ENHANCING SOCIAL COMPETENCE THROUGH A GROUP INTERVENTION PROGRAM FOR SURVIVORS OF CHILDHOOD BRAIN TUMOURS

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy Dalla Lana School of Public Health University of Toronto

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ABSTRACT

Purpose: To examine the social competence of childhood brain tumour survivors in the context of a group social skills intervention program developed to address documented social deficits among this population and to expand outcomes obtained from a feasibility study, by: conceptualizing social competence as three separate but interrelated constructs including social adjustment, social performance, and social skills; incorporating a control group; eliciting teacher responses; and examining sense of self. Methods: Participants were 23 survivors (10 males; 13 females) aged 7 to 15 years and comprised an intervention (n=15) and control group (n=8). The intervention consisted of 8 2-hour weekly sessions focused on social skills including friendship making. At the level of social adjustment, intervention participants, controls, parents, and teachers (n=6) completed standardized measures of social adjustment including: social skills (SSRS, Gresham & Elliott, 1990); social functioning (Varni, 1999); and social problems (Achenbach, 2001). At the level of social performance, behavioural observations were conducted on intervention participants. At the level of social skills, intervention participants responded to the Social Problem-Solving Measure (SPSM; Vannatta, 1993). Survivors also completed
standardized sense of self measures. **Results:** Outcomes related to social adjustment showed a significant increase from Time 1 to Time 2 for parent reported SSRS within and between groups. Significant improvements were also found for parent reported social problems between groups. Child reported social problems decreased within groups and a borderline effect was found between groups. Teachers reported improved SSRS scores form Time 1 to Time 2. For social performance, significant increases in frequency were found for maintaining facial attention and social conversations with peers over the course of the intervention. At the level of social skills, a borderline significant increase was found for quantity of strategies offered from Time 1 to Time 2. No significant findings were found for sense of self data. **Conclusions:** Improvements after intervention were noted at each level of social competence, but primarily at the level of social adjustment. Control group and teacher outcomes strengthen findings. This is the first study to explore varying levels of social competence and provides important insight into the source of survivors’ social deficits.
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ENHANCING SOCIAL COMPETENCE THROUGH A GROUP INTERVENTION PROGRAM FOR SURVIVORS OF CHILDHOOD BRAIN TUMOURS

1.1 Problem Statement and Research Questions

Social competence as a construct has been liberally utilized in psychological research. Yeates and colleagues (2007, p. 536) defined social competence as “the ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships with others over time and across situations”. There are problems inherent in the breadth of such a definition, however, which has led to difficulties in the operationalization and subsequent interpretation and application of research findings. In fact, the lack of a clear definition of social competence highlights a major obstacle to this field of research. Thus, Cavell (1990) proposed that social competence be defined as the umbrella under which social adjustment, social performance on specific tasks, and social skills, have been hypothesized to fall (Cavell, 1990). These components are said to exist in a hierarchy as separate, but interrelated constructs with social adjustment existing at the top, followed by social performance and social skills forming the base of this hierarchy (see Figure 1).

Although childhood brain tumour survivors have been found to have social deficits (Vannatta, Gartstein, Short, & Noll, 1998) the majority of the research on the impact of a brain tumour diagnosis in childhood or adolescence on social competence has focused at the level of social adjustment, and little research has focused at the more rudimentary levels of social skills and social performance. For example, in a recent review of the psychosocial outcomes of brain tumour survivors (Fuemmeler, Elkin, & Mullins, 2002), outcomes were all reported at the level of social adjustment, with the
Child Behavior Checklist (CBCL) (Achenbach, 2001) frequently used to report social difficulties by studies reviewed (Carpentieri, Mulhern, Douglas, Hanna, & Fairclough, 1993; Fossen, Abrahamsen, & Storm-Mathisen, 1998).

Moreover, few efforts have been focused on developing interventions to address these social deficits. Recently, the feasibility and preliminary outcomes of a social skills program designed for children aged 8 to 16 years with brain tumours was assessed for 32 participants similarly based at the level of social adjustment. Repeated measure analyses revealed significant improvements in social adjustment based on parent reports. Specifically, parents reported increased self-control, ratings of social skills, and quality of life (Barrera & Schulte, 2009). Outcomes based on parental reports have provided some support, therefore, for the efficacy of an intervention program for improving social adjustment among childhood brain tumour survivors.

Survivors themselves, however, did not report significant change related to intervention for any of the social adjustment measures (Barrera & Schulte, 2009). These results based on standardized self-reports were disappointing. In contrast, unsystematic observations and subjective views of survivors made by intervention facilitators and parents, as well as survivors’ spontaneous comments and responses to satisfaction questionnaires, suggest survivors did experience positive changes in their social behaviour. The question remains, therefore, why parents reported some improvements in social adjustment, but survivors did not.

First, for the most part, survivors’ scores on measures of social adjustment lay within the normal range at baseline and therefore little improvement in scores could be expected following the intervention. There is evidence that childhood survivors of cancer
Figure 1. Conceptualizing Social Competence
have the tendency to underreport problem behaviours (Canning, Canning, & Boyce, 1992). In addition, results obtained from the feasibility study (Barrera & Schulte, 2009) were based on a time series design with each child serving as his/her own control. Lack of a control group, therefore prevented the ability to rule out potential sample biases such as parental reports reflecting commitment to the group as opposed to actual change. There was also a lack of reports from additional informants, such as teachers to assess potential intervention change in other settings. Implementing a control group and eliciting responses from teachers, therefore, was one of the primary objectives of this study.

It is also possible that evidence of change existed in the feasibility study at the more primary levels of social competence (i.e. social skills, social performance) but the standardized questionnaires used were not sensitive enough to detect such changes as they were more focused on assessing social competence at the level of social adjustment. In fact, methods for assessing social skills or social performance do not typically include standardized questionnaires and instead rely on responses to hypothetical social dilemmas or behavioural observations. Given observations and subjective accounts regarding the positive improvements of these participants, systematic observations may have provided more direct evidence of change. A secondary objective of the study, therefore, was to test the efficacy of the group social skills intervention program assessing social competence at the behavioural level of social performance using systematic observations in addition to eliciting responses to hypothetical social situations at the level of social skills as the primary outcome measures.

Finally, this, and other previous studies focused on the social competence of child brain tumour survivors have remained largely atheoretical and for the most part have
failed to consider other relevant contextual factors that may reflect change following an intervention program. For example, a child’s sense of self may be critical to understanding expressions of social behaviour. Sense of self can be conceptualized as the internal thoughts or feelings about the self as it relates to social experiences, whereas social competence reflects the more objective manifestation of social behaviour. In fact, other conceptualizations of social competence have included sense of self as a critical component to this construct (Vaughn & Hogan, 1990; Yeates et al., 2007). Sense of self, therefore, may be an important factor to consider when assessing social competence and may form important additional foci for evaluation of this aforementioned intervention program to help explain intervention effects. Indeed, the notion of a sense of self has received very little attention among a population of childhood brain tumour survivors, and thus exploratory examinations of this construct will be conducted.

The focus of this investigation, therefore, will be to more comprehensively examine social competence in childhood survivors of brain tumours considering each level of social competence: social adjustment; social performance; and social skills. Specifically, social competence will be investigated in the context of a group social skills intervention program devised to enhance social adjustment, and subsequently social performance, and social skills. In addition, a control group will be recruited and teacher responses will be sought as additional informants of survivors’ social status. This will contribute to the establishment of the empirical validity of this program. Finally, intervention change will also be considered at the level of sense of self, particularly, self-efficacy and self-concept, constructs that will be explored further in a later section.
1.2 Introduction to Child and Adolescent Brain Tumours

Cancers of the central nervous system (CNS) comprise the second most common group of cancers in children (Canadian Cancer Society, 2009). In Canada, between 2000 and 2004, CNS tumours constituted approximately 20% of new cases, second only to Acute Lymphoblastic Leukemia (ALL) (Canadian Cancer Society, 2009). Specifically, the overall incidence of CNS tumours was approximately 112 cases per 1,000,000 children in Canada, with the majority of cases being diagnosed between the age of 1 to 4 years of age. During the same time period, CNS tumours contributed to 30% of Canadian childhood cancer related deaths, making this subgroup of childhood cancers the leading cause of cancer related mortality.

As a group, childhood brain tumours are largely heterogeneous with great disparities in tumour diagnosis emerging from the type of tumours themselves, or the locations in which those tumours exist within the CNS. Brain tumours in children and adolescents have typically been classified according to three different locations: supratentorial, infratentorial, and hypothalamic/parasellar (Anderson et al., 2001). Supratentorial tumours are those that arise above the cerebellum. While in children, the majority of tumours arise below the cerebellum, supratentorial tumours are typically associated with greater medical, neurocognitive and psychosocial morbidity (Mostow, Byrne, Connelly & Mulvihill, 1991). Supratentorial tumours include low and high-grade astrocytomas and other gliomas (Anderson et al., 2001).

Astrocytomas, also known as gliomas, are the most common type of CNS tumour in children (Shimiski-Maher, 2001). Astrocytomas may be slow growing benign tumours, or fast growing. These tumours are not location specific and may occur anywhere in the
brain and spinal cord. The slow-growing tumours, however, are more typically found in the midbrain (supratentorial), or the medulla. These tumours have also been labeled: juvenile pilocytic astrocytoma, oligodendroglioma, mixed glioma, and ganglioglioma. Surgery is the first line of treatment for these slow-growing astrocytomas. Fast-growing astrocytomas, on the other hand, include high-grade anaplastic astrocytomas, glioblastoma multiforme, and gliomatosis cerebri and make up 20% of astrocytomas in children. Fast-growing astrocytomas are treated with surgery, aggressive chemotherapy and radiation therapy.

Infratentorial tumours account for 50-60% of child and adolescent CNS tumours (Shiminski-Maher, 2001). These tumours include primitive neuroectodermal tumours (PNETs, including medulloblastomas), cerebellar astrocytomas, as discussed above, and ependymomas. Medulloblastomas account for approximately 20% of all CNS tumours in children (Shiminski-Maher, 2001). These tumours usually grow in the posterior fossa starting in the cerebellum but medulloblastoma cells can spread throughout the brain and spinal cord. Treatment includes surgery first, but these tumours have also been found to be very responsive to radiation therapy and chemotherapy drugs.

Ependymomas arise from cells that line the ventricles and make up 8 to 10% of child and adolescent brain tumours. About 70% of ependymomas occur in the posterior fossa, usually the 4th ventricle. Ependymomas may also grow in the cerebral hemispheres or the spinal cord (Shiminski-Maher, 2001).

The final class of brain tumours occurring in children are those located in the hypothalamic, parasellar regions. These tumours include craniopharyngiomas, optic pathway gliomas, and germ cell tumours. Craniopharyngiomas grow in the area of the
brain called the suprasellar (includes the hypothalamus, pituitary gland, optic chiasm). They account for approximately 5% of all pediatric brain tumours. Despite their benign appearance, due to the location of the tumour, surgery is a challenging form of treatment and often causes long-term complications such as memory loss, visual deficits, and behavioural and hormonal problems (Shiminski-Maher, 2001).

Impressively, survival rates for childhood brain tumours have increased almost 14% between 1985-1988 and 1999-2003 and a 75% five year survival is now anticipated for these children (Canadian Cancer Society, 2009). While this has led to an increase in the number of childhood brain tumour survivors, new needs are emerging with respect to monitoring the late-effects of therapies required to maintain these remarkable survival rates. Specifically, childhood brain tumour survivors have been found to be at increased risk for physical, and neurocognitive and academic deficits (Butler & Mulhern, 2005; Reddick et al., 2003). Evidence is similarly mounting for social difficulties following diagnosis and treatment among this population (Fuemmeler et al., 2002; Vannatta, Gartstein et al., 1998). The literature related to social functioning in childhood brain tumour survivors will be reviewed in a subsequent section followed by a discussion focused on the source of these deficits and finally ending with research related to rehabilitation. Where research in these respective areas is limited in a population of pediatric brain tumour survivors, the research as it relates to children with other cancers or within the healthy population will be considered.

1.3 Conceptual and Developmental Overview

For the current project, theory has been used as means to help understand the conceptualization of social competence as well as sense of self. With a greater conceptual
understanding of these constructs, a developmental framework will be used to explore the formation of social competence and sense of self. An awareness of these developmental processes will be particularly important when considering childhood brain tumour survivors, as disruptions to this developmental trajectory that may be experienced by these survivors could be at the root of their reported social difficulties.

1.3.1 Conceptualizing Social Competence

The investigation of social competence among children has generated widespread interest in developmental and social psychology. Despite its widespread popularity, the definition of this construct has varied. Social competence has been operationalized using a number of different constructs, and thus assessment of social competence in children takes a number of different forms (John, 2001). While not necessarily problematic should the assessments represent different ways of operationalizing the same construct, in actuality, to date, measures of social behaviour have been assessing different constructs (Cavell, 1990). Herein lies not a methodological problem in assessment therefore, but instead an issue with conceptualization. Moreover, in and of itself, the term social competence is too broad a construct, encompassing a wide range of potential behaviours, and leading to very non specific descriptions of outcomes (John, 2001). It has been proposed, therefore, that social competence be conceptualized as having multiple subconstructs.

Accordingly, researchers interested in the study of social competence have attempted to better differentiate this construct (Cavell, 1990; Rubin, Bukowski, & Parker, 1998). Specifically, social competence has been hypothesized to exist as a hierarchy of three separate but interconnected processes: social adjustment; social performance; and
social skills (Cavell, 1990) (see Figure 1). In a set of related distinctions, three levels of social complexity have been conceptualized: relationships, interactions, and individuals (Rubin, Bukowski, & Parker, 2006). Each of these postulated levels of social competence with respect to conceptualization and operationalization will be examined independently.

1.3.1.1 Social adjustment. At the top of the hierarchy is social adjustment (Cavell, 1990), or relationships (Rubin et al., 2006), defined by the quality of interactions and the extent to which individuals are achieving developmentally appropriate, societally determined goals (Cavell, 1990). As aforementioned, for the most part, measurement of social competence among a brain tumour population to date has focused on this level of social complexity. Instruments classified as measures of social adjustment require observers to make evaluative judgments regarding behavioural performance in social situations. The most common method of measurement focuses on the behavioural aspect of social adjustment, typically measured through parental reports of social competence, including recreational and social activities and school performance (e.g. SSRS, CBCL Social Competence) (Meijer, Sinnema, Bijstra, Mellenbergh, & Wolters, 2000), but also through child self-reports, as well as teacher-report.

