perpetrated by children and adolescents (Foster, 2012; Seedat et al., 2009). This is notably apparent in schools in the Western Cape, where researchers have noted an increase in violent and aggressive behaviour, in association with increasing levels of gangsterism in the province (Burton, 2008; Pinnock, 2016; SACE, 2011; Ward & Cooper, 2012). Longitudinal data on violence in the lives of urban South African children points to the high levels of violence that children experience in their daily environments as well as the high levels of violence that they perpetrate towards others. Evidently, exposures to and experiences of violence are markedly pervasive in the lives of South African children and adolescents (Richter et al., 2018). Furthermore, research suggests that early aggressive behaviour is predictive of adult violence, criminality, and delinquency (Kane-Berman & Cronjé, 2007; Pingault et al., 2013). Compounding the high prevalence of violence and aggression among South African youth is the lack of effective treatment programs for these behaviours, particularly within a South African context. In his book, '*Gang Town*,' investigative South African journalist, Don Pinnnock (2016), identifies empathy as a vital component to consider in explanations of violence and aggression among South African youth.

Empathy and Aggressive Behaviour

The plethora of international research that has emerged in recent years collectively identifies empathy as a notable correlate of aggressive behaviour (i.e., behaviour that intentionally harms another; Tremblay, 2000). Although this association has been largely reported among child and adolescent samples, research findings appear to be inconsistent. For example, in their sample of children, aged 3-13 years, Dadds et al. (2008) found high affective and low cognitive empathy to be correlated with increased levels of aggression. Additional research points to particular deficiencies in the perspective-taking aspect of cognitive empathy and aggressive behaviour, where children misinterpret the intentions and perspectives of others, viewing them as distressing and hostile and thereby responding in an aggressive manner (De Castro et al., 2002; Gini et al., 2007).

On the other hand, research investigating this relationship in young individuals who present with psychopathic traits (i.e., reduced affective concern and empathy) or high callous unemotional traits has found that diminished affective empathy is more strongly associated with aggressive behaviour compared to diminished cognitive empathy (De Wied et al., 2005; Frick & Viding, 2009; Frick & White, 2008). Sutton et al. (1999) support this association and go even further by suggesting that some aggressive individuals present with diminished affective empathy, but display well developed cognitive empathy (ToM), which they use to actively manipulate other individuals. The relationship between empathy and aggressive behaviour appears to be somewhat contingent upon the sample under investigation, where low cognitive empathy is more accordant with aggressive behaviour in neurotypical samples while low affective empathy is more accordant with aggressive behaviour in clinical samples.

In South Africa, the cognitive aspect of empathy appears to be the most common predictor of aggressive behaviour. Specifically, decreased affect regulation has been associated with increased aggression among adolescents in the Western Cape (Pileggi, 2018). Furthermore, evidence from unpublished research presented at international conferences demonstrates a delay in the development of ToM in South African children (Malcolm-Smith et al., 2019). Since deficits in cognitive empathy have been linked to aggressive behaviour in young typically developing samples, these findings lay the groundwork for research to inform interventions aimed at reducing and preventing escalating levels of violence and aggression in South Africa and worldwide.

The Importance of Empathy

The ubiquity of this construct in the psychological literature speaks to the crucial role that it plays in social interactions and interpersonal relationships. Empathy establishes the

basis for reciprocal human relationships and healthy coexistence and is deemed a fundamental component of prosocial behaviour, moral and social development, social cognition, and social cooperation (Warrier et al., 2018). It is also associated with higher calibre peer relationships, greater academic achievement, enhanced social competence and reduced prejudice (Dovidio et al., 2010; Shaffer & Kipp, 2010). Importantly, the development and expression of empathy during childhood and adolescence has been found to promote cooperative, sharing and helping behaviours, positive social interactions, and a greater social understanding (Silke et al., 2018). Of note is that children with higher levels of ToM (one aspect of cognitive empathy) are more likely to participate in such prosocial behaviours (Caputi et al., 2012; Takagishi et al., 2010). Research also indicates that children and adolescents who repeatedly engage in empathic behaviours present with greater social and cognitive adjustment and ultimately assume a greater sense of citizenship and responsibility in later years (Silke et al., 2018; Wray-Lake & Syvertsen, 2011).

Various aspects of empathy have been found to exert unique and combined effects on prosocial behaviour. One such aspect, empathic concern (EC), refers to a constellation of other-oriented emotions which are elicited by perceiving someone in need and which subsequently trigger the motivation to enhance the welfare of this perceived individual (Batson, 2011). The desirable nature of EC is clearly demonstrated in the way that it promotes altruistic motivation and thereby encourages individuals to increase the welfare of other people, based on feelings of empathy. As such, research has found that individuals who experience greater EC are more likely to participate in prosocial, helping behaviours compared to individuals with lower EC levels (Batson, 2011; Van der Graaff et al., 2018). Furthermore, heightened EC has also been associated with reduced antisocial activity, aggression, delinquency, and racial discrimination (Ang & Goh, 2010; Fraser et al., 2012).

By and large, a significant volume of academic research reinforces the notion that empathy is positively correlated with prosocial behaviour (Eggum et al., 2011; Eisenberg et al., 2010), and negatively correlated with antisocial, aggressive, conduct disordered and delinquent behaviour (De Kemp et al., 2007; Lovett & Sheffield, 2007; van Langen et al., 2014). It therefore follows that interventions aimed at enhancing prosocial behaviours and reducing violence and aggression should target empathy for successful change.

Teaching Empathy

The promotion of empathy is undoubtedly a valuable societal goal. To this end, a substantial body of research has been dedicated to the development of specific interventions aimed at enhancing empathic behaviours. The promotion of empathy-related behaviour is

mostly discussed in relation to programs for social-emotional learning (SEL) in schools. SEL is the practice whereby children and adults learn to recognize, comprehend, and regulate their emotions, empathise with, and perceive the emotions of others, create, and maintain positive relationships, set and achieve positive objectives, and make responsible and informed decisions (O'Conner et al., 2017). The Collaborative for Academic, Social and Emotional Learning (CASEL) propose five cognitive, behavioural, and affective competencies that underpin SEL curricula, namely: the ability to understand personal emotions and thoughts, to control personal emotions and behaviour, to understand and empathize with the emotions and perspectives of others, to develop and uphold positive relationships, and the ability to make reasonable and ethical choices (CASEL, 2012). Studies indicate that successful SEL programs enhance learning by incorporating regular activities into the classroom. These activities are implemented consistently, build upon each other, are interesting and engaging, and set aside dedicated classroom time for the development of social and emotional competencies. Furthermore, an important element of successful SEL programs is the provision of teacher training and technical support (O'Conner et al., 2017). Importantly, in their evaluation of the effect of 213 school based SEL programs on behavioural issues, school achievement, and prosocial behaviour, Durlak and colleagues (2011) found that the programs that had the largest effect sizes were those that emphasized empathy, recognizing emotions, managing stress, solving problems, and making decisions. Thus, among the skills pertinent to school-based SEL, empathy-related constructs seem to be an essential aspect of program success.

Since empathy is a prominent correlate of bullying and defensive behaviours among children, numerous anti-bullying interventions include elements that are designed to teach and enhance empathy. The recent development and nation-wide dissemination of the Finnish anti-bullying programme, KiVa, incorporates empathy-building strategies into lesson plans, virtual learning environments and anti-bullying posters that are implemented by virtue of this programme. Research shows that, after five and nine months of KiVa implementation, students presented with increased affective empathy, regardless of individual or contextual factors (Kärnä et al., 2011; Saarento et al., 2015). Furthermore, in a review of the current literature, Cheang et al. (2019) found that mindfulness-based interventions (MBIs) effectively enhanced the empathy levels of children and adolescents. In addition, Goldstein, and Winner (2012) found that children who were exposed to acting training (an activity which involves perspective-taking) for one year showed a significant increase in empathy levels, compared to child participants who received training in other art forms. Finally, Ingram et al. (2019)

investigated the effectiveness of a virtual reality (VR) enhanced anti-bullying intervention among middle school students. Results indicated a significant increase in measures of self-reported empathy among those exposed to the intervention.

While it is notably apparent that this growing body of research has largely been conducted in a High-Income Country context, it nevertheless supports the notion that child and adolescent empathic behaviour can be enhanced by teaching. As recent explanations of violence and aggression have implicated empathy as a significant correlate of such behaviours, the above findings lend themselves to the possibility of using empathy-enhancing interventions as a means to increase child and adolescent empathic behaviour and ultimately reduce violence and aggression in young samples.

However, research to date has largely focused on collating and examining empathy enhancing interventions among healthcare professionals and adult samples (Clark et al., 2019; Everson et al., 2018; Neumann et al., 2011; Nosek et al., 2014). The systematic reviews and meta-analyses that have focused on child and adolescent samples have either assessed the effectiveness of a specific type of intervention (i.e., MBIs, the Good Behaviour Game; Cheang et al., 2019; Smith et al., 2021), or have predominantly centred around clinical samples (McCoy et al., 2016). A review of the rigour of empathy-enhancing interventions among neurotypical child and adolescent samples therefore appears advantageous both in South Africa and internationally and would ultimately fill a gap in the systematic review literature.

Rationale

It is notably apparent that violent and aggressive behaviour is today a major global concern and is alarmingly pertinent in South Africa (Statistics South Africa, 2018). In South Africa, and in various other countries, a significant percentage of these violent and aggressive behaviours are perpetrated by young individuals (Burton, 2008; Pinnock, 2016; SACE, 2011; Ward & Cooper, 2012). Furthermore, early onset aggression has repeatedly been linked to later aggression, which provides a compelling rationale for the treatment and prevention of these behaviours in this segment of the population (Kane-Berman & Cronjé, 2007; Pingault et al., 2013). The escalating levels of youth violence in South Africa and worldwide calls for immediate intervention. However, current treatment strategies are reportedly ineffective, and outcomes are often under-reported and temporary (Lovett & Sheffield, 2007).

Empathy has been deemed a critical aspect in explanations of violence and aggression (Gonzalez-Gadea et al., 2014; van Langen et al., 2014). To elaborate, empathic behaviour has repeatedly been identified as a key deficit in aggressive children and adolescents. Evidently,

in a typically developing population, low cognitive empathy appears to be more consistently linked with aggressive behaviour. This is also seen in a young South African population (Pileggi, 2018). These findings lend themselves to the possibility of using empathy enhancing techniques to counteract youth violent and aggressive behaviours. Since the cognitive component of empathy is reliant on learning, and can therefore be taught, these interventions should employ various teaching strategies to enhance cognitive empathy.

Furthermore, fostering empathic behaviour has frequently been associated with enhanced prosocial behaviour, social cognition and social cooperation among children and adolescents (Clark et al., 2019; Everson et al., 2018; Neumann et al., 2011; Nosek et al., 2014). As empathy plays a crucial role in fostering reciprocal social interactions and interpersonal relationships, interventions aimed at enhancing this construct would, additionally, aid in the development and expression of these vital prosocial behaviours.

Recent international research has demonstrated the effectiveness of various interventions aimed at enhancing child and adolescent empathic behaviours (e.g., Cheang et al., 2019; Ingram et al., 2019; O'Conner et al., 2017). However, disagreement remains regarding the type of intervention and duration of training that is most effective at enhancing empathy. A better understanding and closer examination of these interventions is therefore important for the successful development of empirically informed intervention programs. To this end, it becomes vital to review and integrate the literature that has investigated the interventions that have been used to enhance empathic behaviour among typically developing child and adolescent samples so as to evaluate their efficacy, durability, and applicability to youth-based empathy-enhancing treatment programs.

Objectives

This research aimed to present a systematic review of the existing literature where various interventions have been used to teach empathic behaviour to child and adolescent samples. The author reviewed randomised pre-/post-test experimental studies to systematically assess the interventions that have been used to enhance empathic behaviour (compared to alternative methods or no intervention) among typically developing children and adolescents. To this end, we sought to analyse, synthesise, and categorise the various types of interventions that have been used to enhance empathic behaviour whilst simultaneously determining which aspect of empathic behaviour is most commonly targeted in and most responsive to these interventions.

Method

Protocol and Registration

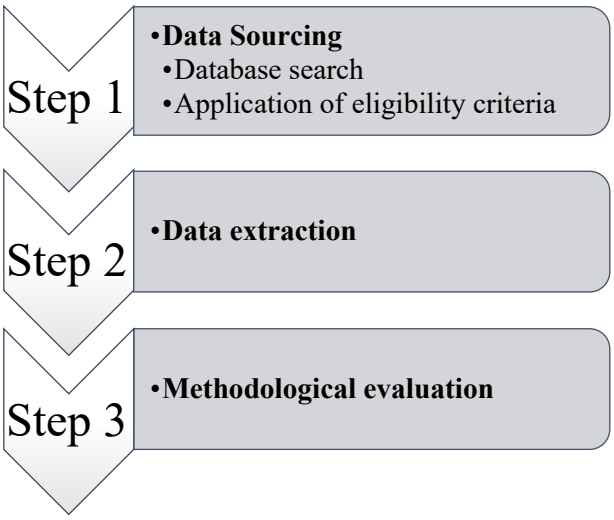
This systematic review was conducted in accordance with the guidelines set out by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA-P) statement. In keeping with these guidelines, a systematic review protocol was registered with the international Prospective Register of Systematic Reviews (PROSPERO; registration number: CRD42022344058). In addition, the review was structured in accordance with the PRISMA-P 2020 checklist (Appendix A; Page et al., 2021). The ethical approval committee in the Department of Psychology at the University of Cape Town gave clearance for this research to be conducted – reference number: PSY2021-024 (see Appendix B).

Search Strategy

As per Figure 1, the systematic review was conducted using a three-phase approach. The first phase involved searching for relevant literature, the second phase involved extracting data from the cited materials, and the final phase involved evaluating the methodological quality of the selected studies.

Figure 1

Flow Chart Demonstrating the Three-Phrase Structure of This Systematic Review



Step 1: Data Sourcing

Database Search. The following online databases were searched from their date of inception to 21 June 2022: PubMed, EBSCO (PsychINFO, PsychArticles, ERIC, Cinahl and AfricaWide), Scopus, and Web of Science. Additional searches were conducted via Google

Scholar as a safeguard. Relevant Boolean phrases (Table 1) were identified through initial searches of the databases and through consults with a library technician from the University of Cape Town (UCT). To ensure literature saturation, the reviewers also hand-searched the reference lists of retrieved papers and relevant studies included in other systematic reviews or meta-analyses.

Search terms were grouped into five conceptual categories: (1) teaching, (2) empathy, (3) intervention, (4) child/adolescents, and (5) study design. Searches were adapted, where necessary, to accommodate the specifications of each database.

Table 1

Table Depicting the Boolean Phrases Used in the Database Search

Key Term	Phrase
Teaching	educat* OR learn* OR teach* OR train* OR instruction OR enhance OR skill*
Empathy	empathy OR "affective empathy" OR "cognitive empathy" OR "theory of mind" OR "emotion sharing" OR prosocial
Child	child* OR youth* OR "young person" OR "young persons" OR teenage* OR adolescent* OR adolescence OR pediatric OR paediatric
Intervention	intervention* OR program* OR workshop* OR course*
Study Design	Trial* OR random* OR double-blind OR single-blind OR research design OR comparative stud* OR evaluation stud* OR follow-up stud* OR prospective stud* OR controlled stud* OR cross-over stud* OR crossover stud* OR mask* OR blind* OR volunteer*

Note. * Denotes any ending in word including, but not limited to, “y”, “s”, “ion”, “ive”, “al”, “ing”, “e”, “ed”

Additionally, in order to refine the search to only neurotypical children and adolescents, three additional key terms were included using the Boolean operator “not,” so as to exclude studies with these phrases (Table 2).

Table 2

Table Listing the Boolean phrases Included with the Boolean Operator "NOT".

Key Term	Phrase
Adult	adult* OR professional* OR universit* OR college* OR "health personnel"
Neurodivergent Sample	autism OR ASD OR "autism spectrum disorder" OR "developmental disability" OR "intellectual disability" OR ADD OR ADHD OR "attention deficit disorder" OR "attention deficit hyperactivity disorder"

Note. * Denotes any ending in word including, but not limited to, "y", "s", "ion", "ive", "al", "ing", "e", "ed"

Application of Eligibility Criteria. Articles were included based on their fulfilment of the following criteria. Randomised pre-/post-test designs investigating the effect of various empathy-enhancing interventions (compared to alternative methods or no intervention) on child and adolescent empathic behaviour were eligible for inclusion.

To further clarify, since this research aims to identify broadly applicable interventions rather than those shown to work specifically in clinical samples, eligible studies included typically developing, non-clinical, child and/or adolescent participants (under 18 years old). Studies investigating children in foster care were excluded as research suggests that these individuals often present with deficits in emotion understanding, ToM and emotion regulation as a result of the adversity that they encounter during the early stages of life (Pears & Fisher, 2005). Furthermore, research also suggests that juvenile delinquents and young offenders tend to have decreased empathy compared to their non-delinquent counterparts (Jolliffe & Farrington, 2004). As such, studies investigating juvenile delinquent or offending samples were excluded.

Studies measuring any component of empathic behaviour (i.e., cognitive empathy, affective empathy, empathic concern, ToM, prosocial behaviour, compassion, perspective taking, emotion recognition) as a primary or secondary outcome were eligible for inclusion. An eligible intervention involved strategies that were specifically designed to enhance or promote empathy, or a sub-component of empathy, or empathy-related construct. Both individual and group-based interventions were eligible for inclusion and no limit was placed on the length of the intervention, such as the number of sessions or the length of sessions.

Furthermore, studies measuring empathic behaviour, via self-report and/or observer report measures were included, regardless of the method of administration.

To ensure quality of evidence in the included literature and to minimize any potential bias, only randomised pre-/post-test experimental studies, with an active or passive control group, were eligible for inclusion.

No publication date or publication restrictions were imposed. Only English-language articles were included that offered full-text availability. To avoid overlapping data, studies were excluded if data was included in a previous study. In this instance, the study with the most exhaustive set of data was included, provided it met the eligibility criteria.

Study Selection. All citations retrieved in the search strategy were downloaded and stored using EndNote (version 20), where all duplicates were identified and removed (The EndNote Team, 2013). The resulting reference list was then transferred to Rayyan, a web-based application that assists with the compilation of reference lists for systematic reviews (Ouzzani et al., 2016). To enhance the accuracy of the literature search, a second reviewer (K. R[1]) assisted with the selection process. The reviewers (A.B and K.R) independently assessed the titles and abstracts of all articles uploaded to the Rayyan software to identify those meeting inclusion criteria. The Rayyan software grouped articles into those that were deemed acceptable or unfit for inclusion. The software also identified any disagreements on study eligibility, which were settled through discussion until an agreement was reached. Full-text manuscripts of the remaining articles were retrieved and independently examined by reviewers A.B and K.R against the inclusion criteria. Again, any disagreements were settled through discussion and negotiation until consensus was reached.

Step 2: Data Extraction

One reviewer (A.B) independently reviewed the full texts of the relevant articles and extracted data using a pre-established Excel spreadsheet. The following data was extracted: study characteristics (authors, year of publication, article title, country of origin), study design (design, duration, control conditions), basic demographic information (sample size, age range, ethnicity, socio-economic status, gender), intervention (title and description of intervention, setting and delivery, duration and frequency), outcome details (time points, type of empathy measured, type of measure, validation of measure), study findings and limitations. The second reviewer (K.R) checked the extracted data.

