

**Conflict, Social Communication Deficits and Behavioural
Inflexibility in Primary School Children**


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2009

A report submitted as a partial requirement for the degree of Masters of Clinical Psychology at the University of Tasmania, 2009.

I declare that this report is my own original work and that contributions of others have been duly acknowledged.



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Acknowledgements

The author would like to recognize the advice and encouragement of Dr Vanessa Green and Professor Jeff Sigafoos – thank you for your support.

Many thanks also to Dr Nenagh Kemp whose time, comments and statistical advice were greatly appreciated.

Much gratitude is due to my family - Jon, Abi and Ellie – thanks for your support, words of encouragement and for putting up with me studying, yet again.

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Literature Review

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Abstract

The problem of disruptive behaviour displayed by primary school children has been an issue in schools for over the last three decades, but has recently resurfaced again as a major social concern. As public concern has risen, so have expectations that this problem area should be managed more effectively by school staff. This review will explore, within a school context, the link between disruptive externalized behaviours and social communication deficits, which are regarded as a key antecedent to disruptive externalized behaviours. In particular, the origins of social communication deficits, displayed by non pathological primary school children, will be explored in order to understand the types of interventions that may be effective for these children. A review of evidence-based social skills training programs and their related successful outcomes will be explored and this will be followed by an analysis of gaps in the research in order to determine future research areas.

Chapter 1: Literature Review

Section 1 – Definitions

Low levels of conflict amongst primary school children may be linked with improvements in developing social coping mechanisms such as resilience (Green & Rechis, 2006). In contrast, moderate to high levels of conflict between primary school children are aversive, causing concern for children and educators alike. Research on conflict is associated with poorer outcomes for both perpetrator and victims including the development of aggressive behaviours (both physical and verbal), increased frustration, anger and Off-Task behaviours by the perpetrator, whilst fears for personal safety, anger, frustration, distress and Off-Task behaviours may be experienced by the victim with whom the conflict has arisen (Aber, Brown, & Jones, 2003).

Conflict can be defined as a disagreement between two (or more) people (Atici, 2007). Within in a primary school context, conflict can be regarded as the observed disruptive behaviour that arises because of a disagreement and notably, this disruptive behaviour is often inappropriate to the situation in which it occurs, e.g. yelling, punching (Jordan & Metais, 1997). Disruptive behaviours, or behavioural problems, are conceptualized to include behaviours that contribute to the diagnosis of disorders such as Conduct Disorder or Oppositional Defiance Disorder, but also include non-diagnosed children who display early signs of disruptive behaviours. Disruptive disorders are commonly categorized into two behavioural groups: externalizing behaviours (e.g., yelling, punching, ignoring adult requests), and internalizing behaviours (e.g., shyness, inability to make eye contact, selective mutism) and may occur for a host of reasons, including mutual conflict over the

rules of a game, access to objects, or as a response to physical or verbal taunts (Baker, Grant, & Morlock, 2008; Repetti, Taylor, & Seeman, 2002). This literature review will focus upon disruptive externalizing behaviours only.

Disruptive externalized behaviours generally denote either antisocial behaviour or aggressive behaviour (Frey, Hirschstein, Snell, Edstrom, MacKenzie, & Broderick, 2005). Antisocial behaviour can be considered the larger model within which aggression lies and is a pervasive pattern of negative and aggressive behaviours that typically begin in childhood and continue through into adulthood (Brotman, Gouley, Huang, Rosenfelt, O'Neal, & Klein, 2008). Aggressive behaviours are defined as strong feelings of displeasure that involve a sense of antagonism towards others (Gansle, 2005). As these concepts are interdependent, similar outcomes are associated with the two, including physically disruptive behaviour (e.g., smashing, damaging or defacing objects, throwing objects, physically annoying other pupils), aggressive behaviour (e.g., hitting, pulling hair, kicking, pushing, using abusive language, biting), socially disruptive behaviour (e.g., screaming, running away, exhibiting temper tantrums), poor quality interpersonal relationships including poor verbal communication with others, authority-challenging behaviour (e.g., refusing to carry out requests, exhibiting defiant verbal and non-verbal behaviour, using pejorative language), poor quality academic work including high levels of Off-Task behaviour, and poor quality social experiences such as low levels of friendships, exclusion by other school children and difficulties in maintaining friendships (Dawson & Sheppard, 1998; Gansle, 2005). Both antisocial behaviour and aggression are

viewed within the literature as types of negative social behaviours children use in order to gain a sense of control over their environment (Frey et al., 2005).

For the purposes of this literature review, the term *disruptive externalized behaviour* will be used to include both antisocial and aggressive behaviours in primary school children. In particular, this review will also focus on disruptive externalized behaviours stemming from social communication deficits, as opposed to being caused by development disorders, or other pervasive developmental problems.

Conflict and Social Communication Deficits – The Link

In primary school settings, students with social communication deficits have been shown to have greater difficulties in stating their needs and negotiating suitable collaborative outcomes, compared to their peers. As these children's poor social skills inhibit effective communication, which is an essential component of conflict resolution, they are more likely to initiate externalized disruptive behaviours to overcome deficits in appropriate social communication skills, including communicating needs and negotiating appropriate outcomes (Atici, 2007; Cook, Gresham, Kern, Barreras, Thornton, & Crews, 2008; Cooper, Paske, Goodfellow, & Mulheim, 2002; Frey et al., 2005; Laursen, Finklestein, & Betts, 2001; Posner & Rothbart, 2000; Sadock & Sadock, 2003; Schmidt, Burts, Durham, Charlesworth, & Hart, 2007).

Research has shown that children with social communication deficits are more prone to repeating inappropriate externalized coping behaviours, regardless of situational context, due to both a proactive aggressive feedback loop (in which the externalized behaviour

(e.g., aggression) brings forth the desired outcome) and a lack of social competency skills to handle the situation in a more appropriate manner (Herbert-Myers, Guttertag, Swank, Smith, & Landry, 2006). Thus the child's learned behavioural style becomes rigid and remains inflexible to the contextual situation, leading to problems of behavioural inflexibility. As a large amount of time at school is spent engaging in classroom activities and rule-based games that require cooperation, children with poor social communication skills and rigid behavioural traits consequently face greater difficulties across a number of social and educational domains.

Summary

This literature review focuses on primary school children who experience social communication deficits, and who express those deficits through disruptive externalizing behaviours. The outcomes of poor social communication skills on academic and social outcomes will be considered, followed by an analysis of the developmental theories of social competence and communication skills. Further, the link between social communication deficits, emotional regulation and behavioural inflexibility leading to externalizing disruptive behaviours will be explored, along with recent interventions that improve social communication skills in children who are more prone to engaging in moderate to high levels of disruptive behaviour. The later part of this review will consider current research gaps in the field of social communication deficits causing disruptive behaviour and behavioural inflexibility and offer suggestions for future research.

Section 2 – Effects of Social Communication Deficits and Disruptive externalized behaviours.

The link between disruptive behaviour and social communication deficits is important, as children with social communication deficits who engage in disruptive externalized behaviours that remain untreated are at greater risk of future academic, social and emotional failure. This in turn may lead to poorer social, emotional and psychological outcomes as adults.

From a basic survival premise, the resolution of conflict is important in maintaining supportive and collaborative relationships between individuals and groups (Horowitz, Jansson, Ljungberg, & Hedenbro, 2006). In particular, the ability of young children to communicate a range of reconciliatory behaviours that include negotiation and collaboration is important in developing and maintaining positive relationships.

Reconciliation of conflict has been shown to facilitate increases in prosocial behaviour and interactions, decrease future aggression and conflict and lead to more supportive and harmonious group environments (Horowitz et al., 2006), with positive effects on social and academic trajectories.

Conversely, children with poor social competencies are more likely to engage in disruptive externalizing behaviours as a coping mechanism for reduced communication abilities (Herbert-Myers et al., 2006). Unfortunately, many studies have shown that such disruptive externalized behaviours, if left untreated, occur along a continuum of increasing behavioural severity as the child matures, indicating that children with poor

social skills in primary school will often (without intervention) struggle to achieve normal teenage/adult developmental markers (Law & Sivy, 2003). This includes completing education, securing and maintaining work and enjoying stable relationships (Cummings, Kaminski, & Merrell, 2008). Other studies have linked proactive aggression and conflict in primary school years with delinquency and increases in crime rates in the teenage years (Fife, Colder, Lochman, & Wells, 2008) and social communication incompetence to anti-social behaviour, delinquency, socially disruptive behaviour and psychological disturbances (Bierman et al., 2002; Cunningham et al., 1998; Eddy, Reid, & Fetrow, 2000; Schmidt et al., 2007; Singer & Flannery, 2000). Interestingly, other research has shown that teachers may perceive problems in social communication as non-compliance, inattentiveness or social withdrawal, thus attributing negative markers to these children. Gouley, Brotman, Huang and Shrout (2008) identified that children's early social competency skills are important predictors of later social adjustments and psychopathology and that reducing disruptive externalized behaviours by developing programs to assist 'at risk' children has clear individual and public health benefits from a social and economic perspective. Therefore the evidence suggests that providing early social communication interventions can help prevent an escalation of disruptive externalizing behavioural problems and that early interventions may assist in developing better outcomes for the child (Brotman et al., 2008; Farmer & Farmer, 2001). The following reviews of trajectories of primary school aged children with poor social communication and conflict resolution skills supports the link between the need for early intervention and healthy psychosocial outcomes.

Academic success is not only about being able to benefit from academic instruction but also being able to follow class routines, being able to move from one physical location to another (behavioural flexibility), being able to change academic instruction, manage time in and around the classroom and be able to interact successfully with peers (Thatcher, Fletcher, & Decker, 2008).

Primary school children who display disruptive behaviours are at greater risk of academic failure, including premature school drop-out, than those school children who do not display disruptive behaviours, as the behaviour interferes with their acquisition of age-appropriate behavioural and academic skills, as listed above (Campbell, Izard, Mostow, & Trentacosta, 2002; Elias & Haynes, 2008; McClelland & Morrison, 2003). In a cyclical pattern, disruptive behaviour causes deficits in learning leading to further behavioural difficulties as the child acts against their inability to cope both academically and socially. It has been noted that children in this negative cycle tend to participate less in classroom activities, maintain less focus and attention during difficult tasks, are more disengaged and are more non-compliant to teacher requests than their peers (Carr, Taylor, & Robinson, 1991). Subsequently, these children have fewer opportunities to develop a broad range of cognitive abilities and achievements, placing them further behind their peers and negatively affecting their future academic trajectories.

Children with disruptive externalized behavioral problems are considerably more difficult to teach than their peers, place greater demands on teaching staff and limit individual attention on class peers. As these children have poor social communication skills, they

are generally appear less interested in learning, have trouble following directions, and lack the self-control to cooperate individually and in a group situation (Arnold, 1999; Rimm-Kaufman, Pianta, & Cox, 2000). This places more stress upon teachers and often requires a commitment of more time and energy to deal with the individual child as opposed to the class as a whole (Atici, 2007; Balderson & Sharpe, 2005; Bub, McCartney, & Willett, 2007; Joseph & Strain, 2003). Often this behaviour sets them apart and against both class peers and teachers, further exacerbating their social communication and conflict resolution deficits.

Social communication skills are fundamental for building positive peer interaction which aids social and academic success. The breadth and richness of learnt social skills from peer/classroom experiences is dependent upon a child being exposed to and participating in a range of activities and being able to effectively communicate in varying situational contexts. Some of the social communication challenges faced by primary school children include negotiating new friendship roles, using language skills to mediate higher levels of cognitive functioning, and being able to use effective communication skills to regulate complex social interactions (which may involve listening to and understanding another's perspective). As children mature, the demands on their personal repertoire of language and communication become progressively more complex, particularly within the school setting, as children are exposed to a wide range of increasingly complex and unpredictable social contexts.

Children with social communication deficits often function poorly in classroom and peer settings as their difficulties interfere with their ability to appropriately communicate. Subsequently they tend to be more frequently rejected by their peers and exposed to fewer positive social and conflict resolution communication experiences (Joseph & Strain, 2003). Developmentally, fewer social interactions lead to inhibited adaptive emotional regulation (e.g., becoming very angry when they don't get what they want) and less behavioural flexibility (e.g., continued shouting and arguing) (Laible, Carlo, Torquati, & Ontai, 2004). This inhibited social deficit can lead to a negative attitude towards school and therefore an increased risk of lower academic success, retention and social competency development (Bub et al., 2007; Vitaro, Larocque, Janosz, & Tremblay, 2001).

Poor behavioural flexibility is the inability to emotionally, psychologically and physically adapt to changes in one's environment. It manifests as a resistance to adapt behaviour to changed circumstances and an attempt to maintain 'sameness' regardless of situational contexts (Green, Sigafos, Pituch, Itchon, O'Reilly, & Lancioni, 2006). Children who display disruptive externalized behavioural problems in primary school are generally demonstrating behavioural inflexibility, an inability to adapt behaviour to changes in circumstance, whether these changes be caused by playground conflict/upheaval, physically changing from one room to another, changing daily routine (e.g., school excursions) or a change in classroom teacher (Green et al., 2007; Pituch et al., 2007).

Behavioural flexibility difficulties are hypothesized to stem from social communication skills deficits and poor emotional regulation (Tremblay, 2000). Poor social communication skills inhibit a child's ability to effectively communicate their worries, frustrations and needs. Consequently they insist upon sameness in order to maintain control and predictability of their environment and because they lack alternative communication models that would enable them to adapt more effectively to situational and environmental change (Green et al., 2007). Emotional regulation is also strongly linked to positive social behaviour, and this ability is therefore also positively related to dealing with peer conflict. Unfortunately, children with social communication deficits are more likely to react immediately and with high intensity to conflict, and often misinterpret other children's actions. They are also noted to choose aggressive rather than passive solutions, and in general lack empathy for others (Cooper et al., 2002). Unfortunately, when children lack behavioural flexibility and have poor emotional regulation, they are forced to rely on disruptive externalized behaviour to maintain a semblance of situational control, rather than developing the skills necessary to regulate their emotions and express their anger and frustration in more prosocial ways (Pelco & Reed-Victor, 2007; Tremblay, 2000). A cyclical deleterious pattern is therefore formed where by social communication deficits lead to difficulties in regulating emotions which leads to behavioural inflexibility and therefore disruptive externalized behaviours as a coping mechanism.

Conclusion

Given the negative social and academic outcomes of disruptive externalized behaviour stemming from poor social communication skills it is necessary to develop early intervention and prevention programs which can assist in increasing social communication competencies. Doing so should aid in emotional regulation, the development of greater behavioural flexibility, and led to decreases in disruptive externalized behaviours (Degnan, Calkins, Keane, & Hill-Soderlund, 2008). In order to develop such programs, it is important to understand the processes involved in the development of social competency, and how these may differ in children who display externalizing behaviours in primary school (Myers & Pianta, 2008; Rimm-Kaufman et al., 2000).

Section 3 – Social Competency and Social Skills - Definitions and Developmental Processes

Social communication skills are embedded, along with other social behaviours, in the broader concept of 'social competence'. Social competence is a term used to describe the effectiveness of learnt social skills as demonstrated through socially appropriate behaviours (Rose-Krasnor, 1997). These behaviours include the quality of interactions perceived by others and appropriate problem solving skills (goal-directed behaviour that allows individuals to interact effectively with others, including the ability to regulate attention and emotional reactivity) (Cummings et al., 2008; Van Hecke et al., 2007). To be judged as socially competent, individuals need to demonstrate the ability to meet their own needs whilst engaging in or maintaining positive relationships with others (Green &

Rechis, 2006; Warnes, Sheridan, Geske, & Warnes, 2005). People who are considered to be socially competent tend to exhibit emotional regulation, advanced cognitive skills (problem solving and goal setting), and behavioural skills that reflect these positive attributes, and do so across the domains of home, school and the wider community (Elias & Haynes, 2008; Selman & Demorest, 1984). To be judged socially competent, children need to develop sound social communication skills in their pre and primary school years (Cooper et al., 2002; Posner & Rothbart, 2000; Sadock & Sadock, 2003).

According to Gresham, Cook, Crews, and Kern (2004), social communication skills are specific learnt behaviours a person exhibits in order to perform competently on a social task. Generally social skills development incorporates (a) learning a specific social skill, (b) enhancing skill performance, (c) reducing or eliminating competing problematic behaviour, and (d) facilitating generalization and maintenance of the skill. However, before discussing specific social skills training programs within the literature it is important to explore the origins of childhood social competency development.

Developmental science - A theory of social competence

There are a large number of theories embedded in the child development literature that attempt to explain why some individuals experience social communication skills deficits and others do not. Past research has focused on information processing models, individual temperament, neurological deficits, specific deficits in social-emotional adjustment (including Autism Spectrum Disorders, Language Impairments and Attention Deficit/Hyperactivity Disorders), and language deficits (including speech impediments,

language processing speed, poor language acquisition and auditory discrimination) (Coon, Carey, Corley, & Fulkner, 1992; Crick & Dodge, 1994; Green et al., 2007; Herbert-Myers et al., 2006). Recently within the literature, a newer meta-theoretical model, known as developmental science, has emerged to explain social skills deficits.