Peers have also been employed as important informants of a child’s social competence at the level of social adjustment. Sociometry, is the science of measuring relationships (Moreno, 1951), and examples of sociometric tools include the Revised Class Play (Masten, Morison, & Pellegrini, 1985), Three Best Friends (Bukowski & Hoza, 1989), and a Liking Rating Scale (S. R. Asher, Singleton, Tinsley, & Hymel, 1979). Sociometric evaluations of children and adolescents at this level of social competence have typically focused on classifying children into categories of general
acceptance (i.e. sociometric preference) including: popular, children who are high in acceptance and low in rejection; rejected, children who are low in acceptance and high in rejection; neglected, children who are low in both acceptance and rejection; average, children who are average in acceptance and rejection; and controversial, children who are high in acceptance and rejection (Rubin et al., 2006). Sociometry has been used for measuring the popularity of healthy children (e.g. Jiang & Cillessen, 2005), children with learning disabilities (e.g. Ochoa & Olivarez, 1995) children with other chronic illnesses (e.g. Bawden, Stokes, Camfield, Camfield, & Salisbury, 1998), children with cancer relative to their peers (e.g. Noll, Bukowski, Davies, Koontz, & Kulkarni, 1993) or social acceptance by peers of children with brain tumours (Vannatta, Gartstein et al., 1998).

Although sociometric measures offer a unique and important perspective of a child’s social function, these measures have also been criticized for relying too heavily on popularity and likeability (Connolly, 1983). On the other hand, multiple informants of social function enrich our understanding of this construct in children, and particularly for survivors. Understandably, such measures require greater involvement of researchers, and as such are not as frequently employed.

There have been several criticisms surrounding the use of assessment measures, predominantly those at the level of social adjustment, designed for ‘normal’ populations among cohorts of children with chronic illnesses including childhood brain tumour survivors (Adams, Streisand, Zawacki, & Joseph, 2002). For example, the implementation of the widely used ‘Child Behaviour Checklist’ (CBCL), with only a small subscale of items dedicated to assessing social competence, may actually reflect limited access to social interaction due to frequent hospitalizations, absence from school,
or impairments in sensory/motor functioning and not, instead, actual deficits in social adjustment or competence (Drotar, Stein, & Perrin, 1995). Moreover, in using these scales, many studies have not specifically assessed peer relationships (Thompson & Gustafson, 1996). Finally, few of these social adjustment scales provide appropriate normative data for a chronically ill population. That being said, social adjustment has been defined as the extent to which individuals are achieving developmentally appropriate, societally determined goals. As such, comparing a chronically ill population, in this case, survivors of childhood brain tumours, to normative data generated for a ‘healthy’ population has its own merits and provides critical information about the level at which these children are functioning compared to their healthy peers. Nevertheless, there has been an increased use of assessment tools developed specifically for children with chronic illness, such as the Pediatric Quality of Life Inventory (PedsQL) (Varni, Seid, & Rode, 1999). This instrument, however, is similarly limited in the number of items used to assess social adjustment and as a result the instrument may not adequately conceptualize or represent social adjustment (McMaugh & Debus, 1998). The strengths of these standardized measures such as the CBCL as well as measures designed specifically for children with chronic illness, such as the PedsQl, however, outweigh their limitations, resulting in their frequent use among studies evaluating this population. Therefore, these measures will similarly be employed in the current study simply to facilitate comparisons across studies and to validate our proposed assessments at the level of social performance and social skills.

1.3.1.2 Social performance. To achieve social adjustment, success at the level of social performance (Cavell, 1990), or social interactions (Rubin et al., 2006) is required.
Social performance or social interactions refer to the social exchange between individuals and the assessment of social performance, is the degree to which an individual’s actions in specific social situations are thought to be socially acceptable (Cavell, 1990).

With respect to operationalization, while there are a multitude of possible interactional behaviours, researchers have typically focused on three main social behaviours thought to be indicative of social performance or interaction typologies: moving toward others (prosocial); moving against others (aggressive); and moving away from others (withdrawn) (Yeates et al., 2007).

Prosocial, aggressive and withdrawn behaviours have typically been assessed by observational methods that evaluate the child in contexts where social performance may be exhibited and can be conducted in either naturalistic settings, such as in the classroom or playground, or in contrived settings such as a playgroup (Bierman, 2004). Observation aims to document the frequency with which individuals engage in particular behavioural styles (e.g. prosocial, aggressive, withdrawn). Several well-known coding systems for such methods of assessment have been developed (Bierman, 2004).

Researchers interested in the evaluation of social skills training must focus on these more performance-based assessments of social competence within specific contexts, including the rate of social interaction, the performance of specific, socially competent behaviours, or the extent to which performance meets the demands of relevant social tasks (Bierman, 2004). Given the focus of the current project, therefore, assessment of social performance will be critical to accurately target change in social competence. Studies of this kind have not been conducted among a population of childhood brain
tumour survivors as a measure of social competence, nor in the context of evaluating a social skills intervention.

1.3.1.3 Social skills. At the bottom of the social competence hierarchy exists social skills (Cavell, 1990), or, the level of the individual (Rubin et al., 2006). This level refers to the specific abilities needed to enable an individual to successfully perform social tasks. These may include such abilities as evaluating nonverbal cues, and generally refers to the social knowledge and social skills repertoires children possess. The level of social skills may also refer to children’s socioemotional and temperamental dispositions (Rubin et al., 2006). Operationalization of social knowledge and social skills is usually accomplished by gauging children’s responses to a variety of hypothetical social dilemmas (Dodge, Laird, Lochman, & Zelli, 2002).

To summarize, social competence as a whole can be construed as a child’s ability to engage successfully at each of these aforementioned levels of social behaviour. In other words, a socially competent child will have: a) acquired and have access to the social skills and social knowledge appropriate to his or her level of development, which will be described in detail in a subsequent section; b) will demonstrate social performance by becoming engaged in a developmentally appropriate peer group structure and participating in group-oriented activities; and c) will become involved in satisfying relationships constructed on balanced and reciprocal interactions, demonstrative of social adjustment.

1.3.2 The Development of Social Competence

Consideration of the development of social competence cannot be conducted in isolation from the influence of significant others. While parents are central to the
initiation of a child’s social interactions during the first two years of life, peers offer unique opportunities for the development of social relations in subsequent years. As well, the nature of peer relationships have been identified as a critical source of social competence (Rubin et al., 2006). Peer relations refer to relationships children establish with same age mates and are inherently different in nature to social relations with adults or even siblings (G. W. Ladd, 2005). Specifically, peers serve as partners in social interaction and learning and allow for the broadening and particularizing of cognitive capabilities required to enact certain social skills, and subsequently social performance and social adjustment (Bandura, 1982). As a result, the development of social competence, which will be described next, will be examined by considering each of the levels of social competence separately, in the context of peer relations.

1.3.2.1 Social adjustment. There is skepticism surrounding the age at which social adjustment or social relationships are initiated, and this is largely predicated by the development of social performance and social skills, which will be described next. For example, friendship formation, maintenance and friendship quality are characterized by the ability to understand emotional displays and social intent and to perspective-take (Dunn & Cutting, 1999; Dunn, Cutting, & Fisher, 2002). The ability to make friends, friendship quality, and stability of young children’s friendships may be associated with, and predicted by, social, cognitive, and emotional maturity (Bukowski & Hoza, 1989). During early childhood, therefore, infants and toddlers rarely show mutual and stable preferences for specific peers (Furman & Bierman, 1983) and peers are not yet really defined as friends.
Compared to early childhood, however, middle childhood is associated with increased stability and reciprocity in friendship choices (Furman & Bierman, 1983). Positive social behaviours in the way of generosity, helpfulness, or cooperation directed towards peers, increases somewhat during these primary and middle school years. Friends that emerge during this period develop a sense of loyalty to one another and particularly among girls, self-disclosure is used as a strategy for maintaining friendships (Buhrmester, 1996). As Sullivan (1953) pointed out, however, the major goal of this stage in development is acceptance by peers. Predictably, children are concerned about self-presentation and want to avoid rejection by their peers. As a result, children begin to form peer groups that differ in status (Crockett, Losoff, & Peterson, 1984; Hartup, 1984).

By adolescence, there is an increased ability to process abstract concepts, hypothetical ideas, and statements that contradict what is known to be true in the real world. Relationships with others further develop from those that originated in middle childhood and are characterized by trust, respect, and similar value systems in addition to more intimate self-disclosure and loyalty (Furman & Bierman, 1983). This does not undermine the importance of the parent-adolescent or sibling relationship, but points toward a gain in importance and influence of peer relationships for positive development.

1.3.2.2 Social performance. There continues to be some disagreement regarding the age at which the development of social performance or interactions are initiated. By the age of two, however, toddlers have begun to display skills of modest complexity (Hay, 1985) leading to social performance or interaction. Specific social performance behaviours thought to develop between the ages of two and five years include: a) the ability to coordinate behaviour with that of the play partner; b) imitation of the peer’s
activity and an awareness of being imitated; c) turn-taking; d) the demonstration of helping and sharing behaviours; and e) the ability to respond appropriately to the peer partner’s characteristics (Rubin et al., 2006). For the most part, these social performance behaviours emerge with the development of locomotion and communication, as will be discussed in social skills.

In addition, during this period, interactive bouts become lengthier and toddler play becomes organized around particular themes or games (Eckerman & Stein, 1990). In fact, play becomes a critical component of children’s social performance behaviours and contributes substantially to the continued development of social strategies and goals. As children progress through development, Parten (1932) described six social play categories that were hypothesized to evolve. These categories include: 1) unoccupied behaviour; 2) solitary play; 3) onlooker behaviour (the child observes others but does not participate in the activity; 4) parallel play (the child plays beside but not with other children); 5) associative play (the child plays and shares with others), and 6) cooperative play (the child engages in interaction that is well coordinated). Certainly, solitary and parallel play are common in pre-schoolers, and the frequency of parallel play appears to remain constant from three to five years (Rubin, Watson, & Jambor, 1978). By the age of five the dominant mode of play has shifted to group play. There are some criticisms, however, to this proposed hierarchy. Parallel play, for example, often serves as an entry into more cooperative, complex activity (Robinson, Anderson, Porter, Hart, & Wouden-Miller, 2003) and children at all ages engage in unoccupied, onlooking, solitary, parallel and group activities (Rubin et al., 1978). In other words, watching and playing near, but
not with others are not necessarily immature forms of social interaction, but instead may be sequenced in a competent manner to gain entry into an ongoing play activity.

1.3.2.3 Social skills. The development of social skills, or changes at the level of the individual, is intimately tied to physical, cognitive, and emotional developmental processes (Rubin & Rose-Krasnor, 1992). Each of these processes interact with each other to elicit further developmental changes. For example, infants: a) are able to discriminate the faces of strangers (Barrera & Maurer, 1981); b) acknowledge familiar others through smiling, frowning and gestures to their play partners (Hay, Nash, & Pedersen, 1983; Howes, 1988); c) carefully observe peers representing a clear sign of social interest (Eckerman, 1979); and d) respond to play partner’s behaviours (Mueller & Brenner, 1977).

During early childhood, the emergence of locomotion and communication facilitates expansion of a child’s social experiences. In addition, an increased frequency of peer interactions affords children a greater network with which to learn and practice social skills and to actively explore their ideas resulting in positive and adaptive developmental outcomes. The ability to understand others’ thoughts, emotions, and intentions also begins to emerge at this stage. This awareness broadens the child’s repertoire of social strategies and goals necessary for successful social competence (Rubin & Rose-Krasnor, 1992).

By late childhood or early adolescence, changes in social skills are again to some extent a function of the increasing cognitive skills that accompany this period. For example, these children become able to process abstract concepts, hypothetical ideas, and statements that contradict what they know to be true in the real world. Moreover, children
are capable of realizing that their own perspectives and feelings are not necessarily shared by others and that these perspectives may reflect more personal opinions rather than reality (Piaget, 1970). This enables children to improve skills such as role-taking, that is, the ability to put oneself mentally in someone else’s position. Role-taking is a critical tool required for the development of specific social skills such as empathy.

1.3.3 Conceptualizing Sense of Self

Sense of self can be conceptualized broadly as a cognitive internal schema that includes information about the self and develops based on interactions with the social world (Bierman, 2004). As a result of repeated interactions within relationships, expectations of what one might come to expect about relationships form the sense of self schema.

Similar to the notion of social competence, there have been a variety of models and theories devised to understand and explain sense of self, resulting in considerable ambiguity in conceptualization and operationalization. Specific challenges to interpreting the notion of a sense of self include an inconsistency in the definitions of self-beliefs throughout the literature. In fact, there have been a variety of terms used to describe sense of self including self-concept, self-esteem, self-worth and self-efficacy each of which are often used interchangeably. While there may be considerable overlap between constructs, differences between each do exist (Harter, 1999). Of these, self-efficacy and self-concept are two self constructs that have received the most attention in trying to understand self-perceptions (Bong & Skaalvik, 2003) and as a result will form the focus of our understanding of sense of self.
1.3.3.1 Self-efficacy. Self-efficacy has been defined as a person’s belief that he or she is capable of a specific behaviour required to produce a desired outcome in a given situation (Bandura, 1982). Rooted in Bandura’s social cognitive theory (1989) self-efficacy is considered central to an individual’s capability to self-reflect, one of five basic individual capabilities postulated by Bandura to be critical to influencing thoughts, feelings, and actions. Specifically, self-reflection allows individuals to make sense of their own experiences, explore their own cognitions and self-beliefs and engage in self-evaluation, thereby altering their thinking and behaviours accordingly (Bandura, 1989). This interaction between self-reflection (personal factor), individual experiences (environmental factor) and resultant thoughts, feelings and actions is critical to Bandura’s social cognitive theory. Self-efficacy, then, embedded within an individual’s beliefs, would be expected to affect behaviour in a variety of ways. Specifically, unless individuals believe that their actions can produce the outcomes they desire, they will have little incentive to act. Thus, one’s beliefs are the best predictors of behaviour. This has been well documented in the adult literature among healthy populations (e.g. Bouffard-Bouchard, Parent, & Larivee, 1991). For example, there is evidence to suggest self-efficacy predicts outcomes such as academic achievements, smoking cessation, pain tolerance, career choices, assertiveness, as well as social skills (Bandura, 1986; Moe & Zeiss, 1982). Self-efficacy, therefore, may be an important indicator of social competence in a pediatric brain tumour population (Wheeler & Ladd, 1982).

1.3.3.2 Self-concept. Self-concept, similarly derived from social cognitive traditions, can be broadly understood as one’s perception of the self and may include components such as one’s knowledge, beliefs, judgments, and feelings about one’s self
Similar to self-efficacy, self-concept is formed through experiences with the environment and may be influenced specifically by environmental reinforcements and significant others (Shavelson, Hubner, & Stanton, 1976). This does differ somewhat from self-efficacy, however, in that self-concept is more concerned with the skills and abilities an individual may possess, as learned through the environment and specifically through social and self-comparisons, as opposed to self-efficacy judgments which focus on the specific ability to accomplish a given task (Bong & Skaalvik, 2003).