[1] To minimize bias from a single point of view, Kim Rousseau, a graduate student in the psychology department at UCT, independently screened and selected articles for inclusion, and evaluated the methodological quality of the included studies.

Step 3: Methodological Evaluation

In the current review, methodological quality was assessed using the Downs and Black (1998) checklist. This methodological quality checklist has been designed for RCTs and non-randomised studies and has demonstrated high internal consistency, reliability, and validity in the assessment thereof (Downs & Black, 1998). The checklist has also been determined to be one of the top six quality assessment tools that are appropriate to use when conducting systematic reviews (Deeks et al., 2003). Given this review's exclusive focus on randomised studies, this assessment tool seemed appropriate.

The Downs and Black (1998) checklist consist of 27-items distributed between the following sub-scales: reporting, external validity, internal validity/bias and internal validity/confounding (selection bias). The original version of this assessment tool is scored on a scale of zero to 32. However, the final question has been found to be unclear and challenging to evaluate. As a result, and in keeping with adjustments made by Eng et al. (2007), the last question was changed from a rating scale of zero to five to a scale of zero to one (Appendix C). A score of one was given if the power or sample size computation was included in a study, while a score of zero was given if there was no power calculation, sample size calculation or explanation regarding the appropriateness of the number of subjects. This modification resulted in a total possible score of zero to 28, with a higher score signifying a higher level of methodological quality.

Of the 27 items, 26 were evaluated as either "yes" (given a score of one) or "no/unable to determine" (given a score of zero) and one item was assessed on a three-point scale, with "yes" receiving a score of two, "partial" receiving a score of one, and "no" receiving a score of zero. Based on their total scores, and in keeping with prior systematic reviews and meta-analyses using this tool, articles were categorized as being of excellent (26-28), good (20-25), fair (15-19), or poor (≤14) quality (Silverman et al., 2012). Although the Downs and Black (1998) checklist does not specify a cut off score for acceptable studies, a score of ≤14 out of 28 has formerly been used as a cut off for the exclusion of articles (Van Wyhe et al., 2017). As a safeguard against the inclusion of problematic methodology, this review excluded any articles that fell within the 'fair' or 'poor' categories, as the quality of the research is not considered sufficient to base overall knowledge on.

The first and second reviewers assessed each article independently, using the slightly modified 27-item checklist. Thereafter, to achieve 100% agreement, the reviewers discussed any discrepancies in the scores until consensus was reached on all articles.

Synthesis of Results

In light of the heterogeneity of measures and conceptualisations of empathy across included studies, this review opted for a narrative, descriptive analysis of the extracted data. The researcher analysed and synthesised the following information from each study: sample, measures, intervention outcomes, results, conclusions, and limitations. Finally, a descriptive trend analysis was conducted to establish common patterns and differences across studies.

Results

The results for each of the aforementioned steps taken in this review (Figure 1) are presented below. The outcome of the database search is reported first, followed by an evaluation of the methodological quality of the included studies, and finally, a description of the characteristics, outcome measures, and findings of each of the studies is presented.

Database Search

Table 3 depicts the number of citations retrieved from each database. The preliminary literature search yielded a total of 3432 articles. After adjusting for duplicates (n = 1,776), a total of 1,656 articles remained.

Table 3

Table Depicting the Number of Citations Retrieved from the Database Search

Database	Citations
PubMed	240
EBSCO (PsychINFO, Africa Wide, PsychArticles, CINAHL, ERIC)	1176
Scopus	1373
Web of Science	643
Total after removal of duplicates	1,656

Note. CINAHL = Cumulative Index to Nursing and Allied Health Literature

Application of Inclusion/Exclusion Criteria

After independently evaluating the titles and abstracts against eligibility criteria, the reviewers had agreed on the inclusion of 178 articles and exclusion of 1,375 articles, while 103 articles remained in conflict. Cohen's κ was run to assess the level of agreement between the two raters in selecting articles for inclusion (n = 1,656). In accordance with the guidelines from Altman (1999), and adapted from Landis and Koch (1977), the result indicated that there was substantial agreement between the two raters, $\kappa = 0.74$ (95% CI, .691 to .788).

All conflicts were resolved through discussion, resulting in the additional inclusion of 27 articles and exclusion of 76 articles. Of the 205 articles included for full-text analysis, 44 were removed as the university lacked access to the full texts of these articles. Therefore, a total of 161 full text articles were independently assessed, of which 113 did not meet the inclusion criteria and were excluded. Specifically, articles were excluded based on: (1) their use of a clinical, foster, juvenile delinquent or offending sample (n = 24), (2) empathic

behaviour not being a primary or secondary outcome (n = 18), (3) using an invalidated measure of empathy (n = 4), (4) no randomisation or control group (n = 34), (5) the sample being over the age of 18 years old (n = 3), (6) no clear empathy enhancing method or intervention (n = 6) and (7) articles considered to be review articles (n = 24). No unpublished relevant studies were obtained. A total of N = 48 articles met the inclusion criteria and were included in the final analysis.

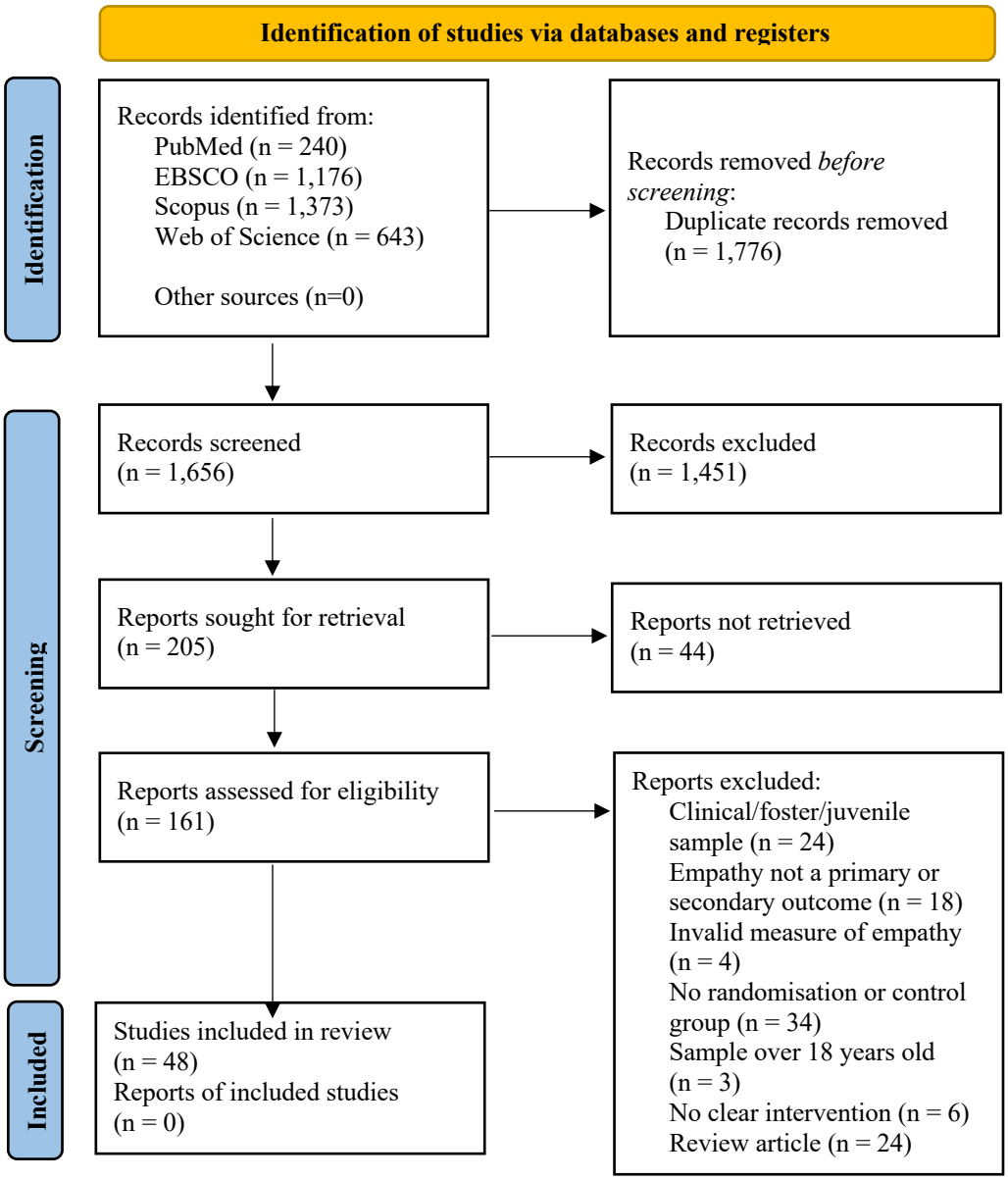
Reference Mining

The reference lists of the final articles and systematic reviews that were found in the literature search were analysed to see if there were any other potential citations. However, no additional studies that met the criteria for inclusion were found.

The PRISMA flow diagram (Figure 2) provides a comprehensive overview of the steps taken to reach the final number of included articles.

Figure 2

PRISMA 2020 Flow Diagram



Methodological Evaluation

The methodological quality of each article was independently evaluated by each reviewer, using the modified Downs and Black (1998) checklist specified in the Methods section of this review (Appendix C). The reviewers discussed any discrepancies in ratings and reached total consensus across the rating criteria for each study. An overview of the final results is presented in Table 4. Pinto-Escalona et al. (2021) was the only study that was rated as having 'excellent' methodological quality (i.e., a score above 25). Ten studies were rated as having 'fair' quality (i.e., a score equal to or below 19 and the cut off score for the current systematic review) and were therefore excluded from the final analysis as their methodological quality is not considered sufficient to base overall knowledge on. The remaining 37 studies were rated as having 'good' quality (i.e., a score between 20 and 25). As such, a total of 38 studies were included in the final analysis.

All studies demonstrated a high quality of reporting, with a minimum score of nine out of 11 across all included studies. Furthermore, most studies mentioned the confounding variables that may have had an influence on their results, which were commonly controlled or adjusted for in the exclusion criteria or data analysis. However, most studies scored fairly low in the external validity category. This is likely a result of the samples of studies not being representative of their populations, with only five studies receiving a score for participants being representative of the entire population. Finally, studies received sufficient scores in the bias category. However, a common trend in this category was a lack of participant blindness in study protocols. This can be accounted for by the nature of the studies under investigation, where it is difficult to blind participants who are actively engaged in empathy-enhancing interventions compared to business-as-usual control participants.

The inter-rater agreement was determined by calculating the intraclass correlation coefficient (ICC) using R studio (2021; see Appendix D). The ICC is a measure of the reliability or consistency of measurements taken by different raters. Values range from zero to one, with higher values indicating higher levels of agreement among the raters. The ICC (A,1) value was .96 (95% CI: .92 to .975, $p < .001$), indicating a high level of agreement among the two independent reviewers (Cicchetti & Sparrow, 2016).

Table 4

Table Depicting the Results of the Methodological Evaluation

Article Citation	Reporting Score (Out of 11)	External Validity Score (Out of 3)	Bias Score (out of 7)	Confounding Variable Score (Out of 6)	Effect Size Score (Out of 1)	Total Score (Out of 28)
Amador Buenabad et al. (2020)	10	1	6	6	0	23
Ashworth et al. (2020)	10	3	5	4	1	23
Bianco and Lecce (2016)	9	2	6	4	0	21
Bianco et al. (2019)	9	2	7	5	0	23
Bianco et al. (2021)	9	1	7	5	0	22
Boduszek et al. (2019)	7	3	5	3	0	18*
Bradshaw et al. (2012)	9	2	5	4	1	21
Brazzelli et al. (2021)	9	2	6	5	0	22
Caputi et al. (2021)	9	2	6	3	0	20
Chinekesh et al. (2013)	6	3	4	3	0	16*
Condello et al. (2021)	11	2	5	5	1	24
de la Barrera et al. (2021)	11	2	6	4	1	24
DeSmet et al. (2018)	11	2	6	5	1	25
DiPerna et al. (2018)	11	2	5	6	0	24
Domitrovich et al. (2022)	11	2	5	5	0	23
Dowdall et al. (2021)	11	2	6	4	1	24
Dray et al. (2017)	11	2	5	5	1	24
Eninger et al. (2021)	8	2	5	3	1	19*
Gao et al. (2020)	9	2	5	4	0	20
Garandeau et al. (2021)	11	3	5	5	1	25
Gibbons et al. (1995)	7	2	5	3	1	18*
Goldstein and Lerner (2018)	9	2	6	5	0	22
Grazzani et al. (2016)	10	2	5	3	0	20
Green et al. (2022)	11	2	5	5	0	23
Haar et al. (2021)	11	2	4	5	1	23
Kärnä et al. (2011)	11	3	5	4	0	23
Kim et al. (2020)	9	2	5	4	1	21
Kourmousi et al. (2018)	9	3	5	4	0	21
Larose et al. (2020)	11	2	5	5	1	24
Li and Zhang (2022)	8	2	5	3	0	18*
Lipschutz (2010)	10	2	6	3	0	21
Muratori et al. (2015)	10	2	5	3	0	20
Muratori et al. (2019)	10	2	5	3	1	21
Muratori et al. (2020)	8	2	5	3	0	18*
Muratori et al. (2016)	11	2	5	5	0	23
Nieh and Wu (2018)	10	2	5	4	0	21
O'Neill et al. (2011)	11	2	6	5	1	25
Ornaghi et al. (2011)	7	2	5	4	0	18*
Paik et al. (2022)	7	2	6	3	0	18*
Peltonen et al. (2022)	11	3	3	4	0	21
Piek et al. (2015)	9	2	5	3	0	19*
Pinto-Escalona et al. (2021)	11	3	6	5	1	26
Schonert-Reichl et al. (2015)	10	2	6	4	0	22
Shechtman et al. (2009)	7	2	5	4	0	18*
Thulin et al. (2022)	11	2	5	4	0	22
Tompkins (2015)	10	2	5	5	0	22
Upshur et al. (2019)	11	2	6	4	0	23
Viglas & Perlman (2018)	10	2	6	4	0	22

Note. *Articles categorized as 'fair' (i.e., a score ≤19), which were subsequently excluded from the analysis

Data Extraction

The results of the data extraction are depicted in Tables 5 to 14. Table 5 depicts the citation information for each study, including the journal of publication, the year of publication and the title of each article. Table 6 details the sample characteristics and design aspects of each study and Tables 7-14 summarise the types of interventions utilized in each study as well as their outcomes and results.

Table 5

Citation Information Extracted from Articles Selected for Review

Authors	Year	Journal	Article Title
Amador Buenabad et al.	2020	Child & Youth Care Forum	Cluster Randomized Trial of a Multicomponent School-Based Program in Mexico to Prevent Behavioral Problems and Develop Social Skills in Children
Ashworth et al.	2020	Journal of Research on Educational Effectiveness	Game Over? No Main or Subgroup Effects of the Good Behavior Game in a Randomized Trial in English Primary Schools
Bianco & Lecce	2016	British Journal of Educational Psychology	Translating child development research into practice: Can teachers foster children's theory of mind in primary school?
Bianco et al.	2019	Infant & Child Development	Enhancing advanced Theory of Mind skills in primary school: A training study with 7- to 8-year-olds
Bianco et al.	2021	Journal of Cognition and Development	Supporting Children's Second-order Recursive Thinking and Advanced ToM Abilities: A Training Study
Bradshaw et al.	2012	Pediatrics	Effects of School-Wide Positive Behavioral Interventions and Supports on Child Behavior Problems
Brazzelli et al.	2021	Journal of Experimental Child Psychology	Promoting prosocial behavior in toddlerhood: A conversation-based intervention at nursery
Caputi et al.	2021	International Journal of Psychology	Theory of mind and loneliness: Effects of a conversation-based training at school
Condello et al.	2021	International Journal of Environmental Research and Public Health	Fostering Holistic Development with a Designed Multisport Intervention in Physical Education: A Class-Randomized Cross-Over Trial
de la Barrera et al.	2021	PLoS One	EmoTIC: Impact of a game-based social-emotional programme on adolescents
DeSmet et al.	2018	Computers in Human Behavior	The efficacy of the Friendly Attac serious digital game to promote prosocial bystander behavior in cyberbullying among young adolescents: A cluster-randomized controlled trial
DiPerna et al.	2018	Journal of Educational Psychology	A Cluster Randomized Trial of the Social Skills Improvement System-Classwide Intervention Program (SSIS-CIP) in First Grade
Domitrovich et al.	2022	Journal of Youth and Adolescence	Promoting Social and Emotional Learning in Middle School: Intervention Effects of Facing History and Ourselves
Dowdall et al.	2021	Child Development	Book-Sharing for Parenting and Child Development in South Africa: A Randomized Controlled Trial
Dray et al.	2017	Journal of Adolescence	Effectiveness of a pragmatic school-based universal intervention targeting student resilience protective factors in reducing mental health problems in adolescents
Gao et al.	2020	Current Psychology	Does executive function influence the development of theory of mind in elementary students?
Garandeau et al.	2021	Journal of Clinical Child and Adolescent Psychology	Effects of the KiVa Anti-Bullying Program on Affective and Cognitive Empathy in Children and Adolescents

Goldstein & Lerner	2018	Developmental Science	Dramatic pretend play games uniquely improve emotional control in young children
Grazzani et al.	2016	European Journal of Developmental Psychology	Conversation on mental states at nursery: Promoting social cognition in early childhood
Green et al.	2022	Journal of Child and Family Studies	Effects of the SPARK Teen Mentoring Program for High School Students
Haar et al.	2021	International Journal of Environmental Research and Public Health	Impact of a Brief Family Skills Training Programme ("Strong Families") on Parenting Skills, Child Psychosocial Functioning, and Resilience in Iran: A Multisite Controlled Trial
Kärnä et al.	2011	Child Development	A Large-Scale Evaluation of the KiVa Antibullying Program: Grades 4–6
Kim et al.	2020	Mindfulness	Effectiveness of the Mindfulness-Based OpenMind-Korea (OM-K) Preschool Program
Kourmousi et al.	2018	International Electronic Journal of Elementary Education	Students' Psychosocial Empowerment with The 'Steps For Life' Personal and Social Skills Greek Elementary Programme
Larose et al.	2020	BMC Psychology	Examining the impact of a social skills training program on preschoolers' social behaviors: a cluster-randomized controlled trial in childcare centres
Lipschutz	2010	Dissertation (Temple University)	The use of digital storytelling to improve the effectiveness of social and conflict resolution skill training for elementary students
Muratori et al.	2015	Prevention science	First Adaptation of Coping Power Program as a Classroom-Based Prevention Intervention on Aggressive Behaviors Among Elementary School Children
Muratori et al.	2019	Journal of School Psychology	Effects of a universal prevention program on externalizing behaviors: Exploring the generalizability of findings across school and home settings
Muratori et al.	2016	Journal of Primary Prevention	Coping Power Adapted as Universal Prevention Program: Mid Term Effects on Children's Behavioral Difficulties and Academic Grades
Nieh & Wu	2018	Journal of School Health	Effects of a Collaborative Board Game on Bullying Intervention: A Group-Randomized Controlled Trial
O'Neill et al.	2011	Journal of School Health	Promoting Mental Health and Preventing Substance Abuse and Violence in Elementary Students: A Randomized Control Study of the Michigan Model for Health
Peltonen et al.	2022	International Journal of Environmental Research and Public Health	Effectiveness of Promotive and Preventive Psychosocial Interventions on Improving the Mental Health of Finnish-Born and Immigrant Adolescents
Pinto-Escalona et al.	2021	Journal of Sport and Health Science	Effects of a school-based karate intervention on academic achievement, psychosocial functioning, and physical fitness: A multi-country cluster randomized controlled trial
Schonert-Reichl et al.	2015	Developmental Psychology	Enhancing Cognitive and Social–Emotional Development Through a Simple-to-Administer Mindfulness-Based School Program for Elementary School Children: A Randomized Controlled Trial
Thulin et al.	2022	American Journal of Community Psychology	Longitudinal effects of Youth Empowerment Solutions: Preventing youth aggression and increasing prosocial behavior
Tompkins	2015	Cognitive Development	Improving Low-Income Preschoolers' Theory of Mind: A Training Study
Upshur et al.	2019	Journal of Applied Developmental Psychology	A randomized efficacy trial of the second step early learning (SSEL) curriculum
Viglas & Perlman	2018	Journal of Child & Family Studies	Effects of a Mindfulness-Based Program on Young Children's Self-Regulation, Prosocial Behavior and Hyperactivity

Design

Table 5 depicts the citation information of each article. Included articles were published from 2010 to 2022, 33 of which were published after 2015. Table 6 outlines the design aspects of each study. In terms of design, 10 of the 38 articles were RCTs, of which, two were group RCTS and one was a time convenience RCT (Bradshaw et al., 2012; Haar et al., 2021; Nich & Wu, 2018). Eighteen of the 38 articles were cluster RCTs, one was a class randomised cross over design and the remaining nine articles used a pre-/post-test randomised experimental design. Most studies (n = 28) used a passive control group, where participants were either assigned to a waitlist control or business-as-usual, while the remaining studies (N=10) used an active control group.