Developmental science focuses on processes by which both internal and external factors integrate and influence each other to shape learning. It gives insights into the critical interactions that cause and stimulate language acquisition (excluding pathological problems), social skills development, and the critical competency factors of effective communication, emotional and behavioural regulation (Farmer & Farmer, 2001).

Developmental science holds that social competence is a multi-factorial concept in which differing ecologies are combined into interrelated systems that support stable patterns of behaviour. These ecologies can promote positive or, conversely, problematic behavioural paths. When the system's ecologies are mostly comprised of negative risk factors (e.g., poor social skills role modeling, poor care giving, poor infant attachment, poor self-regulation, limited access to learning positive modified behavioural responses or behavioural patterns, limited resources available and poor socio economic status) the behavioural path that the individual develops is consequently also negative (Elias & Haynes, 2008). Farmer and Farmer (2002) found that systems that are composed of high levels of negatively correlated risk factors are more likely, than ecologies of positively correlated risk factors, to compromise social competency learning. Poor social competency learning may lead to increasingly problematic behaviour that continues to develop throughout childhood and into adulthood. Evidence suggests that there are three

critical and differing ecological environments that affect school children's development: family, classroom and school.

Families play an important role in the socialization of children prior to school entry.

Socialization encompasses not only the ability to acquire language but also the development of effective social communication skills (how and when language is used), as well as the development of positive emotional regulation and behavioural flexibility (Elias & Haynes, 2008). Evidence suggests that these factors are heavily shaped by a child's early home socialization experiences (Denham, Bassett, & Wyatt, 2007).

Socialization within the family occurs on multiple levels including the use of spoken language, listening and attentiveness skills and conversational interactions with others (Cole, Michel, & Teti, 1994; Denham et al., 2003; Landry, Smith, & Swank, 2006). In an adaptive home environment, young children learn language through integrated communication practice and repetition (e.g. learning speech and how to verbally communicate with others). Children, who are raised in a home environment that supports social communication expressiveness and controls overt negative language, and negative expressions of emotions and behavioural actions, are more likely to engage in positive social interactions with peers, than children who are raised in homes that do not support expressiveness of language or control overt negative language (Strayer & Roberts, 2004). Several other studies have also demonstrated a connection between high levels of parent-child play interactions and a child's ability to engage in prosocial communications (Saarni & Thompson, 1999).

The 'how' and 'when' of language use is also an important part of a child's social communication development process. McDowell and Parke (2002) found that children endorse similar outcomes in social interactions as those of their parents, so if parents display negotiation skills in an effort to meet their needs, young children may observe and imitate these skills in their own social interactions. Similarly, if parents use physical violence as a means of conflict resolution, children learn this behaviour. Other studies support this view, showing that children exposed to higher levels of negative parental communication and emotional content are less accepted by their peers whilst children exposed to positive parental communication and affect patterns are more accepted (Saarni & Thompson, 1999). Hence, children in their early years learn how to attend both emotionally and behaviourally to social relationships within the family context, placing prime importance on their parents' modeling of social communication, emotional regulation and behavioural competencies.

The acquisition and use of language are critical components in the development of social competency skills and are a fundamental precursor to the development of emotional and behavioural competencies. Similarly to language, emotional and behavioural competencies develop through imitation of parents (i.e., learning how to respond emotionally and behaviourally to a given situation) and parental guidance (i.e., learning how to respond to situations, particularly those in which the child does not get their own way) (Deater-Deckard, 2000; Denham & Kochanoff, 2002; Kerr, Lopez, Olsen, & Sameroff, 2004).

As per the factors described in the developmental science meta-theory model, a large number of detrimental ecological factors impinge upon social skills learning. In particular, key risk factors for children under the age of seven years include high levels of family disruption (e.g., divorce, one parent in jail, blended families), poverty, poor social climate, high levels of aggression displayed in the home, non-supportive parental or sibling responses to emotional needs, hostile parenting practices, and antisocial maternal behaviour (Gwynne, Blick, & Duffy, 2009; Hoglund & Leadbeater, 2004; Petitclerc & Tremblay, 2009). These factors can obviously have a significant negative impact on the depth and richness of communication, social skills, adaptive emotional regulation and behavioural flexibility developed by children who are raised in households with such risk factors.

Three familial factors have recently been identified as key determinants of poor social skills development and therefore may contribute to high levels of externalized behaviour in children. These factors are parental responsiveness to a child's emotional needs, the degree of parental control over the child's emotional expressiveness, and the use of harsh parenting techniques.

Children who do not receive positive parental responses to their needs develop a sense of insecurity and a lack of trust, and are said to have insecure attachment (Bowlby, 1969, 1973, 1980). When this pattern is systematic, children are less likely to engage in communications or interactions with their parents and so miss a critical opportunity to absorb and learn social communication, emotional regulation and behavioural flexibility

skills (Deater-Deckard, 2000; Kerr et al., 2004). Research has also found that the effect of inadequate social skills development becomes more prominent as the child ages because social interactions become more complex and demanding. If verbal expression of emotions and thoughts is discouraged by parents, the child has less opportunity to engage in interactions and misses out on concrete social skills development, creating a cycle of worsening social deficits and therefore, as discussed previously, increasing the use of externalizing behaviours to compensate (Engels, Finkenauer, & Meeus, 2001; Halberstadt, Denham, & Dunsmore, 2001; Hastings & De, 2008).

The degree of parental control over a child's emotional regulation has also been linked with communication skills development. Research has found that parents who are less accepting of, and who attempt to control their child's emotions tend to have children who are less able to regulate their affect and enact prosocial behaviours (McDowell & Parke, 2000). Research attributes the use of externalized behaviours by a child to an inability to recognize other's emotional messages and an inability to appropriately control their own emotional and behavioural responses. Again, as stated previously, displays of disruptive externalized behaviour make it likely that children who have social communication deficits and who enact such behaviours will be rejected by their peers. Such rejection can further compound the problem of social communication deficits by giving children who display social communication deficits less access to social situations in which to imitate, practice and improve their social communication skills. Again, as previously discussed, poor social communication skills negatively effects academic trajectories with all the concomitant social problems that this entails (Calkins, Gill, Johnson, & Smith, 2006;

Campbell et al., 2002; Dunman & Margolin, 2007; Hastings & De, 2008; McDowell & Parke, 2000). In summary, children raised in non-expressive (language and emotions) family environments are more likely to engage in disruptive externalized behaviours as a way of expressing thoughts and feelings and/or controlling their environment (Campbell, Shaw, & Gilliom, 2000; DuRant, Barkin, & Krowchuk, 2001; Hastings & De, 2008; O'Neal & Magai, 2005; Sadock & Sadock, 2003; Shirley, 2004; Smith & Walden, 1999).

Poor communication, emotional repression and externalizing problems can be seen in children of hostile and angry parents, particularly fathers (Denham et al., 2003; Denham et al., 2007; Hastings & De, 2008). Harsh parenting techniques are linked with children's use of aggressive actions in conflict situations. In contrast, parental warmth has a mediating effect, decreasing externalizing behaviour (Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005). This supports the developmental science theory that children construct representations of relationships from family experiences and if raised in a hostile environment develop core beliefs that the world is a hostile place. Consequently they often misattribute the intentions of others as hostile and behave aggressively in order to cope with others' expected aggression and in an effort to control their environment. Research suggests that aggressive children come from families whose members frequently criticize, tease, complain, punish or attack each other. Coercive exchanges typically end when one family member escalates their behaviour to the point that the other person backs off. Children therefore learn to deal with the others' aversive behaviour by getting angry, hitting, yelling or throwing tantrums, or in other words, engaging in disruptive externalized behaviours. Frequent low-level coercive interactions

amongst family members have been shown to be a key component leading to serious antisocial behaviour (Biglan & Hinds, 2009). In sum, children of parents who model poor communication skills limit responses to their child's needs and overtly control emotional responses have been found to have poorer communication skills, less emotional and behavioural flexibility, and therefore higher externalizing behavioural levels (Bono, Dinehart, Dobbins, & Claussen, 2007; Deater-Deckard, 2000; Kerr et al., 2004; Rothbaum, Rosen, Pott, & Beatty, 1995; Stams, Juffer, & Van Ijzendoorn, 2002; Velderman, Bakerman, Kraneburg, Juffer, & Ijzendoorn, 2006).

Summary

It can therefore be seen that the negative familial factors of communication deficits, emotional and behavioural regulation problems in both a child and their home environment leads to a deleterious feedback loop that reinforces the child's inflexible behaviours. Children with poor learnt social communication skills may engage in externalized behaviours (e.g., aggression, inappropriate language) to gain a desired outcome because that is what they have learnt to do. Unfortunately as the externalized behaviour generally leads to a positive outcome in the child's eye (e.g., hitting gets the toy they wanted) in the home environment and because the child has limited social skills to handle the conflict more aptly, the behaviour becomes a reinforced well established negative interaction pattern that can evolve into coercive relationships. It also persists upon entry into school where it can cause even more social and educational problems (Conroy, Sutherland, Haydon, Stormont, & Harmon, 2009; Halberstadt et al., 2001; Herbert-Myers et al., 2006).

In accordance with the transactional model of development, the greater the number of individual risk factors within the family ecology, the more severe social competency deficits and disruptive behaviours are likely to be (Campbell, 1994). Unfortunately, negative factors within the home environment are often interconnected, and as such, some family environments have ecological systems driven by multiple high risk factors. These environments may place the child at greater risk of peer rejection due to high levels of both social communication deficits and externalizing behaviours, poor academic performance due to poor communication competencies and peer rejection, and behavioural inflexibility due to both a lack of emotional control and social communication deficits (Bono et al., 2007; Webster-Stratton, Reid, & Stoolmiller, 2008). However, it is noted in the literature that further research is needed to examine the combination of array of family ecological factors that affect a child's development of social competency skills (Calkins, Keane, & Hill-Soderlund, 2008; Carr, 2009).

Social communication and emotional competencies learnt in the home environment during early childhood aid in the development and expansion of social skills, self-control and emotional regulation at school and other contexts (Calkins et al., 2006; Hill, Degnan, Calkins, & Keane, 2006). Through the development of these competencies children learn to understand others' emotional needs, engage in positive social communications and regulate their emotions leading to socially adaptive and prosocial behaviours (behavioral flexibility), as opposed to disruptive externalized behaviours (Degnan et al., 2008; Hastings & De, 2008). By school age, the language and social skills learnt within the home environment are the foundation for further language development, social skills acquisition and emotional and behavioural regulation to be learnt at school. Deficits in

social communication skills supports the need for interventions to be administered to children who display externalized behaviours and live in families where there may be multiple risk factors that inhibit normal social communication development (Criss, Pettit, Bates, Dodge, & Lapp, 2002; Kochanska, Coy, & Murray, 2001).

The ecology of a classroom is also particularly important in the development of a child's social skills competency levels. A child's classroom peers, to whom they are most exposed during the school year, are those with whom they have their most significant social interactions. The social communication abilities of a child's peer's and the quality of interactions between a child and their peers play a significant role in the development of a child's social skills. Research has shown that schools that have a high proportion of children that are vulnerable to social (e.g. coming from lower socio-economic suburbs), emotional or behavioural problems are less likely to expose children to competent and positive peer interactions (Cook, Herman, Phillips, & Settersten, 2002; Criss et al., 2002).

The ecology of the school environment can also have an impact on social skill development. Research has shown that schools that operate in low socio economic areas (often termed 'disadvantaged schools') are more likely to contain children with social competency deficits. Kellam, Ling, Merisca, Brown and Ialongo (1998) found that in schools in which a high proportion of first grade children are from disadvantaged families (families eligible for social support payments) there was an increased risk of behavioural problems in later school years by these first graders, independent of other family or classroom factors. It has also been noted that children from schools in economically

disadvantaged communities are more likely to integrate with deviant peers as they progress through primary school and that there is an increase in peer victimization in such schools (Hanish & Guerra, 2000; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996). Logically it can also be concluded that poorly organized, unfriendly schools with low staff morale and a high staff turnover are more likely to promote an environment which is unstable and unpredictable. This would increase the likelihood of children who are prone to displaying externalizing behaviours actually engaging in such behaviours.

Summary

The above commentary supports the view that social competence is heterogeneous in nature and as much as a child's family of origin can have a significant impact upon competency skills, so can the classroom and the school's ecologies within which it operates. Research to date has not been able to isolate any one individual factor or array of factors that contribute more greatly than others to a child's level of social competence.

Section 4 – Social skills training

The above discussion suggests that multiple factors may be implicit in development of social competency skills in children, making the search for successful interventions complex. This fact is acknowledged by Gumpel (2007) who commented that in the last 25 years, research into social skills interventions has seen little progress. It has also been noted that most behavioural and/or communication interventions have produced successful results at the time of enquiry, but commonly these results have not been able to be maintained and generalized to other school environmental ecologies.

Problem-solving strategies using social communication skills, known as Social Skills Training (SST), are the most common strategies used in developing social competency skills and resolving disruptive behaviour (Atici, 2007; Laursen et al., 2001). Despite differing theoretical orientations, the common link across SST research is the teaching of specific interpersonal skills that enable students to be more successful in their social interactions. SST programs are commonly prosocial, with a focus on increasing social competencies and providing children with the knowledge of what behaviours are expected of them and when to enact those behaviours (Corso, 2007; Farrell, Meyer, Kung, & Sullivan, 2001; Fox, Dunlap, Hemmeter, Joseph, & Strain, 2003; Palmer, Delveaux, & Daniels, 2000; Stoolmiller, Eddy, & Reid, 2000).

SST programs have become more prominently applied in primary school settings in recent years with the literature suggesting that: (a) children with disruptive behavioural problems may not have acquired the skills to be socially adept prior to school entry, as discussed previously, (b) primary school children are more adaptive to learning new communication strategies than adolescents, and (c) social communication skills and codes of behaviour learnt in early childhood form the foundations for future academic and peer successes (Connor et al., 2006; Flannery, et al., 2003; Lösel & Beelmann, 2003; Webster-Stratton & Reid, 2004).

Even though there are more than 1,500 evidence-based psychosocial treatment studies using various social communication interventions that address disruptive or conflict behaviour in children (primary and adolescents), Gumpel's (2007) comments above

suggest that there has been a decrease in the important findings within the field and as future research in the area is still necessary (Eyberg, Nelson, & Boggs, 2008). The current literature often shows mixed results in terms of efficacy, again confirming the need for more research into valid and effective SST interventions. Further there is very little published evidence of the impact of interventions targeting the communication skills of children with emotional and behavioural difficulties (Law & Sivyver, 2003).

Results of Social Skills Training Research – review of the literature

The following section reviews a number of evidence-based social skills training programs targeted towards primary school children identified with disruptive behavioural problems. Only those studies considered effective (see below) are discussed. It is also noteworthy that the literature covers a range of SST treatment approaches that include programs delivered to individual or groups of children (individualized versus universal programs (Petitclerc & Tremblay, 2009), in clinical or school settings; and by mental health professionals or teachers (Greco & Morris, 2001).

A variety of programs, including Helping the Noncompliant Child (HNC), the Incredible Years, Parent Child Interaction Therapy (PCIT), the Positive Parent Program (Triple P) and Problem Solving Skills Training (PSST), are regarded by a number of authors as being effective and have well supported evidence-based practices. To be considered evidence based practices these programs have been researched using stringent study variables including the use of a minimum of two randomized control trials, and the use of books and written material to support the administration and implementation of the

programs for internal consistency. Further, trials must have been reported in peer reviewed literature, their outcomes must of lasted for at least one year beyond treatment, and the outcomes must be regarded as reliable and valid (The California Evidence-Based Clearinghouse, n. d.). The First Steps to Success and the Fast Track program have also been included in this review, as they are commonly used programs that have shown some efficacy in results, though are not yet regarded as ‘well supported’ programs. However, the relative effectiveness of each program does require further research. It has been noted by Dretzke et al. (2009) in a recent meta analysis, that there was still insufficient research evidence to determine the relative effectiveness and merit of differing SST programs and that further research into each program is warranted.

Helping the Noncompliant Child (HNC; Forehand and McMahon, 1981).

An older program, HNC, is well conducted with at least one study showing greater benefits in using the program compared to a control group (Eyberg et al., 2008). Primarily, it is a prevention program aimed at individual families in which parents and children (aged between three and eight years) receive 10 weekly sessions of therapy. The focus is on assisting parents to disrupt the detrimental cycle of coercive parent-child interactions. Parents learn new skills through role modeling, role-plays and in vivo training. Wells and Egan (1988) found HNC effective in the treatment of disruptive behaviour in three- to eight-year -olds. Some limitations of this program exist including the need to engage parents in the intervention and treatment components. Further to this, there have been no clinical trials of this program in socioeconomically disadvantaged populations or with universal populations, such as a group of school children. HNC is

only aimed at intervening with children aged between three and eight years, and so does not include students in higher primary school grades. Lastly, HNC is generally considered amongst researchers as being a general communication improvement program, not a specific SST program.

Incredible Years (IY; Webster-Stratton & Reid, 2003).