1.3.3.3 Contributions of self-efficacy and self-concept to sense of self. Self-efficacy and self-concept are both considered to be multi-dimensional, and may be conceived as existing as a hierarchy from individual experiences in particular situations at the base of the hierarchy to a general sense of self-efficacy or self-concept at the apex (Shavelson et al., 1976). Indeed, this conceptualization assumes relative transferability of one’s efficacy or self-concept judgements across different tasks or abilities to subsume a general sense of self. While there is some evidence to suggest generality of self-concept (Shavelson et al., 1976), more evidence is required to support this assumption for self-efficacy (Lent & Hackett, 1987; Multon, Brown, & Lent, 1991).

For the most part, self-efficacy has focused at assessing specific efficacy-related beliefs. In contrast, the tradition of research in self-concept began examining with a general sense of self-worth. Herein lies perhaps one of the greatest distinctions between these two constructs. Limited empirical evidence supporting the relationship between a general sense of self worth and outcomes (Hansford & Hattie, 1982), however, in contrast to that of more specific self-efficacy related beliefs (Multon et al., 1991), called for a re-operationalization of the self-concept construct (Harter, 1982). More recent formulations
of self-concept, therefore, reject the notion of a global and undifferentiated self, and
instead propose functionally distinct domain-specific self-concepts (Harter, 1982). Self-
concept is now conceptualized in a similar manner to that of self-efficacy with a
particular focus on specific domains. There has been some postulation that at domain
specific levels, self-concept and self-efficacy are empirically similar (Skaalvik & Rankin,
1996). That being said, the focus on domain specific self-concept still tends to reflect
more global and general self-perceptions as opposed to self-efficacy where the focus is
very task and situation specific and often in reference to some type of goal (Bandura,
1986, 1989; Bong & Clark, 1999).

There is some evidence to suggest that self-efficacy is an important component
that serves to influence self-concept (Schunk, 1991) and may in fact provide the cognitive
ingredient to the self-concept (Bong & Clark, 1999). As such, it was thought important to
consider both self-efficacy and self-concept as important factors contributing to one’s
sense of self. Moreover, given the focus of the current project, specific interest will be
paid to the domain specific levels of each of these constructs, to obtain a clear picture of
childhood brain tumour survivors’ social sense of self. It was also felt that focus at these
domain specific levels would be more receptive to intervention change. Concepts of
interest for the current study, therefore, are social self-efficacy, or one’s belief about
being able to engage in socially specific tasks, and social self-concept, one’s perception
of social self-competence, as they are related to social sense of self.

1.3.4 The Development of a Social Sense of Self

Although the conceptual difference between self-efficacy and self-concept may be
relatively weak, their developmental origins provide greater support for their distinctions.
Similar to the case of social competence, however, a discussion of the development of sense of self cannot be conducted independent from consideration of a child’s social relationships. In the case of sense of self, again, peers serve as particularly important sources of comparisons for judging and verifying one's self-efficacy and self-concept.

1.3.4.1 Self-efficacy. The literature on the development of self-efficacy is relatively sparse. Herein lies one of the major criticisms of Bandura’s theory of self-efficacy (Bandura, 1986, 1989). Lacking a concrete developmental framework, it is difficult to identify what could be expected for a child at a specific age with respect to their development of self-efficacy. Instead, sources of self-efficacy have been identified. Specifically, mastery experience, or one’s perceived outcome of a previous performance is arguably the most important influence on self-efficacy beliefs (Bandura, 1986, 1997). Generally, past successful outcomes lead to a higher sense of self-efficacy and failures lead to a decreased sense of efficacy.

In the absence of mastery experience, vicarious experiences influence self-efficacy beliefs on the basis of similar others’ performances on tasks (Bandura, 1989). By observing others succeed at a task, an individual will develop the expectation that they may also succeed. Although not as influential as mastery experience in the formation of self-efficacy, vicarious experience heavily influences the development of self-efficacy and may be particularly important when an individual has limited experience with the task.

Social persuasions or reflected appraisals from others are another way in which self-efficacy beliefs are created. Positive persuasions from others will encourage and promote sense of self whereas negative persuasions will inhibit self-efficacy beliefs.
Social persuasions are easily provided and readily available and therefore serve as a common source of expectations for self-efficacy.

Finally, physiological reactions contribute to self-efficacy beliefs. Somatic and emotional states provide information on the experience of an event and may help to reinforce or threaten self-efficacy beliefs. For example, heart rate and breathing help an individual judge their state of fear or anxiety. Physiological reactions, therefore, provide important positive or negative cues about the experiences of certain situations.

1.3.4.2 Self-concept. The literature on the development of self-concept is better established with respect to developmental timelines and has been described with reference to cognitive stages of growth and therefore, a discussion on the development of self-concept will be embedded in a review of the evolution of cognitive abilities throughout childhood (Harter, 1990). During infancy and early childhood, a child is only capable of describing observable behaviours and characteristics, giving specific examples of themselves rather than generalizations. For example, ‘I am a girl’ or ‘I have yellow hair’. Moreover, during these periods, children tend to be egocentric, or unable to view situations from other’s perspectives (Piaget, 1970). Subsequently, the child’s egocentricity precludes his/her understanding that others may be observing or evaluating the self and social comparison information is not cognitively processed. Finally, children at this stage tend to inflate their sense of competence, a phenomenon linked to an inability to distinguish reality from fantasy as opposed to an effort to misrepresent the self (Harter, 1990).

During middle childhood there is a shift from acknowledging self-attributes that are observable to those that are more conceptual, or trait-like. Such trait levels reflect the
newfound ability to classify specific attributes into categories, to form higher-order generalizations about the self (Harter, 1990). Trait labels represent a conceptual advance over the previous developmental period since one becomes capable of organizing observable, behavioural attributes into self schema. In addition, the self can now be defined comparatively, in relation to others and is more often described in terms of abilities or psychological attributes relative to peers and/or normative standards (Harter, 1990). Broader social comparison processes, and particularly the use of reference groups for self-evaluation, begin to emerge around the age of eight, as children become able to assess their competence in relation to the perceived social standards of groups to which they belong or aspire (Ruble & Frey, 1991). Social comparison allows for frames of reference or standards against which to judge one’s own traits and accomplishments. Peers provide critical information, therefore, about what children ‘should’ be able to do. In fact, during this stage, peers are central to communicating messages about children’s strengths, limitations and overall worth, and therefore are critical to establishing a sense of self.

By adolescence, one begins to describe one’s psychological interior in a way that reflects abstractions about the self in the form of beliefs, wishes, emotions and motives. Self-representations in the form of abstractions represent a cognitive advance over the previous stage where the preadolescent could only combine particular behaviours into trait labels. At this developmental stage, trait labels can be integrated into higher-order abstractions about the self. These unobservable, abstract, self-attributes represent hypothetical constructs about the self and typically require more inference about one’s latent characteristics than do the self-descriptions of children.
One can speculate the ways in which the development of social competence and sense of self may be threatened by the diagnosis and treatment of a brain tumour. As has been described, with age, the development of social competence and sense of self undergoes significant quantitative and qualitative changes. The development of social competence is characterized by an increased frequency of socialization experiences, leading to the development of a strong foundation of social knowledge and skills, coupled with a growing capacity to think more abstractly, including the ability to understand the intent and perspectives of others. For sense of self, with age, opportunities are afforded for social learning and modeling, as well as the ability to process social information and engage in social comparisons (Bandura, 1989; Vygotsky, 1981). Understandably, therefore, disruptions to the development of social cognitive capacities as a result of a brain tumour diagnosis and its subsequent treatment, as well as decreased opportunities for social learning, may have a critical effect on the development of social competence and/or sense of self for childhood brain tumour survivors.

Directly, injury to the central nervous system in and of itself may affect brain structures responsible for processing social information and some of the cognitive skills required to influence the dawning of social competence and sense of self (Bandura, 1986). The cognitive deficits most frequently identified in child and adolescent brain tumour survivors include memory, attention and processing speed. These skills have been linked to the performance of social skills (Lemerise & Arsenio, 2000). In addition, neurobiological systems responsible for memory and attention have similarly been
associated with emotional processing (LeDoux, 1996). Emotional regulation, therefore, may also be implicated in the neurobiological effect of a brain tumour diagnosis and treatment. Children’s ability to regulate emotion, particularly negative emotions, has been found to influence social status among peers (Coie, Dodge, & Kupersmidt, 1990). As the potential biological impact of a brain tumour is beyond the scope of this thesis, it will not be reviewed here.

The impact of other experiences endured by this population on social competence and sense of self has received less attention in the literature. We might expect, however, that children who are treated for cancer in general and those treated for a brain tumour in particular will be deprived of vicarious social learning experiences because of frequent hospitalizations and absences from school. Opportunities for observing, practicing, and mastering social skills within a peer network will therefore be limited (Brown, Eckman, Baldwin, Buchanan, & Dingle, 1995; Rodrigue, Streisand, Banko, Kedar, & Pitel, 1996). This, coupled with potential physical impairments will necessarily limit their participation in social, physical and leisure activities (Breslau, 1985; Daltroy et al., 1992). Moreover, it may even be likely that these brain tumour survivors are required to practice and master different social skills than their peers. For example, La Greca (1990) proposed that telling other children about one’s condition or explaining periods of illness (self-disclosure) by survivors may require skills not usually needed in everyday peer relationships.

As a result of more limited social experiences with peers, the use of same agemates as influential sources of vicarious experience or social comparison will also be threatened. While little is known about the social comparison process of children with
chronic illness, the child or adolescent with a brain tumour may have more limited opportunities to judge or verify their own social competence or sense of self against similar others. In addition, however, upon returning to the school environment, peers may in fact no longer be appropriate sources of comparison for children with brain tumours. Deficits incurred by children with a brain tumour may place them at a different stage of social cognitive growth than their peers. Despite early hypotheses that children engage in social comparisons with similar others (Festinger, 1954), research involving learning disabled children has contradicted this supposition and in fact learning disabled children more often compared themselves to normally achieving peers as opposed to other learning disabled peers (Renick & Harter, 1989). Thus, for brain tumour survivors, having once been able to identify with a ‘normal’ peer group, if social comparisons continue to be made following treatment where incongruencies in experiences may exist, the child with a brain tumour will be at considerable risk for decreased sense of self. These differing points of comparison may make some children focus more upon their illness as a point of difference and potentially as a deficit. The evidence to support this hypothesis, however, is lacking.

Social persuasions or social evaluations of ability are often conveyed indirectly and subtly to people, particularly when believed to be of limited ability (Bandura, 1997). Persuasive social feedback given either directly in the form of evaluation or indirectly in the form of social customs can undermine one’s sense of efficacy or boost it. For some survivors of brain tumours negative peer interactions and school experiences can undermine sense of efficacy or self-concept. That being said, there is the potential to
enhance these capabilities with timely intervention. There is limited evidence to support this postulation.

Finally, social challenges may also be attributed to increased physical limitations imposed by having a brain tumour and related changes in physical appearance (Barrera & Schulte, 2005). With respect to physical limitations, considering theories of social development, the ability to play physically may be more salient in some developmental periods than others. In fact, physical differences and limitations caused by illness in children have been found to disrupt peer interactions (Spirito, DeLawyer, & Stark, 1991). Moreover, in children newly diagnosed with cancer, negative perceived physical appearance was found to be associated with higher levels of social anxiety (Varni, Katz, Colegrove, & Dolgin, 1995).

The potential for deficits in social competence do not rest solely on the child with a brain tumour. Differences in physical, cognitive and social status in a child and how they are perceived by peers will impact the way in which social interactions and learning takes place (Rodrique et al., 1996; Vannatta, Zeller, Noll, & Koontz, 1998; Varni, Katz, Colegrove, & Dolgin, 1993). For example, with respect to physical changes, it may be that healthy children are unsure of how to respond to a peer who has experienced hair loss, is physically compromised, or is often absent from school.

There has been little empirical evidence among a brain tumour population to support these hypotheses. Specifically, the way in which social competence or a social sense of self may be impacted during development as a result of a brain tumour, has not yet been investigated. Nevertheless, there is some evidence to suggest deficits in
childhood brain tumour survivors within each of these concepts. A more detailed review of this literature will follow.

1.3.6 Contributions of Social Competence and Sense of Self to the Current Project

As has been discussed, the development of social competence includes a building of social knowledge based on observational learning provided by opportunities for social interactions with caregivers, other family members including siblings, and peers. Peers are considered key players in this process, providing unique social opportunities and acting as important sources of comparisons for judging and verifying one’s sense of self. Generally, it has been suggested that the diagnosis and treatment of a brain tumour interferes in the normal social developmental process. Children with brain tumours are disadvantaged in this respect, afforded fewer occasions for social interactions and therefore social learning either because of hospitalizations, absences from school, or potential physical limitations. The way in which peers react to these children may also affect the interaction that takes place. As a result, knowledge bases are more immature thereby further impacting social competence and sense of self. Limited opportunities for social experiences with peers, therefore, may cause a lag, or delay in the social development process of children with brain tumours and disrupt the achievement of important developmental milestones.

If it is assumed that there may be a lag or delay in the social development of children with brain tumours, this implies that development in this population continues, albeit somewhat hindered. If a brain tumour diagnosis merely interrupts the development of social competence and a sense of self, as opposed to completely halting it, then we might assume that working to foster and enhance the development of these processes may
diminish some of the deficits that have been demonstrated. Interventions of this nature are being explored in the context of cognitive development (Reddick et al., 2003). We might assume that similarly, exposure to a peer group in a structured format designed to facilitate social interactions may help bolster social competence and/or sense of self among this population.

The impetus for providing a group intervention to children and adolescents with brain tumours is multifold. Firstly, as has been identified, there is some evidence that children with brain tumours struggle with social competence (Fuemmeler et al., 2002). Secondly, relationships that are formed with peers within therapy groups are hypothesized to resemble close friendship relationships (Rogers, 1970; Yalom & Leszcz, 2005). More specifically, the group process fosters a social climate of belonging and trust, enhancing self-acceptance and improving communication competencies (Rogers, 1970). Finally, groups also give participants opportunities for modeling, problem-solving, helping others, and relating to peers who share similar circumstances (Schaefer, 1999).