Sample Characteristics

Studies were conducted in 22 different countries and included a total of N=57123 child and adolescent participants (M = 1,503.23, SD = 33,20.76). Sample sizes ranged from N=49 to N=15403 participants and the age of participants ranged from 21 to 204 months (1.75 to 17 years), with a mean age of 99.11 months (SD = 43.55, median = 104.13). Sixteen studies included only child participants (< 10 years old), 13 studies included both child and adolescent participants and nine studies included only adolescent participants (here adolescents are defined as those in the 10–19-year age group; WHO, 2023). Despite the Bianco and Lecce (2016) article, whose sample consisted of only male participants, all studies reported on mixed sex samples with a mostly equal distribution of male to female participants.

Table 6

Table Depicting the Design Characteristics of Studies

Authors	Study Type	Sample	Control Group	Sample Size
Amador Buenabad et al.	Cluster RCT	Children and adolescents aged 7-11 years old from four urban public schools in Mexico City	Passive (business as usual)	*n*=202 (123 males)
Ashworth et al.	Cluster RCT	Children aged 6-7 years old in 77 schools in three regions across England	Passive (business as usual)	*n*=3,084 (1,622 males)
Bianco & Lecce	Pre-test post-test randomised experimental study	Children aged 8-9 from four different schools in Italy	Active (stories were about physical states)	*n*=72 (72 males)
Bianco et al.	Pre-test post-test randomised experimental study	Children aged 7-8 years old from public schools in Northern Italy	Active (children participated in narrative and language exercises about physical states)	*n*=49 (18 males)
Bianco et al.	Pre-test post-test randomised experimental study	Children aged 7-8 years old from public schools in Northern Italy	Active (children participated in narrative and language exercises about physical states)	*n*=91 (42 males)
Bradshaw et al.	Group RCT	Children and adolescents aged 5-10 years old public elementary schools in the United States	Passive (control schools refrained from implementing the intervention for the 4 years)	*n*=12344 (6482 males)
Brazzelli et al.	Pre-test post-test randomised experimental design	Children aged 1 year and 10 months – 3 years old from 10 different nurseries in the North of Italy (low to middle SES)	Active (children engaged in free play)	*n*=142 (71 males)
Caputi et al.	Pre-test post-test randomised experimental design	Children and adolescents aged 9-10 years old from two primary schools in Northern Italy	Active (language exercise involved physical noun/verbs and the experimenter made no use of mental-state lexicon)	*n*=210 (110 males)
Condello et al.	Class randomised cross-over design	Children and adolescents aged 10-11 years old from twelve classes of two urban schools in the municipality of Alba in the Northern of Italy (high SES)	Passive (received traditional physical education class)	*n*=181 (91 males)
de la Barrera et al.	Pre-test post-test randomised experimental design	Adolescents aged 11-15 years old from public and private high schools in Madrid (Spain)	Passive (waitlist control)	*n*=119 (68 males)
DeSmet et al.	Cluster RCT	Adolescents aged 13-14 years old from secondary education schools in Flanders.	Passive (received intervention after follow-up research was complete)	*n*=216
DiPerna et al.	Cluster RCT	Children aged 6-7 years old from six elementary schools in the Mid-Atlantic region of the United States	Passive (business as usual)	*n*=696 (371 males)
Domitrovich et al.	RCT	Children and adolescents aged 10-17 years old from a mid-sized urban school district in Pennsylvania (Low SES)	Passive (business as usual)	*n*=694 (285 males)
Dowdall et al.	RCT	Children aged 1 years 9 months-2 years 4 months old from Khayelitsha, Cape Town, South Africa (low SES)	Passive (waitlist control)	*n*=140 (75 males)
Dray et al.	Cluster RCT	Adolescents aged 12-16 years old from 32 secondary schools within the Hunter New England region of New South Wales (NSW), Australia (low SES)	Passive (business as usual)	*n*=3,115 (1,557 males)
Gao et al.	Pre-test post-test randomised experimental design	Children and adolescents aged 9-10 years old from a local public school in China	Active (participants read stories similar to the experimental group but questions differed)	*n*=96 (50 males)
Garandeau et al.	RCT	Children and adolescents aged 8-15 years old from primary and secondary schools in Finland	Passive (business as usual)	*n*= 15403 (7470 males)
Goldstein & Lerner	RCT	Children aged 4 years and 1 month – 5 years and 5 months old (low SES)	Active (building block structures in a group)	*n*=97 (49 males)

Grazzani et al.	Pre-test post-test randomised experimental design	Children aged 2 – 3 years old from four different infant-toddler centres in the Greater Milan area (middle SES)	Active (conversation on the material and action dimensions of stories)	*n*=68 (36 males)
Green et al.	RCT	Adolescents aged 14-18 years from four urban public high schools located in the South-Eastern United States	Passive (business as usual)	*n*=372 (179 males)
Haar et al.	Time convenience RCT	Children and adolescents aged 8-12 years old in Tehran and Karaj in Iran	Passive (waitlist control)	*n*=288 (126 males)
Kärnä et al.	Cluster RCT	Adolescents aged 10-12 years old from Finnish comprehensive schools	Passive (business as usual)	*n*=8166 (4075 males)
Kim et al.	Cluster RCT	Children aged 3 years old from four Korean preschools	Passive (business as usual)	*n*=83 (45 males)
Kourmousi et al.	Cluster RCT	Children aged 6-8 years old from six Primary Education Districts of Attica, Greece.	Passive (business as usual)	*n*=2439 (1237 males)
Larose et al.	Cluster RCT	Children and adolescents aged 8-11 years old from 19 public Child Care Centres in Montreal, Canada (low SES)	Passive (waitlist control)	*n*=361 (184 males)
Lipschutz	Cluster RCT	Children and adolescents aged 8 years and 3 months – 11 years and 3 months old from a public elementary school in the metropolitan Philadelphia	Passive (business as usual)	*n*=58 (30 males)
Muratori et al.	Cluster RCT	Children aged 6-8 years old from two primary schools located in Lucca and Capannori (Tuscany, Italy)	Passive (business as usual)	*n*=184
Muratori et al.	Cluster RCT	Children and adolescents aged 8-10 years old from 6 schools of an Italian city (low SES)	Passive (business as usual)	*n*=1030 (510 males)
Muratori et al.	RCT	Adolescents aged 12-14 years old attending 40 middle-school classrooms, located in Italian urban context	Passive (business as usual)	*n*=184
Nieh & Wu	Group RCT	Adolescents aged 11-12 years old from an elementary school in Northern Taiwan	Active (regular bullying curriculum using conventional teaching methods)	*n*=328 (169 males)
O'Neill et al.	Cluster RCT	Children and adolescents aged 9-11 years old at 52 public schools in Michigan and Indiana	Passive (waitlist control)	*n*=2512 (1356 males)
Peltonen et al.	Cluster RCT	Adolescents aged 13-17 years old from schools located across Finland	Passive (waitlist control)	*n*=995 (496 males)
Pinto-Escalona et al.	Cluster RCT	Children aged 7-8 years old from 20 European schools of 5 different countries	Passive (usual physical education)	*n*=721 (377 males)
Schonert-Reichl et al.	Cluster RCT	Children and adolescents aged 9-11 years old in a public school district in Canada (middle SES)	Active (participants received a social responsibility program)	*n*=995 (458 males)
Thulin et al.	Pre-test post-test randomised experimental design	Adolescents aged 11-13 years old from middle schools in Flint, MI, and Genesee County school Districts	Passive (business as usual)	*n*=418 (166 males)
Tompkins	RCT	Children aged 3-5 years old from 21 Head Start classrooms in Ohio, United States (Low SES)	Active (participants either read the same stories, without the discussions; or did not read books at all)	*n*=73 (40 males)
Upshur et al.	Cluster RCT	Children aged 4 years old in 7 community-based preschool and 6 Head Start programs in the United States	Passive (waitlist control)	*n*=770 (385 males)
Viglas & Perlman	Cluster RCT	Children aged 4-6 years old attending kindergarten at three public schools in Toronto, Ontario in Canada	Passive (waitlist control)	*n*=127 (74 males)

Note. In accordance with the World Health Organisation (WHO), adolescents are defined as those aged 10-19 years (WHO, 2023), SES = socio-economic status

Interventions, Outcome Measures and Results

Tables 7-14 outline the names and types of empathy-enhancing interventions extracted from each study, the frequency and duration of each intervention, as well as the outcome measures, time points at which outcomes were measured, the empathic component that was measured and the results of the study. A total of 29 interventions were extracted from the 38 studies. In terms of their overall time span, interventions ranged from three to 208 weeks (M = 28.96, SD = 41.25), excluding one study where the intervention consisted of only one session implemented on one occasion (DeSmet et al., 2018). The total time that participants spent participating in the interventions ranged from three to 104 hours, with a mean duration of 20.29 hours (SD = 23.38). Twelve studies did not explicitly state duration (Bradshaw et al., 2012; Brazzelli et al., 2021; de la Barrera et al., 2021; DeSmet et al., 2018; Domitrovich et al., 2022; Dray et al., 2017; Larose et al., 2020; Lipschutz, 2010; Muratori et al., 2019; O'Neill et al., 2011; Tompkins, 2015; Upshur et al., 2019).

Thirteen studies used self-report measures to assess change in participants empathic behaviour, while 23 studies used other-(objective) report measures, completed by parents (n = 3), teachers (n = 10) or experimenters (n = 10). Amador Buenabad et al. (2020) used a combination of self-report and parent-report measures, while Muratori et al. (2019) used a combination of teacher and parent-report measures. The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), a widely used behavioural screening tool for children and adolescents, was the most frequently used outcome measure, with 11 studies using this measure to assess change in prosocial behaviour (de la Barrera et al., 2021; Domitrovich et al., 2022; Dray et al., 2017; Haar et al., 2021; Muratori et al., 2015, 2016, 2019; Peltonen et al., 2022; Pinto-Escalona et al., 2021; Thulin et al., 2022; Viglas & Perlman, 2018). The second most common outcome measure was the Strange Stories Task (Happé, 1994; White et al., 2009), used by five studies to assess ToM (Bianco & Lecce, 2016; Bianco et al., 2019, 2021; Caputi et al., 2021; Gao et al., 2020). Three studies used the Interpersonal Reactivity Index (IRI; Davis, 1983), where DeSmet et al. (2018) and Domitrovich et al. (2022) used the empathic concern subscale of this measure, while Schonert-Reichl et al. (2015) used both the empathic concern and the perspective taking subscales. Two studies used the Teacher Observation of Classroom Adaptation (TOCA-C; Koth et al., 2009) to assess change in prosocial behaviour (Ashworth et al., 2020; Bradshaw et al., 2012) and two studies used Denham's affective perspective taking task (Denham, 1986; Denham et al., 2002, 2012) to assess emotion understanding (Grazzani et al., 2016; Tompkins, 2015). Two studies used

Wellman and Liu's (2004) Theory of Mind Scale to assess ToM using a set of six different tasks (Dowdall et al., 2021; Goldstein & Lerner, 2018).

Studies evaluated different components of empathic behaviour, the most common of which was prosocial behaviour (n = 16), followed by empathy (n = 6), ToM (n = 6) and emotion understanding (n = 1) and emotion regulation (n = 1). Three studies assessed both empathy and prosocial behaviour, one study assessed prosocial behaviour and ToM, two studies assessed ToM and emotion understanding, one study assessed empathy and perspective taking and one study assessed prosocial behaviour and emotion regulation.

Time frames for measuring outcomes varied. Twenty-two studies did not specify a timeframe for post-intervention measurements, were unclear on a timeframe, or only specified a timeframe for follow-up assessments. For the studies that were explicit, post-intervention measures varied from immediately after the intervention to 10 months post-intervention, with a mean of 68.38 days (SD = 94.46). Fifteen studies conducted follow-up assessments; however, one study did not specify a time frame (Muratori et al., 2016). Follow-up assessments ranged from two weeks to two years post-intervention (M = 7.1 months, SD = 7.17). In terms of results, 24 studies (63.16%) reported a significant increase in empathic behaviour at post-test. Of the 15 studies that conducted follow up assessments, 10 reported significant findings at post-test. However, only four of these studies reported sustained significance at follow-up.

The interventions extracted from each study were categorized into eight groups, according to their content and mode of delivery, and were evaluated as such: (1) classroom-based SEL interventions, (2) narrative/conversation-based interventions, (3) game-based interventions, (4) physical education (PE) interventions, (5) mindfulness-based interventions (MBIs), (6) home-based, caregiver-administered interventions, (7) role playing interventions and (8) other.

Classroom-Based SEL Interventions

Table 7 lists the classroom based SEL interventions, the most commonly used intervention approach (n = 10). These interventions were delivered by teachers, with the exception of Green et al. (2022; where the intervention was delivered by trained facilitators), in school classrooms, either as a separate lesson or as an integrated component to daily classroom activities. Two studies employed the Second Step Violence Prevention Curriculum (Committee for Children, 2002, 2004, 2011). Lipschutz (2010) added a digital role-playing component and investigated 8–11-year-old children's prosocial behaviour while Upshur et al. (2019) investigated 4 year old children's emotion understanding, using the Second Step Early

Learning Curriculum, modified for preschools. Both studies reported that the intervention had no significant effect on empathic behaviour.

Furthermore, three studies reported on the Coping Power Program (CPP; Muratori et al., 2015, 2016, 2019), a universal classroom based SEL prevention intervention. The outcome across all three studies was prosocial behaviour. Studies had a mean age of 8.11 years, where two studies implemented CPP into elementary schools, one of which was of a lower SES (Muratori et al., 2015, 2019) and one into a primary school (Muratori et al., 2016). Across all three studies, CPP classes demonstrated increased prosocial behaviours.

The remaining five studies utilised various SEL interventions. Significant effects were reported for prosocial behaviour following the implementation of the School-Wide Positive Behavioural Interventions and Supports (SWPBIS; Bradshaw et al., 2012) and the Facing History intervention (conducted in a low SES context), which also reported a significant effect for empathy (Domitrovich et al., 2022). Furthermore, significant effects were also reported for empathy following the implementation of the Social Skills Improvement System-Classwide Intervention (DiPerna et al., 2018) and the Steps for Life Elementary Curriculum (Kourmousi et al., 2018). Finally, Green et al. (2022) reported a significant effect for emotion regulation following implementation of the Speaking to the Potential, Ability, and Resilience Inside Every Kid (SPARK) Teen Mentoring program.

Narrative/Conversation-Based Interventions

The second most common intervention approach was the narrative/conversation-based method (n = 8; see Table 8). Of these studies, five used a ToM training program developed by Lecce et al. (2014), where participants answered questions and engaged in group discussion about two stories and two language exercises relating to mental states (Bianco & Lecce, 2016; Bianco et al., 2019, 2021; Caputi et al., 2021; Gao et al., 2020). Participants in these studies were between 7 and 10 years old (primary school) and interventions were mostly administered by researchers in school classrooms, with the exception of Bianco and Lecce (2016), where the intervention was administered by teachers. Grazzani et al. (2016) and Tompkins (2015) used a similar intervention approach, where participants (in low-middle SES cohorts) listened to stories about mental states and subsequently engaged in conversations about mental states and false belief. These studies used a younger sample, ranging from 2-5 years old and investigated change in participants' emotion understanding and ToM. However, in Tompkins (2015), children took part in one-on-one book reading exchanges with the researcher, while in Grazzani et al. (2016), children participated in group reading sessions which were conducted by the classroom teacher.

Brazzelli et al. (2021) developed a slightly modified version of the above-mentioned approach, known as TEPP (Toddlers Empathy Prosociality Program), where participants listen to stories about prosocial behaviours, read by schoolteachers, and subsequently participated in discussions about prosocial actions and inner states. This study utilised a younger sample (21-36 months old) from a low-middle socio-economic cohort.

These interventions fit primarily into the cognitive domain of empathy, with seven out of eight interventions targeting ToM. Two interventions evaluated both ToM and emotion understanding, while one intervention targeted empathy and prosocial behaviour. Post-intervention measurements ranged from one to two weeks (M = 10.43 days, SD = 3.51 days). Gao et al. (2020) did not specify time of post-intervention measurements. Four studies included follow up assessments, which ranged from 2-3 months (M = 2.25, SD = 0.5). In terms of results, all studies reported a significant increase in empathy scores at post-intervention measurements. Five studies reported a significant increase in ToM using the Strange Stories task (Bianco & Lecce, 2016; Bianco et al., 2019, 2021; Caputi et al., 2021; Gao et al., 2020). Grazzani et al. (2016) reported a significant increase in ToM using the Desire-Emotion Task (Wellman & Wooley, 1990) and the True-Belief Task (Wellman, 1991), while Tompkins (2015) reported a significant increase in ToM using four false belief tasks. However, only Grazzani et al. (2016) reported a significant increase in emotion understanding, using the Italian validated version of the Puppet Interview (Camodeca & Coppola, 2010; Denham, 1986). Finally, Brazzelli et al. (2021) reported a significant increase in empathy and prosocial behaviour using the Empathy Questionnaire (EmQue-I13; Grazzani et al., 2017) and the Child Prosocial Behavior Questionnaire (CPBQ; Brazzelli et al., 2018). These significant findings remained stable at follow-up assessments for all, except for one follow up study (Caputi et al., 2021). These findings demonstrate that ToM can be taught to school aged children with a somewhat short training intervention and that such interventions are effective in low-middle socio-economic contexts.