The IY is aimed at reducing childhood aggression and behavioural problems by improving social communication skills and increasing social competence both at home and school. There are three separate universal treatment programs aimed at children, parents and classroom/teachers. The IY Child Training program (IY-CT) has been found to be more effective than a wait list group in reducing disruptive behavioural problems and that this reduction in disruptive behavioural levels was maintained in 75% of children over a two-year period (Reid, Webster-Stratton, & Hammond, 2003; Webster-Stratton, Reid, & Hammond, 2001). Similarly, the IY Parent training program has shown effective results in reducing disruptive behaviour in children (Fergusson, Stanley, & Horwood, 2009; Rogers, 2008). Significant reductions in disruptive behaviour have also been found in oppositional defiant disorder (ODD) children if they were administered either the child treatment program or parent program alone, but not teacher program alone. Reductions in disruptive behaviours have also been found in children who have received the IY Child Training program in conjunction with their parents and teachers receiving the parents and teacher components. Similar results have been found when both children and parents have jointly received the interventions, or if the child and teacher jointly have received the interventions. (Jones, Daley, Hutchings, Bywater, & Eames, 2008; Larsson,

Fossum, Clifford, Drugli, Handergard, & Morch, 2009; Webster-Stratton, Reid, & Hammond, 2004).

In more recent studies, the Incredible Years parent and classroom programs were evaluated for the first time in socioeconomically disadvantaged primary school settings. In addition to the classroom and child training programs, some children were randomly assigned to receive parental training as well. Results showed that the combined parent training, child training and classroom training programs were more effective than the child and classroom intervention alone. In particular, children who received the child, parent and classroom training programs showed more social competence and emotional self regulation and fewer conduct problems than did those children who received only the child and classroom interventions (Reid, Webster-Stratton, & Hammond, 2007; Webster-Stratton et al., 2008). Similarly to other programs, the IY program has some limitations. The main concern is the need for parental involvement for more effective results. Similarly to the HNC above, the recommended age range for interventions is between four – eight years old, thus generally precluding primary school children from Grade Three upwards. However, the advantages of this program are that it has been applied universally across a number of grades within a primary school and that it has been trialed in socioeconomically disadvantaged schools, in which successful outcomes have been reported. Finally, the IY's programs are recognized by researchers as containing a strong SST component, enabling it to be considered a useful SST intervention.

Parent Child Interaction Therapy (PCIT; Brinkmeyer and Eyberg, 2003).

This program targets children with disruptive behavioural problems who are between the ages of three and six years. The focus of therapy is to enhance parents' positive parenting abilities, such as building warm positive relationships, and to manage their child's behaviour more effectively. PCIT has found to be useful in reducing disruptive behaviours compared to a wait list (Leung, Tsang, Heung, & Yiu, 2009; Matos, Baurermeister, & Bernal, 2009) and is considered to be a program well supported by research evidence (The California Evidence Based Clearinghouse, n.d.). One of the limitations of use is the need to engage parents in the program which may present problems if there is limited parental compliance. Also the program is targeted towards individual students and is not applicable as a universal program. Similarly to some of the programs above, the intervention is only targeted towards children aged between 3 and 6 years old, so, within a primary school context, it only targets Kindergarten and Grade 1 children thus limiting its use in a school environment. Within the literature it is regarded as a useful intervention in reducing disruptive behaviours, but is not necessarily considered to be a specific social skills training tool.

Positive Parenting Program (Triple P; Sanders 1999).

The Triple P is a multilevel program aimed at parent and family support. It is targeted towards parents with children who display severe behavioural, emotional and/or developmental problems. The program incorporates five levels of intervention, based upon increasing intensity, for parents with children aged between infancy and adolescence. Families are matched to program levels on the basis of needs and problem

severity. Level Four (Triple P Standard Individual Program) and Level Five (Triple P Enhanced Treatment) meet the criteria for effective randomized controlled trials with a sustained effect for at least one year after intervention (The California Evidence Based Clearinghouse, n.d.; Markie-Dadds & Sanders, 2006). The Triple P Standard Individual Program has been found to be more effective than a wait-list in reducing disruptive behaviour in preschool children, whilst the Triple P Enhanced Treatment has been described as superior to a waitlist in reducing the disruptive behaviour of three- to four-year-olds from dysfunctional families (Eyberg et al., 2008). The Triple P program has recently been studied using Australian indigenous families from disadvantaged backgrounds with results showing improvements in child behaviours and positive parenting skills, compared to a wait list. However, small study numbers provide some limitation to the veracity of this piece of research (Turner, Richards, & Sanders, 2007). In general, a limitation to the Triple P program is the use of parents in all levels of treatment, which assumes that parents will engage and comply with the treatment regime, though this may not always be possible. Unlike the IY program listed above, the Triple P has only had limited trials with disadvantaged populations and further study replication is needed for external validity. Lastly, the Triple P has only been used as an individualized program and has not been manipulated to run as a universal program. This may limit its usefulness in primary schools settings as, as an individualized program, much higher level of both funding and effort are required to run the programs.

Problem Solving Skills Training (PSST; Kazdin, 2003).

PSST is an individualized treatment for five- to 13-year-olds who exhibit disruptive behaviour. The program teaches children how to cope positively with their overwhelming thoughts and feelings instead of resorting to antisocial behaviour. It also demonstrates appropriate social interactions through role modeling, play acting and positive reinforcement. Specific problem-solving strategies are then generalized to the environment of the child. Some parent involvement is required but the primary intervention is with the child. Research has found this program to be reasonably effective in reducing disruptive behaviour (Eyberg et al., 2008; The California Evidence Based Clearinghouse, n.d.; Webster-Stratton & Hammond, 1997; Webster-Stratton et al., 2001, 2004). Advantages of this program are that it does not necessitate the use of parents in the treatment (though parent sessions can be arranged) and it is specifically targeted towards primary school children. One limitation of this program is the fact that it is individualized, which again may limit its applicability to a broader school community. Secondly, this program has not been trialled using primary school aged children who reside in disadvantaged communities. Lastly, the PSST has only a limited focus on specific social skills training, in favour of training across more general communication skills.

First Steps to Success.

This program has been studied by a number of authors and is commonly used with at-risk kindergarten students who have been identified by teachers as exhibiting externalizing, aggressive and maladaptive behaviours. The intervention involves student, parents and

teachers and is based upon a token economy system with behavioural reinforcements. Most studies using this program reflect decreases in problem behaviours and substantial improvements in classroom behaviours (Beard & Sugai, 2004; Golly, Stiller, & Walker, 1998; Golly, Sprague, Walker, Beard, & Gorham, 2000). However a similar study conducted by Overton, McKenzie, King and Osborne (2002) concluded that even though there were improvements in some behaviours, not all results have shown significant reductions in disruptive externalized behaviours, nor an increase in prosocial choice-making behaviours. In particular Beard and Sugai (2004) found the intervention was significantly successful only when both parents and teachers were involved in the intervention process. Similar to limitations in the above programs, the First Steps to Success is a program that requires both parent and teacher involvement for greater success outcomes. Such involvement may not always be possible by teachers and parents, due to work, financial and resource limitations. The program is also only aimed at primary school children in the Kindergarten years, so has limited applicability to a primary school environment. Similarly to the most of the studies above, the First Steps to Success has not been trialed on populations living in disadvantaged areas and attending schools in such areas.

Fast Track.

Fast Track is a social skills training program which aims to increase communication skills in children exhibiting disruptive externalized behavioural problems, in particular conduct disorder problems. The program uses a combination of social skills training and anger management techniques targeted to both parents and child. In a study by Bierman

et al., (2002) using the Fast Track program, 37% of the intervention group were determined to be free of serious conduct problems, compared with a control group of children who had also been diagnosed with conduct problems and had not received the intervention. A limitation of the Fast Track program is the need to engage parents in the program for outcomes to be more successful. Similarly to other programs, it is an individualized program aimed at specified children and in which the intervention can be adjusted by some degree to meet individual needs, as opposed to a universal program in which the intervention is applied to a group of children without modification. Another noted concern raised by researchers of the Fast Track program is its emphasis on communication and parent training, but not necessarily on specific social skills training, leaving some question about whether the intervention is a social skills training tool, as it is designed to be, or a more general communication training tool.

Summary

As can be seen from the above discussion, there are a number of strongly supported evidence based SST programs aimed at improving social competency and reducing disruptive behaviours. In addition to the above programs, there are other numerous social skills training programs that have not been mentioned in this review, primarily because they are not rated as either effective or valid as the ones listed above. It is not intended to discount such research, but to discuss these programs as well is beyond the scope of the present review. Even though there are many treatment programs available for use by schools, particularly the ones noted above, there are still barriers and gaps within the

research literature to be explored. These gaps within the literature are discussed in the following section.

Barriers to using evidence based social skills training programs

The interventions discussed above are generally seen to be effective in reducing disruptive externalized behaviour by increasing social communication and prosocial skills. Unfortunately the outcomes and responsiveness of children to training programs are often influenced by variables not directly related to the child, such as those listed below.

One of the key gaps identified within the literature is that only a few of the SST interventions have been implemented with school target populations living in socioeconomically disadvantaged areas. Neighbourhood disadvantage is evidenced by poverty, systemic multi-generational unemployment, limited access to resources, substandard housing and high crime rates including illegal drug usage (Turner, et al., 2007). As described in the preceding sections, and in developmental science meta theory, research suggests that children exposed to these stressor-filled social environments are at a high risk of developing problem behaviours and poor social skills. Within these environments, additional risk factors include exposure to dysfunctional family life, including parents who are not engaged in supporting or promoting children's social communication skills, peer modeling of antisocial behaviour including truancy, and constricted social networks (Etats-Unis Connor et al., 2006). Research has shown that children who attend school in low social economic areas show the poorest development

of social skills (Etats-Unis Connor et al., 2006). A recent study by Elias and Haynes (2008) across a number of schools in socioeconomically disadvantaged areas showed improvements in academic outcomes when social competence levels were improved, although effects upon externalizing behaviours were not noted. However, it was observed that future research should focus on students' social-emotional competencies and decision-making skills. Again, this suggests a need for future studies to address social skills training in socioeconomically disadvantaged schools.

A second gap in the literature has been the limited research into universal interventions, as opposed to individual interventions, particularly in primary school settings. Bellini, Peters, Benner, and Hopf (2007) found that SST programs using individualized programs as opposed to universal programs demonstrated only minimal more effectiveness in reducing disruptive behaviours in targeted participants. This suggests that universal interventions actually may be more effective than individualized programs as other children who receive the intervention (outside of the target population) may model and enact the intervention behaviour and implicitly encourage the target population to do the same. However, other researchers have found smaller positive outcome effects when using a universal treatment as opposed to an individualized program. These mixed findings suggest that further research is needed clarify this issue (Gansle, 2005; Wilson, Lipsey, & Derzon, 2003).

There has been much less research done with disadvantaged than advantaged children in terms of universal preventative interventions (Durlak, 1998). Among the dozen or so

studies of universal school-based interventions designed to prevent challenging behavioural problems, a variety of methodological challenges has limited the quality and applicability of their usefulness. In particular it has been found that studies using universal interventions in disadvantaged communities have high attrition rates of participants (primary school children, parents and teachers). It has been noted that in disadvantaged schools there is often a higher teacher turn-over rate than in schools in more advantaged areas, which makes consistent application of interventions difficult to maintain, again suggesting the need for further research (Aber, Brown, & Jones, 2003).

A third gap in the research relates to the willingness of parents and/or teachers to engage in treatment programs. Clearly the majority of programs discussed above involve parental training as either the key to the program or as an important adjunct to the child training component. Carr (2009) concluded that behavioural parent training is particularly effective in ameliorating childhood behaviour problems leading to improvement in up to 70% of children with gains maintained at one-year follow-up. However, the question arises as to what happens in circumstances in which parents do not comply with the intervention program? Parental non-compliance may occur for a host of reasons including poor mental health which may affect the ability by the parent to comply with the intervention. Parents may also not comply with an intervention program as they may lack knowledge regarding the need for their child to engage in the program. Similarly other stressors, such as the need to work, and other time constraints, may interfere with a parent's ability to invest time in an intervention program, particularly if parents do not see a need for the program. Unfortunately, all of these factors have been linked with

poorer child outcomes, regardless of intervention type (Reyno & McGrath, 2005). Gillies (2006) found that parents from poorer socioeconomic levels were more inclined to view education with a negative bias. Often these parents considered education to be associated with disappointment and failure and school was viewed to be a hostile and dangerous place to be avoided. This suggests that programs need to be developed, in disadvantaged communities, that do not involve parental input and that can be administered within the school environment.

Similarly, programs requiring classroom/teacher involvement often have barriers preventing teachers from successfully incorporating the programs. These often include a lack of time to undertake training in the program and a lack of time to implement the program within the classroom setting, given that there are curricula goals that need to be achieved. Teachers have also complained of inadequate resource material to support the implementation of a program, including not knowing where to get support when they need it (Fitzpatrick & Knowlton, 2009). Another concern raised by teachers, that often impacts on their ability to apply an intervention program, is that the day to day behavioural problems of the children involved in the program takes up time and effort in dealing with, allowing less teacher time and energy for program implementation (Fitzpatrick & Knowlton, 2009). Again programs may need to be developed which either focus on minimal input from teachers or use a mental health professional to administer the treatment.

One further gap in the literature is that a majority of social skills training interventions have been implemented with non-normative target populations. In particular there has been a strong focus on pathological externalized behaviours such as Conduct Disorder (Etats-Unis Connor et al., 2006) rather than non-pathological, or normative, behaviours (Cummings et al., 2008). Given the profound effects that early childhood behavioural problems can have on long term schooling outcomes, relationships and future socioeconomic status, as outlined above, there is a strong need to consider prosocial interventions in normative school populations. These interventions may influence positive developmental outcomes for children who exhibit social and emotional developmental delays (e.g., internalizing and externalizing behaviours) that are not diagnosed as pathological (Baker et al., 2008).

The few studies that have focused social skills interventions on normative school populations have found a moderating effect on children's behavioural and emotional problems (Baker et al., 2008; Bierman et al., 2002). Despite these studies focusing on normative school populations, other factors have limited their applicability to becoming universal evidence-based best practice intervention programs. Again future research may be able to demonstrate successful outcomes in populations who display disruptive behaviours but who are not diagnosed with particular developmental or behavioural disorders.

Summary

Despite the extensive array of studies into improving social competency in order to reduce disruptive behaviours, many gaps still exist within the literature and no one single intervention program has emerged as 'best practice'. New research and study replication are vitally important to continue to add to the body of existing evidence regarding what constitutes an effective social communication treatment intervention for decreasing conflict behaviours at school (Reyno & McGrath, 2006). Future research is particularly important if an evidence-based best practice intervention is to be found that can be universally applied. Specifically, there has been little research or even replication of research into universal social skills interventions in normative populations living in disadvantaged socioeconomic areas. The divide between the "haves" and "have not's" is ever expanding in the current economic climate and extra government funding is limited often only to diagnosed pathological populations (Shirley, 2004). Schools with generally normative populations are finding it increasingly difficult to obtain funding to implement social skills training programs yet are recognizing the need to implement universal models of social skills training that target disruptive behaviours. There is push by researchers' into developing evidence-based models of social skills training that can be applied universally with minimal logistical and financial effort required for implementation. Secondary to this, there are multiple influences on the outcomes of treatments for disruptive behaviours and research is needed to understand the way in which treatments work (Eyberg et al., 2008). Furthermore, current research into social skills training has not addressed the impact that such training has on reducing playground or classroom conflict or improving behavioural flexibility (Gansle, 2005).

In summary, there are still many gaps in the literature that can be addressed by researchers that would contribute to a further understanding of how conflict and disruptive behaviour can be reduced in primary school populations.

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Empirical Report

Conflict, Social Communication Deficits and Behavioural Inflexibility in Primary School Children

Abstract

Previous research has focused on the close association between poor social communication skills and behavioural difficulties. However, little attempt has so far been made to examine this relationship in primary school aged children who live in socioeconomically disadvantaged communities. In particular there is limited research on the impact of universally presented social communication skills interventions on this group of children. This study explores the notion that children who live in socioeconomically disadvantaged communities and who display disruptive behaviours in school need specially designed social skills intervention programs to meet their specific requirements. Further, this study explores the hypothesis that a universal school-based, teacher-delivered social communication skills intervention, not requiring parental support, will decrease levels of problematic behaviour. Results showed a non-significant decrease in children's levels of problematic behaviours in the Playground environment, but showed a significant reduction in their levels of problematic behaviour in a classroom environment. Gender and school levels appear to have a moderating effect on outcomes. This study concluded that in the short term at least, the type of intervention carried out may have had some beneficial effect for the participants, but this was not sustained over a longer time period. Implications for the use of specific interventions to this population and suggestions for future research are also discussed.

Chapter 2: Empirical Report

Introduction

There are growing community concerns regarding increasing levels of conflict, or disruptive behaviour, displayed by primary school aged children. Even though these problems have historically been noted in the literature, they have recently resurfaced as a major social issue in school environments (Fergusson, Stanley, & Horwood, 2009).

Disruptive behaviours are conceptualized to include poor behaviours that may, if severe, contribute to a DSM-IV diagnosis of Conduct Disorder and/or Oppositional Defiance Disorder. Often children diagnosed with such disorders are able to access a range of government-funded interventions to provide individualized support. However, there are many primary school children who display signs of disruptive behaviours, ranging from mild to severe, yet remain undiagnosed and therefore receive no funded interventions beyond classroom teacher support. These children, if left untreated, are at high risk of many serious social and psychological outcomes, and so the need to develop both cost- and time-effective treatments for these children is a high priority.