The question remains, therefore, whether or not if provided with structured opportunities for social interaction and learning in the context of a peer group of similar others, including mastery experience, performance accomplishment, and vicarious experience we may also enhance social competence and sense of self and circumvent the negative social outcomes for children with brain tumours. Before addressing this hypothesis, documenting the social outcomes of children with brain tumours as well as existing intervention programs will be reviewed next.
1.4 Review of Related Research

1.4.1 Evidence for Deficits in Social Competence and Sense of Self in Children and Adolescents with Brain Tumours

1.4.1.1 Social competence: Social adjustment. As has been discussed, research focused on the social competence of child and adolescent survivors of brain tumours to date has remained conceptually weak with respect to operationalization of social competence and largely atheoretical. Consistently, this research has been conducted at the level of social adjustment and to our knowledge no research has yet attempted to evaluate the level of social skills or social performance, with one exception (Bonner et al., 2008).

Social adjustment has been considered significantly decreased in children and adolescents diagnosed with a brain tumour compared to normative values (Aarsen et al., 2006; Bhat et al., 2005; Carey, Barakat, Foley, Gyato, & Phillips, 2001), healthy controls (Barrera, Shaw, Speechley, Maunsell, & Pogany, 2005; Pedreira et al., 2006; Pompili et al., 2002) siblings (Zebrack et al., 2004), and peers (Vannatta, Gartstein et al., 1998). In addition, children with brain tumours have reported lower social competence compared to survivors of other cancer, including children with acute lymphoblastic leukemia (Barrera et al., 2005; Meeske, Katz, Palmer, Burwinkle, & Varni, 2004). These deficits have been exhibited early after diagnosis and treatment (Bhat et al., 2005), as well as more than five (Barrera et al., 2005) to ten years following treatment (Zebrack et al., 2004).

Moving beyond the use of standardized questionnaires, there has been some research that has incorporated reports from additional informants to enrich the outcomes related to social adjustment. For example, Vannatta and colleagues (Noll, Ris, Davies, Bukowski, & Koontz, 1992; Vannatta, Gartstein et al., 1998) have used sociometric
methodology to conduct comprehensive examinations of the relationship between brain tumour survivors and their peers. Results of these studies found that children with brain tumours were described as socially isolated and received fewer friendship nominations from classmates and teachers than healthy peers (Vannatta, Gartstein et al., 1998). Moreover, these nominations were received more frequently for brain tumour survivors as compared to children with sickle cell disease who were found to be no different from healthy peers (Noll et al., 1992). This research lends some support to the specificity of social adjustment difficulties in childhood brain tumour survivors but more importantly characterizes the nature of these difficulties as relating to social isolation (withdrawn) and having fewer friends (rejection).

Using semi-structured interviews, Upton and Eiser (2006) similarly reported that parents and teachers described children with brain tumours as having significantly more difficulties with peer relationships (Upton & Eiser, 2006). Mothers specifically reported their children were socially isolated and half of these mothers felt their child’s behaviour limited social opportunities (Upton & Eiser, 2006). Two consistent themes emerged from these interviews. First was the discrepancy between reports of their child’s social relationships prior to cancer treatment and the subsequent downfall with peers following the return to school. The second theme to emerge was reports of peer exclusion and bullying (Vance, Eiser, & Horne, 2004).

1.4.1.2. Social competence: Social performance. There is no research that has been conducted at the level of social performance in pediatric survivors of brain tumours. Nevertheless, outcomes reported at the level of social adjustment suggest that at the level of social performance brain tumour survivors may be categorized generally as withdrawn
rejected (Vannatta, Gartstein et al., 1998). Again, this level of analysis was not the focus of the aforementioned studies, and therefore this supposition requires specific confirmatory evidence.

Among a healthy population of children, again, three identified levels of social performance have been identified. These are: prosocial, aggression, and withdrawn (Yeates et al., 2007). Examples of prosocial behaviour include acts that are viewed as cooperative, supportive, or affectionate, such as social conversation and cooperative play. Such prosocial behaviours have been found to be associated with peer acceptance (Hartup, Glazer, & Charlesworth, 1967) and create friendships bonds among children (Coie & Kupersmidt, 1983).

Contrastingly, problematic interactions within normal children include aggression and withdrawal, and subsequently low levels of prosocial behaviours. Such behaviours have been associated with peer rejection (Hartup et al., 1967; Rubin et al., 2006). Specific examples of behaviours found to be associated with aggressive rejected children include verbally or physically aggressive behaviours (Dodge, Coie, & Brakke, 1982). Behaviours typically associated with withdrawn rejected children include solitary play, off-task or context inappropriate behaviour, as well as higher than normal interactions with adults (Dodge et al., 1982; Lahey, Green, & Forehand, 1980).

Both aggression and withdrawal have been associated with peer victimization. For aggressive children, victimization may occur because their behaviour is found to be annoying and bothersome and therefore may provoke teasing and bullying from others (Hodges, Malone, & Perry, 1997; Olweus, 1993). Research examining the association between aggressiveness and victimization has consistently documented their positive
relationship (Hodges et al., 1997; Snyder et al., 2003). On the other hand, a withdrawn child may be the target of victimization because they are seen to be nontargeting and unlikely to retaliate when provoked. There is evidence to support this hypothesis (Olweus, 1993). Anxious and socially reticent children have been found to be victims of bullying behaviour (Hanish & Guerra, 2004; Kochenderfer-Ladd, 2003; Olweus, 1993).

Again, given findings obtained at the level of social adjustment for survivors of brain tumours, we might expect these children to fall into the withdrawn social performance category.

1.4.1.3 Social competence: Social skills. Again, no research has been conducted examining social skills among brain tumour survivors, nor in children with other cancers, with one exception (Bonner et al., 2008) This study focused on the evaluation of social skills by way of a cognitive assessment and specifically assessed facial recognition skills. Facial recognition skills are acknowledged to be essential for proficient social communication and interaction as well as to provide critical nonverbal social information to observers (Crick & Dodge, 1994). This results of this study found that child survivors of brain tumours made significantly more facial recognition errors compared to children with Juvenile Rheumatoid Arthritis (JRA) (Bonner et al., 2008). This is the first study to explore social competence at the level of social skills among this population and may begin to help elucidate important targets for intervention. Among healthy children, however, at the level of social skills, withdrawn rejected children in particular have been found to offer fewer prosocial strategies to hypothetical social dilemmas (Renshaw & Asher, 1983), suggest adult intervention as a solution more often (Rubin, Daniels-Beirness, & Bream, 1984) and focus on more instrumental as opposed to relationship
oriented goals (Crick & Ladd, 1990). Future research should focus on confirming hypotheses related to the withdrawn-rejected classification of brain tumour survivors and to generate some evidence at the level of social skills. Potential deficits identified at these levels could answer important questions regarding the foci required for interventions to enhance social competence.

1.4.1.4 Sense of self: Self-efficacy. There has been no research evaluating self-efficacy among a population of childhood brain tumour survivors.

There is one qualitative study that has explored efficacy beliefs as they may contribute to learning experiences in children with cancer (Crossland, 2002). Unique in that it was conducted within the hospital setting, the study identified that children were slow to develop relationships with other children in the hospital and attributed this finding to the presence of low peer social efficacy beliefs. Relationships with adults, on the other hand, were observed as being considerably stable resulting from continued reinforcement from adults while in the hospital (Crossland, 2002). Although these results were based on a sample of five children, and therefore require further replication, these findings support our hypothesis that reduced exposure to peers contributes to decreased self-efficacy in this realm.

Although relatively absent among a childhood cancer population, self-efficacy has been explored within other pediatric populations as it relates to prevention and health behaviour change (Glanz, Rimer, & Lewis, 2002). For example, self-efficacy has been related to adherence to health regimens by adolescents with other chronic acute illnesses where higher self-efficacy was related to greater adherence (Baranowski, Perry, & Parcel, 2002).
1.4.1.5 Sense of self: Self-concept. Research pertaining to the impact of a brain tumour on self-concept, is similarly scarce. One study, however, included a measure of self-concept in an analysis of factors that may influence depressive symptoms in childhood brain tumour survivors (Barrera, Schulte, & Spiegler, 2008). Not surprisingly, results of the study found males with greater self-worth expressed less depressive symptomatology than males with low self-worth. This relationship was enhanced when males also reported poor social adjustment. If social adjustment scores were high, however, depression scores were within the normal range and self-worth did not appear to make much difference. The pattern for females was more complex. Females with average self-worth exhibited average depression scores if their social adjustment scores were high. If social adjustment was low, females expressed depression scores at a clinical level. For those females with low self-worth, however, the pattern was reversed, with higher social adjustment being associated with higher depression scores. Further research is needed to better clarify these relationships.

Examination of self-concept has received some attention as it pertains to children with cancer, excluding brain tumour survivors (Madan-Swain et al., 1994; Noll et al., 1993; Noll, LeRoy, Bukowski, Rogosch, & Kulkarni, 1991; Sloper, Larcombe, & Charlton, 1994; Spirito, Stark, Cobiella, & Drigan, 1990). These studies have found no differences between pediatric cancer patients on or off treatment and peer controls on self-concept outcomes. Interestingly, however, ratings of these survivors also tend to fall in the normal range.
1.4.2 Source of Deficits in Social Competence and Sense of Self in Children and Adolescents with Brain Tumours

1.4.2.1 Social competence. As aforementioned, there is little research that has attempted to understand the mechanisms underlying decreased social competence among this population, except to focus on demographic or treatment effects (Wallander & Varni, 1992) and it follows, only at the level of social adjustment. One seminal study focused on the effects of whole brain radiation therapy (CRT) on children with brain tumours and found the level of social adjustment in these children to be compromised compared to those who did not receive whole brain radiation therapy based on sociometric assessments (Vannatta, Gartstein et al., 1998). Furthermore, intensity of CNS treatment has been linked to poor peer functioning (Vannatta, Gerhardt, Wells, & Noll, 2007). In contrast, the impact of radiation alone has been found to have no effect on social adjustment when standardized questionnaires such as the CBCL were used (Holmquist & Scott, 2003). As discussed earlier, however, the CBCL has received criticism as a tool to assess social competence among a population of childhood illness and these results should therefore be interpreted with caution (Drotar et al., 1995).

Contrasting evidence also exists for the impact of chemotherapy. Treatment with particular chemotherapy drugs, such as vincristine, cytoxan and VP16 have been found to be associated with greater social withdrawal, as determined by social adjustment assessments in survivors of pediatric brain tumours compared to those who were not receiving chemotherapy regimes (Holmquist & Scott, 2003). Although using different outcome variables (i.e. depression, anxiety), Zebrack and colleagues (2004) found no effect of chemotherapy on outcome. Children having received multiple treatments, (i.e.
surgery and radiation, chemotherapy and radiation, or surgery and chemotherapy) were more likely to experience difficulty with social adjustment three to four years following diagnosis compared to those who had only one treatment or no treatment (Kullgren, Morris, Morris, & Krawiecki, 2003).

As has been suggested, indirect consequences of a cancer diagnosis may also impact levels of social competence, although this supposition remains to be validated. For example, due to prolonged school absences, children and adolescents with a brain tumour are not only deprived of academic learning opportunities in the classroom, but also opportunities for social learning with peers (Noll, Bukowski, Rogosch, LeRoy, & Kulkarni, 1990). Paradoxically, more recently, it has been argued a cancer diagnosis may enhance a child’s level of maturity which may impose a heightened sense of empathy, a social skill that requires one to consider the perspectives of others (Parry & Chesler, 2005). Thus this may enhance the potential to augment children’s peer relations. Considering the existing evidence demonstrating decreased social competence, however, this hypothesis seems unlikely.

1.4.2.2 Sense of self. With little literature demonstrating the presence or absence of sense of self deficits among this population, there is currently no empirical work that has investigated sources of potential deficits in sense of self in pediatric brain tumour survivors and specifically with respect to social sense of self. That being said, one of the aforementioned studies conducted in this area identified a relationship between self-concept, depression and social adjustment (Barrera et al., 2008). While this study was cross-sectional in nature and causality could not be determined, certainly these components seem to share an important link among this population.
One may speculate that considering the traumatic and intrusive nature of treatment for childhood brain tumours there is a high likelihood that such treatment may change how the child sees him/herself (Woodgate & McClement, 1997). Nevertheless, research focused on sense of self among child survivors of other cancers have concluded that global self-concept does not change in response to a life-threatening condition (Anholt, Fritz, & Keener, 1993).

Among healthy children, sense of self deficits have been linked to: a lack of relatedness and secure connections with others; a sense of threatened autonomy; and the inability to predict and control outcomes (Connell & Wellborn, 1991).

1.4.3 Evidence for Intervention Programs in Children and Adolescents with Brain Tumours

1.4.3.1 Social competence. There is a paucity of research that has examined the effect of group intervention among children with brain tumours. Targeting boys with brain tumours and their parents, DieTrill and colleagues (1996) developed a social skills intervention based on deficits reported by participants including assertiveness, and handling teasing by peers. Eight families participated in one group intervention that was scheduled to run for eight sessions, but was extended to 16 sessions as requested by participants. Assessment of the group was conducted using satisfaction questionnaires devised by the authors and administered to the families upon completion of the group. Results of this program found both the boys and parents reported improvements in social adjustment after completion of the program. Without baseline assessment, an absence of standardized questionnaires, and a sample of only eight boys, little can be derived from
these results. Moreover, satisfaction questionnaires do not allow for a direct assessment of improvements at any level of social competence.

Barakat and colleagues (2003) conducted a pilot study of a social skills intervention for 13 children with brain tumours. Results were based on the outcomes from survivors, their parents and teachers. The intervention consisted of six sessions targeting social skills such as nonverbal communication and cooperation. Assessments were conducted using standardized scales such as the social skills rating system (SSRS; (Gresham & Elliott, 1990a) and the child behavior checklist (CBCL, (Achenbach, 1991b) one month prior to the intervention to obtain a baseline measure and 10 months following the intervention. Social adjustment based on the SSRS and the CBCL changed in the direction of improved functioning. Again, assessments were only based at the level of social adjustment. In addition, the small sample size limited the validity of these findings. Finally, with a baseline only one month prior to the intervention, a follow-up assessment 10 months post intervention, and no control group, it is difficult to attribute the changes to the intervention alone.

The limited validity and generalizability of these two studies (small sample size, lack of a control group) coupled with the dearth of research in this area, necessitates greater attention. Clearly, there is a need to develop and empirically validate a program designed specifically for addressing social behaviour and competence in children and adolescents with brain tumours. According to the conceptualization of social competence derived by Cavell and colleagues (1990) assessment at the level of social performance may be a more accurate methodology when evaluating social skill intervention groups. These measures provide more objective observational accounts of social performance.
An early study evaluated individual social skills training in newly diagnosed children with cancer, excluding those with brain tumours (Varni et al., 1993). Compared to controls, participants reported greater perceived social support from peers and teachers and parents reported decreased internalizing and externalizing behaviour problems and increased social competence. Given that children with brain tumours were excluded in this study, however, it is also questionable whether these findings can be generalized to this population.