Game-Based Interventions

Three studies reported on interventions involving game-based learning (Table 9), two digital serious game interventions and one collaborative board game. Across all studies, participants ranged from 11-13 years old. De la Barrera et al. (2021) used *emoTIC*, a game-based social-emotional program and digital application that can be used on a smartphone or tablet. The game was played in classroom group sessions and at home. Participants were between the ages of 11 and 15 years old and the classroom part of the intervention was facilitated by teachers. DeSmet et al. (2018) also used a digital serious game intervention, the

Friendly Attac game, which targets bystander behaviours in cyberbullying among adolescents. Participants were 13-14 years old, and the game was only played once, administered by researchers. Finally, Nieh and Wu (2018) also targeted bullying behaviours, using the Galaxy Rescuers Game, a collaborative board game. Participants were 11-12 years old, and the intervention was administered in classrooms by trained facilitators.

Since the Friendly Attac and Galaxy Rescuers Games targeted bullying behaviours, both interventions assessed participants empathy towards victims as an outcome. DeSmet et al. (2018) used the affective empathy subscale of the Dutch version of the IRI, while Nieh and Wu (2018) used a validated instrument developed for their study that was based on previous research. On the other hand, de la Barrera et al. (2021) measured prosocial behaviour using the SDQ. Post-intervention measurements were only specified for DeSmet et al. (2018) where assessments were conducted immediately after the intervention. DeSmet et al. (2018) and Nieh and Wu (2018) both conducted follow up assessments four weeks and two weeks after the intervention, respectively. In terms of results, only Nieh and Wu (2018) reported a significant increase in empathy for the experimental group with a debriefing component. However, these significant effects were not sustained at follow-up. No other significant effects on empathy or prosocial behaviour were found in the remaining studies.

Physical Education (PE) Interventions

Two studies reported on interventions involving PE (Table 10). Condello et al. (2021) used a multisport enriched PE intervention that targets the development of cognitive, motor and socio-emotional competencies. This intervention was administered during PE lessons by PE specialists and participants ranged from 10-11 years old. Pinto-Escalona et al. (2021) used a school-based karate intervention, which was also administered during PE lessons by a trained, black-belt certified karate teacher. Participants were 7-8 years old. Both studies assessed prosocial behaviour as an outcome, however, Condello et al. (2021) also assessed empathy, using the Multisource Assessment of Social Competence Scale (MASCS; Junttila et al., 2006). Pinto-Escalona et al. (2021) used the SDQ. Studies were not explicit about post-measurement time frames; however, post-test measurements were conducted at the end of the school year in both studies, which corresponded with the end of the intervention in both cases. Only Condello et al. (2021) reported a significant increase in empathy for children who participated in the multisport enriched intervention in comparison to those who partook in traditional PE lessons.

Mindfulness-Based Interventions (MBIs)

Three studies reported on MBIs (Table 11) implemented into school classrooms. Kim et al. (2020) used the OpenMind-Korea (OM-K) program which consists of guided meditation practices and mindfulness activities, combining mindfulness with SEL competencies. Participants were 3-5 years old, and the program was implemented by schoolteachers. Schonert-Reichl et al. (2015) also used a mindfulness-based SEL program (the MindUP program), added on to the regular school curriculum, consisting of mindfulness practices as well as other SEL activities. Participants from a middle SES background, ranging from 9-11 years old, received the intervention from trained research assistants. Finally, Viglas and Perlman (2018) used a MBI where mindfulness lessons where integrated into the school curriculum and were administered by teachers to children aged 3-6 years old. Kim et al. (2020) and Viglas and Perlman (2018) assessed prosocial behaviour as an outcome, using the Korean version of the Modified Professional Behavioural Questionnaire (Mod-PBQ; Doescher, 1986; Lee, 1996) and the SDQ, respectively. Kim et al. (2020) also assessed emotion regulation using the Korean version of the Emotion Regulation Checklist (ERC; Kim, 2007; Shields & Cicchetti, 1997) while Schonert-Reichl et al. (2015) assessed empathy and perspective taking using the IRI (Davis, 1983), modified for children (Schonert-Reichl et al., 2012). Schonert-Reichl et al. (2015) and Viglas and Perlman (2018) did not conduct follow up assessments and furthermore, did not specify post measurement time frames. However, Kim et al. (2020) conducted three post-test evaluations, one post-intervention evaluation and two follow up evaluations, 6- and 12-months post-intervention. All three studies reported a significant increase on all empathy-related outcome measures at post-intervention and Kim et al. (2020) found that these significant findings persisted on follow up assessments.

Home-Based, Caregiver Administered Interventions

Two studies reported interventions administered by caregivers (Table 12), which mostly took place at participants' respective homes. Dowdall et al. (2021) used a group-based dialogic book-sharing program consisting of caregiver training sessions and at home reading sessions with the caregiver and child. Child participants were 21-28 months old. Haar et al. (2021) used the Strong Families Program, a short-term family skills prevention intervention aimed at the enhancement of parenting skills, family resilience, and the overall physical and mental well-being of both children and families. Both caregivers and children attended the sessions and child participants ranged from 8-12 years old. Both studies assessed prosocial behaviour as an outcome measure using the SDQ, however, as an additional measure,

Dowdall et al. (2021) used a prosocial "helping" task (Buttelmann et al., 2009; Murray et al., 2016) administered by researchers. Dowdall et al. (2021) also assessed pre-ToM as an outcome using a set of six tasks and a scale developed by Wellman and Liu (2004). In both studies, data were collected immediately post-intervention and at one follow up of six months for Dowdall et al. (2021) and six weeks for Haar et al. (2021). Only Haar et al. (2021) reported a significant increase in prosocial behaviour over time for the intervention group.

Role-Playing Interventions

Goldstein and Lerner (2018) used dramatic pretend play games (DPPG) to enhance social and emotional outcomes in 4–5-year-old children from a low SES background (Table 13). The intervention employed in this study encouraged children to physically act out various scenarios, starting with short, easy DDPGs and advancing to more complicated ones. Sessions were conducted in classrooms by group leader research assistants and post-intervention data was collected in the week following the last day of the intervention. Outcome measures included ToM, which was assessed using the ToM scale (Wellman & Liu, 2004). Results indicated that involvement in DPPG was not related to changes in ToM.

Interventions Classified as 'Other'

Nine studies were categorized as 'other' as they could not be classified, or were described as mixed interventions, incorporating more than one element of the abovementioned categories. Amador Buenabad et al. (2020), a mixed interventions study, assessed two interventions: (1) Leaving Traces on Your Life (Huellitas) and (2) Raising Children with Love, Promoting Harmony and Self-Improvement (CAPAS-Mx). The first, Heullitas, is a SEL classroom-based intervention, while the second is a home-based, caregiver administered intervention. Interestingly, significant effects for prosocial behaviour were only found in the group that received both of the interventions. Two studies investigated the KiVa antibullying program (Garandeau et al., 2021; Kärnä et al., 2011). Only Kärnä et al. (2011) reported a significant increase in empathy following KiVa implementation, however, these effects were not sustained at follow up. Finally, a significant effect for prosocial behaviour was reported following the implementation of the Youth Empowerment Solutions (YES) program, which was sustained at 12-month follow up (Thulin et al., 2022).

Table 7

Table Listing Classroom Based SEL Interventions

Author	Intervention		Outcome			Results
	Name	Frequency and Duration	Measure	Time Points	Empathy Outcome	
Bradshaw et al.	School-Wide Positive Behavioural Interventions and Supports (SWPBIS)	4 years	The Teacher Observation of Classroom Adaptation—Checklist (TOCA-C)	(1) Baseline (2) Post-test (completed 5 times each year for 4 years)	Prosocial behaviour	Children in the intervention demonstrated increased prosocial behaviour compared with those in the control
DiPerna et al.	The Social Skills Improvement System-Classwide Intervention Program (SSIS-CIP)	20-25 minutes, 3 times/week for 12 weeks	Social Skills Improvement Rating Scales-Teacher Form (SSIS-RST)	(1) Baseline (2) Post test	Empathy	The intervention had a moderate positive effect on empathy
Domitrovich et al.	Facing History	Integrated into classrooms for 1 year	Empathic Concerns subscale of the Interpersonal Reactivity Index and the SDQ	(1) Baseline (2) Post test	Empathy and prosocial behaviour	Student in the intervention program demonstrated a significant increase in empathy over time and reported higher levels of self-awareness in social situations and more prosocial behaviour
Green et al.	Speaking to the Potential, Ability, and Resilience Inside Every Kid (SPARK) Teen Mentoring program.	One 1-hour session once a week for 13 weeks	Difficulties in Emotional Regulation Scale (DERS-SF; Kaufman et al., 2016).	(1) Baseline (2) Post test	Emotion regulation	Students who received the intervention showed increased emotion regulation, compared to controls
Kourmousi et al.	Steps for Life Elementary Curriculum	2-hour lessons once a week for 27 weeks	The Personal and Social Skills Scale for Elementary Students Aged 7-9 (Kourmousi et al., 2017)	(1) Baseline (2) Post-test (1 month after intervention was complete)	Empathy	The intervention group significantly improved in empathy
Lipschutz	Second Step: A Violence Prevention Program (with the addition of a digital role-playing)	2 - 3 times a week for 9 weeks	The School Social Behavior Scales, 2nd Edition (SSBS-2, Merrell, 2002)	(1) Baseline (2) Post-test	Prosocial Behaviour	No significant differences on prosocial behaviour were found
Muratori et al.	Coping Power Program (CPP)	One 60–75-minute session a week for 24 weeks	The Italian SDQ translation and norms	(1) Baseline (2) Post-test (1 month after end of intervention)	Prosocial Behaviour	CCP intervention classes demonstrated increased prosocial behaviours
Muratori et al.	Coping Power Universal (CPU)	One session per week for 24 weeks	The Italian SDQ translation and norms	(1) Baseline (2) Post-test	Prosocial Behaviour	Students who received intervention showed more prosocial behaviours
Muratori et al.	Coping Power Program (CPP)	One 60-minute session per week for 24 weeks	SDQ	(1) Baseline (2) Post-test (3) Follow-up	Prosocial Behaviour	CP classes showed more prosocial behaviours
Upshur et al.	The Second Step Early Learning Curriculum (SSEL)	2 years of implementation	Emotion Matching Task (EMT)	(1) Baseline (2) Post-intervention	Emotion understanding	Intervention had no significant effect on SE skills (effect size was also small)

Table 8

Table Listing the Narrative/Conversation-Based Interventions

Author	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Bianco & Lecce	Conversation-based ToM intervention	4 sessions, 50 minutes each	The Strange Stories Task (Happé, 1994; White, Hill, Happé, & Frith, 2009)	(1) Baseline (2) Post-test (1 week after end of training program) (3) Follow-up (2 months after end of intervention)	ToM	The children in the intervention outperformed the control group in the ToM task at both post-test and follow-up. These findings held regardless of their pre-test ToM performance and controlling for other variables.
Bianco et al.	ToM training program	4 session, 40-50 minutes each	The Strange Stories task (practiced task) Triangle task (transfer task)	(1) Baseline (2) Post-test (2 weeks after)	ToM	The experimental group children showed significant gains in ToM compared to the control group during the training period, on both the trained and transferred ToM tasks
Bianco et al.	ToM training program	4 +/- 50-minute sessions twice a week	Advance ToM: Strange Stories Task	(1) Baseline (2) Post-test (2 weeks after end of intervention)	ToM	(1) Second Order RT intervention group: Children in the II-order-RT group outperformed the control group on the Strange Stories task at post-test and showed enhanced performance from pre-test to post-test on this task. This positive effect extended to Adv_ToM. (2) ToM training group: Children in the Adv_ToM group demonstrated enhanced Adv_ToM performance over the training period. They also outperformed participants in the control condition on Adv_ToM at post-test
Brazzelli et al.	The TEPP (Toddlers Empathy Prosociality Program)	3 times a week for 2 months	Empathy Questionnaire (Grazzani et al., 2017) The Child Prosocial Behavior Questionnaire (Brazzelli et al., 2018) Prosocial tasks (PT): a battery of 3 prosocial tasks	(1) Baseline (2 weeks before intervention) (2) Post-test (2 weeks after completion of the intervention)	Empathy Prosocial behaviour	Children in the experimental condition demonstrated significant improvement in empathic behaviour as perceived by their parents, compared to the control group. The experimental group children showed greater improvement in prosocial behaviours (helping, sharing, and comforting tasks) from pre-test to post-test compared to the control group children.
Caputi et al.	ToM training intervention	One 50-minute session per week for 5 weeks	The Strange Stories task	(1) Baseline (2) Post-test (1 week after the intervention) (3) Follow-up (2 months later)	ToM	The ToM training group participants demonstrated a significant increase in scores on Strange Stories task at post-test compared to the no-ToM training group children. However, these results were not maintained at follow up.

Gao et al.	ToM training tasks	One 40–60-minute session per week for 4 weeks	The Strange Stories test	(1) Baseline (2) Post-test	ToM	Scores on the Strange Stories Task increased significantly from pre- to post-test for the intervention group, compared to controls.
Grazzani et al.	Intervention based on conversing about mental states	10–15-minute training sessions every day for one month	ToM: The Desire-Emotion Task and The True-Belief Task Emotion understanding: The Italian validated version of the Puppet Interview	(1) Baseline (10 days before intervention) (2) Post-test (10 days after end of intervention) (3) Follow-up (3 months after post-test)	ToM Emotion understanding	The experimental group children outperformed the control group on both ToM and EU tasks, and the positive impact of the intervention was sustained at follow-up.
Tompkins	Storybook interactions focused on characters' mental states	Each child received 13-15 storybooks on separate days (approximately 3 books per week over 5 weeks)	4 false belief tasks Emotion understanding: Denham's affective perspective taking task	(1) Baseline (1 week before intervention) (2) Post-test (1 week after training) (3) Follow-up (2 months after training)	ToM Emotion understanding	The experimental group demonstrated enhanced false belief understanding at post-tests 1 and 2, compared to both controls. However, the intervention did not improve children's emotion understanding.

Table 9

Table Listing the Game-Based Interventions

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
de la Barrera et al.	emoTIC	4 classroom group sessions and 12 individual home activities over 4 weeks	SDQ	(1) Baseline (2) Post test	Prosocial behaviour	No significant increase in prosocial behaviour
DeSmet et al.	The Friendly Attac serious digital game	Game was played once	The affective empathy subscale of the Dutch version of the IRI	(1) Baseline (2) Post-test (immediately after) (3) Follow up (4-weeks after)	Empathy	No significant effects on empathy.
Nieh & Wu	The Galaxy Rescuers game (a collaborative board game)	One 40-minute session a week for 5 weeks	Instrument developed for study based on previous research	(1) Baseline (2) Post-test (3) Follow-up (2 weeks after intervention)	Empathy for victims	The game-with-debriefing group showed enhanced empathy

Table 10

Table Listing PE-Based Interventions

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Condello et al.	Multisport enriched PE intervention	One hour once a week for 6 months	The Multisource Assessment of Social Competence Scale (MASCS)	(1) Baseline (2) Post-test (6 months after baseline)	Prosocial behaviour Empathy	Children in the intervention group demonstrated increased empathy levels compared to the controls involved in traditional PE
Pinto-Escalona et al.	School-based karate intervention	2 hours per week for one year	Online version of the SDQ	(1) Baseline (2) Post-test (end of academic year)	Prosocial Behaviour	No significant between-group differences reported for prosocial behaviour

Table 11

Table Listing MBIs

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Kim et al.	Mindfulness-based OM-K program (OpenMind-Korea program)	One 8-minute meditation every school day throughout the school year for 1 year	Prosocial behaviour: Korean version of the Modified Professional Behavioural Questionnaire Emotion regulation: the Korean version (Kim, 2007) of the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997)	4 evaluations. (1) Baseline: (March 2017. T2) (2) Post-test (February 2018) (3) Follow-up 1 (September 2018) (4) Follow-up 2 (February 2019)	Prosocial Behaviour Emotion Regulation	Findings indicates a significant difference in scores, between the intervention and control group across all outcome variables, and over time.
Schonert-Reichl et al.	MindUP program	One 40–50-minute lesson once a week for 12 weeks	Interpersonal Reactivity Index (IRI; Davis, 1983) modified for children (Schonert-Reichl et al., 2012).	(1) Baseline (2) Post-test	Empathy Perspective taking	Children in intervention group demonstrated significant improvements from pre- to post-test in empathy and perspective-taking, as well as self- and peer-reported prosocial behaviour, compared to controls
Viglas & Perlman	A mindfulness-based program adapted for kindergarten classrooms	18 twenty-minute lessons, delivered 3 times a week for a total of 6 weeks.	SDQ	(1) Baseline (2) Post-test	Prosocial behaviour	Children in the interventions group demonstrated significant improvements in teach-reported prosocial behaviour compared to controls

Note. MBI = Mindfulness Based Interventions

Table 12

Table Listing Home-Based, Caregiver Administered Interventions

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Dowdall et al.	A group-based dialogic book-sharing program	60–90-minute sessions once a week for 8 weeks	Prosocial behaviour was assessed using the SDQ as well as directly using a prosocial "helping" task Pre-ToM was assessed using a set of 6 tasks adapted from tasks	(1) Baseline (2) Post-test (3) Follow-up (at 6-months)	Prosocial behaviour Pre-ToM	No group differences were seen prosocial behaviour or pre-theory of mind
Haar et al.	The Strong Families Program	One 1-1.5-hour session per week for 3 weeks	SDQ	(1) Baseline (1 week before intervention) (2) Post-test (3) Follow up (6 weeks after intervention)	Prosocial Behaviour	Results demonstrated an improvement in prosocial behaviour for the intervention group

Table 13

Table Listing Role-Playing Interventions

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Goldstein & Lerner	Dramatic pretend play games	Three 30-minute sessions per week for 8 weeks	Theory of mind scale (Wellman & Liu, 2004) Index of Empathy for Children (Bryant, 1982)	(1) Baseline (2) Post-test (in the week after the last day of the intervention)	ToM	Participation in interventions was unrelated to changes in ToM

Table 14

Table Listing Interventions Classified as 'Other'

Authors	Intervention		Outcome			Results
	Name	Duration	Measure	Time Points	Empathy Outcome	
Amador Buenabad et al.	Intervention 1: Huellitas Intervention 2: CAPAS-Mx	One session a week for 12 weeks. Sessions ranged from 1 (Huellitas) to 1.5 (CAPAS-Mx) hours	1) The Child Social Skills Questionnaire (Sánchez et al., 2019) 2) The Huellitas-Caregivers (Sánchez et al., 2019) questionnaire	(1) Baseline (2) post-test (at the end of the 12-week treatment phase) (3) Follow-up 1 at 24 weeks after randomisation (4) Follow-up 2 (36 weeks after randomisation)	Prosocial behaviour	The Huellitas-CAPAS-Mx condition showed improved parent reports on child prosocial behaviour
Ashworth et al.	The Good Behaviour Game (GBG)	Two 15 minutes session a week for 2 years	the Teacher Observation of Classroom Adaptation (TOCA-C; Koth et al., 2009).	(1) Baseline (2) Post test	Prosocial behaviour (positive social interactions)	There was no overall effect on the prosocial behaviour of children who received the GBG
Dray et al.	A universal, school-based, pragmatic intervention	2 years	SDQ	(1) Baseline (2) Post-test (after 2 years of intervention implementation)	Prosocial behaviour	No significant difference reported between intervention and control groups for prosocial behaviour outcomes
Garandeau et al.	The KiVa Antibullying Program	Ten 2-hour lessons delivered throughout the school year	A seven-item questionnaire, designed for the evaluation of the KiVa program, was used to assess two types of empathy toward the victim (Kärnä et al., 2011).	(1) Baseline (2) post-intervention	Affective and cognitive empathy	After 9 months, KiVa improved affective empathy but had no significant effect on cognitive empathy. Mean levels of both types of empathy decreased over time in both control and intervention classrooms. The positive impact on affective empathy was due to lower decreases in KiVa classrooms compared to control classrooms, with a small effect size. This suggests limited clinical significance.
Kärnä et al.	Kiva Antibullying Program	Ten 2-hour lessons delivered throughout the school year for 1 year	Empathy toward victims: 7-item empathy scale (Poyhonen & Salmivalli., 2008).	Three times: (1) Baseline (May 2007) (2) Post-test (December 2007/January 2008 -middle of school year, 7 months after pre-test) (3) Follow-up (May 2008 - end of the school year, 12 months after pre-test measures)	Empathy	At post-test, students in KiVa schools had more empathy compared to students in the control schools. However, by follow-up, the positive effects of the intervention had diminished, resulting in non-significant findings