Disruptive behaviours can be defined as either externalized or internalized. Externalized disruptive behaviour is behaviour that is inappropriate to the situation in which it occurs (Jordan & Metais, 1997) and often includes actions such as bullying, physical and verbal aggression, physical damage (e.g. kicking, hitting, pinching, biting), and high levels of Off-Task behaviour. To a lesser extent, disruptive behaviour also includes an unwillingness to participate or engage in classroom activities, all of which can potentially

cause disruption to educators and class peers (Baker, Grant, & Morlock, 2008; Gansle, 2005; Repetti, Taylor, & Seeman, 2002).

Unfortunately there are many long-term problems linked to disruptive externalized behaviour in childhood and these problems tend to become more severe as the child matures, if the child does not receive any effective interventions. Problems that are linked with externalized disruptive behaviour include difficulties in completing education because of a lack of focus on academic work, difficulties in securing and maintaining work because of poor academic achievement and less ability to maintain stable relationships because of poor social communication skills (Campbell, Izard, Mostow, & Trentacosta, 2002; Cummings, Kaminski, & Merrell, 2008; Elias & Haynes, 2008). Other studies have linked proactive aggression and conflict in primary school years with delinquency and increased engagement in crime in the teenage years (Fife, Colder, Lochman, & Wells, 2008); and anti-social behaviour, delinquency, socially disruptive behaviour and psychological disturbances (Bierman et al., 2002; Cunningham et al., 1998; Eddy, Reid, & Fetrow, 2000; Schmidt, Burts, Durham, Charlesworth, & Hart, 2007; Singer & Flannery, 2000).

Nationally, five to 15% of school students demonstrate externalized disruptive behaviours that require some support over and above what an individual classroom teacher can provide, with a further one to 5% of students exhibiting extreme forms of externalized disruptive and anti-social behaviours (Barry, 2006). However, this percentage is thought to be much higher in young children from low income families,

averaging around 22% of primary school children, which suggests that there is an urgent need for interventions to reduce disruptive behaviours in socioeconomically disadvantaged communities (Reyno & McGrath, 2005).

In order to develop intervention programs that address externalized disruptive behaviour in a primary school context, it is important to gain insight into the origins of conflict. Nearly every child will, at some point, engage in conflict with their peers in primary school. Low levels of conflict have been linked with improving social coping mechanisms in young children, such as resilience, and are considered an important part of childhood development (Green & Rechis, 2006). However, some students consistently display high levels of conflict or disruptive externalized behaviours, compared to their peers, regardless of the situational context. This may occur because of language impairment (e.g. phonological language disorder), diagnosed pathologies that inhibit emotional and behavioural regulation (e.g., Autism or Aspergers Syndrome), or diagnosed intellectual/physical disabilities. However as stated previously, there are students who engage in high levels of disruptive externalized behaviours who do not meet the criteria for DSM-IV diagnoses or who remain undiagnosed. It is thought that a significant proportion of these students may display disruptive behaviours in reaction to a deficit in their social communication skills, and therefore in their ability to verbally express their needs (Herbert-Myers, Guttentag, Swank, Smith, & Landry, 2006).

The notion of social communication deficits, embedded in social communication theory (Farmer & Farmer, 2001), suggests that the inability of a child to verbally negotiate

negative and stressful social situations such as conflict, may lead to feelings of powerlessness that generate frustration, anger and anxiety and cause the enactment of disruptive externalized behaviours (Atici, 2007; Jordan & Metais, 1997). As social skills deficits limit effective social communication, children with these deficits are more likely to initiate externalized disruptive behaviours, compared to their socially competent peers, as a compensatory method to gain control over their environment (Atici, 2007; Cook et al., 2008; Frey et al., 2005; Laursen, Finklestein, & Betts, 2001; Posner & Rothbart, 2000; Schmidt et al., 2007).

Similarly children with social communication deficits often experience greater levels of frustration and anger because of their poor communication abilities, which can lead to greater difficulties in emotional regulation and adaptation of behaviour to contextual situations (behavioural flexibility) (Horowitz, Jansson, Ljungberg, & Hedenbro, 2006; Tremblay, 2000). Unfortunately, research has shown that children with social communication deficits may react immediately and with high intensity to conflict, often misinterpret other children's actions, choose aggressive rather than passive pro-social solutions and in general lack empathy for others because of their poor communication abilities (Cooper et al., 2002). So in situations of conflict, children with social communication deficits not only lack the communication skills necessary to negotiate a collaborative outcome, but are more likely to over-react emotionally to the situation, adding to heightened levels of disruptive behaviours (Pelco & Reed-Victor, 2007; Tremblay, 2000).

Behavioural inflexibility is defined as the inability to emotionally, psychologically and physically adapt to changes in one's environment and manifests as a resistance to adapt one's behaviour to changed circumstances. It has been noted in the literature that there is often a desire by children who display externalized disruptive behaviours to insist upon sameness in order to gain a sense of control and predictability over their environment (Green, Sigafos, Pituch, Itchon, O'Reilly, & Lancioni, 2006). Children with social communication deficits are more likely to find changes in their school environments (e.g., changing from one room to another), or in their daily routine (e.g., school excursions or a change in classroom teacher) to be emotionally overwhelming. As these children's poor social communication skills inhibit emotional literacy, they are more likely to engage in disruptive externalized behaviours as a means of coping or in response to these situations (Green et al., 2006; Green, Sigafos, O'Reilly, Pituch, Didden, Lancioni, & Singh, 2007).

Thus, a cyclical deleterious pattern is formed whereby social communication deficits lead to difficulties in regulating emotions, which lead to behavioural inflexibility and disruptive externalized behaviours. Research has shown that children with social communication deficits are more prone than their peers to repeating inappropriate disruptive externalized behaviours. This may be due to both a proactive aggressive feedback loop in which the externalized behaviour (e.g. aggression) brings forth the desired outcome or a lack of social competency skills to handle the situation in a more appropriate manner (Herbert-Myers, et al., 2006). Research therefore needs to focus on

interventions aimed at populations which contain high numbers of children who are at risk of poor social competency development skills.

At-Risk Populations for Development of Poor Social Communication Skills

The theory of developmental science (Farmer & Farmer, 2001) can be used to identify at-risk populations of children with social communication deficits. This theory states that social competence is a multi-factorial concept in which different ecologies (family, classroom and school environment) are combined into interrelated systems of constraints or barriers affecting social communication competency development. Depending on the factors that comprise this system, the constraints can promote either positive or, conversely, problematic behavioural paths. When the system's ecologies are mostly comprised of negative risk factors the behavioural path that the individual develops can be deleterious (Elias & Haynes, 2008; Farmer & Farmer, 2001). Disadvantaged communities often have families that experience a high number of negative risk factors across the family itself, the classroom and the school environment. A disadvantaged population, or community, is frequently measured by education level, occupation, and income, and is often evidenced by socioeconomic poverty, systemic multi-generational unemployment, limited access to resources, substandard housing, and high crime rates. Children exposed to these stressor-filled environments are at an increased risk of poor social communication skills development, which can contribute to problematic behaviours. In disadvantaged populations there are generally more detrimental ecological factors that impinge upon social communication skills learning, in comparison to non-disadvantaged populations. These factors may include greater exposure to dysfunctional

family lifestyles and family disruption such as exposure to divorce, having a parent in jail, or being part of a large blended family all of which may affect parental attention to social skills development. Further to this, children growing up in disadvantaged communities may be exposed to greater levels of peer modeling of antisocial behaviour including truancy, shoplifting and lighting fires. Children may also be exposed to less positive communication styles within the family because of high stress levels due to socioeconomic hardship. Such stressors may also impact upon the levels of aggression displayed in the home and as such, parents may end up role modeling inappropriate behaviours. Similarly social communication competencies may be affected by less supportive parental responses to children's emotional needs, which affect secure attachment and consequently social communication (Hoglund & Leadbeater, 2004). As children's patterns of social communication, emotional development and behavioural flexibility are heavily shaped by their early home socialization experiences, the above factors can adversely impact upon the depth and richness of communication, social skills training and adaptive emotional regulation development modeled and taught by parents to their children (Calkins, Keane, & Hill-Soderlund, 2008; Denham, Bassett, & Wyatt, 2007; Hastings & De, 2008; Hill, Degnan, Calkins, & Keane, 2006).

Additional research has shown that children who attend schools in disadvantaged areas consistently show poor development of social skills and consequently have the lowest academic achievement outcomes compared with children in advantaged schools (Elias & Haynes, 2008; Etats-Unis et al., 2006). It has also been noted that schools in disadvantaged communities that aim to implement social skills training programs which

require parental involvement often have poor outcomes because of poor parental attendance. This is explained by the family stress model of economic hardship which postulates that as economic pressure increases, parental psychological stress also increases, which precipitates a decline in parental skills, thus affecting the ability of parents to comply with social skills treatment programs (Reyno & McGrath, 2005). Anecdotal evidence also suggests that in disadvantaged communities parents take an 'us' versus 'them' mentality towards the school, based upon the perception that school teachers are highly educated and often live outside of the community. As such, parental compliance with intervention programs can be difficult to achieve. Similarly, within the classroom ecology, research has shown that schools that cluster together children who are vulnerable to social, emotional or behavioural problems are less likely to expose children to competent and positive peer interactions (Cook, Herman, Phillips, & Settersten, 2002; Criss, Pettit, Bates, Dodge, & Lapp, 2002). As the collective competencies and quality of interactions amongst peers plays a significant role in the development of a child's social skills, children who live in low socioeconomic areas are less likely gain exposure to high levels of competent communication skills. Kellam, Ling, Merisca, Brown and Ialongo (1998) found that higher proportions of children from disadvantaged families (families eligible for social support payments) in first grade led to an increased risk of behavioural problems in later school years independent of other family or classroom factors, suggesting that intrinsic communication factors may be affecting such outcomes. It has also been noted that children from schools in economically disadvantaged communities are more likely to integrate with deviant peers as there are generally greater levels of deviancy and truancy in these communities compared with advantaged communities.

Similarly, it has been noted that in economically disadvantaged communities there is an increase in peer victimization in schools suggesting that children may need to focus their attention on other non-social and non-academic issues to ‘survive’ school (Hanish & Guerra, 2000; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996).

Summary

As seen from the discussion above, children living and going to school in disadvantaged communities are at high risk of having poor social competency skills, which can negatively affect their behaviours and their long term academic, socioeconomic and emotional outcomes. It is therefore necessary to develop early intervention and prevention programs that can assist in increasing social communication competencies and decrease conflict behaviours in disadvantaged primary aged school children (Degnan, Calkins, Keane, & Hill-Soderlund, 2008). The use of effective social communication skills has been shown to facilitate increases in prosocial behaviour and interactions, decrease aggression and antisocial behaviours, and lead to more supportive and harmonious peer and group environments. Therefore reducing conflict by developing social communication programs to assist at-risk children in disadvantaged populations has clear individual and public health benefits (Brotman et al., 2008; Horowitz et al., 2006).

Social Communication Skills Intervention Programs

Eyberg, Nelson and Boggs (2008), in a review of the literature, identified a number of “model” social communication skills intervention programs that produced positive

results. Interventions were identified as “model” programs if they were randomized, used control/wait list groups, had high participant numbers, and clearly defined samples. Current programs identified as “model” interventions include Helping the Noncompliant Child (HNC), the Incredible Years, Parent Child Interaction Therapy (IY-CT), the Positive Parent Program (Triple P), and Problem Solving Skills Training (PSST). These programs have been repeatedly used and studied in what could be considered ideal conditions. These conditions include the use of advantaged populations, individually targeted interventions (as opposed to universal applications), targeting only pathologically defined children, and having parents involved. However, application of these model programs in less than ideal conditions has rarely been reviewed and the few programs (not listed) that have been trialed in ‘real world’ conditions show much smaller effect sizes than outcomes in ideal conditions (Farmer, Compton, Burns, & Robertson, 2002).

One area that needs further research is in relation to the use of social communication skills intervention programs in disadvantaged communities. The model intervention programs listed above, albeit effective, have used programs individually targeted to advantaged and non-pathological populations. One exception to this is the ‘Incredible Years’ program whose child component has successfully been trialed (albeit in a limited fashion) with disadvantaged, high-risk families (Hutchings et al., 2007). Similarly, an adaption of the Incredible Years program, the ‘Dinosaur School’ module, has been trialed with children living in disadvantaged communities. The Dinosaur School program is universally applied to all children in Kindergarten and Grade One, and delivered by

teachers who engage in a biweekly curriculum with students and send home work sheets to encourage parent involvement. The use of the program in disadvantaged school communities has led to increases in students' levels of social competence and emotional self-regulation and fewer conduct problems than students in control groups who have problem behaviours but who did not receive the intervention. These results suggested that universal, teacher-delivered programs aimed at younger primary school children can be effective (Webster-Stratton, Reid, & Stoolmiller, 2008).

Other social communication skills programs that are noted in the literature to have been trialed in disadvantaged populations, though not considered model programs as above, include the High/Scope Perry Preschool Program, which has been cited as an effective preschool intervention program, and the Early Head Start program. Both have found some degree of success in terms of increasing social and emotional literacy in disadvantaged student populations which resulted in reductions in disruptive behaviour. However, both programs only target children of preschool, not primary school age (NSW Department of Community Services (DOCS), n.d.). A further program targeting social communication competency that has been successfully used in disadvantaged school populations is the Fast Track program. This program postulates that improvements in child competencies (including social communication skills) and parent effectiveness will lead to a decrease in conduct disordered behaviour. Trials conducted in disadvantaged communities have found that children who received the intervention and whose parents complied with the intervention program were less likely, in a follow-up three years later, to engage in disruptive behaviours than those children whose parents were not actively

involved in the program (Bierman et al., 2002). Similarly a recent study by Elias and Haynes (2008) across a number of schools in disadvantaged areas showed improvements in academic outcomes when social competence levels were improved through a video series program targeting social communication and emotional regulation. The program was universally applied to children between grade 3 and grade 6 in selected schools and positive outcomes were found for improvements in social emotional competence, although effects on externalizing behaviours were not noted. Similarly, the 'Coping Power' program is a cognitive-behavioural intervention delivered to children displaying aggressive behaviours. Specifically, the program has been studied using children in disadvantaged schools as the target population. The program contains both a parent component (addressing stress management skills), and a school component (addressing social problem solving skills). Results of a one-year follow-up suggested that there had been improvements in post-intervention behaviours that had led to preventive effects on delinquency for children at risk (Lochman & Wells, 2003).

In summary, there are few social communication interventions that have been implemented within school target populations living in disadvantaged socioeconomic areas, and not all of these have been specifically focused on reducing disruptive behaviour, or have specifically targeted primary school aged children. Further research is required with disadvantaged primary school populations to determine effective interventions in primary school settings with children who exhibit emotional and/or behavioural problems (Cook et al., 2008).

Another area in the research literature that needs addressing is the degree of parental involvement in programs. Again most programs noted in the literature require some degree of parental involvement to obtain effective results (Carr, 2009). Support for parental involvement in intervention programs is noted as important in ameliorating negative childhood behaviours. Presumably for this reason, the majority of social communication programs involve parental training as either the key to the program or as an important adjunct to the child training component. In disadvantaged communities there is a high incidence of non compliance to programs by parents. This has been attributed in part to the family stress model of economic hardship, as described previously, which acknowledges a number of high external stressors in disadvantaged communities affecting parental involvement in interventions. Unfortunately these stressors are linked with poorer child outcomes, regardless of the type of intervention used, as parents often fail to attend enough sessions for the treatment programs to be beneficial (Reyno & McGrath, 2005). The information above suggests that future research may need to focus on developing social skills intervention programs aimed at children living in disadvantaged communities that require no parental involvement. Such programs, if specifically designed for this purpose, may prove to be more beneficial and cost effective than trying to adapt current programs to this population's needs (Lavigne et al., 2008).

An additional gap in the literature that needs addressing is in relation to who delivers the intervention program. The model programs listed above use a combination of teachers and external health workers (e.g., psychologists, nurses) to deliver material to children

and parents, requiring significant time and opportunity cost to the school community.

There are a few other programs that use teacher and/or school counselors to deliver the intervention material, one being the 'Peacemakers Program'. The delivery of this school-based intervention for students aged nine to 14 years, by both teachers and school counselors, has been shown to have a significant positive effect on social skills, leading to decreased disruptive behaviour (Flannery et al., 2003; Shapiro, Burgoon, Welker, & Clough, 2002). Other intervention programs using teacher-delivered social communication skills programs have also been found to be effective in reducing disruptive behaviour. This suggests that teachers can be effective in delivering programs if given enough time to do so and if the program does not require a substantial commitment by the teacher over and above their regular curriculum duties (Heydenberk & Heydenberk, 2007). In particular, it appears that the qualities of the teacher-student relationship are considered to be significant predictors of children's adherence to programs and consequently levels of disruptive behaviours at school. Student-teacher relationships characterized by warmth, trust and low degrees of conflict have been associated with more positive school outcomes (Baker et al., 2008; Hyatt & Filler, 2007). These studies suggest that intervention programs may be more effective if delivered by teachers perceived as warm and caring and with whom the children have a developed a positive relationship. This is in contrast to using allied health workers to deliver interventions, as these workers have often had a limited chance of developing a relationship with the students. However, one moderating factor on the effectiveness of program outcomes delivered by teachers and/or school counselors is the degree of involvement and commitment required by the teacher. In the model programs listed

above, a great deal of time and effort is required by teachers to implement the programs, suggesting that school resources would need to accommodate teachers in doing so. However, in many schools, particularly in disadvantaged communities, a number of barriers prevent the implementation of intervention programs. These barriers include a lack of time to complete training in delivery of the program to students and a lack of time in implementing the program after training, particularly if there is a high number of children in the classroom with disruptive behaviours. Other barriers may include not having access to resource material to support the program or being able to access an external support person to answer queries (Fitzpatrick & Knowlton, 2009). These problems suggest that there is a need to develop intervention programs which require minimal input from teachers or school counselors to deliver the treatment.