Recently, a meta-analysis was conducted on the intervention programs to date that have targeted pediatric oncology populations (Pai, Drotar, Zebracki, Moore, & Youngstrom, 2006). The focus of this meta-analysis, however, was interventions designed to address psychological distress and adjustment generally, and not specifically social competence.

There is a large body of research that has focused on examining the efficacy of social skills intervention programs for ‘healthy’ children and a full review of this body of literature is beyond the scope of the current paper. There have been several meta-analyses conducted on this work and the results of one of these are presented here. Beelman and colleagues (1994) conducted a meta-analysis of 49 studies evaluating outcomes of social competence training in children and adolescents. Results revealed that social competence training was moderately effective but that the long-term effect tended to be weak. The limited sustainability of intervention effects has been noted elsewhere (Gresham, 1994). Strong effects were found when the outcome measures were related to the specific social skills that the programs were designed to teach (e.g. social cognitive skills). On measures of social adjustment, however, the effect of social competence training was found to be
minimal. Outcomes were similarly weaker for children with emotional and behavioural disorders.

For children and youth with emotional and behavioural disorders, Quinn and colleagues (1999) conducted a meta-analysis of 35 group social skill intervention programs designed specifically for this population. Results of this analysis replicated those of Beelmann and colleagues (1994) and yielded a very small overall effect size indicating less than substantial changes in behaviour. Furthermore, no effect was found for type of intervention (established vs. experimental), duration of treatment (< 12 weeks vs. > 12 weeks), quality of research design, or participant’s age. Interestingly, however, when comparing perceptions of multiple informants, evaluations conducted in a school environment (teachers, peers) revealed greater reported treatment effects compared to when evaluations were conducted by parents. In fact, the largest effect sizes were found for outcomes generated using sociometric methodology. Again, however, studies included in this analysis only incorporated assessments at the level of social adjustment.

Based on these two meta-analyses, one directed at healthy children and one focused on children with emotional and behavioural disorders, it is clear that social skills interventions demonstrate minimal to moderate efficacy, depending on the nature of difficulties among the population. Moreover, it may be concluded that assessments of social adjustment are not as effective in demonstrating intervention effect as assessments related to the specific social skills that the programs were designed to teach.

Alternatively, the use of observational assessments to evaluate the effect of group social interventions at the level of social performance has generated compelling evidence. For example, Bierman (1986) collected videotapes throughout a social skills training
session designed to teach conversational skills to unpopular preadolescents. Children were randomly assigned to either a peer-experience group or a peer-experience plus conversational skills coaching. Results of this study found children who received the peer-experience plus conversational skills coaching displayed more conversational skills and more positive peer support during the intervention than the children who did not receive the coaching (Bierman, 1986). More recently, Boulanger and Langevin (1992) used direct observation to evaluate play-group therapy for boys with parent reported social difficulties and found improvements in prosocial behaviour when comparing pre- and post-group observations such as offering help, comfort or apologies, initiating conversation, and assertion. Behavioural observations following intervention programs, as opposed to throughout the program, have similarly typically found improvements at the level of social performance (Bierman & Furman, 1984; G. Ladd, 1981).

Finally, intervention research employing assessment methodologies at the level of social skills has found strong effects (Denham & Almeida, 1987). Specifically, a meta-analysis evaluating the outcomes of healthy children between the ages of three and 12 years enrolled in social skills intervention programs have been found to demonstrate significantly higher scores on measures of social problem-solving following the intervention compared to a control group (Denham & Almeida, 1987).

1.4.3.2 Sense of self. There is no research that has yet considered the impact on sense of self in the context of an intervention with pediatric brain tumour survivors, nor in a population of other childhood cancer survivors. Among populations of healthy children, self-efficacy has been explored in the context of social skills interventions. Specifically, when the group intervention was focused on enhancing peer acceptance, the
interventions were successful in increasing participants’ feelings of self-efficacy, subsequently resulting in increased social skills and peer acceptance (Bierman & Furman, 1984). On the other hand, interventions focused on specific skills training, conducted on an individual basis, had no impact on reports of self-efficacy (Bierman & Furman, 1984).

1.4.4 Background of the Social Skills Intervention Group

A research group at SickKids Hospital in Toronto, Canada, conducted a preliminary two-hour focus group discussion for adolescents who have/had a brain tumour (Barrera, Damore-Petingola, Fleming, & Mayer, 2006). This session was organized through the B.r.a.i.n.Child Annual Conference in 1999. Ten survivors participated in this group and they ranged in age from 12 to 22 years. The objective of the session was to identify issues of concerns for these survivors. The major themes during the group discussion included being made fun of by peers, a paucity of close friendships with classmates and difficulties communicating their academic difficulties to teachers. At the end of the session participants were asked to fill out an evaluation of the group. Participants found the group discussion particularly helpful as it gave them the chance to share their individual experiences with others who had similar experiences.

This one-session group discussion led to the development of a group social skills intervention program for children and adolescents who have/had a brain tumour that was funded by B.r.a.i.n.child in 2000. A detailed description of the Social Skills Program, including step-by-step description of every session, is available in the manual created for this purpose (Barrera, Fleming, & Al-Khalili, 2004).
1.4.5 Preliminary Evidence of the Social Skills Intervention Group for Survivors of Brain Tumours

The feasibility and preliminary outcomes of the social skills program with 32 participants were assessed (see Barrera & Schulte, 2009, Appendix A). Briefly, program acceptability, recruitment and retention and treatment fidelity all yielded promising results. In addition to demonstrating promising outcomes related to feasibility, repeated measure analyses revealed significant improvements in social adjustment based on parent reports. Specifically, parents reported increased self-control, social skills and quality of life (Barrera & Schulte, 2009). Thus, parental reports provide some support, for the efficacy of the intervention program for improving social adjustment outcomes among childhood brain tumour survivors. Remarkably, these improvements were maintained after six-month follow-up.

Interestingly, no significant change was found for any standardized outcome measures completed by survivors. Several points need to be considered. First, survivors’ scores on measures of social adjustment lie within the normal range at baseline and therefore little improvement following intervention would be expected. In addition, as aforementioned, this may largely be due to the use of standardized questionnaires designed for ‘normal’ populations (e.g. CBCL). Moreover, the Social Skills Rating system, originally designated as the primary outcome measure, was initially designed for descriptive assessment purposes (Gresham & Elliott, 1990a) and therefore may not be sensitive to change when used in an evaluative context (Kirshner & Guyatt, 1985). Finally, as already discussed, assessment at the level of ‘social adjustment’ may be too complex to detect behavioural change afforded by a social skills intervention, which is
more appropriately targeted at the level of social skills and social performance. Finally
evaluation of additional self-constructs such as social sense of self may serve as alternate
assessments of improvement following involvement in a social skills intervention.

1.5 Aims and Hypotheses

The general aim of the current project was to foster and improve the development of social competence among child survivors of brain tumours through the manualized “Group Social Skills Intervention Program for Childhood Brain Tumours” (Barrera et al., 2004). Specifically, research was conducted to validate this program at each of the hypothesized levels of social competence: social adjustment; social performance; social skills (Cavell, 1990).

The primary aim and focus of the current project was to use measures of social adjustment to further results obtained from the feasibility study and implement more sophisticated methodology to better validate the efficacy of the social skills intervention program, as well as to replicate previous findings (Barrera & Schulte, 2009). Thus, a control group was implemented and teacher responses elicited to strengthen the methodological design. Based on the feasibility study (Barrera & Schulte, 2009), parent reported outcomes on standardized measures were expected to increase following the intervention whereas child reports were expected to show no change from pre- to post intervention. As well, measures of social adjustment were used to validate exploratory measures of social behavioural observations and social problem solving skills.

Of note, the social skills rating system (SSRS)(Gresham & Elliott, 1990a) included as a standardized measure at the level of social adjustment, yields a total ‘social
skills’ score. This score, however, is not conceptually similar to our proposed level of social skills and therefore herein will be referred to as the SSRS.

Exploration of social competence at the level of social performance and social skills was thought to be an important component to a process evaluation of the group social skills intervention. At the level of social performance, therefore, assessment included observational methods that evaluated the child in contexts where social performance may be exhibited, i.e. during the group intervention. There are several advantages to using behavioural observation systems as a means of assessing children’s social functioning; for example, direct observations may provide a more concrete and specific assessment (Michelson & Dilorenzo, 1981). As well, they are usually sensitive indicators of momentary behavioural status within a particular set of stimulus conditions (Irvin & Walker, 1993).

Specifically Dodge’s Social Behaviour Coding System (Dodge, 1983), initially designed as a means to identify behavioural antecedents of peer social status, was employed. This coding system includes categories for solitary active play, interactive play, verbalizations, non-verbal, physical contact with peers and interactions with adult group leader. Such categorizations seemed appropriate for the current purposes and it was expected that prosocial interactive behaviours would increase among peers over the course of the group intervention whereas withdrawal behaviour would decrease.

At the level of social skills, childrens’ ability to respond to a variety of hypothetical social dilemmas was assessed (Dodge et al., 2002). Pictures were used and shown to participants depicting situations with peers that involve skills for initiating interactions, maintaining friendships and dealing with potential conflict. The skills
depicted in each scenario parallel many of the social skills learned in the group (e.g. initiating friendships, dealing with conflict, dealing with bullies). For this reason, it was expected that the ability to respond to each social dilemma would improve over the course of the group.

In addition to including assessments at the level of social skills and social performance as a means of evaluating the process of the social skills intervention, assessment at these levels might also further elucidate the nature of social difficulties experienced by brain tumour survivors. Specifically, as aforementioned, at the level of social performance, a hypothesis was put forth about the withdrawn-rejected classification of brain tumour survivors. Evidence generated from this study at the level of social performance and social skills may provide the confirmatory evidence required to validate this supposition. Therefore aims related to this hypothesis were included as a component of this study. Specifically, as withdrawn rejected children have been found to demonstrate low prosocial behaviours and high withdrawal behaviours, aims included that survivors in the intervention would demonstrate an increase in prosocial behaviours and a decrease in withdrawal behaviours over the course of the intervention. A low frequency of aggressive behaviours was anticipated. Examination of these hypotheses would be important to help further refine the social skills intervention program for survivors of childhood brain tumours.

Finally, given very limited evidence to date with respect to sense of self in this population, exploratory investigations were similarly carried out concerning the ability of the program to enhance self-efficacy and self-concept. Activities were performed to enhance social self-efficacy and self-concept such as mastery experience, performance
accomplishment and vicarious experience in the context of a peer group. Self-efficacy was measured using the Children’s Self-Efficacy for Interactions with Peers (Wheeler & Ladd, 1982), a questionnaire which assesses children’s perceived efficacy level of social behaviour. Self-concept was measured using the Self-Perception Profile (Harter, 1985), also well known for assessing perceptions of several competencies including social competence. It was expected that children’s social self-efficacy and social self-concept would improve over the course of the intervention compared to the control group.

Aims and Hypotheses:

At the level of social adjustment:

1) To compare outcomes related to SSRS, social functioning, and social problems from standardized measures of social adjustment between intervention and control groups from Time 1 to Time 2, based on self and parents’ reports

   a) Hypothesis 1a: There will be a significant improvement in parent reported outcomes for survivors in the intervention group compared to those in the control group over time.

   b) Hypothesis 1b: There will be no improvement in self-reported outcomes for survivors in the intervention group compared to those in the control group over time.

2) In the intervention group, to compare teacher reported SSRS and social problems from standardized measures of social adjustment

   a) Hypothesis 2a: There will be a significant improvement in teacher scores from Time 1 to Time 2.
At the level of social performance:

3) In the intervention group, to compare behavioural observations related to peer interactions during the first, fourth and final intervention sessions

   a) Hypothesis 3a: There will be a significant improvement in behavioural ratings on scores of prosocial behaviours over the course of the intervention.

   b) Hypothesis 3b: There will be a significant decrease in ratings of withdrawal behaviours over the course of the intervention

At the level of social skills:

4) In the intervention group, to compare children’s social problem solving skills and social knowledge based on hypothetical social situations at Time 1 and Time 2.

   a) Hypothesis 4a: There will be a significant improvement in social problem solving skills related to content of strategies offered to social dilemmas, quantity of responses, and quality of responses based on interview outcomes from pre- to post-intervention.

At the level of sense of self:

5) To compare outcomes related to self-efficacy and self concept from standardized measures of sense of self between intervention and control groups from Time 1 to Time 2, based on self-reports
a) Hypothesis 5a: There will be a significant improvement in outcomes for survivors enrolled in the intervention program compared to those enrolled in the control group over time.

2. Methods

2.1 Participants

Participants were referred by the Neuro-oncology team at a large pediatric center, between January 2008 and January 2009 based on social difficulties identified by the team or as reported by parents. Additional steps taken to enhance recruitment included: providing health care professionals within the hospital with flyers advertising that a social skills group will be running for brain tumour survivors of an approximate age range (see Appendix B); and obtaining lists of patients diagnosed with a brain tumour from the Division of Neurosurgery, for surgery-only treated tumours; and the Division of Haematology/Oncology.

Inclusion criteria required that survivors: (1) had a diagnosis of a brain tumour (benign and/or malignant); (2) were between 7 and 18 years of age; (3) had completed treatment and were medically stable as determined by the survivors’ neuro-oncologist; (4) did not present with severe cognitive or communication impairments as determined by survivor enrollment in full-time special education; and (5) were English-speaking.

2.1.1 Recruitment

Forty-six participants were referred to the program and assessed for eligibility. Referrals came from neuro-oncologists ($n = 15$); neuro-psychologists ($n = 7$); nurses ($n = 3$); health psychologists ($n = 3$); endocrinologists ($n = 1$); and social workers ($n = 1$) as
well as from an other study investigating the friendships of brain tumour survivors ($n = 16$).

Four were not eligible, four were unable to be contacted and 11 refused to participate due to lack of interest. Twenty-seven families expressed interest in participating in the study. Of the 27 interested in participating, 12 formed the convenience sample for the control group as they had transportation or scheduling difficulties. Of those recruited to the control group, eight parents and seven survivors completed Time 1 and Time 2 assessments. Figure 2 shows the flow chart of the potential participants (CONSORT; www.consortstatement.org). The 61% participation rate is strong and comparable to the previous feasibility study (Barrera & Schulte, 2009).

Three group interventions were completed. Group 1 ($n = 5$) had a mean age of 12.88 years ranging from 11.55 to 14.82 years; Group 2 ($n = 6$) had a mean age of 10.14 years ranging from 8.72 to 11.99 years; and Group 3 ($n = 4$) had a mean age of 12.82 years ranging from 7.79 to 15.11 years. Attendance for each of these groups ranged from 79.17% to 80%. There were no drop-outs.