Larose et al.	The Minipally program	1 session every 2 weeks for 8 months	The Social Behavior Questionnaire	(1) Baseline (2) post-intervention	Prosocial Behaviour	No main effect of the intervention for prosocial behaviours
O'Neill et al.	The Michigan Model for Health (MMH)	Grade 4: 12-weeks Grade 5: 14-weeks (40-50 minutes)	Prosocial behavior was measured using items developed by Bosworth and Espelage (1995)	(1) Baseline (1 week before intervention) (2) Post-test (1 week after end of intervention) (3) Follow-up (5-6 weeks after end of intervention)	Prosocial behaviour	No significant effect found for prosocial behaviour in the intervention group compared to the control group
Peltonen et al.	Peer integration and enhancement resource (PIER)	8 sessions ranging from 45 - 90 minutes	SDQ for 11–17-year-olds	(1) Baseline (2) Post-intervention (at six months) (3) Follow-up (at 12 months)	Prosocial behaviour	Prosocial behaviour did not increase in the intervention group
Thulin et al.	Youth Empowerment Solutions (YES) program	30 90-minute sessions twice a week for over 15 weeks	Five 5-point Likert items adapted from Goodman (2001)	(1) Baseline (2) Post-intervention (3) Follow-up (12 months after start of program)	Prosocial behaviour	YES intervention had a long-term influence on prosocial behaviour

Discussion

Given the crucial role that empathy plays in social interactions, interpersonal relationships and, importantly, reduced levels of violence and aggression, teaching children and adolescents to be more empathic seems to be a practical approach to counteract escalating levels of youth violence and aggression (Warrier et al., 2018). To this end, the aim of the current systematic review was to analyse, synthesis and categorise the various interventions that have been used to enhance empathic behaviour among child and adolescent samples. This review also sought to determine which component of empathic behaviour is most commonly targeted in, and most responsive to, these different categories of interventions. What follows is a discussion of the outcomes and key findings of this review, with reference to current research in the field, the real-world applicability and importance of these findings, as well as the limitations of the evidence base and review process and recommendations for future research.

This review contributes to an emerging field of empathy-enhancing research in a number of ways. As previously mentioned, 63% of studies reported a significant increase in empathic behaviour. These findings suggest that interventions can successfully enhance empathic behaviour among neurotypical child and adolescent samples. These results are encouraging considering that all included studies were considered to have good methodological quality and were mostly RCTs or cluster RCTs. However, given their variety and complexity, these interventions were categorized according to their educational features and modes of delivery to allow more meaningful conclusions to be drawn from the results of the review.

Based on previous reviews by Batt-Rawden et al. (2013) and Kelm et al. (2014) and through an in-depth analysis of the common characteristics of each intervention, the researcher developed eight intervention categories: (1) classroom-based SEL interventions, (2) narrative/conversation-based interventions, (3) game-based interventions, (4) PE interventions, (5) MBIs, (6) home-based, caregiver-administered interventions and (7) role playing interventions. Interventions that could not be classified, or were described as mixed interventions, incorporating more than one element of the abovementioned categories, were categorized as (8) ‘other.’ The most common intervention type was classroom-based SEL. This was expected as the promotion of empathic behaviour is mostly discussed in relation to SEL programs in schools. SEL research has also seen a recent surge in the past few decades and has gained a high level of interest from states and educational districts, who have implemented mandates for incorporating SEL into classrooms (Barbarasch & Elias, 2009).

This partly explains the overarching prevalence of SEL-based interventions in the current review.

Classroom-Based Social Emotional Learning (SEL) Interventions

The findings of this review support the efficacy of universal, classroom based SEL interventions in fostering empathic behaviour among children and adolescents. Specifically, classroom based SEL interventions had a positive effect on child and adolescent prosocial behaviour, empathy and emotion regulation. This is in keeping with Durlak and colleagues (2011) who, in their evaluation of the effect of 213 school based SEL interventions on behavioural issues, academic achievement, and prosocial behaviour, found that the programs that had the largest effect sizes were those that emphasized empathy, recognizing emotions, managing stress, solving problems, and making decisions. Similarly, in their review of 83 studies, O'Conner et al. (2017) also reported encouraging outcomes of SEL programs on the empathy and emotion recognition of 8–9-year-old students in the general population.

The findings of this review therefore contribute to the growing empirical evidence regarding the positive impact and importance of universal SEL programs. In keeping with previous research, this review demonstrates that, among the skills targeted in school-based SEL, empathy-related outcomes appear to be particularly receptive to such interventions. This further underscores the significance of these programs in the promotion of empathy-related behaviour. In addition, SEL interventions are universally applicable and are easily integrated into classroom learning in the early and later years, making them an ideal method for the enhancement of child and adolescent empathic behaviour (Durlak et al., 2011).

The Second Step Violence Prevention Curriculum was the only classroom based SEL intervention that did not enhance empathic behaviour in this review (Committee for Children, 2011). However, this may be attributed to the short duration of intervention implementation, in one study, as well as the implementation of state regulated SEL-type learning programs in all classrooms, including control classrooms, in another study (Lipschutz, 2010; Upshur et al., 2019). Furthermore, although previous research has demonstrated the long-term sustainability of these interventions, the results of this review cannot verify their long-term efficacy on empathic behaviour, as only one study included a follow-up assessment. Despite this limitation, the efficacy of these interventions was consistent across a wide age range of young children to older adolescents. This demonstrates the basic developmental differentiation incorporated into the curriculum design of most SEL programs (CASEL, 2003). This is particularly salient for the promotion of empathic behaviour, which varies substantially across developmental trajectories (Decety, 2011).

Narrative/Conversation-Based Interventions

The development of empathic behaviour is particularly relevant to interventions aimed at enhancing cognitive empathy, or, more specifically, ToM, which only starts to develop at around 2 years of age (Rakoczy, 2022). This type of empathy appears to be most commonly targeted in narrative/conversation-based interventions. Current findings indicate that narrative/conversation-based interventions yielded positive effects on empathic behaviour, particularly ToM, as well as empathy and prosocial behaviour. This finding was maintained across all studies in this category of the review and at follow-up assessment. In most cases, children encountered situations, in the form of stories or picture books, which they listened to or read themselves, and were subsequently prompted to engage in explicit discussion about mental states and, in one study, prosocial behaviours. These findings are in keeping with observational research which suggests that exposure to certain socio-linguistic environments, specifically direct exposure to mental state language, is associated with enhanced ToM abilities (e.g., Ornaghi et al., 2011).

From a theoretical point of view, these findings are congruent with a social-constructivist perspective, where ToM development is considered to be embedded in interpersonal relationships and social interactions (Caputi et al., 2021; Hari et al., 2015). This is supported by a plethora of research which has indicated that the degree to which parents pay attention to and talk about mental states greatly influences the development of ToM (Devine & Hughes, 2018; Hoffman et al., 2016). Furthermore, the efficacy of using language to help children focus on mental states and, specifically, different perspectives, is in keeping with research on individual (neurotypical) differences in the acquisition of ToM, where children's language abilities, especially in the context of perspective taking, and children's participation in pretend role play, have been linked to their ToM abilities (Hoffman et al., 2016; Lillard & Kavanaugh, 2014).

Importantly, these findings suggest that, as expected, cognitive empathy can be enhanced in child and adolescent samples, with relatively short narrative/conversation-based interventions. This is in keeping with a recent meta-analysis on ToM training interventions, which demonstrated that, overall, interventions were efficacious in enhancing children's ToM abilities, a finding which was supported by a large average effect size (Hoffman et al., 2016). Furthermore, these findings support the idea that individual differences in ToM abilities are not just a consequence of developmental changes or advances in cognitive processing but are connected to and influenced by the kind of social and environmental experiences that children have (Hoffman et al., 2016). Finally, since higher levels of ToM have been linked to

an increased tendency to engage in prosocial behaviours, these findings could be in applied to interventions targeting the enhancement of other empathic domains, such as prosocial behaviour. Despite the ubiquity of meta-analyses and the emerging research evaluating ToM enhancing interventions, this review is the first to synthesise the narrative/conversation-based approaches for neurotypical samples, and, given the efficacy of these interventions, this review provides an important platform for future research to delve deeper into the efficacy and intricacies of these interventions.

Game-Based Interventions

Game-based interventions are largely associated with a recent transition towards technology-infused learning environments, where digital serious games and game-based SEL applications have been incorporated into classroom environments in an effort to enhance prosocial behaviours. In contrast to Saleme et al. (2020), who reported positive and mixed results of prosocial digital games on socio-emotional competencies and prosocial behaviours, current findings do not support the efficacy of digital game-based interventions on prosocial behaviour and empathy. However, since the *Friendly Attac* serious digital game was a cyberbullying prevention intervention, our findings are in keeping with previous systematic reviews investigating the efficacy of bullying and cyberbullying interventions, which have demonstrated limited effectiveness (Evans et al., 2014; Nocentini et al., 2015). Furthermore, the digital interventions evaluated in this review used self-report measures of prosocial behaviour and empathy, which have been shown to yield significantly lower effects than observational outcome data in previous non-digital prosocial programs literature (Durlak et al., 2011).

The results of this study did, however, demonstrate the efficacy of a non-digital collaborative board game, the Galaxy Rescuers game (Nieh & Wu, 2018). Although this positive finding contradicts the aforementioned outcomes of most bullying and cyberbullying games, the positive effects of the Galaxy Rescuers Game were only demonstrated in the group with a debriefing component. Therefore, this study did not necessarily demonstrate the efficacy of the collaborative board game, but rather demonstrated the significance of adding a debriefing component, which encourages reflection, group discussion and a connection to real-world experiences (Garris et al., 2002). However, since digital game-based learning is still an emerging area of research and is fast becoming a central component of children's lives, future research should concentrate on studying the attributes and design elements that enhance the efficacy of these games, identifying the best practices for their future development and implementation.

Physical Education (PE) Interventions

A long-standing evidence base exists on the numerous benefits of physical activity on child and adolescent mental health, prosocial behaviour, cognitive and academic abilities, and motor skills (García-Hermoso et al., 2020; Li & Zhang, 2022; Rodríguez et al., 2019). Although the findings of this review partially support the efficacy of one PE-based intervention (a multisport-enriched PE intervention) on empathy, these findings cannot uphold the isolated efficacy of physical activity on empathic behaviour, as, in both of the included studies, control groups received traditional, business-as-usual PE classes (Condello et al., 2021; Pinto-Escalona et al., 2021). As such, both groups participated in some level of physical activity, making the findings incomparable to previous research in this domain. However, these findings are consistent with research emphasising the importance of enhancing the quality of PE lessons to enhance their efficacy (García-Hermoso et al., 2020). Increased research attention should thus be devoted to these interventions as schools are ideal environments for advocating and promoting physical activity, and PE is the primary vehicle for promoting physical activity in this young population.

Mindfulness-Based Interventions (MBIs)

Research has reported a consistent and overwhelming effect of mindfulness practices on self-regulation, i.e., the use of skills to react to environmental stresses in an appropriate manner and to accomplish intended objectives (Montroy et al., 2014). Since self-regulation has repeatedly been associated with empathy and prosocial behaviour, it follows that MBIs have previously been found to have a significant positive effect on overall empathy levels, ToM, prosocial behaviour, and compassion (Donald et al., 2019; Kreplin et al., 2018; Tan et al., 2014). Although these interventions have predominantly centred around adults, health professionals and occupational samples, similar outcomes have been reported for child and adolescent samples (Bockmann & Yu, 2022; Cheang et al., 2019). In keeping with these findings, this review found convincing support for MBIs, specifically, in their enhancement of empathy, prosocial behaviour, emotion regulation and perspective taking among children and adolescents.

Interestingly, MBIs administered by trained researchers or professionals were equally as effective as MBIs delivered by teachers, who received a brief period of training. This conflicts with the previously established belief that mindfulness teachers must have significant experience and training in order to produce effective and desirable outcomes (Crane et al., 2012). One possible explanation, as suggested by Schonert-Reichl et al. (2015), is that, by leading MBIs, teachers became more nurturing and therefore had a positive impact

on their students. As such, MBIs are easily incorporated into the classroom setting, and, in light of their efficacy, these interventions are a practical and widely applicable method for promoting empathic behaviour. This review thus makes an important contribution to the limited, but growing body of literature that has investigated these interventions among child and adolescent populations.

Although these results are promising, it is important bear in mind that two out of the three interventions in this category combined mindfulness with SEL activities (Kim et al., 2020; Schonert-Reichl et al., 2015). Since SEL itself has been shown to significantly enhance empathic behaviour, it is difficult to determine whether the increase in empathic behaviour is associated with the mindfulness, or other SEL components (Cheang et al., 2019).

Home-Based, Caregiver-Administered Interventions

The results of this review partially support the efficacy of home-based, caregiver-administered interventions, defined as those that involved caregiver training sessions, where skills learnt were translated to, or implemented in home environments as a means to enhance child and adolescent empathic behaviour. Only one out of the two interventions included in this category, namely, the Strong Families Program, reported positive outcomes for empathic behaviour, specifically prosocial behaviour (Haar et al., 2021). The feasibility of this program has been demonstrated across seven different countries (Haar et al., 2020). However, it appears most applicable to low-income families living in stressful settings and is therefore not a universal program. The group-based dialogic book-sharing program, also implemented in a low SES context, reported no significant effects on the prosocial behaviour and pre-ToM of young children (Dowdall et al., 2021). This may be accounted for by the reported delay in ToM development in South African children, the country in which the study was conducted (Malcolm-Smith et al., 2019). Furthermore, multi-component programs such as these are less likely to follow sequenced, active, focused, and explicit (SAFE) practices in the promotion of skills development and are more likely to come across implementation issues, accounting for the lack of significant findings (Durlak et al., 2011).

Role-Play Interventions

Surprisingly, the current findings are incongruent with previous research on role-play and perspective taking, which position these interventions as an effective means of enhancing empathic behaviour (Batt-Rawden et al., 2013; Goldstein & Winner, 2012). Specifically, in this review, dramatic pretend play games had no effect on ToM or prosocial behaviour. This is surprising as dramatic pretend play games are largely reliant on perspective taking, which has been reported as an effective method of promoting empathic behaviours (Hassan, 2020).

However, it should be noted that these results are based on one study, with a short intervention duration (Goldstein & Lerner, 2018). Future research should thus assess the intricacies of these types of interventions, especially considering the growing interest in technological interventions and virtual reality (Ingram et al., 2019).

Interventions Classified as 'Other'

Interventions were classified as 'other' if they did not fit into one of the seven aforementioned categories or were described as having mixed interventions. The current results reveal that these interventions were largely ineffective which, as previously mentioned, may be due to their decreased tendency to follow the SAFE procedures, a common flaw of multi-component interventions (Durlak et al., 2011). Interestingly, despite its ubiquity in the empathy enhancing literature, the results of this review do not support the efficacy of the KiVa antibullying program in enhancing empathic behaviour. Again, this may be due to its multiple components and the challenges associated with adhering to the SAFE procedures when implementing an intervention that requires such careful planning (Durlak et al., 2011).

Limitations and Recommendations for Future Research

Limitations of Included Studies

Both the review process and the included studies presented with several limitations. Included studies were limited by frequently occurring methodological weaknesses, including small sample sizes, a lack of participant and experimenter blindness and a lack of follow up assessments. The lack of blindness commonly reported in these studies appears to be a common limitation of empathy-enhancing interventions, specifically SEL programs, and is indicative of the nature of these interventions, where it is difficult to blind participants who are actively engaged in empathy-enhancing interventions compared to business-as-usual control participants (Luo et al., 2020). Most studies were conducted at single institutions, which may not have been fully representative of the population. Furthermore, information about SES was often vague or absent. As such, the generalisability, and ultimately, external validity, of findings was somewhat limited. This was also evidenced in home-based, caregiver administered interventions, where the generalizability of findings was weakened as a result of a female dominated caregiver sample. Finally, as ToM-enhancing interventions involve ToM training, followed by specific ToM-related outcome measures, the generalisability of these interventions are called into question as the ToM training may enhance the participants performance on the outcome measures instead of their overall capacity for ToM.

The overall body of literature was also marked by a lack of reporting of intervention durations and outcome evaluation time periods and, importantly, a lack of follow-up assessments. In light of the paucity of follow-up assessments in the reported literature, their varying duration and the inconsistency in findings, this review was unable to evaluate the long-term efficacy of intervention outcomes. This limitation should be highlighted as a major weakness in the reported literature, as, although child and adolescent empathic behaviour may significantly increase immediately following certain interventions, the success of these interventions relies heavily on their long-term sustainability. Future evaluations of empathy-enhancing interventions should thus direct attention towards the longevity of intervention effects, and, in so doing, establish a standardised duration for follow-up assessments, as the most sought-after interventions are those that can demonstrate utility in the long-term.

Finally, since empathy develops significantly from infancy to adolescence, the results of studies that assessed a wide age range of participants may have been confounded by the large developmental change that occurs during this period (Rakoczy, 2022). Future research should focus on more specific, narrower, age groups within the child/adolescent cohort to gain a better idea of which interventions are most effective for which age groups.

Limitations of the Review Process

The lack of a comprehensive, unanimously accepted, operational definition of empathy represents a limitation in both the review process as well as the included studies. Due to the problematic nature of defining empathy, this review opted for a broad, all-inclusive, evaluation of empathy-related outcomes (i.e., cognitive empathy, affective empathy, empathic concern, ToM, prosocial behaviour, compassion, perspective taking, emotion recognition). However, with the lack of a definitive conceptualisation of empathy, we were unable to determine one intervention that was most effective at its enhancement. Our judgement was further clouded by the heterogeneity of measurement tools used to assess empathic behaviour, which hindered our ability to meta-analytically assess the data, and thus, results were reported in a narrative and descriptive manner. The efficacy of future interventions appears to rely heavily on the conceptual clarity of this concept. Furthermore, future research interests should be directed towards developing more objective, physiological measures of empathy, as the self- and other report measures commonly used in these studies are largely susceptible to social desirability biases (Lagattuta et al., 2012). Moreover, while additional studies in other languages may have existed, this review was limited to articles written in or translated into English. Finally, due to the inaccessibility of unpublished research in this emerging field of literature, the findings of this review are based solely on

studies published in peer reviewed journals, subjecting this review to potential publication bias.