All of the model programs previously described, target individual children with disruptive behavioural problems, as opposed to universally presenting an intervention program to all children within a school or grade level. It has been noted by Aber, Brown, and Jones (2003) that the literature on school-based social communications interventions aimed at preventing disruptive behaviour is replete with programs targeting subgroups of high-risk children, but is comparatively poor in studies using universal preventative interventions targeting the general school population. One program that does use a universal intervention is the 'Peacemakers' program. This program has been positive in reducing violence in primary schools, through its aim of changing the school culture and climate (Flannery et al., 2003). However, this program has not been studied with schools in disadvantaged neighbourhoods. The literature shows mixed results in relation to the

use of universal versus individually targeted intervention programs. Bellini, Peters, Benner, and Hopf (2007) found that social communication programs using individual as opposed to universal groups demonstrated only minimal effectiveness. These researchers suggested that universal interventions may be more effective than individual programs, as other children who receive the intervention (outside of the target population) may model and enact the intervention behaviour, and thus implicitly encourage the target population to do the same. However, other researchers have found smaller outcome effects when using a universal treatment, as opposed to an individualized program, which suggests that further research, is needed to clarify this issue (Gansle, 2005; Wilson, Lipsey, & Derzon, 2003). It should also be noted that studies that focus on universal preventive interventions are also comparatively poorer in number when implemented with disadvantaged children, compared to advantaged children, which suggests a requirement for further research in this area (Durlak, 1998). Unfortunately, among the dozen or so best studies of universal school-based interventions designed to prevent challenging behavioural problems, a variety of methodological challenges has limited the quality and applicability of their usefulness (e.g., high attrition rates; lack of control of externalizing factors), again suggesting the need for further research (Aber, et al., 2003).

A last remaining gap in the literature is that a majority of social skills training interventions have been implemented with non-normative target populations. In particular there has been a strong focus on pathological externalized behaviours such as Conduct Disorder (Etats-Unis et al., 2006) rather than non-pathological or extreme normative behaviours (Cummings et al., 2008). Given the profound effects that early childhood

behavioural problems can cause on long term schooling outcomes, relationships, and future socioeconomic status, there is a strong need to consider prosocial interventions that may influence positive developmental outcomes for children who are not diagnosed as pathological (i.e., the normative population), but who may exhibit social and emotional deficits (Baker et al., 2008). The few studies that have focused social skills interventions on normative school populations have found a moderating effect on children's behavioural and emotional problems (Baker et al., 2008; Bierman et al., 2002). Despite these studies, other factors have limited their ability to become universal, evidence-based, best practice intervention programs. Again there is a need for future research to focus on non pathological populations who display disruptive behaviours, but who are not diagnosed with particular developmental or behavioural disorders.

The Current Study

This study attempts to address a number of gaps in the understanding of the types of social communication skill interventions that might reduce disruptive externalized behaviour among children in disadvantaged neighbourhoods, taking into consideration other moderating components affecting outcomes. As already noted in the literature, improvements in social communication competency skills are linked with decreases in disruptive behaviours. As these improvements in social communication competency may predict more positive future outcomes for a child, it is imperative to develop interventions that can be successfully applied to a wide range of at risk children with minimal cost and effort required by the school. This study will thus aim to expand upon this area of the literature by universally applying a social skills intervention program to disadvantaged

primary school children in order to prompt appropriate verbal responses and emotional regulation to facilitate adaptive, flexible, and non disruptive behavioural responses to situational change. This intervention will be applied only to children and will not require parent intervention as previously noted in the literature, many parents, particularly in disadvantaged communities, may be restricted in their ability to cooperate in interventions. Additionally, this intervention will target a non-pathological population within the school environment, because there has been limited research in this area and as there is no financial support available for interventions to non-pathological populations, it suggests a greater need for the provision of effective interventions to ensure this population can maximize their social and academic outcomes.

Given that the use of effective social communication skills has been shown to facilitate increases in prosocial behaviour and interactions, decrease aggression and antisocial behaviours, and lead to more supportive and harmonious peer and group environments, the following hypotheses have been formulated. It is hypothesized that following the implementation of a universally presented social communication skills intervention:

- (1) Disruptive Behavioural levels, Behavioural Inflexibility levels and Off-Task levels will decrease in the Playground environment.
- (2) Disruptive Behavioural levels, Behavioural Inflexibility levels and Off-Task levels will decrease in the P.E. classroom environment.
- (3) Pro-social communication behaviours will increase in the Playground.
- (4) Pro-social communication behaviours will increase in the P.E. class environment.

Method

Participants

Participants were all children in a disadvantaged primary school (pre-school age to Year 6) residing in an outer suburb of Hobart, Tasmania. The socioeconomic demographics of this community showed that, at the time of the study, 46% of individuals in the Labour Force were employed full-time, compared with 61% nationally. Also 40% of families were single-parent families, compared to 13% nationally and 54% of dwellings were rented, compared with 27% nationally. The majority of rental properties were provided by the Housing Commission (Australian Bureau of Statistics, 2009).

Within the cohort of students at the primary school, 19 were identified as being eligible participants for the study. Participation in the study was based upon the child exhibiting notable disruptive behaviours, and was assessed by using two questionnaires: the Sameness Questionnaire and the Behavioural Flexibility Rating Scale. Both of these scales consider levels of behavioural inflexibility displayed by the child in a range of situations and consider how the child responds to changes in circumstances such as through yelling, acting out and so on. . The Sameness questionnaire was developed by Prior and MacMillian (1973) and focuses on a child's levels of resistance to change, whilst the Behavioral Flexibility Rating Scale (BFRS) (Pituch, Green, Sigafos, Itchon, O'Reilly, Lancioni & Didden, 2006) was developed in order to, amongst other factors, rate the extent to which individuals show a lack of behavioral flexibility. These two questionnaires were completed by both teachers and parents. Students who scored moderate (the behaviour is present to some degree, though not markedly strong, but

causes some problems) to severe behaviours (the behaviour is markedly frequent and causes severe problems) on both questionnaires were asked to participate in the study. As this was a single subject design, students who did not display disruptive behaviours were not included in the research. Once parental consent was obtained, students were then admitted to the study. Of 19 students who participated in the study, 18 were identified by classroom teachers as having severe externalizing behavioural problems, including yelling, swearing, kicking, hitting, absconding and Off-Task behaviour whilst the one remaining child was identified by their class teacher as having moderate externalizing behavioural problems.

Participants in the study ranged in age from six to twelve years, with 3 students being senior primary school students either in Grade Five or Six, and six students being middle primary school children either in Grades Three or Four. For analysis purposes, results from these students were combined and labeled as results from 'middle primary school'. The remaining ten students were in lower primary school, either in Grade One or Grade Two. The accumulation of these students' results was labeled 'lower primary school'. Of the participants eleven were boys (seven boys in middle primary school and four boys in lower primary school) and eight were girls (three girls in middle primary school and five girls in lower primary school). This experiment was approved by the Tasmanian University's Ethics Committee (Ethics Reference number: H9181). All participants' behaviours were recorded in the Playground environment, but only eight participants' behaviours were recorded in the P.E. class environment.

Design

This experiment was a within-subjects repeated-measures design. The independent variable (IV) was the intervention task which had two levels: pre intervention and post intervention. Data obtained both during and after the intervention were combined together and called post intervention results. The dependent variables (DV's) were Disruptive Behaviour, Behavioural Inflexibility, Off-Task Behaviour, and Advanced Communication. Disruptive Behaviour, Behavioural Inflexibility and Off-Task Behaviour all contained five levels: No level; a Mild level; a Moderate level; a High Level; and a Severe level. Advanced Communication contained two levels: No Advanced Communication versus Advanced Communication.

The DV's were defined in accordance to work done by Beard and Sugai (2004):

- Disruptive Behaviour was defined as any behaviour that disrupted another student from performing a particular task or disrupted a teacher from performing a certain task because of a need to control the disruptive behaviour. Disruptive Behaviour also included talking out of turn, the use of an inappropriate tone of voice, or the use of inappropriate words. Participants who yelled or screamed in class or who swore loudly were considered to have engaged in Disruptive Behaviour. Similarly participants who touched others in an aggressive manner (e.g. grabbing or hitting), and touched another person's property in a similar way, were also considered to have engaged in Disruptive Behaviour. Disruptive Behaviours also included leaving a classroom or the school premises during class time or playtime without permission to do. Participants who ran, as opposed to walked, in

inappropriate areas such as school corridors or who climbed onto the roof of school buildings were also considered to have engaged in Disruptive Behaviours.

- Behavioural Inflexibility was defined as the use of any Disruptive Behaviour that occurred following an immediate change in environmental circumstance. Changes in environmental circumstances included students being kept indoors to play on wet days, students being moved from one classroom to another for a different lesson, or students being moved from one location to another during a class. For example, a P.E. class that started inside a building and then moved outside for different activities was considered to be a change in environmental circumstances.
- Off-Task behaviour was defined as any behaviour where participants failed to initiate what they were told to do by a teacher within ten seconds of being asked. Similarly, Off-Task behaviour was considered to have occurred when participants left a teacher-requested activity to engage in their own choice of activity, or when participants were not focussing on teacher requests, and instead engaged in behaviour such as talking to other students or daydreaming.
- Advanced Communication was defined as any spoken word or sentence by participants that asked for support or assistance with a problem. It included the intervention sentence as described below, or single words or phrases that demonstrated the need for help with a problem. Words or sentences needed to be stated in a normal tone of voice without aggression to be considered Advanced Communication.

The research design involved a single group of participants with similar characteristics. Single subject/group designs have been identified as the “best research design for isolating the cause for behaviour change and for determining which treatment procedures result in the most effective and efficient behaviour change” (Foster, Watson, Meeks, & Young, 2002, p. 147). This study involved using a group of urban disadvantaged school students in a single repeated measure treatment (AB) behavioural design to determine if social communication skills training could improve emotional regulation and decrease levels of Behavioural Inflexibility, Disruptive Behaviour, Off-Task behaviour and improve Advanced Communication skills. The treatment condition involving social communication skills was universally presented to all students within the primary school.

Inter-observer agreement

A convenience sample of 20% of all participants was identified for inclusion in inter-observation by independently assigned mental health workers to evaluate the inter-rater agreement for the coding procedure. Means were calculated for each dependent variable and Cohen’s kappa was calculated to ensure inter-rater results were not due to chance agreement. Agreement for observations on dependent variables was .98 (range .81-1.00)

Materials

The intervention was a simple child-directed social communication skills learning task delivered by classroom teachers. Teachers were involved in a one hour training session prior to program implementation. The training session outlined the goals of the intervention and how the intervention was to be delivered. Teachers were given an intervention manual outlining the intervention program, and this program was implemented on a daily basis over a two-week period. Teachers delivered the 20 minute

intervention in daily Meet and Greet sessions held at the start of every school morning.

The intervention was delivered in ten sessions over the two week period. The intervention manual required teachers, in each Meet and Greet session, to:

1. Discuss with students the notion of prosocial behaviour that can be undertaken in the playground environment, and in particular, to make a list of the types of positive activities that students can engage in during play time. Teachers were also asked to identify with students the types of activities that would not be accepted by the school, including wrestling, fighting, yelling and property destruction.
2. Teachers were asked to discuss and make a list with students of important aspects of play and how students could appropriately engage in structured activities in play time. Important aspects of play included:
 - a. The concept of inclusionary play, which proposes that any child should be allowed to participate and be part of any playtime game. In this activity students were asked to consider how they would feel if they were told they could not join in a game and to identify feelings of sadness, anger, or disappointment that may accompany this experience. Teachers were asked to discuss with students how such an experience may make students feel worthless. Students were then asked to consider how they could help others feel better about themselves, and how they could enact positive feelings by making the right choices and allowing others to be included in play. In particular teachers were asked to assist students to identify words, sentences or behaviours that could be used to include and exclude

someone from play and to practice saying inclusionary words and sentences in the Meet and Greet sessions.

- b. The need to respect the notion of taking turns and sharing equipment.

Students were asked to consider how they would feel if another student pushed in front of them and didn't wait for their turn in an activity.

Teachers were again asked to discuss with students how such an experience would make them feel and how they could respond in appropriate ways. In particular teachers were asked to assist students to identify words, sentences or behaviours that could be used to deal with the notions of taking turns and sharing and to practice saying these words and sentences in the Meet and Greet sessions.

- c. Students being able to engage in prosocial communications when they experience a problem or conflict situation. This included a discussion by teachers of the importance of not being critical or negative of another student's ability's. Teachers were also asked to discuss with students what they could do if they felt that they did not have the right words to help fix a problem. In particular students were encouraged to seek out teachers in the playground and to get help by saying: "I have a problem – can you help me please?" This phrase was repeated in the Meet and Greet sessions to reinforce the action.

This very simplistic intervention task was based upon Heydenberk and Heydenberk's (2007) work ("A Powerful Peace: The Integrative Thinking Classroom") and Sandy and

Procedure

Participants were observed pre- and post-intervention during both lunch (Playground environment) and classroom time (P.E. classroom environment) by the experimenter, trained in observational data collection techniques. Observations of behaviour were recorded on a data collection sheet which listed each DV (Disruptive Behaviour, Behavioural Inflexibility, Off-Task behaviour and Advanced Communication) alongside the name of each participant. The DV's of Disruptive Behaviour, Behavioural Inflexibility and Off-Task Behaviour were graded along a 5 point Likert rating scale with a rating of 0 being no problematic behaviour and 4 being very high /severe behaviour, so higher scores indicated more severe problematic behaviour. The DV of Advanced Communication was rated on a Dichotomous scale of 0 = Advanced Communication used and 1 = Advanced Communication used to solve a conflict or behavioural problem.

Observations

In the Playground environment, all 19 participants were observed and 26 observations were recorded over a three month period. In the P.E. classroom environment, eight participants were observed during a P.E. class and again, 26 observations were recorded over a three month period. For both the Playground and P.E. classroom environment, each individual observation point was for a period of one hour. Prior to the intervention phase, nine observations were made of participants and a further remaining 17 observations were made collectively during the intervention and post intervention stage. Only one observation was made for each participant on the days that the experimenter was observing behaviour. Even though some participants engaged in multiple problem behaviours over an observation period, it was often difficult to determine when one

episode of problematic behaviour stopped and another started. For this reason, it was decided to record the most severe behaviour that each participant displayed during any one observational time period and use this as the data point for analysis.

After an initial baseline period of nine observations per participant, in either the Playground or P.E. classroom environment, the whole school engaged in the intervention program. As stated above, this intervention was a simple child-directed social communication skills learning task delivered by classroom teachers in daily 'Meet and Greet' sessions. All school students undertook ten 20- to 30-minute training sessions intensively administered over two weeks. Classroom teachers were actively engaged in the training sessions and assisted in reinforcing learned social communication skills in both the classroom and playground environments. Post-intervention observations, which included observations made during the intervention period, were conducted for a further 17 observations per participant in both the Playground and P.E. classroom environments. The number of observations was based on the duration of remaining school year available for implementation and study of the intervention. The researchers also felt that a minimum of ten observations pre- and post-intervention would provide enough data to gain a clear understanding of participants' behaviour (Green, et al., 2007).

Data Analysis

The DV's were analyzed using the software package SPSS (v.16). There were no missing data in the original data set. The DV's were analyzed for significant decreases between pre and post intervention scores on the Likert scales. The fixed factors of gender (female

and male), environment (Playground or P.E. class) and school level (lower primary school and middle primary school) were analyzed for variability between pre- and post-intervention scores for each DV. Violations of sphericity were checked against Levene's Statistic and if necessary adjusted using the Huynh-Feldt correction. Statistical significance was set at $p \leq 0.05$ unless otherwise stated.

Analysis

The study was of a quasi-experimental nature. Data were screened for violations of normality and variability and testing revealed a need for transformations.

Transformations were performed using a square root function to meet assumptions of variance and normality. Descriptive statistics, correlations and repeated measure analysis of variance (ANOVAs) were performed to determine if significant differences had occurred in levels of the dependent variables pre and post intervention.

Results

The four DVs of Disruptive Behaviour, Behavioural Inflexibility, Off-Task Behaviour and Advanced Communication were analyzed. The means and standard deviations of the four DVs are shown in Table 1 below.

Table 1

Means and Standard Deviations for each DV Pre and Post Intervention Scores

Dependent	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Variable	Pre Intervention	Pre Intervention	Post	Post
			Intervention	Intervention
Disruptive	0.73	1.32	0.44	1.06
Behaviour				
Behavioural	0.67	1.2	0.35	0.86
Inflexibility				
Off-Task	0.12	5.06	0.19	4.17
Behaviour				
Advanced	0.00	0.00	0.00	0.00
Communication				

Note. Values for Disruptive Behaviour, Behavioural Inflexibility and Off-Task Behaviour are mean scores on a 5-point Likert rating scale (0=no behaviour, 4= severe behaviour). Values for Advanced Communication are mean scores on a dichotomous scale (0=no Advanced Communication, 1=Advanced Communication).