There were no significant differences in age, gender, tumour diagnosis, or tumour location between those who agreed to participate in the study (intervention or comparison) and those who did not. Participants were also compared to the greater brain tumour population in the hospital ($n = 127$) diagnosed between 2000 and 2006. There were no significant differences for gender, age at diagnosis, or diagnosis. Finally, there were no significant differences between the intervention and control group based on demographic variables including: age; gender; Socioeconomic Status (SES); ethnicity
Figure 2.

Recruitment Flow-Chart

Assessed for eligibility (n = 46)

Excluded (n = 19)
- Not meeting inclusion criteria (n = 4)
- Not Interested (n = 11)
- Unable to contact (n = 4)

Enrollment

Allocated to intervention (n = 15)
- Received allocated intervention (n = 15)
- Did not receive allocated intervention (n = 0)

Recruited to Control (n = 12)
- Completed
  - Parent Report (n = 8)
  - Self-Report (n = 7)
- Did not Complete
  - Parent Report (n = 4)
  - Self-Report (n = 5)

Allocation

Analyzed
- Social Adjustment: (n = 15)
- Social Performance: (n = 14)
- Social Skills: (n = 13)

Excluded from analysis
- Social Adjustment: (n = 0)
- Social Performance: (n = 1)
  - Reason: Missed assessments
- Social Skills: (n = 2)
  - Reason: Missed assessments

Analysis

Excluded from analysis (n = 0)
and clinical variables including: age at diagnosis; tumour diagnosis; tumour location; treatment; time since treatment; and time off treatment.

2.1.2 Descriptive Statistics

Descriptive statistics are summarized for the total group in table 1. Tumour types were categorized according to the International Classification for Childhood Cancer (ICCC) (Kramarova et al., 1996): primitive neuroectodermal tumour or medulloblastoma; astrocytoma; and ependymoma and others.

2.1.2.1 Descriptive statistics for the total sample. In total, 23 children (≤ 12 years; \( n = 12 \)) and adolescents (> 12 years, \( n = 11 \)), 10 males, 13 females, participated in the study. The mean age of participants was 12.31 years. The mean age at diagnosis was 6.81 years. Mean time since diagnosis ranged from 1.14 years to 10.22 years; mean time off treatment ranged from .80 years to 9.47 years. Sixty-four percent of the sample described themselves as white and the remaining represented diverse ethnic and cultural backgrounds. Based on the Hollingshead Scale of Occupations (Hollingshead, 1975), most children came from middle class families, represented by 53% of families in the middle range (Levels 4-6). Diagnoses included 26% PNET and Medulloblastoma, 30% Astrocytoma and 44% Others (Craniopharyngioma, Ependymoma, Germinoma).

2.2 Design and Procedure

The study was approved by the Hospital for SickKids Research Ethics Board (REB). Referred families were contacted by telephone (see Appendix C). After obtaining verbal consent, one parent of each available participant was interviewed by telephone to verify inclusion criteria and to obtain further personal information (See Appendix D).
The design consisted of a cohort comparison with repeated measures. For the intervention group, there were two pre-intervention assessments (controlling for the passage of time before intervention): baseline; and pre-intervention (Time 1); and one post-intervention assessment (Time 2), immediately after the intervention had ended (see Figure 2). For the control group, there were two assessments approximately eight weeks apart (Time 1, Time 2).

Parents in the intervention group were asked permission to approach survivors’ teachers and were given a questionnaire package to deliver to teachers including: a letter describing study details (see Appendix H); consent forms (see Appendix I); measures; and a stamped, addressed envelope. Upon completion of the intervention, parents were again asked to deliver questionnaire packages to teachers. Six teachers completed Time 1 and Time 2 assessments.

Comparison families were mailed questionnaire packages including a letter detailing the purpose of the study (see Appendix J); consent and assent forms (see Appendix K, L, M); detailed instructions for completion; measures; a stamped, addressed envelope; and a $10 gift certificate as a token of appreciation for their participation in the study. Once completed packages were returned, approximately six weeks elapsed and a second package was mailed out. Another $10 gift certificate was included in this mailing. Eight parents (100% mothers) and seven survivors returned questionnaire packages at the two time points with a mean of 96.71 days apart.
Table 1.
Sample Characteristics

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<tr>
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<tr>
<td>&gt; 12 years</td>
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\( ^a \) Hollingshead Scale of Occupations (Hollingshead, 1975).
2.2.1 Group Intervention Program

The intervention program consisted of a 2-hour group session once a week for 8 weeks. The program was supervised by a psychologist and conducted by a total of four graduate students, two students per group. The graduate students were clinically trained as group facilitators. Training involved reading the manual, observing group sessions through a one-way mirror and assisting facilitators prior to running groups. Meetings with facilitators and the supervisor occurred before and after every intervention session to plan for the incoming session and to debrief about the previous session to determine whether treatment goals were obtained. Facilitators completed ‘session logs’ describing group participation, cooperation and engagement as well as the group process.

Each session followed a specific structure including: a) Pre-Activities, which served to keep participants occupied upon arrival and provided the opportunity for informal verbal interaction among facilitators and participants; b) Review, which served to help refresh the learning acquired in the previous session through discussion of the homework, and re-involving any participant who might have missed the previous session; c) Mental Set Activity, the first specific activity of each session that addressed the theme/social skills of that session and aimed to focus participants’ attention, interest, motivation and curiosity into thinking about the session’s theme and social skill; d) Social Skills, where each skill was taught by implementing the ‘Tell’ phase, in which the facilitator introduced the skills by describing it and asking questions, involved the group participants, provided a rationale for the importance of the skills, and outlined the specific skills steps, followed by the ‘Show’ phase, which involved the facilitators modeling the behaviour positively and negatively by role-playing with active
involvement of group participants (Elliott & Gresham, 1991), followed by role-playing of positive or negative behaviour by participants and finally a discussion of the role-play; e) Snack, a 10-minute break allowing for spontaneous social interactions among group participants; f) Main Activity, designed to consolidate the social skill learned in the session; and finally g) Homework, to practice the social skill learned in the session at home and school to facilitate generalization to participants’ everyday lives.

The intervention focused on six specific skills based on previous intervention work (Barakat et al., 2003; DieTrill et al., 1996; Varni et al., 1993): social initiation and friendship making; cooperation; managing teasing and bullying; conflict resolution; empathy; and assertion with self-confidence building (Barrera et al., 2004). Each of these skills were taught during the first six sessions using a variety of fun activities and games guided by cognitive behaviour strategies and expressive therapies such as music, art, and drama. A collection of activities designed for different developmental levels and age ranges are included within the intervention manual. Activities for each session were carefully selected by facilitators and the supervisor based on the different age and skill levels of the group members during the planning and supervision meeting. The seventh session was a review of all previous skills both in the regular structured setting (the first hour) and in an unstructured (new) setting (second hour) to ensure consolidation and to facilitate generalization of the skills to other settings. The unstructured setting was of a large children’s play area contained within the hospital where children were free to play a variety of games. This setting provided children with opportunities for practicing their social skills under the supervision of the group facilitators. The final session provided additional opportunity to practice skills and put closure on the group experience by
preparing for the graduation ceremony, which included describing to parents what was learned. As well, children completed the post intervention (Time 2) assessments. The group facilitators ensured that children participated in every activity and assisted those who needed extra help either understanding the activities or engaging with others.

2.2.2 Forming a Group

The composition of each group was planned in accordance with developmental principles, considering the children’s age and gender, estimated developmental/maturation level in the various areas of development (cognitive, verbal, emotional, and social functioning), and interests. The success of each group was partly determined by the careful selection of participants in forming the group. This ensures cohesiveness and maximizes group communication and cooperation. In general, for school age children with lower developmental age, intervention activities should be concrete and externally controlled, with clear direction and support. For groups of adolescents, developmental age and cognitive functioning are also critical, and activities need to be adjusted to account for some of the unique physical and social needs of adolescents (e.g. cognitive development, interest in their physical appearance, independence from parents, group acceptance, and peer relationships). Adolescent survivors, however, whose development is below their age group may fit better with a younger group. Thus, flexibility needs to be exercised to ensure that both children and teenagers feel empowered within the groups and that the therapists are not perceived as negative authority figures.
2.3 Measures

2.3.1 Social Adjustment

The following scales or subscales were used as indices of social adjustment: 1) Social Skills Rating System (SSRS) (Gresham & Elliott, 1990a) parent, child and teacher versions; 2) the social problems subscale of the Child Behavior Checklist (CBCL), Youth Self Report (YSR) for children over the age of 11, and Teacher Report Form (TRF) (Achenbach, 2001) and 3) the Pediatric Quality of Life Inventory (PedsQL, Generic module) (Varni, Burwinkle, Katz, Meeske, & Dickinson, 2002; Varni et al., 1999) social functioning subscale, both parent and child versions. Where children had difficulty completing assessments as a result of cognitive and developmental limitations, such as an inability to read, a research assistant read the questions to the child.

Social Skills Rating System (SSRS) (Gresham & Elliott, 1990a). The SSRS assesses social skills, problem behaviours, and academic competence with forms to be completed by children, parent proxies, and teachers. The SSRS has two versions, one for Elementary school children (grades 3-6) and one for those in Secondary school (grades 7-12). The various forms and versions range in number of items from 34 - 57. Responses are recorded according to a three-point Likert scale ranging from “never” to “very often” with regards to frequency of behaviour. Missing responses are coded as “sometimes”. Four social skills subscales are derived: cooperation; assertion; self-control; and responsibility (or empathy for the child form); and a total score. Raw scores are computed to a standard score with a mean of 100 and SD of 15, with higher scores representing better social skills. Internal consistency estimates for the SSRS ranged from
Test-retest reliability was assessed over a four-week interval and was .68 for the child self-report, .87 for the parent reported total score and .85 for the teacher report form. Subscale reliability estimates ranged from .52 to .66 for children, .77 to .84 for parents and .75 to .88 for teachers (Gresham & Elliott, 1990b). The scale has shown good content, criterion related and construct validity (Gresham & Elliott, 1990b). Internal consistency (Cronbach’s α) for this measure in our sample was .90 for the parent report .86 for the child self-report and .87 for the teacher report with Cronbach’s α ranging from .67 to .80 for subscale scores, based on Time 1 data. As aforementioned, results related to this outcome measure are subsequently reported as SSRS. Only total SSRS scores were used in the current study.

**Child Behavior Checklist (CBCL)/Youth Self-Report (YSR)/Teacher Report Form (TRF) (Achenbach, 2001).** The CBCL parent form is a standardized 118-item inventory consisting of nine subscales summarized into total, internalizing and externalizing scores, as well as three different competence scales (social, academic, activities). Responses to behaviour items are recorded on a three-point Likert scale ranging from “not true” to “often true” of the child. Internal consistency reliability ranges for the CBCL from .97 for total problems scores, to .79 for total competence scores across ages (Achenbach, 2001). Test-retest reliability was calculated at a mean interval of eight days, using Intraclass Correlation Coefficients, yielding a value of .94 for the total 118 problem items and ranging from .82 to .92 for subscale scores and .82 to .93 for competence scores (Achenbach, 2001). The YSR is the self-report version of the CBCL that is completed by youth 11 years and older. It provides similar scores as the CBCL. Internal consistency reliability ranges from .95 for total problems and .75 for competence scores. Test retest
reliability conducted for the YSR at a mean interval of eight days was .87 for the total problems items and ranged from .67 to .89 for subscale scores and .83 to .91 for competence scores (Achenbach, 2001). Eleven survivors were old enough (>11 years) to complete the YSR. The TRF is the teacher equivalent measure to the CBCL and YSR. Internal consistency reliability ranges from .97 for total problems and .90 for competence scores (Achenbach, 2001). Test retest reliability of the TRF was calculated at a mean interval of 16 days and was .95 for total problem items and ranged from .60 to .96 for subscale scores and .83 to .93 for competence scores (Achenbach, 2001). Six teachers completed the TRF. Raw scores of these measures are transformed to standardized T scores available for each domain with a uniform mean of 50, and SD of 10. Higher scores reflect more behavioural difficulties. T scores above 60 for the summary scales are considered clinically significant (Achenbach, 1991a). In this study we examined the social problems subscale from the CBCL, YSR, and TRF only.

*Pediatric Quality of Life Inventory (PedsQL4.0)(Varni et al., 1999).* The PedsQL is a 23-item measure designed to assess health related quality of life (HRQOL). The module includes both parent proxy reports (ages 2-18 years) and self-report forms (ages 5-18 years). The measure derives a total HRQOL score as well as four subscales: physical function, social function, emotional function and school function. Scores range from zero to 100 with higher scores reflecting better reported HRQOL. Test-retest reliability was not conducted in the initial development paper of this scale as short-term fluctuations in functioning are likely given the variability of disease and treatment factors among this population (Varni et al., 2002). Internal consistency reliability ranged from 0.67 to 0.94 for parent proxy reports across subscales and 0.70 to 0.92 for child self-
reports (Varni et al., 2002). Only the social functioning subscale of the PedsQL was used in the current study. In our sample, internal consistency estimates for the social functioning subscale were .89 for parent reports and .86 for the child self-report at Time 1.

2.3.2 Social Performance

A video recording system was used to document the behavioural interactions of children participating in the social skills program during their snack time for approximately a ten-minute duration. Snack time of the first, fourth and eighth sessions were videotaped and coded for behavioural analysis. The coding system was based on Dodge’s observation of peer-interactive behaviours (Dodge, 1983), with a slight modification based on prior experience with the social skills program. The ‘Physical Contact’ category which included hitting, object possession, and physically affectionate behaviour was excluded as these behaviours were not expected to occur during the group sessions. In addition, a category ‘Adaptive Peer Interactions’ was added in accordance with a coding scheme developed by Michelson and Dilorenzo (1981), to reflect behaviours thought important in the context of the social skills group including maintaining facial attention and making eye contact, behaviours specifically taught to be important within the social skills intervention sessions. The final coding scheme included the following behaviour categories: 1) Adaptive Peer Interactions; 2) Solitary Activity; 3) Interactive Play; 4) Verbalizations; and 5) Interactions with Adult Group Leader.

The following are the operational definitions for each of the aforementioned categories: 1) Adaptive peer interactions was defined as behaviour directed specifically toward another peer (e.g. listening to others speak to him or her, maintaining facial
attention (e.g. smiling), or eye contact; 2) Solitary Activity was characterized by the child pursuing his/her own activity without reference to what other children were doing and initiating no conversation with other peers. This category included on-task behaviour, which was defined as playing independently with games or activities that are different from those used by the other children and making no effort to get close to other children, off task behaviour, in which the child was not engaged in goal directive behaviours (such as staring out the window, gazing around the room, or walking about the room) and watching peers; 3) Interactive play category included: cooperative play, involving turn taking or games; aggressive play, often called rough-and-tumble play; and inappropriate play, such as standing on tables and disrupting peers’ games; 4) The verbalizations category included: extraneous verbalizations (e.g. laughs, cheers); prosocial verbalizations with peers, which served to maintain contact with others (e.g. asking questions, exchanging information or opinions, joking or talking about one’s activities); norm-setting comments (e.g. rule making, directives to peers); hostile verbalizations; supportive or explicitly positive comments to others (e.g. compliments, offers of help); and speaking when someone else was talking; and finally 5) responses to staff, defining behaviour in which the child directed his/her behaviour only to an adult, including verbal, nonverbal and reprimands from group leaders. Each of these five categories were mutually exclusive.