Implications for Future Research

To date, systematic reviews and meta-analyses have predominantly focused on collating and examining the effectiveness of empathy enhancing interventions among healthcare professionals and adult samples (Clark et al., 2019; Everson et al., 2018; Neumann et al., 2011; Nosek et al., 2014). The handful of reviews that have focused on younger populations have either assessed the effectiveness of a specific type of intervention, such as Cheang et al.'s (2019) review of MBIs or have exclusively focused on clinical samples (McCoy et al., 2016). The current study therefore filled a gap in the literature through a review of the universally applicable empathy-enhancing interventions for neurotypical child and adolescent samples. Furthermore, just as the current review is novel, so too is the evidence base it evaluated. This is evidenced in the publication dates of included studies, which ranged from 2010 to 2022, with most studies having been published in the last seven years. This review is therefore the first of its kind to systematically analyse this emerging field of literature in an all-inclusive, universal, manner, and provide a current and relevant synthesis and categorisation of the interventions that are being used to enhance empathic behaviour in neurotypical child and adolescent samples.

Importantly, this review advances the understanding that empathic behaviour can be enhanced in a young, typically developing, population. As per our initial predictions, our findings indicated that the higher-order cognitive component of empathy, namely, ToM, is receptive to interventions aimed at its enhancement and can ultimately be taught to neurotypical children and adolescents. ToM appears to be most commonly and effectively enhanced through narrative/conversation-based training methods, the long-lasting, positive effects of which have been demonstrated in low SES settings. In addition, interventions are short-lived and easy to implement. This finding has promising implications both globally and in the South African context. As recent research has demonstrated a delay in the development of ToM in South African children, these easy to implement, short-lived, interventions are relevant and suitable for this population (Malcolm-Smith et al., 2019).

This finding also pertains to the underlying issue that this review sought to address, namely, the escalating levels of youth violence and aggression in South Africa and various other countries. As previously mentioned, diminished cognitive empathy appears to be more consistently associated with aggressive behaviour in a young typically developing population both globally and in South Africa (De Castro et al., 2002; Gini et al., 2007; Pileggi, 2018). As

such, this research not only advances the understanding that cognitive empathy can be taught, but also presents the category of intervention that appears to be effective in doing so. Although a considerable amount of research still needs to be done, these findings lay the groundwork for the development of ToM-enhancing interventions as well as the use of these interventions in violence reduction and prevention strategies.

Furthermore, numerous correlational studies have documented connections between ToM and prosocial behaviour (Imuta et al., 2016). While only the continued implementation of these interventions can determine best practice, the findings of this review provide important implications for the use of the abovementioned interventions in the enhancement of prosocial behaviours, which are important in establishing interpersonal relationships and individual socialisation (Caprara et al., 2014).

Similarly, this review demonstrated the effectiveness of various classroom based SEL interventions on prosocial and other empathic behaviours. These interventions hold immense practical value for the enhancement of socio-emotional skills, as they are easily integrated into routine educational curricula, can be effectively administered by teachers and are effective across different grades. As these interventions are becoming increasingly more widespread, these findings support recent mandates for incorporating SEL into classrooms and encourage the implementation of these mandates in other countries and districts (Barbarasch & Elias, 2009). However, this study also identifies the need for more research on these interventions in low SES contexts, such as South Africa.

This review also highlights the overarching challenges associated with making definitive conclusions and direct comparisons about empathy-enhancing interventions, given the ambiguity that still plagues this concept. Moving forward, some concrete, universally recognized definition of empathy should be at the forefront of future research in this field.

Conclusion

The current study sheds light on the current state of empathy-enhancing interventions and suggests that targeted programs may be effective in enhancing empathic behaviour in neurotypical child and adolescent samples. The reported increase in youth violence and aggression, and its associated relationship with reduced empathic behaviour, amplifies the importance of these interventions. Furthermore, the development of empathic behaviour is a vital component of social interactions and interpersonal relationships. As such, the current findings hold significant potential for enhancing socio-emotional outcomes as well as informing strategies for the reduction and prevention of youth violence and aggression, the effects of which carry on into adulthood. The enhancement of empathy is undoubtedly a

valuable societal goal and, while ongoing research is necessary to refine the outcomes of these interventions, this review contributes to and strengthens the emerging body of evidence investigating these interventions in neurotypical child and adolescent samples.

References

Altman, D. G. (1999). Altman DG. Relation between two continuous variables. *Practical Statistics for Medical Research. London: Chapman & Hall*, 277-299.

Amador Buenabad, N. G., Sánchez Ramos, R., Schwartz, S., Gutiérrez López, M. L., Díaz Juárez, A. D., Ortiz Gallegos, A. B., González Ortega, T. G., Vázquez Pérez, L., Medina-Mora Icaza, M. E., Domenech Rodríguez, M. M., & Villatoro Velázquez, J. A. (2020). Cluster randomized trial of a multicomponent school-based program in Mexico to prevent behavioural problems and develop social skills in children. *Child & Youth Care Forum, 49*(3), 343-364. https://doi.org/10.1007/s10566-019-09535-3

Ang, R. P., & Goh, D. H. (2010). Cyberbullying among adolescents: The role of affective and cognitive empathy, and gender. *Child Psychiatry & Human Development, 41*, 387-397. https://doi.org/10.1007/s10578-010-0176-3

Ashworth, E., Humphrey, N., & Hennessey, A. (2020). Game over? No main or subgroup effects of the good behaviour game in a randomized trial in English primary schools. *Journal of Research on Educational Effectiveness, 13*(2), 298-321. https://doi.org/10.1080/19345747.2019.1689592

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.

Barbarasch, B., & Elias, M. J. (2009). Fostering social competence in schools. In R. W. Christner & R. B. Mennuti (Eds.), *School-based mental health: A practitioner's guide to comparative practices*. Routledge/Taylor & Francis Group.

Batson, C. D. (2011). Empathy-induced altruism: friend or foe of the common good?. *For the Greater Good of All: Perspectives on Individualism, Society, and Leadership*, 29-47. https://doi.org/10.1057/9780230116269

Batt-Rawden, S. A., Chisolm, M. S., Anton, B., & Flickinger, T. E. (2013). Teaching empathy to medical students: An updated, systematic review. *Academic Medicine*, *88*(8), 1171-1177. https://doi.org/10.1097/ACM.0b013e318299f3e3

Bianco, F., & Lecce, S. (2016). Translating child development research into practice: Can teachers foster children's theory of mind in primary school?. *British Journal of Educational Psychology, 86*(4), 592-605. https://doi.org/10.1111/bjep.12125

Bianco, F., Lombardi, E., Lecce, S., Marchetti, A., Massaro, D., Valle, A., & Castelli, I. (2021). Supporting children's second-order recursive thinking and advanced ToM abilities: A training study. *Journal of Cognition and Development, 22*(4), 561-584. https://doi.org/10.1080/15248372.2021.1901712

Bianco, F., Lombardi, E., Massaro, D., Castelli, I., Valle, A., Marchetti, A., & Lecce, S. (2019). Enhancing advanced Theory of Mind skills in primary school: A training study with 7- to 8-year-olds. *Infant and Child Development, 28*(6). https://doi.org/10.1002/icd.2155

Bibby, H., & McDonald, S. (2005). Theory of mind after traumatic brain injury. *Neuropsychologia, 43*(1), 99-114. https://doi.org/10.1016/j.neuropsychologia.2004.04.027

Blair, R. J. R. (2005). Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition*, *14*, 698-718. https://doi.org/10.1016/j.concog.2005.06.004

Bockmann, J. O., & Yu, S. Y. (2022). Using mindfulness-based interventions to support self-regulation in young children: A review of the literature. *Early Childhood Education Journal*, 1-11. https://doi.org/10.1007/s10643-022-01333-2

Boduszek, D., Debowska, A., Jones, A. D., Ma, M., Smith, D., Willmott, D., Trotman Jemmott, E., Da Breo, H., & Kirkman, G. (2019). Prosocial video game as an intimate partner violence prevention tool among youth: A randomised controlled trial. *Computers in Human Behavior, 93*, 260-266. https://doi.org/10.1016/j.chb.2018.12.028

Bosworth, K., & Espelage, D. (1995). Teen conflict survey. *Bloomington, IN: Centre for Adolescent Studies, Indiana University*.

Bradshaw, C. P., Waasdorp, T. E., & Leaf, P. J. (2012). Effects of school-wide positive behavioural interventions and supports on child behaviour problems. *Paediatrics, 130*(5), E1136-E1145. https://doi.org/10.1542/peds.2012-0243

Brazzelli, E., Farina, E., Grazzani, I., & Pepe, A. (2018). La misura dei comportamenti prosociali nella prima infanzia: Uno studio di validazione del CPBQ [The measurement of prosocial behaviors in early childhood: A validation study of the CPBQ]. *Psicologia Clinica dello Sviluppo, 22*, 555–570.

Brazzelli, E., Grazzani, I., & Pepe, A. (2021). Promoting prosocial behavior in toddlerhood: A conversation-based intervention at nursery. *Journal of Experimental Child Psychology, 204*. https://doi.org/10.1016/j.jecp.2020.105056

Bryant, B. K. (1982). An index of empathy for children and adolescents. *Child Development*, *53*(2), 413-425. https://doi.org/10.2307/1128984

Burton, P. (2008). Merchants, skollies and stone. Experience of school violence in South Africa. *Monograph Series*, No. 4. Cape Town: Centre for Justice and Crime Prevention.

Buttelmann, D., Carpenter, M., & Tomasello, M. (2009). Eighteen-month-old infants show false belief understanding in an active helping paradigm. *Cognition, 112*, 337–342. https://doi.org/10.1016/j.cognition.2009.05.006

Camodeca, M., & Coppola, G. (2010). Competenza socio-emotiva e difficoltà di relazionein età prescolare: Un approccio multidimensionale [Socioemotional competenceand relational difficulties in the preschool years: A multidimensional approach]. InE. Baumgartner (Ed.), Gli esordi della competenza emotiva (pp. 51–74). LED.

Caprara, G. V., Kanacri, B. P. L., Gerbino, M., Zuffiano, A., Alessandri, G., Vecchio, G., Caprara, E., Pastorelli, C., & Bridglall, B. (2014). Positive effects of promoting prosocial behavior in early adolescence: Evidence from a school-based intervention. *International Journal of Behavioural Development*, *38*(4), 386-396. https://doi.org/10.1177/0165025414531464

Caputi, M., Cugnata, F., & Brombin, C. (2021). Theory of mind and loneliness: Effects of a conversation-based training at school. *International Journal of Psychology, 56*(2), 257-265. https://doi.org/10.1002/ijop.12707

Caputi, M., Lecce, S., Pagnin, A., & Banerjee, R. (2012). Longitudinal effects of theory of mind on later peer relations: The role of prosocial behavior. *Developmental Psychology, 48*(1), 257. https://doi.org/10.1037/a0025402

Cheang, R., Gillions, A., & Sparkes, E. (2019). Do mindfulness-based interventions increase empathy and compassion in children and adolescents: A systematic review. *Journal of Child and Family Studies, 28*(7), 1765-1779. https://doi.org/10.1007/s10826-019-01413-9

Chinekesh, A., Kamalian, M., Eltemasi, M., Chinekesh, S., & Alavi, M. (2013). The effect of group play therapy on social-emotional skills in pre-school children. *Glob J Health Sci, 6*(2), 163-167. https://doi.org/10.5539/gjhs.v6n2p163

Cicchetti, D. V., & Sparrow, S.A. (2016). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Journal of Clinical Child and Adolescent Psychology, 45*(1), 4–23. https://doi.org/10.1080/15374416.2015.1012991

Clark, M. A., Robertson, M. M., & Young, S. (2019). "I feel your pain": A critical review of organizational research on empathy. *Journal of Organizational Behavior, 40*(2), 166-192. https://doi.org/10.1002/job.2348

Collaborative for Academic, Social, and Emotional Learning (CASEL). (2003). Safe and sound: An educational leader's guide to evidence based social and emotional learning (SEL) programs. CASEL.

Collaborative for Academic, Social, and Emotional Learning. (2012). *2013 CASEL guide: Effective social and emotional learning programs – Preschool and elementary school edition*. CASEL.

Committee for Children (2011). *Second step early learning*. Committee for Children.

Committee for Children. (2002). Second Step: A Violence Prevention Curriculum for Grades 1-3. Committee for Children.

Committee for Children. (2004). Second Step: A Violence Prevention Curriculum. Committee for Children.

Condello, G., Mazzoli, E., Masci, I., Fano, A. D., Ben-Soussan, T. D., Marchetti, R., & Pesce, C. (2021). Article fostering holistic development with a designed multisport intervention in physical education: A class-randomized cross-over trial. *International Journal of Environmental Research and Public Health, 18*(18). https://doi.org/10.3390/ijerph18189871

Crane, R. S., Kuyken, W., Williams, J. M. G., Hastings, R. P., Cooper, L., & Fennell, M. J. (2012). Competence in teaching mindfulness-based courses: Concepts, development, and assessment. *Mindfulness, 3*(1), 76–84. https://doi.org/10.1007/s12671-011-0073-2

Dadds, M. R., Hunter, K., Hawes, D. J., Frost, A. D., Vassallo, S., Bunn, P., Merz, S., & El Masry, Y. E. (2008). A measure of cognitive and affective empathy in children using parent ratings. *Child Psychiatry and Human Development*, *39*, 111-122. https://doi.org/10.1007/s10578-007-0075-4

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113–126. https://doi.org/10.1037/0022-3514.44.1.113.

De Castro, B. O., Veerman, J. W., Koops, W., Bosch, J. D., & Monshouwer, H. J. (2002). Hostile attribution of intent and aggressive behavior: A meta-analysis. *Child Development*, *73*(3), 916-934.

De Kemp, R. A. T., Overbeek, G., De Wied, M., Engels, R. C. M. E., & Scholte, R. H. J. (2007). Early adolescent empathy, parental support, and antisocial behaviour. *The Journal of Genetic Psychology, 168*, 5-18.

De la Barrera, U., Mónaco, E., Postigo-Zegarra, S., Gil-Gómez, J. A., & Montoya-Castilla, I. (2021). EmoTIC: Impact of a game-based social-emotional programme on adolescents. *PLoS One, 16*(4), e0250384. https://doi.org/10.1371/journal.pone.0250384

De Waal, F. B. M. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology, 59*, 279-300. https://doi.org/10.1146/annurev.psych.59.103006.093625.

De Wied, M., Goudena, P. P., & Matthys, W. (2005). Empathy in boys with disruptive behavior disorders. *Journal of Child Psychology and Psychiatry*, *46*(8), 867-880. https://doi.org/10.1111/j.1469-7610.2004.00389.x

Decety, J. (2011). Dissecting the neural mechanisms mediating empathy. *Emotion Review, 3*, 92-108. https://doi.org/10.1177/1754073910374662

Decety, J., & Cowell, J. (2014). The complex relation between morality and reason. *Trends in Cognitive Sciences, 18*, 337-339. https://doi.org/10.1177/17455691614545130

Decety, J., & Jackson, P. L. (2004). A social-neuroscience perspective on empathy. *Current Directions in Psychological Science, 15*, 54-58. https://doi.org/10.1177/1534582304267187

Decety, J., & Lamm, C. (2006). Human empathy through the lens of social neuroscience. *The Scientific World Journal, 6*, 1146-1163. https://doi.org/10.1100/tsw.2006.221

Decety, J., & Meyer, M. (2008). From emotion resonance to empathic understanding: A social developmental neuroscience account. *Development and Psychopathology*, *20*(4), 1053-1080. https://doi.org/10.1017/S0954579408000503

Decety, J., & Moriguchi, Y. (2007). The empathic brain and its dysfunction in psychiatric populations: Implications for intervention across different clinical conditions. *BioPsychoSocial Medicine*, *1*(1), 1-21. https://doi.org/10.1186/1751-0759-1-22

Deeks, J. J., Dinnes, J., D'Amico, R., Sowden, A. J., Sakarovitch, C., Song, F., Petticrew, M., & Altman, D. G. (2003). Evaluating non-randomised intervention studies. *Health Technology Assessment*, *7*(27), iii-173.

Denham, S. A. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development, 57,* 194–201.

Denham, S. A., Bassett, H. H., Way, E., Mincic, M., Zinsser, K., & Graling, K. (2012). Pre-schoolers' emotion knowledge: Self-regulatory foundations, and predictions of early school success. *Cognition & Emotion, 26*(4), 667-679. https://doi.org/10.1080/02699931.2011.602049

Denham, S. A., Caverly, S., Schmidt, M., Blair, K., DeMulder, E., Caal, S., Hamada, H., & Mason, T. (2002). Preschool understanding of emotions: Contributions to classroom anger and aggression. *Journal of Child Psychology and Psychiatry, 43*(7), 901-916.

DeSmet, A., Bastiaensens, S., Van Cleemput, K., Poels, K., Vandebosch, H., Deboutte, G., Herrewijn, L., Malliet, S., Pabian, S., Van Broeckhoven, F., De Troyer, O., Deglorie, G., Van Hoecke, S., Samyn, K., & De Bourdeaudhuij, I. (2018). The efficacy of the Friendly Attac serious digital game to promote prosocial bystander behaviour in cyberbullying among young adolescents: A cluster-randomized controlled trial. *Computers in Human Behaviour, 78*, 336-347. https://doi.org/10.1016/j.chb.2017.10.011

Devine, R. T., & Hughes, C. (2018). Family correlates of false belief understanding in early childhood: A meta-analysis. *Child Development*, *89*(3), 971-987. https://doi.org/10.1111/cdev.12682

DiPerna, J. C., Lei, P., Cheng, W., Hart, S. C., & Bellinger, J. (2018). A cluster randomized trial of the social skills improvement system-class wide intervention program (SSIS-CIP) in first grade. *Journal of Educational Psychology, 110*(1), 1-16. https://doi.org/10.1037/edu0000191

Doescher, S. M. (1986). Impact of prosocial classroom and home learning programs on preschool children's prosocial behavior. [Unpublished doctoral dissertation, Corvallis: Oregon State University].

Domitrovich, C. E., Harris, A. R., Syvertsen, A. K., Morgan, N., Jacobson, L., Cleveland, M., Moore, J. E., & Greenberg, M. T. (2022). Promoting social and emotional learning in middle school: Intervention effects of Facing History and Ourselves. *Journal of Youth and Adolescence, 51*(7), 1426-1441. https://doi.org/10.1007/s10964-022-01596-3

Donald, J. N., Sahdra, B. K., Van Zanden, B., Duineveld, J. J., Atkins, P. W., Marshall, S. L., & Ciarrochi, J. (2019). Does your mindfulness benefit others? A systematic review and meta-analysis of the link between mindfulness and prosocial behaviour. *British Journal of Psychology*, *110*(1), 101-125. https://doi.org/10.1111/bjop.12338

Dovidio, J. F., Johnson, J. D., Gaertner, S. L., Pearson, A. R., Saguy, T., & Ashburn-Nardo, L. (2010). Empathy and intergroup relations. *Empathy and Intergroup Behavior,* 1-25.