As Disruptive Behaviour and Behavioural Inflexibility mean scores decreased after the intervention, while Off-Task Behaviour increased and Advanced Communication stayed the same, correlations were performed to investigate possible DV relationships. The two DVs of Disruptive Behaviour and Behavioural Inflexibility were highly positively correlated ($r = .94, p < 0.01$). Off-Task Behaviour was noted to correlate positively with

Disruptive Behaviour ($r = .57, p < 0.01$) and Behavioural Inflexibility ($r = .48, p < 0.01$).

No Advanced Communication skills were recorded despite the intervention.

Figure 1 below provides a visual representation of the mean scores of participants for each observational point. The scores are shown for each of the four DVs pre and post-intervention.

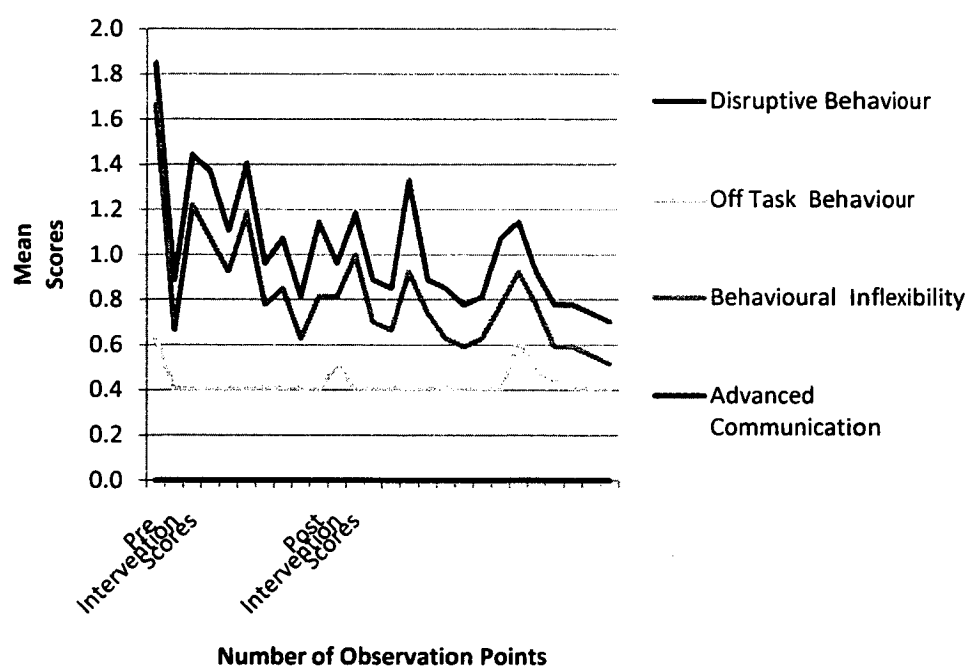


Figure 1

Mean Scores for Participants across all Observation Points

Figure 1 shows a decrease in Disruptive Behaviour and Behavioural Inflexibility scores across the observation points. As predicted by the correlations noted above, Disruptive Behaviour and Behavioural Inflexibility show a similar pattern of results. Off-Task

behaviour shows some similarities in pattern to Disruptive Behaviour and Behavioural Inflexibility scores, again supported by the correlation results above.

DV results

Advanced Communication results were zero for all observations pre- and post-interventions and so no further analysis was reported on this variable. Levene's test on the remaining three DVs, after square root transformations for normality, showed that the variances in the groups were equal for Disruptive Behaviour, $F(1, 137) = 0.36$, ns, and Behavioural Inflexibility, $F(1, 137) = 0.68$, ns, but not for Off-Task behaviour, $F(1, 137) = p < 0.05$. Thus, the assumption that the variances in the Disruptive Behaviour and Behavioural Inflexibility measures were not significant is tenable. A histogram of Off-Task behaviour showed a non-normal positive skew which suggested that any further interpretation of this DV's result needed to be treated with caution, so no further analysis was conducted on this DV.

The two environments of Playground and P.E. class were analyzed independently as all participants were observed in the Playground environment but not all participants were observed in the P.E. class, as noted above. A repeated-measure ANOVA was conducted comparing Disruptive Behaviour's with Behavioural Inflexibility's pre-intervention and post-intervention scores, for the Playground environment and incorporating the factors of school level and gender. Results showed no significant main effect of problem behaviours (Disruptive Behaviour and Behavioural Inflexibility), $F(1, 45) = 0.81$, $p > 0.05$. This result combined with the DVs means, suggested that overall children did

engage more in Disruptive Behaviour, pre and post-intervention $M = 1.81$, than Behavioural Inflexibility, pre and post-intervention $M = 1.76$, but that the difference between the means was not significant. Results of this ANOVA also found a main effect of time that approached significance, $F(1, 45) = 3.84, p = 0.05$. The pre-intervention mean for the target behaviours (Disruptive Behaviour and Behavioural Inflexibility), $M = 1.85$, compared with the post-intervention mean for the target behaviours (Disruptive Behaviour and Behavioural Inflexibility), $M = 1.71$, showed that overall children engaged in less problem behaviour post-intervention, than they did pre-intervention, but that this result was not quite significant. There were no significant main effects for levels of school (lower primary versus middle primary), $F(1, 45) = 0.15, p > 0.05$, or for gender (male versus female), $F(1, 45) = 1.96, p > 0.05$. A significant interaction effect was found between time, gender and school levels, $F(1, 45) = 5.21, p < 0.05$, using Huynh-Feldt corrections for violation of the assumption of sphericity. *T*-tests were conducted to explore the differences between these means further.

The mean scores of problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) pre-intervention for males' in lower primary school was $M = 1.79$ and for females' in lower primary school was, $M = 1.88$. The mean scores of problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) pre-intervention for males' in middle primary school was $M = 1.93$ and for females' in middle primary school was $M = 1.59$. Figure 2 below shows means for males' problem behaviour scores in lower primary school and middle primary school and means for females' problem behaviour scores in lower primary school and middle primary school at the pre-intervention time.

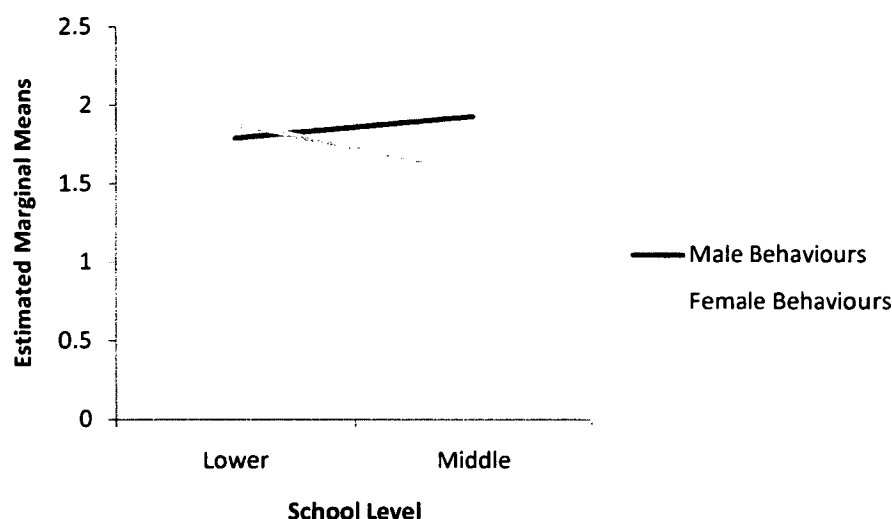


Figure 2

Estimated Means at Pre-Intervention Times for Males and Females across School Levels.

Figure 2 above shows that, pre-intervention, females in lower primary school engaged in more problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) than did males and that in middle primary school, this trend was reversed with males engaging in more problematic behaviours than females. There was a significant difference between males and females scores in lower primary school, $t(1, 45) = 40.77, p < 0.02$ but there was no significant difference between males and females scores in middle primary school $t(1, 45) = 10.35, p > 0.02$. P values were set at $p = 0.02$ to correct for type 1 errors using Bonferroni correction.

The mean scores of problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) post-intervention for males' in lower primary school was $M = 1.69$ and for females' in lower primary school was, $M = 1.52$. The mean scores of problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) post-intervention for males' in

middle primary school was $M = 1.72$ and for females' in middle primary school was $M = 1.75$. Figure 3 below shows means for males' problem behaviour scores in lower primary school and middle primary school and means for females' problem behaviour scores in lower primary school and middle primary school at the post-intervention time.

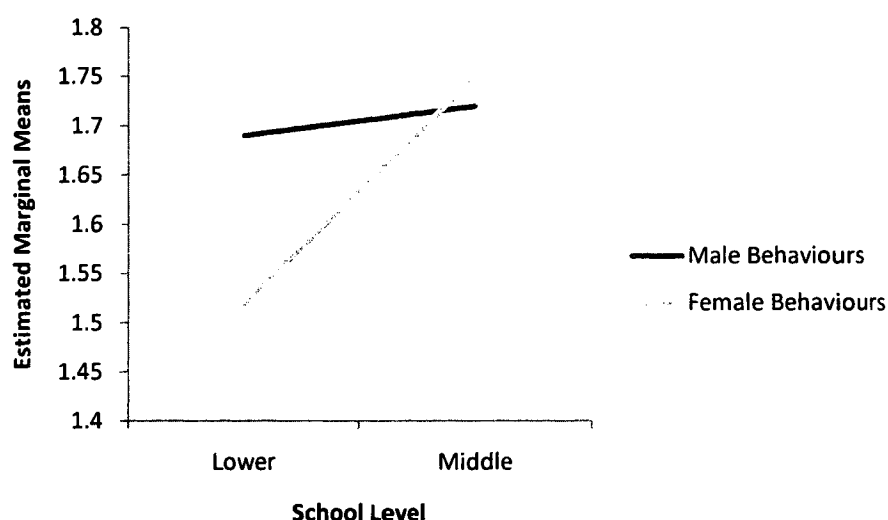


Figure 3

Estimated Means at Post-Intervention Times for Males and Females across School Levels.

Figure 3 above shows that, post-intervention, females in the lower primary school engaged in less problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) than did males and that in middle primary school, this trend was reversed with females engaging in more problematic behaviours than males. There was no significant difference between males and females scores in lower primary school, $t(1, 45) = 18.88, p > 0.02$ but there was a significant difference between males and females scores in middle primary school $t(1, 45) = 115.67, p < 0.02$.

A one-way repeated measure ANOVA was conducted comparing Disruptive Behaviour with Behavioural Inflexibility pre-intervention and post-intervention scores, for the P.E. class observations. As stated previously, a separate ANOVA was performed for the P.E. environment, excluding the Playground environment, as only a small subset of participants were observed in the P.E. class. There was no significant main effect for problem behaviours (Disruptive Behaviour and Behavioural Inflexibility), $F(1, 5) = 0.27$, $p > 0.05$. This result suggested that children did not engage in one type of behaviour (Disruptive Behaviour or Behavioural Inflexibility) significantly more than the other. The combined pre and post-intervention means for Disruptive Behaviour, $M = 1.51$ and the combined pre and post-intervention means for Behavioural Inflexibility, $M = 1.49$, showed that overall children engaged slightly more in Disruptive Behaviour than Behavioural Inflexibility, but that the difference between the means was not significant. Results of this ANOVA also found a main effect for time that was significant, $F(1, 5) = 20.79$, $p < 0.05$. The pre-intervention mean for the combined problem behaviours (Disruptive Behaviour and Behavioural Inflexibility), $M = 1.83$, compared with the post-intervention mean for the combined problem behaviours, $M = 1.16$, showed that overall children engaged in less Disruptive Behaviour and Behavioural Inflexibility behaviours post-intervention, than they did pre-intervention in the P.E. classroom environment. As population numbers were small in the P.E. class, no further analysis was conducted for the factors of school level and gender. A significant interaction was found between time and behaviours (Disruptive Behaviour and Behavioural Inflexibility), $F(1, 5) = 8.34$, $p < 0.05$, using Huynh-Feldt corrections for violation of the assumption of sphericity. *T*-tests were conducted to explore this interaction further.

The mean scores, across all factors, for Disruptive Behaviour pre-intervention was $M = 1.95$ and for post-intervention was, $M = 1.09$. The mean scores of Behavioural Inflexibility pre-intervention was $M = 1.71$ and for post-intervention was $M = 1.28$. Figure 4 below shows means for Disruptive Behaviour and Behavioural Inflexibility scores pre-intervention and post intervention time.

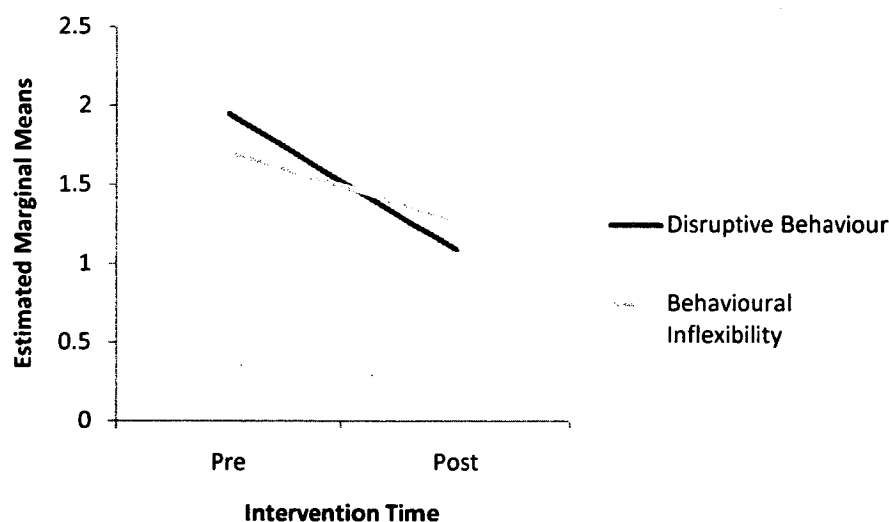


Figure 4

Estimated Means for Disruptive Behaviour and Behavioural Inflexibility Pre and Post-Intervention Times.

Figure 4 above shows that in the P.E. class, participants decreased their levels of Disruptive Behaviour more than their levels of Behavioural Inflexibility after the intervention. The t -tests showed a significant difference between Disruptive Behaviour's combined pre and post-intervention scores and Behavioural Inflexibility's combined pre and post-intervention scores, $t(1, 5) = 301, p < 0.02$.

The statistical analysis of the above data can be reviewed in Appendix A (Statistical Analysis).

Discussion

The current study explored the effectiveness of a universal social communications skills intervention administered within a disadvantaged primary school population. The results showed that in the Playground environment, improvements in problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) between pre-intervention and post-intervention scores approached significance. Results also showed that in the P.E. class environment, improvements in problem behaviours (Disruptive Behaviour and Behavioural Inflexibility) between pre-intervention and post-intervention scores were significant. However, as sample size is small, caution should be taken when interpreting these results and applying to broader situations.

The first hypothesis stated that the social communication intervention would significantly decrease Disruptive Behavioural levels, Behavioural Inflexibility levels and Off-Task behaviour in the Playground. Results indicated that this hypothesis was not supported. There was a decrease in Disruptive Behavioural levels and Behavioural Inflexibility levels by participants after the intervention but results did not reach significance, compared to pre-interventions scores. In relation to Off-Task behaviour, it was previously noted that the data for this DV did not meet basic statistical assumptions of normality. Thus, Off-Task behavioural results are not addressed in this discussion. The result for Off-Task Behaviour may have been attributed to difficulties in defining the behaviour.

The Playground is a rapidly changing environment, and children who became Off-Task to a particular game were able to start a new game, or interact with other people without there being any specific repercussions (e.g., they could leave a game of handball and go and play chasey). As such, their behaviour could not really be defined as Off-Task behaviour. Future research into Off-Task Behaviour in Playgrounds would need to address the issue of the definition of this term.

The findings that problematic behaviour (Disruptive Behaviour and Behavioural Inflexibility) decreased after the intervention, but not significantly, differs from findings from other programs, such as the Incredible Years and Problem Solving Skills Training (PSST) programs, which have shown effectiveness in decreasing problematic behaviours. These decreases in problem behaviours have been attributed to improvements in communication skills and prosocial behaviours. As noted previously, the current study's participants did not engage in any Advanced Communication, or prosocial communication activities, thus potentially affecting results and making the outcome of this study different from those programs listed above. One possibility as to why the current study's participants did not use Advanced Communication skills learnt in the intervention may be attributed to the length of time that the intervention was taught and reinforced. Programs such as the Incredible Years and PSST use interventions that are conducted for a minimum of ten weeks or longer, given that the programs are individualized to each student and delivered by allied health professionals. In contrast, the current study used a universally applied, teacher-administered intervention. As teachers were used to deliver the intervention, a number of time constraints affected the

length of implementation. These included teachers needing to continue to deliver the state's education curricula, comply with school administration demands and deal with students' needs. If the current study's intervention had been actively promoted and reinforced over a ten-week period, similar to the Incredible Years program, and teachers had more time available to invest in the implementation of the intervention, then results may have shown significant decreases in problematic behaviours (Disruptive Behaviour and Behavioural Inflexibility) between pre and post-intervention scores in the Playground environment.