Behaviours were also categorized consistent with social performance classifications outlined by Yeates and colleagues (2007) into ‘prosocial’, ‘withdrawn’, and ‘aggressive’ distinctions. Therefore, the prosocial category comprised of: listening to others speak; maintaining facial attention; eye contact; cooperative play; prosocial
conversations with peers; and supportive statements. The withdrawn category was comprised of: solitary on-task behaviour; solitary off-task behaviour; watching peers; social conversations with group leaders; and non-verbal interactions with group leaders. Finally, the aggressive category included: aggressive play; and hostile verbalizations. These categorizations were analyzed in addition to the behaviour categorizations stipulated by the implemented coding scheme, as well as the analysis of individual behaviours comprising each category.

Analysis of data, including interrater reliability, took place using Noldus Information Technology and the computer software program The Observer®XT. The Observer®XT is a tool for collection, analysis, presentation and management of observational data. The Observer®XT allows coding of behaviour by means of simple keystrokes that correspond to a user-definable coding scheme. The frequency of behaviours can then be tallied and analyzed. Interrater reliability is calculated by considering each behaviour scored within each data file (from each of two raters) and searches for a matching event in the other file within a defined ‘tolerance window’. Given the current interest in coding behaviour within 10 second intervals, the tolerance window was set to 10 seconds.

The videotaped ten-minute snack periods were subsequently divided into ten-second intervals to code behaviour occurring within each of these intervals. Videotapes were coded by a primary rater watching the entire data set of videos for each child independently to assure uniform coding across all design factors (Coie & Kupersmidt, 1983). This coder had had no prior contact with the survivors and was blind to the intervention process or the objectives of the study. The primary rater was trained by the
investigator by first being introduced to the behavioural taxonomy prior to beginning data collection. Training resumed by pairing the primary rater with the investigator for several hours of observation time. Comprehensive training was received by the investigator on the implementation of this software package.

The investigator coded 25% of the tapes (3 out of 9 sessions) from which interrater reliability was calculated. Group 1, Session 1, Group 2, Session 8 and Group 3, Session 4 were double-coded. Disagreements were resolved until a kappa coefficient of .70 was reached. Kappa coefficients were calculated using the Observer®XT. Average reliability across the three groups was Kappa = .74, with the coefficient .76 for Group 1, .74 for Group 2, and .71 and Group 3 suggesting moderate to high agreement (Landis & Koch, 1977). The total number of agreements and disagreements between the primary and secondary coder is presented in Table 2.

Data was based on the frequency with which each of the aforementioned behaviours occurred within the ten-minute interval. Changes in the frequency of these behaviours overtime were the basis of behavioural analyses. Coding was not limited to only one behaviour per interval. Where the same behaviour occurred more than once within an interval with separate foci, behaviours were coded as separate occurrences (e.g. conversation with two different peers). Where behaviours overlapped intervals (i.e. occurred over two intervals), the behaviour was coded twice. A total of 37.5 hours was spent coding behavioural data by the primary rater and 12.5 hours by the secondary rater for a total of 50 hours.
Table 2.

Total Agreements and Disagreements for Social Performance: Total Behaviour and Behaviour Categories

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<th>Verbalizations</th>
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<td>Agreements</td>
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<td>.77</td>
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<td>.99</td>
<td>.67</td>
<td>.77</td>
<td>.94</td>
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</tbody>
</table>
2.3.3 Social Skills

The social problem solving interview measure (SPSM) is intended to assess children’s social problem solving skills and social knowledge. Developed by Vannatta (1993), the SPSM is based on a social problem-solving measure originally developed by Asher and colleagues (1980), and was modified by Vannatta (1993) primarily to incorporate additional hypothetical scenarios to encompass a wider age range (personal communication with Vannatta, 2008). New scenarios were derived from tools developed by Lochman and Lampron (1986) focused on adolescents, and Rubin and Wills (1988), focused on children. The SPSM is comprised of a total of 10 scenarios.

Interviewers were trained to administer the SPSM by the developer of the measure (Vannatta). For the purposes of the current study, children and adolescents were shown five of the 10 scenarios of hypothetical social dilemmas and asked to generate as many strategies as possible that could be used by the target child or protagonist in the story. The five scenarios employed for the current study were selected based on their relevance to the social skills covered in the social skills program and depicted situations with peers that involve skills for initiating interactions, maintaining friendships and dealing with potential conflicts. The sex of the protagonist in the stories was matched to the sex of the participant being interviewed. Participants were administered the SPSM at two time points, pre-intervention (Time 1) and post-intervention (Time 2). Interviewers were blind to the aims of the study.

Responses were audio-taped and subsequently transcribed verbatim. Strategies offered were then coded for quantity, content and quality. Quantity reflects the number of original solutions offered for each scenario. Content codes included: 1) Aggression,
which was subdivided into physical, verbal, and social/emotional aggression categories; 2) Verbal Assertion, defined as verbal communication with others that tries to meet the goals/needs of self and others and encompassed commands, requests, seeks information, self-statements and offers of support, advice and compliments; 3) Passive responses, defined as withdrawal from a situation or avoidance of action that could change a situation or resolve it. This category involved: passive active, to engage in another activity and/or take steps to retreat from the situation; passive non-active; re-appraisal, or to cognitively change the meaning of the situation for oneself so it is less distressing; and delayed response; 4) Direct Intervention, or to engage in a definite action that involves altering/entering the current situation; 5) Vague, defined as an incomplete strategy or sometimes wishful statement about the end result or the way a situation should go without clear means for attaining this goal; and 6) Authority Intervention, to seek the help of some outside person with more power such as a teacher, parent or older child.

The number of strategies that received different categories of content codes were tallied to obtain a total quantity of strategies scores. In addition to obtaining a total quantity score, responses were summed within their ‘conflict’ and ‘non-conflict’ domains to obtain conflict and non-conflict quantities. Moreover, each solution was coded for quality in terms of how prosocial they were. Prosocial was defined as “an interaction between two people, or an act by one person, done in order to achieve an altruistic or benevolent goal. It is done with regard to the feelings of and impact on others” (Vannatta, 2008). Prosocial ratings were based on a scale of 1 to 5 with 1 being “not at all prosocial” and 5 being “extremely prosocial”. Operational definitions for content and quality codes can be found in Appendix N.
Two raters coded each protocol separately, one of which was blind to the aims of the study. After the first 10% of interviews were coded, percent agreement was checked for content and prosocial coding; disagreements were resolved until >85% agreement was maintained. This was monitored for the remainder of interview coding to watch for ‘drift’. After all interviews were coded, Cohen’s kappa agreement was used to ascertain final agreement between the two raters for the content codes. The Kappa coefficient was found to be .94 ($p < .01$), for Time 1 and .93 ($p < .01$) for Time 2, suggesting excellent reliability for content codes (Landis & Koch, 1977). Intraclass correlation coefficients were performed to determine reliability for prosocial ratings among raters. Given their continuous nature, Intraclass Correlation Coefficients were calculated using a two-way random effects model (i.e. model 2,1) (Shrout & Fleiss, 1979) to determine the interrater reliability of prosocial ratings. The model 2 ICC is well suited for inter-rater reliability studies where participants are measured by 2 raters from a population of raters, and the raters are considered representative of a larger population of similar raters (Shrout & Fleiss, 1979). A value of .91 was found for Time 1 and .84, at Time 2 suggesting moderate to high agreement (Landis & Koch, 1977).

2.3.4 Sense of Self

Social self-efficacy and social self-concept were the constructs of interest for sense of self assessments. The Children’s Self-Efficacy for Peer Interaction Scale (CSPI) (Wheeler & Ladd, 1982) was employed as a measure of social self-efficacy and the Self-Perception Profile (SPP)(Harter, 1985) perceived social competence subscale was employed to assess social self-concept. Each of these were self-report scales. Where children had difficulty completing assessments as a result of cognitive and developmental
level, a research assistant read the questions to the child.

Children’s Self-Efficacy for Peer Interaction Scale (CSPI) (Wheeler & Ladd, 1982). The CSPI is a 22-item measure designed to assess children’s social self-efficacy in peer situations. Each item consists of a statement describing a social situation followed by an incomplete statement requiring the child to evaluate his or her ability to perform a verbal persuasive skill. For example, for each item children are requested to circle one of four choices from “very easy” to “very hard”. Twelve items depict conflict situations and 10 items depict non-conflict situations. Response ratings for each item are summed for a total social self-efficacy score. Missing data for items on the CSPI were handled using expectation maximization methods (described in Results). Test-retest reliability was assessed in the initial development paper over a two-week time period and was .90 for boys and .80 for girls which suggests that children’s perception of social self-efficacy were relatively stable (Wheeler & Ladd, 1982). Alpha coefficients of internal consistency were .85 for the total scale, .85 for the conflict component and .73 for the nonconflict component. In the current study, Cronbach’s alpha was .95.

Self-Perception Profile (SPP)(Harter, 1985). The SPP is available in both a child (8-12 years of age) and adolescent (12-18 years of age) version. The child version is 36-item scale to assess children’s opinions of their competence in 5 specific domains (scholastic competence, social acceptance, athletic competence, physical appearance, and behavioural conduct) and a global self-worth scale. The adolescent version is 45-items and includes additional domains for job competence, romantic appeal, and close friendship. Participants are presented with a two-step choice for each item: first they decide which of two statements is most like them. For example, “Some kids are happy
with the way they look, but, Other kids are not happy with the way they look”. They are then asked to rate the statement as being “sort of true for me”, or “really true for me”. Higher scores on the domains represent better self-perception. The Self-Perception Profile has been shown to have good internal reliability with alphas ranging from .74 to .93 for the different subscales among different populations (Harter, 1985). For the current study only the social competence scale was used. Internal reliability estimates was .72 for this subscale score.

3. Results

3.1 Overview of Statistical Analyses

Table 3 lists all the dependent variables included in analyses and a description of each, categorized according to their relevant level of analysis. Preliminary analyses were conducted to evaluate violations of the assumptions to the parametric statistical model within each of the levels of social competence and sense of self. Two central assumptions in this model are: 1) the assumption of normality, which states that the population distributions are normal; and 2) that populations have equal variances. Following examination of assumption violations, decisions were made regarding whether to proceed with parametric or non-parametric analyses for each dependent variable. Analyses and management of missing data were undertaken.

Results were explored and subsequently described, separately for each of the hypothesized levels of social competence, and sense of self, and parallel to proposed research aims. Despite a large number of a priori hypotheses and planned comparisons, hypotheses related to social performance, social skills and sense of self were all
Table 3.

List of Variables and Descriptions of the Variables Used in Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Assessment Intervals</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Adjustment – Parent Reports</strong></td>
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<tr>
<td></td>
<td>SSRS</td>
<td>- total score from the SSRS(^a)</td>
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<td></td>
<td>Time 1 / Time 2</td>
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<td></td>
<td>Social Functioning</td>
<td>- subscale from the PedsQL(^b)</td>
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<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td></td>
<td>Social Problems</td>
<td>- subscale from the CBCL(^c)</td>
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<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td><strong>Social Adjustment – Survivor Reports</strong></td>
<td></td>
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<tr>
<td></td>
<td>SSRS</td>
<td>- total score from the SSRS(^a)</td>
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<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td></td>
<td>Social Functioning</td>
<td>- subscale from the PedsQL(^b)</td>
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<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td></td>
<td>Social Problems</td>
<td>- subscale from the YSR(^d)</td>
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<td>Time 1 / Time 2</td>
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<tr>
<td><strong>Social Adjustment – Teacher Reports</strong></td>
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<tr>
<td></td>
<td>SSRS</td>
<td>- total score from the SSRS(^a)</td>
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<tr>
<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td></td>
<td>Social Problems</td>
<td>- subscale from the TRF(^e)</td>
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<tr>
<td></td>
<td>Time 1 / Time 2</td>
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<tr>
<td><strong>Social Performance – Behavioural Observations</strong></td>
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<tr>
<td>Adaptive Peer Interactions</td>
<td></td>
<td>- behaviours directed specifically toward another peer</td>
</tr>
<tr>
<td>Session 1 / Session 4 / Session 8</td>
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<tr>
<td>Listening to Others Speak</td>
<td></td>
<td>- behaviours that demonstrate active listening specifically toward another peer who is speaking</td>
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<tr>
<td>Session 1 / Session 4 / Session 8</td>
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</table>
Table 3. (cont.)