Dowdall, N., Murray, L., Skeen, S., Marlow, M., De Pascalis, L., Gardner, F., Tomlinson, M., & Cooper, P. J. (2021). Book-Sharing for parenting and child development in South Africa: A randomized controlled trial. *Child Development, 92*(6), 2252-2267. https://doi.org/10.1111/cdev.13619

Downs, S. H., & Black, N. (1998). The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. *Journal of Epidemiology & Community Health*, *52*(6), 377-384. https://doi.org/10.1136/jech.52.6.377

Dray, J., Bowman, J., Campbell, E., Freund, M., Hodder, R., Wolfenden, L., Richards, J., Leane, C., Green, S., Lecathelinais, C., Oldmeadow, C., Attia, J., Gillham, K., & Wiggers, J. (2017). Effectiveness of a pragmatic school-based universal intervention targeting student resilience protective factors in reducing mental health problems in adolescents. *Journal of Adolescence, 57*, 74-89. https://doi.org/10.1016/j.adolescence.2017.03.009

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405-432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Eggum, N. D., Eisenberg, N., Kao, K., Spinrad, T. L., Bolnick, R., Hofer, C., & Fabricius, W. V. (2011). Emotion understanding, theory of mind, and prosocial orientations: Relations over time in early childhood. *Journal of Positive Psychology, 6*(1), 4-16. https://doi.org/10.1080/17439760.20100536776

Eisenberg, N., Eggum, N. D., & di Giunta, L. (2010). Empathy-related responding: Associations with prosocial behaviour, aggression, and intergroup relations. *Social Issues and Policy Review, 4*(1), 143-180. https://doi.org/10.1111/j.1751.2409.2010.01020.x

EndNote Team. (2013). *EndNote* (Version 20) [Computer program]. Clarivate. https://endnote.com/

Eng, J., Teasell, R., Miller, W., Wolfe, D., Townson, A., Aubut, J. A., Abramson, C., Hsieh, J. T., Connolly, S., & Konnyu, K. (2007). Spinal cord injury rehabilitation evidence: Method of the SCIRE systematic review. *Topics in Spinal Cord Injury Rehabilitation*, *13*(1), 1-10. https://doi.org/10.1310/sci1301-1

Eninger, L., Ferrer-Wreder, L., Eichas, K., Olsson, T. M., Hau, H. G., Allodi, M. W., Smedler, A. C., Sedem, M., Gull, I. C., & Herkner, B. (2021). A cluster randomized

trial of promoting alternative thinking strategies (PATHS®) with Swedish preschool children. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.695288

Evans, C. B. R., Fraser, M. W., & Cotter, K. L. (2014). The effectiveness of school-based bullying prevention programs: A systematic review. *Aggression and Violent Behavior, 19*(5), 532–544. https://doi.org/10.1016/j.avb.2014.07.004

Everson, N., Levett-Jones, T., & Pitt, V. (2018). The impact of educational interventions on the empathic concern of health professional students: A literature review. *Nurse Education in Practice, 31*, 104-111. https://doi.org/10.1016/j.nepr.2018.05.015

Foster, D. (2012). Gender, class, 'race' and violence. In C. L. Ward, A. Van der Merwe, & A. Dawes (Eds.), *Youth Violence: Sources and Solutions in South Africa*, (pp. 21–51). Cape Town: UCT Press.

Fraser, A. M., Padilla-Walker, L. M., Coyne, S. M., Nelson, L. J., & Stockdale, L. A. (2012). Associations between violent video gaming, empathic concern, and prosocial behavior toward strangers, friends, and family members. *Journal of Youth and Adolescence, 41*(5), 636–649. https://doi.org/10.1007/s10964-012-9742-2.

Frick, P. J., & Viding, E. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, *21*(4), 1111-1131. https://doi.org/10.1017/S0954579409990071

Frick, P. J., & White, S. F. (2008). Research review: The importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry*, *49*(4), 359-375. https://doi.org/10.1111/j.1469-7610.2007.01862.x

Gao, Q. Y., Huang, Q. Y., Zhang, Q. L., & Chen, W. (2020). Does executive function influence the development of theory of mind in elementary students? *Current Psychology, 39*(2), 389-396. https://doi.org/10.1007/s12144-018-0107-1

Garandeau, C. F., Laninga-Wijnen, L., & Salmivalli, C. (2021). Effects of the KiVa anti-bullying program on affective and cognitive empathy in children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 51*(4), 515-529. https://doi.org/10.1080/15374416.2020.1846541

García-Hermoso, A., Alonso-Martínez, A. M., Ramírez-Vélez, R., Pérez-Sousa, M. Á., Ramírez-Campillo, R., & Izquierdo, M. (2020). Association of physical education with improvement of health-related physical fitness outcomes and fundamental motor skills among youths: A systematic review and meta-analysis. *JAMA*

Pediatrics, *174*(6), e200223-e200223. https://doi.org/10.1001/jamapediatrics.2020.0223

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simul & Gaming, 33*(4), 441-467. https://doi.org/10.1177/1046878102238607

Gibbons, S. L., Ebbeck, V., & Weiss, M. R. (1995). Fair play for kids: Effects on the moral development of children in physical education. *Research Quarterly for Exercise and Sport, 66*(3), 247-255. https://doi.org/10.1080/02701367.1995.10608839

Gini, G., Albiero, P., Benelli, B., & Altoe, G. (2007). Does empathy predict adolescents' bullying and defending behavior?. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *33*(5), 467-476. https://doi.org/10.1002/ab.20204.

Goldstein, T. R., & Lerner, M. D. (2018). Dramatic pretend play games uniquely improve emotional control in young children. *Developmental Science, 21*(4). https://doi.org/10.1111/desc.12603

Goldstein, T. R., & Winner, E. (2012). Enhancing empathy and theory of mind. *Journal of Cognition and Development, 13*(1), 19-37. https://doi.org/10.1080/15248372.2011.573514

Gonzalez-Gadea, M. L., Herrera, E., Parra, M., Gomez Mendez, P., Baez, S., Manes, F., & Ibanez, A. (2014). Emotion recognition and cognitive empathy deficits in adolescent offenders revealed by context-sensitive tasks. *Frontiers in Human Neuroscience, 8*, 1-11. https://doi.org/10.3389/fnhum.2014.00850

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(11), 1337–1345. https://doi.org/10.1097/00004583-200111000-00015

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581-586.

Grazzani, I., Ornaghi, V., & Brockmeier, J. (2016). Conversation on mental states at nursery: Promoting social cognition in early childhood. *European Journal of Developmental Psychology, 13*(5), 563-581. https://doi.org/10.1080/17405629.2015.1127803

Grazzani, I., Ornaghi, V., Pepe, A., Brazzelli, E., & Rieffe, C. (2017). The Italian version of the Empathy Questionnaire for 18- to 36-month-old children: Psychometric properties and measurement invariance across gender of the EmQue-I13. *European Journal of*

Developmental Psychology, 14, 118–126. https://doi.org/10.1080/17405629.2016.1140640

Green, A. L., Ferrante, S., Boaz, T. L., Kutash, K., & Wheeldon-Reece, B. (2022). Effects of the SPARK teen mentoring program for high school students. *Journal of Child and Family Studies, 31*(7), 1982-1993. https://doi.org/10.1007/s10826-022-02298-x

Haar, K., El-Khani, A., Molgaard, V., Maalouf, W., & Afghanistan field implementation team. (2020). Strong families: A new family skills training programme for challenged and humanitarian settings: A single-arm intervention tested in Afghanistan. *BMC Public Health, 20*, 1-16. https://doi.org/10.1186/s12889-020-08701-w

Haar, K., El-Khani, A., Mostashari, G., Hafezi, M., Malek, A., & Maalouf, W. (2021). Impact of a brief family skills training programme ("Strong Families") on parenting skills, child psychosocial functioning, and resilience in Iran: A multisite controlled trial. *International Journal of Environmental Research and Public Health, 18*(21). https://doi.org/10.3390/ijerph182111137

Happé, F. G. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and normal children, and adults. *Journal of Autism and Developmental Disorders, 24*(2), 129-154. https://doi.org/10.1007/BF02172093

Hari, R., Henriksson, L., Malinen, S., & Parkkonen, L. (2015). Centrality of social interaction in human brain function. *Neuron, 88*(1), 181–193. https://doi.org/10.1016/j.neuron.2015.09.022

Hassan, R. (2020). Digitality, virtual reality and the 'empathy machine'. *Digital Journalism, 8*(2), 195-212. https://doi.org/10.1080/21670811.2018.1517604

Hoffman, S. G., Doan, S. N., Sprung, M., Wilson, A., Ebesutani, C., Andrews, L. A., Curtiss, J., Harris, P. L. (2016). Training children's Theory-of-Mind: A meta-analysis of controlled studies. *Cognition, 150*, 200–212. https://doi.org/10.1016/j.cognition.2016.01.006

Imuta, K., Henry, J. D., Slaughter, V., Selcuk, B., & Ruffman, T. (2016). Theory of Mind and prosocial behavior in childhood: A meta-analytic review. *Developmental Psychology, 52*(8), 1192–1205. https://doi.org/10.1037/dev0000140

Ingram, K. M., Espelage, D. L., Merrin, G. J., Valido, A., Heinhorst, J., & Joyce, M. (2019). Evaluation of a virtual reality enhanced bullying prevention curriculum pilot trial. *Journal of Adolescence, 71*, 72-83. https://doi.org/10.1016/j.adolescence.2018.12.006

Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior, 9*, 441–476. https://doi.org/10.1016/j.avb.2003.03.001

Junttila, N., Voeten, M., Kaukiainen, A., & Vauras, M. (2006). Multisource assessment of children's social competence. Educational and psychological measurement, 66(5), 874-895.

Kane-Berman, J. S., & Cronjé, F. (2007). *South Africa Survey, 2006/2007*. Johannesburg: South African Institute of Race Relations.

Kärnä, A., Voeten, M., Little, T. D., Poskiparta, E., Alanen, E., & Salmivalli, C. (2011). Going to scale: A nonrandomized nationwide trial of the KiVa antibullying program for grades 1–9. *Journal of Consulting and Clinical Psychology, 79*(6), 796. https://doi.org/10.1037/a0025740

Kärnä, A., Voeten, M., Little, T. D., Poskiparta, E., Kaljonen, A., & Salmivalli, C. (2011). A large-scale evaluation of the KiVa antibullying program: Grades 4-6. *Child Development, 82*(1), 311-330. https://doi.org/10.1111/j.1467-8624.2010.01557.x

Kaufman, E. A., Xia, M., Fosco, G., Yaptangco, M., Skidmore, C. R., & Crowell, S. E. (2016). The Difficulties in Emotion Regulation Scale Short Form (DERS-SF): Validation and replication in adolescent and adult samples. *Journal of Psychopathology and Behavioral Assessment, 38*, 443-455. https://doi.org/10.1007/s10862-015-9529-3

Kelm, Z., Womer, J., Walter, J. K., & Feudtner, C. (2014). Interventions to cultivate physician empathy: A systematic review. *BMC Medical Education*, *14*(1), 1-11. https://doi.org/10.1186/1472-6920-14-219

Kim, E., Jackman, M. M., Jo, S. H., Oh, J., Ko, S. Y., McPherson, C. L., Hwang, Y. S., & Singh, N. N. (2020). Effectiveness of the mindfulness-based OpenMind-Korea (OM-K) preschool program. *Mindfulness, 11*(4), 1062-1072. https://doi.org/10.1007/s12671-020-01337-2

Kim, J. Y. (2007). *The effects of pre-schoolers' temperament, marital conflict and preschoolers' emotion regulation on problem behaviour*. Unpublished master's thesis, Seoul: Ewha Womans University.

Koth, C. W., Bradshaw, C. P., & Leaf, P. J. (2009). Teacher observation of classroom adaptation-checklist: Development and factor structure. *Measurement and Evaluation in counseling and development, 42*(1), 15-30. https://doi.org/10.1177/0748175609333560

Kourmousi, N., Markogiannakis, G., Lazaridis, I., Kolli-opoulou, K., Papoutsaki, K., Kounenou, K., Tza-vara, C., & Koutras, V. (2017) Validity and reliability of an adaptation of personal and social skills scale for K-students for use in 2.691 Greek elementary students. *Creative Education, 8*, 2352-2376. https://doi.org/10.4236/ce.2017.814161.

Kourmousi, N., Markogiannakis, G., Tzavara, C., Kounenou, K., Mandrikas, A., Christopoulou, E., & Koutras, V. (2018). Students' psychosocial empowerment with the 'steps for life' personal and social skills Greek elementary programme. *International Electronic Journal of Elementary Education, 10*(5), 535-549. https://doi.org/10.26822/iejee.2018541303

Kreplin, U., Farias, M., & Brazil, I. A. (2018). The limited prosocial effects of meditation: A systematic review and meta-analysis. *Scientific Reports, 8*(1), 2403 https://doi.org/10.1038/s41598-018-20299-z.

Lagattuta, K. H., Sayfan, L., & Bamford, C. (2012). Do you know how I feel? Parents underestimate worry and overestimate optimism compared to child self- report. *Journal of Experimental Child Psychology*, *113*(2), 211-232. https://doi.org/10.1016/j.jecp.2012.04.001

Landis, J. R., & Koch, G. G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, 363-374. https://doi.org/10.2307/2529786

Larose, M. P., Ouellet-Morin, I., Vergunst, F., Vitaro, F., Girard, A., Tremblay, R. E., Brendgen, M., & Côté, S. M. (2020). Examining the impact of a social skills training program on preschoolers' social behaviors: A cluster-randomized controlled trial in childcare centers. *BMC Psychology, 8*(1). https://doi.org/10.1186/s40359-020-00408-2

Lecce, S., Bianco, F., Devine, R., Hughes, C., & Banerjee, R. (2014). Promoting theory of mind in middle childhood: A training program. *Journal of Experimental Child Psychology, 126*, 52–67. https://doi.org/10.1016/j.jecp.2014.03.002

Lee, H. J. (1996). The effect of prosocial behavioral training on age- and gender-related children's prosocial moral reasoning, social responsibility, and prosocial behavior motivation. [Unpublished doctoral dissertation, Daegu, Korea: Kyungpook National University].

Li, H., & Zhang, Q. (2022). Effects of prosocial video games on prosocial thoughts and prosocial behaviors. *Social Science Computer Review*, 1-8. https://doi.org/10.1177/08944393211069599

Li, J., Huang, Z., Si, W., & Shao, T. (2022). The effects of physical activity on positive emotions in children and adolescents: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health*, *19*(21), 14185. https://doi.org/10.3390/ijerph192114185

Lillard, A. S., & Kavanaugh, R. D. (2014). The contribution of symbolic skills to the development of an explicit theory of mind. *Child Development*, *85*(4), 1535-1551. https://doi.org/10.1111/cdev.12227

Lipschutz, B. D. (2010). The use of digital storytelling to improve the effectiveness of social and conflict resolution skill training for elementary students [Doctoral dissertation, Temple University].

Lovett, B. J., & Sheffield, R. A. (2007). Affective empathy deficits in aggressive children and adolescents: A critical review. *Clinical Psychology Review, 27*, 1-13. https://doi.org/10.1016/j.cpr.2006.03.003

Luo, L., Reichow, B., Snyder, P., Harrington, J., & Polignano, J. (2020). Systematic review and meta-analysis of classroom-wide social-emotional interventions for preschool children. *Topics in Early Childhood Special Education*. https://doi.org/10.1177/0271121420935579

Malcolm-Smith, S., Donald, K. A., du Plooy, C., Zar, H. & Stein, D.J. (2019). *Early developing theory of mind and self-regulation in the Drakenstein cohort: Examining differences across very low SES communities.* Paper presented at the 3rd Biennial Meeting of the International Convention for Psychological Science, Paris, March 2019.

Mar, R. A. (2011). Deconstructing empathy. *Emotion Review, 3*(1), 113-114. https://doi.org/10.1177/1754073910384158

McCoy, A., Holloway, J., Healy, O., Rispoli, M., & Neely, L. (2016). A systematic review and evaluation of video modelling, role-play and computer-based instruction as social skills interventions for children and adolescents with high-functioning autism. *Review Journal of Autism and Developmental Disorders*, *3*, 48-67. https://doi.org/10.1007/s40489-015-0065-6

Merrell, K. W. (2002). School Social Behavior Scales (2nd ed.). Baltimore, MD: Brooks.

Montroy, J. J., Bowles, R. P., Skibbe, L. E., & Foster, T. D. (2014). Social skills and problem behaviours as mediators of the relationship between behavioural self-regulation and academic achievement. *Early Childhood Research Quarterly*, *29*(3), 298-309. https://doi.org/10.1016/j.ecresq.2014.03.002

Muratori, P., Bertacchi, I., Catone, G., Mannucci, F., Nocentini, A., Pisano, S., & Lochman, J. E. (2020). Coping Power Universal for middle school students: The first efficacy study. *Journal of Adolescence, 79*, 49-58. https://doi.org/10.1016/j.adolescence.2019.12.014

Muratori, P., Bertacchi, I., Giuli, C., Lombardi, L., Bonetti, S., Nocentini, A., Manfredi, A., Polidori, L., Ruglioni, L., Milone, A., & Lochman, J. E. (2015). First adaptation of coping power program as a classroom-based prevention intervention on aggressive behaviors among elementary school children. *Prev Sci, 16*(3), 432-439. https://doi.org/10.1007/s11121-014-0501-3

Muratori, P., Bertacchi, I., Giuli, C., Nocentini, A., Ruglioni, L., & Lochman, J. E. (2016). Coping power adapted as universal prevention program: Midterm effects on children's behavioral difficulties and academic grades. *Journal of Primary Prevention, 37*(4), 389-401. https://doi.org/10.1007/s10935-016-0435-6

Muratori, P., Bertacchi, I., Masi, G., Milone, A., Nocentini, A., Powell, N. P., Lochman, J. E., Jones, S., Kassing, F., & Romero, D. (2019). Effects of a universal prevention program on externalizing behaviors: Exploring the generalizability of findings across school and home settings. *Journal of School Psychology, 77*, 13-23. https://doi.org/10.1016/j.jsp.2019.09.002

Murray, L., De Pascalis, L., Tomlinson, M., Vally, Z., Dadomo, H., MacLachlan, B., Woodward, C., & Cooper, P. J. (2016). Randomized controlled trial of a book-sharing intervention in a deprived South African community: Effects on carer-infant interactions, and their relation to infant cognitive and socio-emotional outcome. *Journal of Child Psychology and Psychiatry, 57*(12), 1370–1379. https://doi.org/10.1111/jcpp.12605

Neumann, M., Edelhäuser, F., Tauschel, D., Fischer, M. R., Wirtz, M., Woopen, C., Haramati, A., & Scheffer, C. (2011). Empathy decline and its reasons: A systematic review of studies with medical students and residents. *Academic Medicine, 86*(8), 996-1009. https://doi.org/10.1097/ACM.0b013e318221e615

Nieh, H. P., & Wu, W. C. (2018). Effects of a collaborative board game on bullying intervention: A group-randomized controlled trial. *Journal of School Health, 88*(10), 725-733. https://doi.org/10.1111/josh.12675

Nocentini, A., Zambuto, V., & Menesini, E. (2015). Anti-bullying programs and information and communication technologies (ICTs): A systematic review. *Aggression and Violent Behavior, 23*, 52–60. https://doi.org/10.1016/j.avb.2015.05.012

Nosek, M., Gifford, E. J., & Kober, B. (2014). Nonviolent Communication training increases empathy in baccalaureate nursing students: A mixed method study. *Journal of Nursing Education & Practice, 4*(10), 1-15. https://doi.org/10.5430/jnep.v4n10p1

O'Conner, R., De Feyter, J., Carr, A., Luo, J. L., & Romm, H. (2017). A Review of the Literature on Social and Emotional Learning for Students Ages 3-8. REL 2017-245. *Regional Educational Laboratory Mid-Atlantic*. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic.