Another factor affecting difference in results between the current study and those listed above may have been the use of a disadvantaged population. Studies' using the Incredible Years and the PSST showed results based on analysis of advantaged populations, whereas the current study targeted a disadvantaged population. This factor may have contributed to differences in program outcomes. However, other programs, such as the High/Scope Perry Preschool program and the early Head Start program have been trialed in disadvantaged populations and have shown successful reductions in problem behaviours. However, the difference in these programs and the current study is that these programs were individually targeted to participants, and were trialed on a younger cohort, making comparisons between them and the current study somewhat untenable.

One study that used a universal, as opposed to individual, social and emotional learning intervention was Hallam, Rhamie, and Shaw's (2006) study. These authors found that the universal intervention contributed to less problematic behaviour being enacted in the

playground. Typically, universal interventions are thought to encourage compliance in targeted children because other children, beyond those studied, become engaged in prosocial choice making, and thereby display behaviours that are less likely to encourage study participants to enact problem behaviours. Similarly, non-study participants who engage in the intervention may act as role models for the study participants, again discouraging problematic behaviour in the study participants. Thus, in the current study it was thought that prosocial behaviour would become the playground 'norm' as opposed to problematic behaviour, and that this may have encouraged the study participants to be less reactive to conflict. Adding weight to this supposition is research suggesting that children with social communication deficits often struggle with peer relationships and tend to have far fewer friends than children without communication deficits. As such, it is thought that such children are more likely to comply with and model the behaviour of peers who are enacting prosocial choice making through increased verbal communication skills (Laible, Carlo, Torquati, & Ontai, 2004). However, the current study's findings did not support the findings from the above studies. Again the current study's authors feel that the intervention was not modeled and reinforced enough in the school playground to provide a significant change in behaviours in the targeted population. Reasons for this are similar to those above, in that the intervention may not have been applied for a long enough period, coupled with the significant external confounding factor (see below) that may have affected the study outcomes. A further contributing factor may have been the high number of children in the school who displayed problem behaviours, but who were not part of the current study because they did not receive parental consent to participate. Also as the school was in a disadvantaged population there was a high number of

students within the school who engaged in problematic behaviours, making marked changes to the children's behaviour more challenging than perhaps would be in a school in an advantaged population.

Given that the current study did not achieve a significant decrease in Disruptive Behaviour and Behavioural Inflexibility levels in the Playground environment after implementation of the intervention, it was thought by the current study's authors that there was a significant confounding variable that may have impacted on the efficacy of the intervention program. The variable that may have had a significant impact on levels of problematic behaviour was a State Government announcement, during the second week of implementation of the intervention that the school was to be used for other purposes at the end of the school year. Consequently, all students were to be reallocated to other schools within the district. Clearly this announcement had many psychological impacts upon both staff and students and was likely to have detracted greatly from the focus and energy being invested by staff into the intervention within the school. This suggests that study replication is needed to occur within a disadvantaged school environment that would not be subject to such a perilous confounding variable.

In relation to Disruptive Behaviour levels, Behavioural Inflexibility levels and gender, there was no significant main effect or difference between male and female results both pre and post intervention for the Playground environment. A review of the DV s (Disruptive Behaviour and Behavioural Inflexibility) means showed that male's results were higher than female's at both the pre and post-intervention times. The current study

agrees with past research, in which male students were perceived as more disruptive than female students, and subsequently engaged in more serious problematic behaviours (Hill et al., 2006). However, the current study's result is different to that of a study by Shapiro's et al. (2002) in which an intervention, focused on resolving conflict, had a significantly greater effect in reducing problematic behaviour in boys compared to girls. Similar results were found by Raver et al. (2009) using an intervention based on the Incredible Years program. In this gender-matched study, the intervention led to significant reductions in boys' problematic behaviours compared with those of girls. However, the current study's results are similar to those from a study by Allen (2009) which used the same intervention as that of Shapiro et al. (2002) and found no gender differences post intervention. This suggests that there may be some limitations in the knowledge base about social communication treatment outcomes for boys and girls. As noted by Farmer and Farmer (2001), gender differences are rarely reported in studies that are aimed at reducing problem behaviours in children and many studies have relatively small sample sizes, and so do not provide sufficient power to examine the issue effectively. Therefore it is suggested by Farmer and Farmer (2001) and supported by this current study, that additional research is needed to explore more positive interventions for both boys and girls displaying problematic behaviours.

In relation to Disruptive Behaviour levels, Behavioural Inflexibility levels and school levels, there was no significant difference between lower primary school and middle primary school results both pre and post intervention for the Playground environment. A review of the DV s (Disruptive Behaviour and Behavioural Inflexibility) means showed

that lower primary school results were higher than middle primary school results at the pre-intervention time but that middle primary school results were higher than lower primary school at the post-intervention time. This is similar to other research which has shown that younger children display stronger outcome effects than do older children (Shapiro et al., 2002; Wilson et al., 2003). However, other studies have shown stronger effects in middle or upper primary school children compared with early primary school children, perhaps because by middle primary school age, problematic behaviours have become more entrenched (Flannery et al., 2003). Collectively these studies suggest that interventions that may be effective for one age group (e.g., lower primary), may not be effective with other age groups (e.g., middle primary), due to the differences in social, emotional and cognitive capacities. This is a factor future researchers need to consider when developing universal programs (Farmer & Farmer, 2001). The lack of main effect for school level in the current study may reflect the fact that many of the children in the lower primary group did not report substantially greater behavioural problems compared with the middle primary children. This may explain why the small observed changes in Disruptive Behaviour and Behavioural Inflexibility remained non-significant.

The significant interaction effect between gender, school level and time suggests that gender and school levels combined in a way that affected outcomes pre and post-intervention. Results showed that both males and females in lower primary school decreased their problem behaviours after the intervention was implemented. However, only males in middle school decreased problem behaviours post- intervention in contrast to females in middle school whose problem behaviours actually increased post-

intervention. Again this is somewhat similar to Raver's (2009) study which found that males decreased problem behaviours more than females post-intervention due to having more severe problematic behaviours to start with. However, it does not explain why in this study, females' problematic behaviour increased post-intervention in the Playground environment. The current study's author can only surmise that this result occurred as an unwanted adverse outcome of the school being focused upon problematic behaviours that attracted adult attention. Thus it is thought that these girls may have increased their problematic behaviours as a means of attention seeking from teachers.

The second hypothesis stated that the social communication intervention would significantly decrease Disruptive Behavioural levels, Behavioural Inflexibility levels and Off-Task behaviours in the P.E. class. This hypothesis was supported for Disruptive Behaviour and Behavioural Inflexibility but not for Off-Task behaviours, as discussed previously. Disruptive Behaviour and Behavioural Inflexibility in the structured P.E. classroom environment were significantly lower after the intervention. This result is similar to those of other studies that have used social communication interventions and found decreases in problematic behaviours across a range of environmental contexts (e.g., Eyberg et al., 2008; Jones, Daley, Hutchings, Bywater, & Eames, 2008; Larsson et al., 2009; Wells & Egan, 1988). Of the two environments, Playground and P.E. classroom, it was thought by the current study's author that the Playground environment would be more likely to show a decrease in problematic behaviours, as opposed to the P.E. class, as there were many more students available to model the intervention. In contrast, a classroom environment has a number of factors that can affect positive outcomes.

Research by Kaplan, Gheen, and Midgley (2002) showed that problem behaviour in the classroom often occur because of an individual student's behaviour, or as a result of a deficiency in the teacher's skills in managing the classroom, or as a combination of both. Hence lowering problematic behaviour in the classroom setting may mean that a number of factors, beyond the students' own level of control, need to be considered. A second factor is that problematic behaviours vary between classrooms and that the classroom culture, and in particular the classroom goal structure, is an important predictor of this variance. In classes where individual ability and doing better than others are valued, levels of problematic behaviour are likely to be high. In contrast, children in classes in which improving performance, understanding and learning are valued, show less problematic behaviour (Kaplan, et al., 2002). The classroom environment used in the current study was the P.E. class with many of the skills focusing upon individual ability and the promotion of competition between peers (e.g., ball games, running games). Further, P.E. classes require a higher degree of behavioural flexibility and emotional regulation than other class types. For example, students need to organize themselves into teams, move from one location to the next readily and be able to verbally encourage peers one minute (high excitability) and then listen to the teacher the next (controlled emotions). Again, both the teacher's ability to manage the class and the students' desire to enact appropriate behaviours may impact upon problematic behaviour levels in the classroom. Even though in the current study, levels of problematic behaviours (Disruptive Behaviour and Behavioural Inflexibility) decreased after the intervention, the presence of a substitute teacher on a number of occasions may have impinged upon

behavioural outcomes. This factor may have contributed to smaller changes in levels of problematic behaviour than may otherwise have been recorded.

The third and fourth hypotheses, that more prosocial communication strategies (known as Advanced Communication) would be used to resolve conflict in both the Playground and P.E. class environments, was not supported. There was no use of Advanced Communication by study participants. These results differ from those of other research which showed that social communication use increased following a social communication skills training programs (Beard & Sugai, 2004; Herbert-Myers et al., 2006; Letcher, Smart, Sanson, & Toumbourou, 2008). However, most of these studies involved parents as part of the training process, and so it is difficult to isolate the results of children's increased use of communication as a stand-alone function. The current study's results are also contrary to findings by Stanton-Chapman, Denning, and Jamison (2008) whose multi-component social communication intervention did improve peer related social interactions. Similarly, work by Cook et al. (2008) showed improvements in two-thirds of participants who had been identified with emotional and/or behavioural disorders and who received social skills training. The results from this current study suggest that future research needs to consider how to define and score increases in Advanced Communication. For the current study, children were defined as engaging in Advanced Communication if they were actually undertaking verbal communication with others (including teachers) that led to a resolution of conflict. However, the expectation that a child who enacts problematic behaviour will, after a two-week intervention, engage in Advanced Communication skills in this style may have been too great. The universal

application of this intervention may have been the key to its ability to reducing levels of problematic behaviours (Disruptive Behaviour and Behavioural Inflexibility) even without there being a significant increase in Advanced Communication. This is because other school students may have modeled and engaged in appropriate conflict resolution behaviours, though perhaps not as strongly as thought, as discussed previously. Future research may need to refine and identify some of the small changes leading to Advanced Communication (such as smiling at another child or listening to someone else's comments), in order to observe and record Advanced Communication choice making in more detail.

Limitations

This study had some significant limitations. Firstly, the study used a very brief ten-session intervention that was conducted only in one school over a two-week period, which may have limited both the results and the ability to generalize the results to other schools within the district, and maybe more so across other districts. Secondly, there were a number of key unexpected, and unusual, confounding variables that the authors feel may have significantly affected the outcomes of this intervention program, causing teacher time and effort to be focused on issues away from the intervention. Future research using disadvantaged cohorts may need to factor in greater time allowance for delivery of the intervention and to ensure population stability (school, teacher and child) over the duration of the study. In summary, the authors consider that the duration of the intervention was not long enough for a disadvantaged population, and the study was significantly affected by the announcement that the school was going to close shortly.

Conclusion

This study sheds light on the challenges that schools experience in dealing with children with behavioural problems, particularly in disadvantaged communities. Principally, the outcomes show that children in disadvantaged communities do respond to social communication skills training intervention programs that do not require parental involvement. In particular, the results demonstrate that simple, clear and concrete interventions that are teacher-implemented over a short duration can decrease levels of Disruptive Behaviour and Behavioural Inflexibility in disadvantaged children. The results also highlight the effect that gender and school levels may play in the success of social communication skills intervention programs in reducing Disruptive Behaviour and Behavioural Inflexibility. The current research shows that some problematic behaviours can be improved by a very brief intervention, without the need for parental involvement, or for large and complex programs. It is hoped that the present work will provide incentive for future researchers to specifically design and target gender specific social communication skills intervention programs that are teacher-implemented, and require no parental involvement, as the consequences of not intervening in this high risk population cohort are too significant to be ignored.

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Appendix A

Statistical Analysis

Playground – RM ANOVA

Descriptive Statistics

School_ Gender level			Mean	Std. Deviation	N
pgpreDB	0	0	1.8280	.26129	5
		1	1.9500	.32429	31
		Total	1.9331	.31587	36
	1	0	1.8833	.42712	3
		1	1.5880	.28114	10
		Total	1.6562	.32628	13
	Total	0	1.8488	.30324	8
		1	1.8617	.34847	41
		Total	1.8596	.33856	49
pgpostDB	0	0	1.7580	.36534	5
		1	1.7558	.33245	31
		Total	1.7561	.33165	36
	1	0	1.5167	.18475	3
		1	1.7790	.18169	10
		Total	1.7185	.20900	13
	Total	0	1.6675	.31878	8
		1	1.7615	.30070	41
		Total	1.7461	.30233	49
pgpreBI	0	0	1.7680	.29803	5
		1	1.9271	.25043	31
		Total	1.9050	.25888	36
	1	0	1.8833	.42712	3
		1	1.5980	.39852	10
		Total	1.6638	.40642	13
	Total	0	1.8112	.32625	8
		1	1.8468	.32131	41
		Total	1.8410	.31896	49
pgpostBI	0	0	1.6220	.45746	5
		1	1.6903	.27134	31
		Total	1.6808	.29597	36
	1	0	1.5167	.18475	3

	1	1.7120	.26603	10
	Total	1.6669	.25711	13
Total	0	1.5825	.36374	8
	1	1.6956	.26689	41
	Total	1.6771	.28362	49

Multivariate Tests ^b							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
behaviours	Pillai's Trace	.018	.809 ^a	1.000	45.000	.373	.018
	Wilks' Lambda	.982	.809 ^a	1.000	45.000	.373	.018
	Hotelling's Trace	.018	.809 ^a	1.000	45.000	.373	.018
	Roy's Largest Root	.018	.809 ^a	1.000	45.000	.373	.018
behaviours * Gender	Pillai's Trace	.008	.359 ^a	1.000	45.000	.552	.008
	Wilks' Lambda	.992	.359 ^a	1.000	45.000	.552	.008
	Hotelling's Trace	.008	.359 ^a	1.000	45.000	.552	.008
	Roy's Largest Root	.008	.359 ^a	1.000	45.000	.552	.008
behaviours * School_level	Pillai's Trace	.000	.018 ^a	1.000	45.000	.895	.000
	Wilks' Lambda	1.000	.018 ^a	1.000	45.000	.895	.000
	Hotelling's Trace	.000	.018 ^a	1.000	45.000	.895	.000
	Roy's Largest Root	.000	.018 ^a	1.000	45.000	.895	.000
behaviours * Gender * School_level	Pillai's Trace	.004	.188 ^a	1.000	45.000	.667	.004
	Wilks' Lambda	.996	.188 ^a	1.000	45.000	.667	.004
	Hotelling's Trace	.004	.188 ^a	1.000	45.000	.667	.004
	Roy's Largest Root	.004	.188 ^a	1.000	45.000	.667	.004
time	Pillai's Trace	.079	3.837 ^a	1.000	45.000	.056	.079
	Wilks' Lambda	.921	3.837 ^a	1.000	45.000	.056	.079
	Hotelling's Trace	.085	3.837 ^a	1.000	45.000	.056	.079
	Roy's Largest Root	.085	3.837 ^a	1.000	45.000	.056	.079
time * Gender	Pillai's Trace	.004	.159 ^a	1.000	45.000	.692	.004
	Wilks' Lambda	.996	.159 ^a	1.000	45.000	.692	.004
	Hotelling's Trace	.004	.159 ^a	1.000	45.000	.692	.004
	Roy's Largest Root	.004	.159 ^a	1.000	45.000	.692	.004
time * School_level	Pillai's Trace	.048	2.250 ^a	1.000	45.000	.141	.048
	Wilks' Lambda	.952	2.250 ^a	1.000	45.000	.141	.048

	Hotelling's Trace	.050	2.250 ^a	1.000	45.000	.141	.048
	Roy's Largest Root	.050	2.250 ^a	1.000	45.000	.141	.048
time * Gender *	Pillai's Trace	.104	5.213 ^a	1.000	45.000	.027	.104
School_level	Wilks' Lambda	.896	5.213 ^a	1.000	45.000	.027	.104
	Hotelling's Trace	.116	5.213 ^a	1.000	45.000	.027	.104
	Roy's Largest Root	.116	5.213 ^a	1.000	45.000	.027	.104
behaviours * time	Pillai's Trace	.005	.206 ^a	1.000	45.000	.652	.005
	Wilks' Lambda	.995	.206 ^a	1.000	45.000	.652	.005
	Hotelling's Trace	.005	.206 ^a	1.000	45.000	.652	.005
	Roy's Largest Root	.005	.206 ^a	1.000	45.000	.652	.005
behaviours * time * Gender	Pillai's Trace	.000	.009 ^a	1.000	45.000	.924	.000
	Wilks' Lambda	1.000	.009 ^a	1.000	45.000	.924	.000
	Hotelling's Trace	.000	.009 ^a	1.000	45.000	.924	.000
	Roy's Largest Root	.000	.009 ^a	1.000	45.000	.924	.000
behaviours * time *	Pillai's Trace	.000	.010 ^a	1.000	45.000	.920	.000
School_level	Wilks' Lambda	1.000	.010 ^a	1.000	45.000	.920	.000
	Hotelling's Trace	.000	.010 ^a	1.000	45.000	.920	.000
	Roy's Largest Root	.000	.010 ^a	1.000	45.000	.920	.000
behaviours * time * Gender	Pillai's Trace	.001	.066 ^a	1.000	45.000	.799	.001
* School_level	Wilks' Lambda	.999	.066 ^a	1.000	45.000	.799	.001
	Hotelling's Trace	.001	.066 ^a	1.000	45.000	.799	.001
	Roy's Largest Root	.001	.066 ^a	1.000	45.000	.799	.001