O'Neill, J. M., Clark, J. K., & Jones, J. A. (2011). Promoting mental health and preventing substance abuse and violence in elementary students: A randomized control study of the Michigan model for health. *Journal of School Health, 81*(6), 320-330. https://doi.org/10.1111/j.1746-1561.2011.00597.x

Ornaghi, V., Brockmeier, J., & Gavazzi, I. G. (2011). The role of language games in children's understanding of mental states: A training study. *Journal of Cognition and Development, 12*(2), 239-259. https://doi.org/10.1080/15248372.2011.563487

Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan QCRI [Computer software and mobile app]. Qatar Computing Research Institute. https://doi.org/10.1186/s13643-016-0384-4

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., & Moher, D. (2021). Updating guidance for reporting systematic reviews: Development of the PRISMA 2020 statement. *Journal of Clinical Epidemiology, 134*, 103-112. https://doi.org/10.1016/j.jclinepi.2021.02.003

Paik, J. H., Duh, S., Lopez, C., & Rodriguez, R. (2022). Emotion knowledge and theory of mind among Chinese preschoolers: A curriculum-based approach. *Early Education and Development, 33*(5), 764-785. https://doi.org/10.1080/10409289.2021.1995258

Pears, K. C., & Fisher, P. A. (2005). Emotion understanding and theory of mind among maltreated children in foster care: Evidence of deficits. *Development and Psychopathology*, *17*(1), 47-65. https://doi.org/10.1017/S0954579405050030

Peltonen, K., Aalto, S., Vänskä, M., Lepistö, R., Punamäki, R. L., Soye, E., Watters, C., De Wal Pastoor, L., Derluyn, I., & Kankaanpää, R. (2022). Effectiveness of promotive and preventive psychosocial interventions on improving the mental health of Finnish-born and immigrant adolescents. *International Journal of Environmental Research and Public Health, 19*(6), Article 3686. https://doi.org/10.3390/ijerph19063686

Piek, J. P., Kane, R., Rigoli, D., McLaren, S., Roberts, C. M., Rooney, R., Jensen, L., Dender, A., Packer, T., & Straker, L. (2015). Does the Animal Fun program improve social-emotional and behavioural outcomes in children aged 4-6 years? *Human Movement Science, 43*, 155-163. https://doi.org/10.1016/j.humov.2015.08.004

Pileggi, L. A. (2018). *Investigating correlates of aggressive behaviour in South African children and young adolescents living in the Western Cape: The role of empathy.* [Doctoral dissertation, University of Cape Town].

Pingault, J-B., Côté, S. M., Lacourse, E., Galera, C., Vitaro, F., & Tremblay, R. E. (2013). Childhood hyperactivity, physical aggression, and criminality: A 19-year prospective population-based study. *PLoS One, 8*, 1-7. https:/doi.org/10.1371/journal.pone.0062594

Pinnock, D. (2016). *Gang Town*. NB Publishers.

Pinto-Escalona, T., Gobbi, E., Valenzuela, P. L., Bennett, S. J., Aschieri, P., Martin-Loeches, M., Paoli, A., & Martinez-de-Quel, O. (2021). Effects of a school-based karate intervention on academic achievement, psychosocial functioning, and physical fitness: A multi-country cluster randomized controlled trial. *Journal of Sport and Health Science*. https://doi.org/10.1016/j.jshs.2021.10.006

Poyhonen, V., & Salmivalli, C. (2008). New directions in research and practice addressing bullying: Focus on defending behavior. In D. Pepler & W. Craig (Eds.), An international perspective on understanding and addressing bullying (PREVNet Publication Series, 1, pp. 26–43). AuthorHouse.

Preston, S. D. (2007). A perception-action model for empathy. *Empathy in Mental Illness, 1*, 428-447.

Rakoczy, H. (2022). Foundations of theory of mind and its development in early childhood. *Nature Reviews Psychology*, *1*(4), 223-235. https://doi.org/10.1038/s44159-022-00037-z

Rameson, L. T., & Lieberman, M. D. (2009). Empathy: A social cognitive neuroscience approach. *Social and Personality Psychology Compass*, *3*(1), 94-110.

Richter, L. M., Mathews, S., Kagura, J., & Nonterah, E. (2018). A longitudinal perspective on violence in the lives of South African children from the birth to twenty plus cohort study in Johannesburg-Soweto. *South African Medical Journal, 108*(3), 181-186. doi: 10.7196/SAMJ.2018.v108i3.12661

Rodriguez-Ayllon, M., Cadenas-Sánchez, C., Estévez-López, F., Muñoz, N. E., Mora-Gonzalez, J., Migueles, J. H., Molina-García, P., Henriksson, H., Mena-Molina, A., Martínez-Vizcaíno, V., Catena, A., Löf, M., Erickson, K. I., Lubans, D. R., Ortega, F. B., & Esteban-Cornejo, I. (2019). Role of physical activity and sedentary behavior in the mental health of preschoolers, children, and adolescents: A systematic review and meta-analysis. *Sports Medicine, 49*(9), 1383-1410. https://doi.org/10.1007/s40279-019-01099-5

Saarento, S., Boulton, A. J., & Salmivalli, C. (2015). Reducing bullying and victimization: Student-and classroom-level mechanisms of change. *Journal of Abnormal Child Psychology, 43*(1), 61-76. https://doi.org/10.1007/s10802-013-9841-x

Saleme, P., Pang, B., Dietrich, T., & Parkinson, J. (2020). Prosocial digital games for youth: A systematic review of interventions. *Computers in Human Behavior Reports, 2*. https://doi.org/10.1016/j.chbr.2020.100039

Sánchez, R., Gutiérrez, M. L., Alcántara, V., Gaytán, L., Díaz, A., González, T., & Villatoro, J. A. (2019). Design and validation of two scales to measure social skills in elementary school: Children and caregivers' version. Salud Mental (in press).

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental Psychology, 51*(1), 52-66. https://doi.org/10.1037/a0038454

Schonert-Reichl, K. A., Smith, V., Zaidman-Zait, A., & Hertzman, C. (2012). Promoting children's prosocial behaviors in school: Impact of the "Roots of Empathy" program on the social and emotional competence of school-aged children. *School Mental Health, 4*, 1–21. https://doi.org/10.1007/s12310-011-9064-7

Seedat, M., Van Niekerk, A., Jewkes, R., & Ratele, K. (2009). Violence and injuries in South Africa: Prioritising an agenda for prevention. *The Lancet, 374*, 1011- 1022.

Shaffer, D. R., & Kipp, K. (2010). *Developmental psychology: Childhood and adolescence*. Cengage Learning.

Shechtman, Z., Wade, N., & Khoury, A. (2009). Effectiveness of a forgiveness program for Arab Israeli adolescents in Israel: An empirical trial. *Peace and Conflict, 15*(4), 415-438. https://doi.org/10.1080/10781910903221194

Shields, A., & Cicchetti, D. (1997). Emotion regulation among school-age children: the development and validation of a new criterion Q-sort scale. *Developmental Psychology, 33*(6), 906–916.

Silke, C., Brady, B., Boylan, C., & Dolan, P. (2018). Factors influencing the development of empathy and pro-social behaviour among adolescents: A systematic review. *Children and Youth Services Review, 94*, 421-436.

Silverman, S. R., Schertz, L. A., Yuen, H. K., Lowman, J. D., & Bickel, C. S. (2012). Systematic review of the methodological quality and outcome measures utilized in exercise interventions for adults with spinal cord injury. *Spinal Cord*, *50*(10), 718-727. https://doi.org/10.1038/sc.2012.78

Smith, S., Barajas, K., Ellis, B., Moore, C., McCauley, S., & Reichow, B. (2021). A meta-analytic review of randomized controlled trials of the good behavior game. *Behavior Modification*, *45*(4), 641-666. https://doi.org/10.1177/0145445519878670

South African Council of Educators (SACE). (2011). *School-based violence report: An overview of school-based violence in South Africa*. SACE.

Statistics South Africa. (2018). *Crime Against Women in South Africa: An In-Depth Analysis of the Victims of Crime Survey Data* (No. 03-40-05). https://www.statssa.gov.za/publications/Report-03-40-05/Report-03-40-05June2018.pdf

Sutton, J., Smith, P. K., & Swettenham, J. (1999). Social cognition and bullying: Social inadequacy or skilled manipulation? *British Journal of Developmental Psychology, 17*, 435-450. https://doi.org/10.1348/026151099165384

Takagishi, H., Kameshima, S., Schug, J., Koizumi, M., & Yamagishi, T. (2010). Theory of mind enhances preference for fairness. *Journal of Experimental Child Psychology, 105*(1-2), 130-137.

Tan, L. B., Lo, B. C., & Macrae, C. N. (2014). Brief mindfulness meditation improves mental state attribution and empathizing. *PLoS One, 9*(10), e110510. https://doi.org/10.1371/journal.pone.0110510.

Thulin, E. J., Lee, D. B., Eisman, A. B., Reischl, T. M., Hutchison, P., Franzen, S., & Zimmerman, M. A. (2022). Longitudinal effects of Youth Empowerment Solutions:

Preventing youth aggression and increasing prosocial behavior. *American Journal of Community Psychology, 70*(1-2), 75-88. https://doi.org/10.1002/ajcp.12577

Tompkins, V. (2015). Improving low-income preschoolers' theory of mind: A training study. *Cognitive Development, 36*, 1-19. https://doi.org/10.1016/j.cogdev.2015.07.001

Tremblay, R. E. (2000). The development of aggressive behaviour during childhood: What have we learned in the past century?. *International Journal of Behavioural Development*, *24*(2), 129-141.

Upshur, C. C., Wenz-Gross, M., Rhoads, C., Heyman, M., Yoo, Y., & Sawosik, G. (2019). A randomized efficacy trial of the second step early learning (SSEL) curriculum. *Journal of Applied Developmental Psychology, 62*, 145-159. https://doi.org/10.1016/j.appdev.2019.02.008

Vachon, D. D., Lynam, D. R., & Johnson, J. A. (2013). The (Non)Relation Between Empathy and Aggression: Surprising Results from a Meta-Analysis. *Psychological Bulletin, 140*, 751-773. https://doi.org/10.1037/a0035236

Van der Graaff, J., Carlo, G., Crocetti, E., Koot, H. M., & Branje, S. (2018). Prosocial behavior in adolescence: Gender differences in development and links with empathy. *Journal of Youth and Adolescence*, *47*(5), 1086-1099. https://doi.org/10.1007/s10964-017-0786-1

Van der Graaff, J., Meeus, W., De Wied, M., van Boxtel, A., van Lier, P. A., Koot, H. M., & Branje, S. (2016). Motor, affective, and cognitive empathy in adolescence: Interrelations between facial electromyography and self-reported trait and state measures. *Cognition and Emotion*, *30*(4), 745-761.

van Langen, M. A. M., Wissink, I. B., van Vugt, E. S., van der Stouwe, T., & Stams, G. J. J. M. (2014). The relation between empathy and offending: A meta-analysis. *Aggression and Violent Behavior, 19*, 179-189. https://doi.org/10.1016/j.avb.2014.02.003

Van Wyhe, K. S., Van de Water, T., Boivin, M. J., Cotton, M. F., & Thomas, K. G. (2017). Cross-cultural assessment of HIV-associated cognitive impairment using the Kaufman assessment battery for children: A systematic review. *Journal of the International AIDS Society*, *20*(1), 21412. https://doi.org/10.7448/ias.20.1.21412

Viglas, M., & Perlman, M. (2018). Effects of a mindfulness-based program on young children's self-regulation, prosocial behavior, and hyperactivity. *Journal of Child & Family Studies, 27*(4), 1150-1161. https://doi.org/10.1007/s10826-017-0971-6

Ward, C. L., & Cooper, A. (2012). Gangs and child safety. In A. van Niekerk, S. Suffla, & M. Seedat (Eds.), *Crime, violence, and injury in South Africa: 21st century solutions*

for child safety (pp. 148-161). Tygerberg: MRC-University of South Africa Safety and Peace Promotion Research Unit.

Warrier, V., Toro, R., Chakrabarti, B., Børglum, A. D., Grove, J., & Agee, M. (2018). Genome-wide analyses of self-reported empathy: Correlations with autism, schizophrenia, and anorexia nervosa. *Transl Psychiatry*, *8,* 35. https://doi.org/10.1038/s41398-017-0082-6

Wellman, H. M. (1991). From desire to beliefs: Acquisition of a theory-of-mind. In A. Whiten (Ed.), Natural theories of mind. Evolution, development, and simulation of everyday mindreading (19–38). Oxford: Blackwell.

Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development, 75*(2), 523-541.

Wellman, H. M., & Wooley, J. D. (1990). From simple desires to ordinary beliefs: The early development of everyday psychology. *Cognition, 35*, 245–275. https://doi.org/10.1016/0010-0277(90)90024-E

White, S., Hill, E., Happé, F., & Frith, U. (2009). Revisiting the strange stories: Revealing mentalizing impairments in autism. *Child Development, 80*(4), 1097-1117. https://doi.org/10.1111/j.1467-8624.2009.01319.x

Williams, A., O'Driscoll, K., & Moore, C. (2014). The influence of empathic concern on prosocial behavior in children. *Frontiers in Psychology, 5*, 425. https://doi.org/ 10.3389/fpsyg.2014.00425.

Wong, K. K. (2021). *Examining the relationships among parental mind-mindedness, parental connected talk, mental-state talk, and children's social understanding: a longitudinal study* (Doctoral dissertation, University of Birmingham).

World Health Organization. (2023). Adolescent health. Retrieved from https://www.who.int/health-topics/adolescent-health#tab=tab_1

Wray-Lake, L., & Syvertsen, A. (2011). The developmental roots of social responsibility in childhood and adolescence. In C. Flanagan & B. Christens (Eds.), Youth development: Work at the cutting edge. *New Directions for Child and Adolescent Development, 134*, 11-25. https://doi.org/10.1002/cd.308

Yazdi, A. A., German, T. P., Defeyter, M. A., & Siegal, M. (2006). Competence and performance in belief-desire reasoning across two cultures: The truth, the whole truth and nothing but the truth about false belief?. *Cognition, 100*(2), 343-368. https://doi.org/10.1016/j.cognition.2005.05.004

Zaki, J., & Ochsner, K. N. (2012). The neuroscience of empathy: Progress, pitfalls, and promise. *Nature Neuroscience, 15*(5), 675-680. https://doi.org/10.1038/nn.3085

Appendix A

PRISMA-P 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

Appendix B

UCT Department of Psychology Ethical Approval

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

07 July 2021

Ashlee Blacher
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Ashlee

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *A Systematic Review of the Methods for Teaching Empathy in Adult and Child Samples.* The reference number is PSY2021-024.

I wish you all the best for your study.

Yours sincerely

Signed by candidate

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

Appendix C

Modified Downs and Black (1998) Checklist

Item	Criteria	Range			Total
	Reporting				0
1	Is the hypothesis/aim/objective of the study clearly described?	yes (1)	no (0)	-	
2	Are the main outcomes to be measured clearly described in the Introduction or Methods section?	yes (1)	no (0)	-	
3	Are the characteristics of the patients included in the study clearly described?	yes (1)	no (0)	-	
4	Are the interventions of interest clearly described?	yes (1)	no (0)	-	
5	Are the distributions of principal confounders in each group of subjects to be compared clearly described?	yes (2)	partial (1)	no (0)	
6	Are the main findings of the study clearly described?	yes (1)	no (0)	-	
7	Does the study provide estimates of the random variability in the data for the main outcomes?	yes (1)	no (0)	-	
8	Have all important adverse events that may be a consequence of the intervention been reported?	yes (1)	no (0)	-	
9	Have the characteristics of patients lost to follow-up been described?	yes (1)	no (0)	-	
10	Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?	yes (1)	no (0)	-	
	External Validity				0
11	Were the subjects asked to participate in the study representative of the entire population from which they were recruited?	yes (1)	no (0)	u (0)	
12	Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	yes (1)	no (0)	u (0)	
13	Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive?	yes (1)	no (0)	u (0)	
	Internal Validity - Bias				0
14	Was an attempt made to blind study subjects to the intervention they have received?	yes (1)	no (0)	u (0)	
15	Was an attempt made to blind those measuring the main outcomes of the intervention?	yes (1)	no (0)	u (0)	
16	If any of the results of the study were based on "data dredging", was this made clear?	yes (1)	no (0)	u (0)	
17	In trials and cohort studies, do the analyses adjust for different lengths of followup of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls?	yes (1)	no (0)	u (0)	
18	Were the statistical tests used to assess the main outcomes appropriate?	yes (1)	no (0)	u (0)	
19	Was compliance with the intervention/s reliable?	yes (1)	no (0)	u (0)	
20	Were the main outcome measures used accurate (valid and reliable)?	yes (1)	no (0)	u (0)	
	Internal validity – confounding (selection bias)				0
21	Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population?	yes (1)	no (0)	u (0)	
22	Were study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time?	yes (1)	no (0)	u (0)	
23	Were study subjects randomized to intervention groups?	yes (1)	no (0)	u (0)	
24	Was the randomised intervention assignment concealed from both patients and health care staff until recruitment was complete and irrevocable?	yes (1)	no (0)	u (0)	
25	Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	yes (1)	no (0)	u (0)	
26	Were losses of patients to follow-up taken into account?	yes (1)	no (0)	u (0)	
27	Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%?	present (1)	not (0)	-	
	DOWNS & BLACK OVERALL TOTAL				0

Appendix D

Coding Script for ICC Analysis

```
#Packages required for analysis
library(pacman)
p_load(tidyverse, janitor, psych, knitr, magrittr, car, rstanarm,
       patchwork, PerformanceAnalytics, broom, caret, ggpmisc, irr)
# Create an empty data frame with 48 rows and 2 columns
df_data <- data.frame(matrix(nrow = 48, ncol = 2))

# Add column names to the data frame
colnames(df_data) <- c("Ashlee", "Kim")

# Fill the data frame with sample data (replace this with actual data)
df_data$Ashlee <- rnorm(48, mean = 50, sd = 10)
df_data$Kim <- rnorm(48, mean = 55, sd = 15)

# Check the dimensions of the data frame
dim(df_data)
```

```
# Replace sample data with actual data
df_data$Ashlee <- c(23, 23, 22, 21, 23, 18, 21, 23, 20, 16, 24, 23, 26, 24,
23, 24, 24, 19, 20, 25, 18, 22, 20, 23, 24, 23, 21, 23, 24, 18, 21, 20, 23,
21, 18, 21, 25, 18, 18, 23, 19, 26, 23, 18, 22, 22, 23, 22)
df_data$Kim <- c(23, 23, 22, 21, 23, 18, 21, 22, 20, 13, 25, 23, 25, 24, 23
, 24, 25, 18, 20, 25, 18, 22, 20, 23, 23, 23, 20, 21, 24, 19, 21, 20, 23, 2
1, 18, 21, 25, 19, 18, 22, 19, 25, 22, 17, 22, 22, 23, 22)
```

```
icc(df_data, model="twoway", type="agreement", unit="single")
```