- a. Exact statistic
- b. Design: Intercept + Gender + School_level + Gender * School_level
- Within Subjects Design: behaviours + time + behaviours * time

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
behaviours	Sphericity Assumed	.044	1	.044	.809	.373	.018
	Greenhouse-Geisser	.044	1.000	.044	.809	.373	.018
	Huynh-Feldt	.044	1.000	.044	.809	.373	.018
	Lower-bound	.044	1.000	.044	.809	.373	.018
behaviours * Gender	Sphericity Assumed	.019	1	.019	.359	.552	.008
	Greenhouse-Geisser	.019	1.000	.019	.359	.552	.008

	Huynh-Feldt	.019	1.000	.019	.359	.552	.008
	Lower-bound	.019	1.000	.019	.359	.552	.008
behaviours * School_level	Sphericity Assumed	.001	1	.001	.018	.895	.000
	Greenhouse-Geisser	.001	1.000	.001	.018	.895	.000
	Huynh-Feldt	.001	1.000	.001	.018	.895	.000
	Lower-bound	.001	1.000	.001	.018	.895	.000
behaviours * Gender * School_level	Sphericity Assumed	.010	1	.010	.188	.667	.004
	Greenhouse-Geisser	.010	1.000	.010	.188	.667	.004
	Huynh-Feldt	.010	1.000	.010	.188	.667	.004
	Lower-bound	.010	1.000	.010	.188	.667	.004
Error(behaviours)	Sphericity Assumed	2.436	45	.054			
	Greenhouse-Geisser	2.436	45.000	.054			
	Huynh-Feldt	2.436	45.000	.054			
	Lower-bound	2.436	45.000	.054			
time	Sphericity Assumed	.434	1	.434	3.837	.056	.079
	Greenhouse-Geisser	.434	1.000	.434	3.837	.056	.079
	Huynh-Feldt	.434	1.000	.434	3.837	.056	.079
	Lower-bound	.434	1.000	.434	3.837	.056	.079
time * Gender	Sphericity Assumed	.018	1	.018	.159	.692	.004
	Greenhouse-Geisser	.018	1.000	.018	.159	.692	.004
	Huynh-Feldt	.018	1.000	.018	.159	.692	.004
	Lower-bound	.018	1.000	.018	.159	.692	.004
time * School_level	Sphericity Assumed	.255	1	.255	2.250	.141	.048
	Greenhouse-Geisser	.255	1.000	.255	2.250	.141	.048
	Huynh-Feldt	.255	1.000	.255	2.250	.141	.048
	Lower-bound	.255	1.000	.255	2.250	.141	.048
time * Gender * School_level	Sphericity Assumed	.590	1	.590	5.213	.027	.104
	Greenhouse-Geisser	.590	1.000	.590	5.213	.027	.104
	Huynh-Feldt	.590	1.000	.590	5.213	.027	.104
	Lower-bound	.590	1.000	.590	5.213	.027	.104
Error(time)	Sphericity Assumed	5.093	45	.113			
	Greenhouse-Geisser	5.093	45.000	.113			
	Huynh-Feldt	5.093	45.000	.113			
	Lower-bound	5.093	45.000	.113			
behaviours * time	Sphericity Assumed	.014	1	.014	.206	.652	.005

	Greenhouse-Geisser	.014	1.000	.014	.206	.652	.005
	Huynh-Feldt	.014	1.000	.014	.206	.652	.005
	Lower-bound	.014	1.000	.014	.206	.652	.005
behaviours * time * Gender	Sphericity Assumed	.001	1	.001	.009	.924	.000
	Greenhouse-Geisser	.001	1.000	.001	.009	.924	.000
	Huynh-Feldt	.001	1.000	.001	.009	.924	.000
	Lower-bound	.001	1.000	.001	.009	.924	.000
behaviours * time * School_level	Sphericity Assumed	.001	1	.001	.010	.920	.000
	Greenhouse-Geisser	.001	1.000	.001	.010	.920	.000
	Huynh-Feldt	.001	1.000	.001	.010	.920	.000
	Lower-bound	.001	1.000	.001	.010	.920	.000
behaviours * time * Gender * School_level	Sphericity Assumed	.005	1	.005	.066	.799	.001
	Greenhouse-Geisser	.005	1.000	.005	.066	.799	.001
	Huynh-Feldt	.005	1.000	.005	.066	.799	.001
	Lower-bound	.005	1.000	.005	.066	.799	.001
Error(behaviours*time)	Sphericity Assumed	3.137	45	.070			
	Greenhouse-Geisser	3.137	45.000	.070			
	Huynh-Feldt	3.137	45.000	.070			
	Lower-bound	3.137	45.000	.070			

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	behaviours	time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
behaviours	Linear	time	.044	1	.044	.809	.373	.018
behaviours * Gender	Linear	time	.019	1	.019	.359	.552	.008
behaviours * School_level	Linear	time	.001	1	.001	.018	.895	.000
behaviours * Gender * School_level	Linear	time	.010	1	.010	.188	.667	.004
Error(behaviours)	Linear	time	2.436	45	.054			
time	behaviours * time	Linear	.434	1	.434	3.837	.056	.079
time * Gender	behaviours * time	Linear	.018	1	.018	.159	.692	.004
time * School_level	behaviours * time	Linear	.255	1	.255	2.250	.141	.048

time * Gender * School_level	behaviours * time	Linear	.590	1	.590	5.213	.027	.104
Error(time)	behaviours * time	Linear	5.093	45	.113			
behaviours * time	Linear	Linear	.014	1	.014	.206	.652	.005
behaviours * time * Gender	Linear	Linear	.001	1	.001	.009	.924	.000
behaviours * time * School_level	Linear	Linear	.001	1	.001	.010	.920	.000
behaviours * time * Gender * School_level	Linear	Linear	.005	1	.005	.066	.799	.001
Error(behaviours*time)	Linear	Linear	3.137	45	.070			

Tests of Between-Subjects Effects

Measure:MEASURE_1
 Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	289.787	1	289.787	2234.726	.000	.980
Gender	.254	1	.254	1.958	.169	.042
School_level	.019	1	.019	.146	.705	.003
Gender * School_level	.083	1	.083	.640	.428	.014
Error	5.835	45	.130			

2. Gender

Measure:MEASURE_1

Gender	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
0	1.787	.043	1.700	1.875
1	1.685	.059	1.565	1.804

3. School_level

Measure:MEASURE_1

School_level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound

0	1.722	.066	1.590	1.854
1	1.750	.033	1.684	1.816

4. behaviours

Measure:MEASURE_1

behaviours	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	1.757	.045	1.666	1.849
2	1.715	.042	1.630	1.799

5. time

Measure:MEASURE_1

time	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	1.803	.051	1.701	1.906
2	1.669	.050	1.569	1.769

6. Gender * School_level

Measure:MEASURE_1

School_level		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
0	0	1.744	.081	1.582	1.906
	1	1.831	.032	1.766	1.896
1	0	1.700	.104	1.491	1.909
	1	1.669	.057	1.555	1.784

7. Gender * behaviours

Measure:MEASURE_1

behaviours		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
0	1	1.823	.054	1.715	1.931
	2	1.752	.049	1.652	1.852

1	1	1.692	.073	1.544	1.840
	2	1.678	.068	1.541	1.814

8. Gender * time

Measure:MEASURE_1

Gender time		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
0	1	1.868	.060	1.747	1.990
	2	1.707	.059	1.589	1.824
1	1	1.738	.082	1.573	1.904
	2	1.631	.080	1.470	1.792

9. School_level * behaviours

Measure:MEASURE_1

School_ behavio level urs		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
0	1	1.747	.081	1.583	1.910
	2	1.698	.075	1.546	1.849
1	1	1.768	.041	1.687	1.850
	2	1.732	.037	1.657	1.807

10. School_level * time

Measure:MEASURE_1

School_ level time		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
0	1	1.841	.091	1.657	2.024
	2	1.603	.089	1.425	1.782
1	1	1.766	.045	1.674	1.857
	2	1.734	.044	1.645	1.823

11. behaviours * time

Measure:MEASURE_1

behaviors	time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1	1	1.812	.065	1.682	1.942
	2	1.702	.062	1.577	1.828
2	1	1.794	.061	1.671	1.917
	2	1.635	.059	1.517	1.754

12. Gender * School_level * behaviours

Measure:MEASURE_1

Gender	School_level	behaviors	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
0	0	1	1.793	.100	1.592	1.994
		2	1.695	.092	1.510	1.880
	1	1	1.853	.040	1.772	1.934
		2	1.809	.037	1.734	1.883
1	0	1	1.700	.129	1.441	1.959
		2	1.700	.119	1.461	1.939
	1	1	1.684	.071	1.541	1.826
		2	1.655	.065	1.524	1.786

13. Gender * School_level * time

Measure:MEASURE_1

Gender	School_level	time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
0	0	1	1.798	.112	1.573	2.023
		2	1.690	.109	1.471	1.909
	1	1	1.939	.045	1.848	2.029
		2	1.723	.044	1.635	1.811
1	0	1	1.883	.144	1.593	2.174
		2	1.517	.140	1.234	1.799
	1	1	1.593	.079	1.434	1.752
		2	1.746	.077	1.591	1.900

14. Gender * behaviours * time

Measure:MEASURE_1

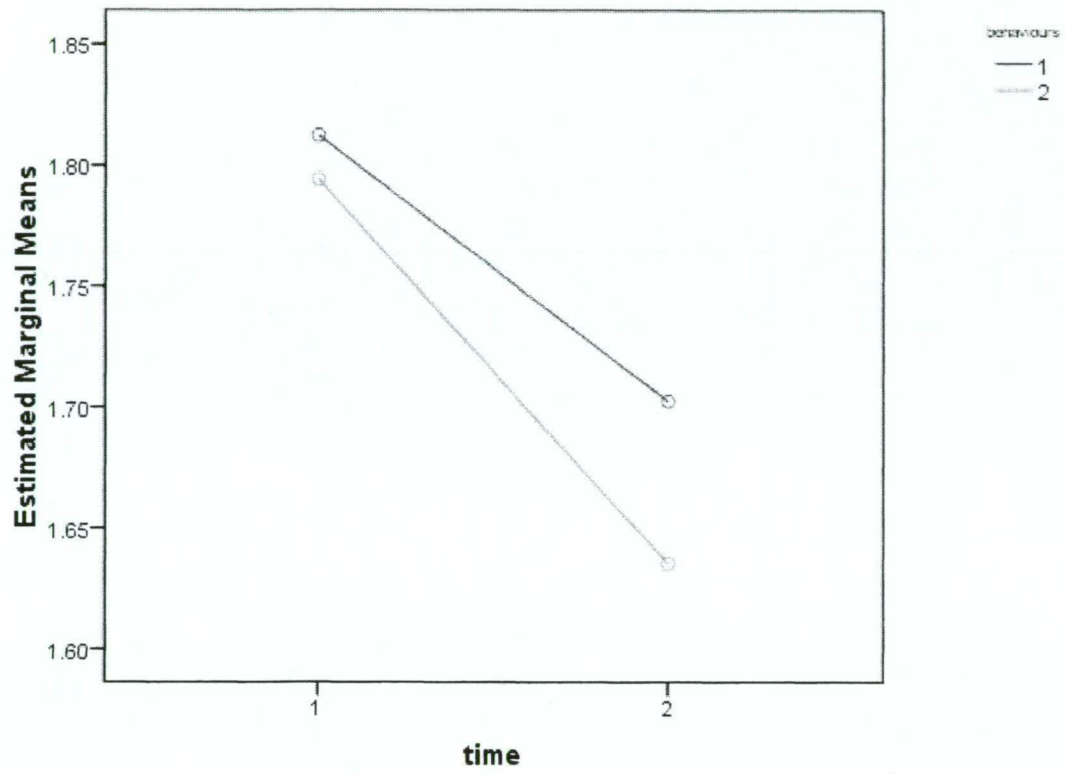
behavior			Mean	Std. Error	95% Confidence Interval	
Gender	urs	time			Lower Bound	Upper Bound
0	1	1	1.889	.076	1.735	2.043
		2	1.757	.074	1.608	1.905
	2	1	1.848	.072	1.702	1.993
		2	1.656	.070	1.516	1.796
1	1	1	1.736	.104	1.526	1.945
		2	1.648	.101	1.445	1.851
	2	1	1.741	.099	1.542	1.939
		2	1.614	.095	1.423	1.806

15. School_level * behaviours * time

Measure:MEASURE_1

School_ behavior			Mean	Std. Error	95% Confidence Interval	
level	urs	time			Lower Bound	Upper Bound
0	1	1	1.856	.116	1.623	2.088
		2	1.637	.112	1.412	1.862
	2	1	1.826	.109	1.606	2.046
		2	1.569	.105	1.357	1.782
1	1	1	1.769	.058	1.653	1.885
		2	1.767	.056	1.655	1.879
	2	1	1.763	.054	1.653	1.872
		2	1.701	.052	1.595	1.807

Estimated Marginal Means of MEASURE_1



P.E. class – RM ANOVA

Descriptive Statistics

	Mean	Std. Deviation	N
VAR00010	1.9500	.19411	6
VAR00011	1.0683	.16738	6
VAR00012	1.7133	.26417	6
VAR00013	1.2750	.50039	6

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
behaviours	Sphericity Assumed	.001	1	.001	.027	.875	.005
	Greenhouse-Geisser	.001	1.000	.001	.027	.875	.005
	Huynh-Feldt	.001	1.000	.001	.027	.875	.005
	Lower-bound	.001	1.000	.001	.027	.875	.005
Error(behaviours)	Sphericity Assumed	.246	5	.049			
	Greenhouse-Geisser	.246	5.000	.049			
	Huynh-Feldt	.246	5.000	.049			
	Lower-bound	.246	5.000	.049			
time	Sphericity Assumed	2.614	1	2.614	20.768	.006	.806
	Greenhouse-Geisser	2.614	1.000	2.614	20.768	.006	.806
	Huynh-Feldt	2.614	1.000	2.614	20.768	.006	.806
	Lower-bound	2.614	1.000	2.614	20.768	.006	.806
Error(time)	Sphericity Assumed	.629	5	.126			
	Greenhouse-Geisser	.629	5.000	.126			
	Huynh-Feldt	.629	5.000	.126			
	Lower-bound	.629	5.000	.126			
behaviours * time	Sphericity Assumed	.295	1	.295	8.341	.034	.625
	Greenhouse-Geisser	.295	1.000	.295	8.341	.034	.625
	Huynh-Feldt	.295	1.000	.295	8.341	.034	.625
	Lower-bound	.295	1.000	.295	8.341	.034	.625

Error(behaviours*time)	Sphericity Assumed	.177	5	.035			
	Greenhouse-Geisser	.177	5.000	.035			
	Huynh-Feldt	.177	5.000	.035			
	Lower-bound	.177	5.000	.035			

Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source			Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
behaviours	Linear	time	.001	1	.001	.027	.875	.005
Error(behaviours)	Linear	time	.246	5	.049			
time	behaviours * time	Linear	2.614	1	2.614	20.768	.006	.806
Error(time)	behaviours * time	Linear	.629	5	.126			
behaviours * time	Linear	Linear	.295	1	.295	8.341	.034	.625
Error(behaviours*time)	Linear	Linear	.177	5	.035			

4. behaviours * time

Measure:MEASURE_1

behaviours time		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1	1	1.950	.079	1.746	2.154
	2	1.068	.068	.893	1.244
2	1	1.713	.108	1.436	1.991
	2	1.275	.204	.750	1.800

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	2	1.8350	.06364	.04500
VAR00002	2	1.7600	.24042	.17000

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAR00001	40.778	1	.016	1.83500	1.2632	2.4068
VAR00002	10.353	1	.061	1.76000	-.4001	3.9201

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	2	1.6050	.12021	.08500
VAR00002	2	1.7350	.02121	.01500

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAR00001	18.882	1	.034	1.60500	.5250	2.6850
VAR00002	115.667	1	.006	1.73500	1.5444	1.9256

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	2	1.8300	.16971	.12000
VAR00002	2	1.1850	.13435	.09500

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAR00001	15.250	1	.042	1.83000	.3053	3.3547
VAR00002	12.474	1	.051	1.18500	-.0221	2.3921

Var1 – pre db and bi scores diff b/w

Var2 – post db and bi scores diff b/w

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAR00001	3.432	1	.181	1.51000	-4.0807	7.1007
VAR00002	6.953	1	.091	1.49500	-1.2368	4.2268

Var1 between pre and post DB

Between pre and post BI

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAR00003	301.000	1	.002	1.50500	1.4415	1.5685

Diff between pre and post scores DB and pre and post score BI