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<thead>
<tr>
<th>Variable</th>
<th>Assessment Intervals</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining Facial Attention</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- behaviour demonstrating facial responses specifically toward another peer</td>
</tr>
<tr>
<td>Eye Contact</td>
<td></td>
<td>including smiling</td>
</tr>
<tr>
<td>Solitary Activity</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- behaviour demonstrating making eye contact specifically toward another peer</td>
</tr>
<tr>
<td>On-Task Behaviour</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- behaviours characterized by playing independently with games or activities that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>were different from other children and making no effort to get close to other children</td>
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<tr>
<td>Off-Task Behaviour</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- behaviours characterized by disengagement in goal directive activities including</td>
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<tr>
<td></td>
<td></td>
<td>staring out the window, gazing around the room, or walking about the room</td>
</tr>
<tr>
<td>Watching Peers</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- behaviour that involves the observation of other peers non-speaking without being</td>
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<tr>
<td></td>
<td></td>
<td>directly involved in the interaction</td>
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<tr>
<td>Interactive Play</td>
<td>Session 1 /Session 4 / Session 8</td>
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<tr>
<td>Cooperative Play</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- play behaviour including turn-taking or games</td>
</tr>
<tr>
<td>Aggressive Play</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- play behaviour including rough-and-tumble play</td>
</tr>
<tr>
<td>Inappropriate Play</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- play behaviour including standing on tables and disrupting peers’ games</td>
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<tr>
<td>Verbalizations</td>
<td>Session 1 /Session 4 / Session 8</td>
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<td>Extraneous Verbal</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- verbal expressions including laughing, cheering</td>
</tr>
<tr>
<td>Social Conversations with Peers</td>
<td>Session 1 /Session 4 / Session 8</td>
<td>- verbal expressions that served to maintain contact with others</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
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<tr>
<td>Speaking When Someone Else Talking</td>
<td>- verbal expressions occurring amidst another verbal conversation already ongoing</td>
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<tr>
<td>Hostile Verbalizations</td>
<td>- verbal expressions that are directed against others</td>
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</tr>
<tr>
<td>Supportive Statements</td>
<td>- verbal expressions including compliments or offers of help</td>
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</tr>
<tr>
<td>Interactions With Group Leader</td>
<td>- behaviour directed only to an adult</td>
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<tr>
<td>Social Conversation with Leader</td>
<td>- verbal conversation directed only at group leader</td>
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<tr>
<td>Non-Verbal with Leader</td>
<td>- nonverbal behaviours directed only at group leader</td>
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<tr>
<td>Reprimand from Leader</td>
<td>- verbal scolding from the group leader</td>
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<tr>
<td>Prosocial</td>
<td>- a combined score reflecting the frequency with which survivors engaged in behaviours that relate to moving towards others including: listening to others speak, maintaining facial attention, eye contact, cooperative play, social conversations with peers and supportive statements</td>
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<tr>
<td>Withdrawn</td>
<td>- a combined score reflecting the frequency with which survivors engaged in behaviours that relate to moving away from others including: on-taks behaviour, off-task behaviour, watching peers, social conversation with group leader and nonverbal conversation with group leader</td>
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<tr>
<td>Aggressive</td>
<td>- a combined score reflecting the frequency with which survivors engaged in behaviours that relate to moving against others including: aggressive play and hostile verbalizations</td>
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<tr>
<td>Variable</td>
<td>Description</td>
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<td><strong>Social Skills</strong></td>
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<td>Total Original Strategies</td>
<td>- the total number of original solutions offered for each scenario</td>
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<td>Time 1 / Time 2</td>
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<td>Total Original Conflict Strategies</td>
<td>- the total number of original solutions offered for each conflict scenario</td>
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<td>Time 1 / Time 2</td>
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<tr>
<td>Total Original Non-Conflict Strategies</td>
<td>- the total number of original solutions offered for each non-conflict scenario</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Aggressive</td>
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<tr>
<td>Physical</td>
<td>- solutions reflecting the act of using physical force to induce bodily harm</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Verbal</td>
<td>- solutions reflecting verbal communication (speak, shout, yell) directed toward someone that scares, threatens, or insults them</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Social/Emotional</td>
<td>- solutions reflecting a verbal or nonverbal action that attempts to hurt others by excluding them, turning others against them, or otherwise harming their social standing or relationships with others</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Verbal Assertion</td>
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<tr>
<td>Command</td>
<td>- solutions reflecting ordering someone to do something</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Request</td>
<td>- solutions reflecting asking, inviting, or seeking permission from someone to do something</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Seek-Information</td>
<td>- solutions reflecting gathering information about the environment/situation, a person or their opinion, what they’re doing or why they’re doing it</td>
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<tr>
<td>Time 1 / Time 2</td>
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<tr>
<td>Self-Statement</td>
<td>- solutions reflecting statements about who you are, your preferences, what belongs to you, or feelings</td>
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<td>Time 1 / Time 2</td>
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<td>Variable</td>
<td>Description</td>
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<tr>
<td><strong>Assessment Intervals</strong></td>
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<td></td>
<td><strong>Supportive</strong> Time 1 / Time 2</td>
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<td></td>
<td>- solutions including verbally offering instrumental (offer possession) or</td>
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<td></td>
<td>emotional aid, suggesting strategies or explanations, compliments</td>
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<td>Other Time 1 / Time 2</td>
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<tr>
<td></td>
<td>- solutions reflecting nonaggressive verbal responses that don’t fit types</td>
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<td>Passive Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting engaging in another activity and/or taking steps to</td>
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<td></td>
<td>retreat from the situation</td>
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<td>Active Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting ignoring or avoiding the situation</td>
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<td>Non-Active Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting cognitively changing the meaning of the situation to</td>
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<td></td>
<td>reduce distress</td>
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<td>Reappraisal Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting responses involve waiting until a later point in time</td>
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<td>for action</td>
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<td></td>
<td>Wait Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting engaging in a definite action that involves altering/</td>
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<td></td>
<td>entering the current situation</td>
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<td>Direct Action Time 1 / Time 2</td>
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<tr>
<td></td>
<td>- solutions reflecting an incomplete strategy or sometimes wishful statement</td>
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<td></td>
<td>about the end results or the way a situation should go without clear means</td>
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<td></td>
<td>for attaining this goal</td>
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<tr>
<td></td>
<td>Vague Time 1 / Time 2</td>
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<td></td>
<td>- solutions reflecting seeking the help of some outside person with more</td>
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<td></td>
<td>power such as a teacher, parent, or older child</td>
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<td></td>
<td>Authority Intervention Time 1 / Time 2</td>
<td></td>
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<tr>
<td></td>
<td>- solutions that do not fit into any other classes.</td>
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<tr>
<td>Sense of Self</td>
<td></td>
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<tr>
<td></td>
<td><strong>Social Self-Efficacy</strong> Time 1 / Time 2</td>
<td></td>
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<tr>
<td></td>
<td>- total score based on the CSPI$^f$</td>
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Table 3. (cont.)

<table>
<thead>
<tr>
<th>Variable</th>
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<tbody>
<tr>
<td>Assessment Intervals</td>
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<tr>
<td>Social Self-Concept</td>
<td>- subscale from the SPP(^g)</td>
</tr>
<tr>
<td>Time 1 / Time 2</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)SSRS (Social Skills Rating System; Gresham & Elliott, 1990). \(^b\)PedsQL (Pediatric Quality of Life Index; Varni, 2002). \(^c\)CBCL (Child Behavior Checklist; Achenbach, 1991). \(^d\)YSR (Youth Self Report; Achenbach, 1991). \(^e\)TRF (Teacher Report Form; Achenbach, 1991). \(^f\)CSPI (Children’s Self-Efficacy for Peer Interaction Scale; Wheeler & Ladd, 1982). \(^g\)SPP (Self Perception Profile; Harter, 1985).
considered exploratory (Aims 3, 4, and 5) and therefore thought not to threaten the Type I error rate. Moreover, given the small sample size, analyses of each of the dependent variables were considered independent so as not to further inflate the Type I error (familywise error rate). Analyses can be treated separately despite being potentially statistically dependent if their content or intended use are considered unrelated (Hochberg & Tamhane, 1987).

3.1.1.1 Social adjustment. Paired sample t-tests were first used to assess whether a difference existed between baseline and Time 1 assessments for the intervention group. Where no differences existed between baseline and Time 1 assessments, only Time 1 data were used in subsequent analyses. A repeated measures ANOVA with between subjects factors (Aim 1) were utilized to analyze change in social adjustment outcomes from Time 1 to Time 2 for normally distributed data. Where significant interactions were found, one-way ANOVA’s were conducted to ascertain whether differences existed between the intervention and control group at the two time points. Friedman’s signed ranks test were used in the case of non-normality. To assess change in teacher ratings from Time 1 to Time 2 (Aim 2) paired-sample t tests or Wilcoxon signed ranks test in the case of non-normality, were used. This non-parametric test was chosen instead of others (e.g. McNemar) because it is generally considered a more sensitive test, particularly in the case of paired data (Pett, 1997).

3.1.1.2 Social performance. Repeated measures ANOVA or Friedman’s signed ranks test for non-normal data were used to assess the change in observed behaviour across intervention sessions from Session 1 to Session 4 to Session 8 (Aim 3). Where significant differences existed, post-hoc comparisons were conducted. As only significant
differences were analyzed post-hoc, and only two comparisons were conducted per significant finding, no correction for multiple comparisons was performed (Iobst et al., 2009).

3.1.1.3 Social skills. Paired-sample t tests or the non-parametric Wilcoxon signed ranks tests were used to assess change in strategies offered to hypothetical social dilemmas from Time 1 to Time 2 (Aim 4).

3.1.1.4 Sense of self. Paired sample t-tests were again used to assess whether a difference existed between baseline and Time 1 assessments for the intervention group. Where differences were found to exist, baseline data was used as a covariate in subsequent analyses. A between subjects repeated measures ANOVA was utilized to analyze change in sense of self outcomes from Time 1 to Time 2 between the intervention and control group (Aim 5). Again, where significant interactions were found, one-way ANOVA’s were conducted to ascertain whether differences existed between the intervention and control group at the two time points. Friedman’s signed ranks test was used in the case of non-normality.

3.1.2 A Priori Power Analyses

Power is the probability of correctly rejecting a false null hypothesis (Cohen, 1988). Power can be calculated by multiplying effect size \( (d) \) by the square root of sample size \( (n) \) to obtain delta \( (\delta) \). Statistics tables are then consulted to ascertain the value of power for the value of \( \delta \) (Howell, 1997). To estimate the power of the planned analyses, therefore, the effect size was estimated from social adjustment outcomes obtained in a previous study (Barrera & Schulte, 2009) and sample size was based on
databases obtained from the Division of Hematology/Oncology for patients diagnosed between 2000 and 2006. Of note, however, no previously published studies were available to determine the effect size for social performance and social skills data. As a result, effect size and subsequent power calculations were based on social adjustment data, but the implications of these values will be applied for all analyses, including social performance and social skills.

3.1.2.1 Estimating effect size. Effect size calculations help to determine the “degree to which the null hypothesis is false” (Cohen, 1988). For paired means, the formula used is Cohen’s $d$, calculated as $(m_x - m_y / \sigma)$ with $m_x$ representing the mean of the pre-intervention assessment, $m_y$ representing the mean of the post-group assessment, and $\sigma$ representing the standard deviation of the population. The correlation between the matched pairs is also accounted for such that the $d$ is adjusted to become $d / \sqrt{1-r}$, where $r$ represents the correlation between the means (Cohen, 1988). Data from the feasibility study for the social skills intervention program was used to estimate the expected effect size (Barrera & Schulte, 2009). Specifically, effect size calculations were based on data derived from the primary social adjustment outcome measure, the SSRS. As aforementioned, there are no comparable published data based on social performance and social skills outcomes. From this study, the mean of parent reported SSRS at pre-intervention was 83.38, and at post intervention, 88.45 with a pooled standard deviation across both groups of 14.38 (Barrera & Schulte, 2009). The correlation between the pre- and post-intervention assessments was $r = 0.77$. Based on these findings, the effect size is calculated to be 0.72. Cohen (1988) defined three levels of importance of $d$ for the effect: $d$ of 0.20-0.49 represents a small effect; $d$ of 0.50-0.79 represents a medium effect; and $d$
of 0.80 or more represents a large effect. Based on these conventions, we had a medium effect for SSRS change based on preliminary intervention outcomes.

3.1.2.2 Estimating sample size. There are approximately 250 new cancer diagnoses per year at SickKids. According to the Canadian Cancer Society, childhood brain tumours account for 20% of new pediatric diagnoses (Canadian Cancer Society, 2009) which yields an estimate of 50 new patients from SickKids every year. Of these, 65% are expected to meet inclusion criteria (approximately 32 new diagnoses). Moreover, based on outcomes from the feasibility study (Barrera & Schulte, 2009), and considering more active recruitment from the hematology/oncology database, a refusal rate of approximately 20% was estimated, leaving approximately 6 potential recruits based on new diagnoses per year. Although there are an estimated 6 new diagnoses each year, a larger number of eligible patients for participation in the group intervention was expected, as there was no specified inclusion or exclusion criteria for time since diagnosis and, therefore, recruitment was not restricted to new diagnoses per year. Therefore 10 participants were expected each year. Recruitment was conducted over a two-year period.

3.1.2.3 Estimating power. Power can be calculated by multiplying effect size by the square root of sample size. For the pre- and post intervention group comparisons, therefore, given the above estimations of effect size and sample size, a sample of 10 for each the intervention and control group will yield a power of .63, a sample of 15 will yield power of .80 and a sample of 20 for each group will yield a power of .89. A minimum power for effect sizes is set conventionally at .80 (Cohen, 1988). If power is below this cut-off, which would be the case if less than 15 participants were group were recruited to the study, there is a high risk of making a Type II error, or incorrectly failing
to reject a false null hypothesis. In other words, Type II error results in failing to observe a difference when in fact, a difference does exist. This suggests that if there were more survivors as participants, it would be more likely that a significant effect be found for repeated measure analyses. Nevertheless, given the nature of this clinical sample and the difficulty in conducting research with children who have rare and challenging medical conditions, the number of potential participants available (10/year) was the target for the current study. The power limitation, however, was kept in mind as a limitation for all of the subsequent analyses, including those at the level of social performance and social skills.

3.2 Preliminary Analyses

3.2.1 Check For Violations to Assumptions for Parametric Statistical Model

3.2.1.1 Social adjustment. Tests were performed for social adjustment data on the conditions of the parametric statistical model that should be met before parametric statistics are used. To examine the normality assumption, skewness, which is a measure of the symmetry of the distribution, and kurtosis, which is a measure of the peakedness of the distribution were examined (Howell, 1997). Acceptable values of skewness and kurtosis are thought to occur between −2 and +2, with values within −1 and +1 thought to be excellent (Peat & Barton, 2005). Table 4 displays the violations to the normality assumption at the level of social adjustment.

The second assumption of the parametric statistical test model, homogeneity of variance, was tested for the social adjustment data to be used for repeated measures ANOVA with a within-subjects factor by using Levene’s Test for equality of variances. A non-significant Levene’s test suggests that the variance of scores is normally
distributed. Table 5 contains a list of violations of homogeneity of variance for the social adjustment data used in analyses.

All social adjustment data were normally distributed with the exception of YSR social problems. Furthermore, violations to the homogeneity of variance assumption existed. Given that these data were skewed, a decision was made to carry-out both parametric and non-parametric tests. There is a lack of agreement on whether parametric tests are more powerful than non-parametric tests. Non-parametric tests involve the ranking of raw scores and are not as affected by extreme scores as parametric tests. The main advantage of using non-parametric tests, therefore, is that they do not rely heavily on any restrictive assumptions concerning the shape of the curve. Parametric tests are potentially less powerful when there are extreme scores involved (Siegel, 1956).

Nevertheless, most researchers agree that substantial departures from the normal distribution have little effect on the results of statistical tests (e.g. Keppel, 1982). Specifically, ANOVA is known to be quite robust to moderate violations of the normality assumption. Moreover, in the case of repeated measure analyses, non-parametric tests are restricted to within-group comparisons only (Pett, 1997). For the social adjustment data, no difference in outcomes was found between the parametric and non-parametric tests. Thus, outcomes based on parametric tests are reported for the outcomes related to social adjustment.
Table 4.
Test for Violation of the Assumption of Normality for Social Adjustment Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Baseline</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent Reports</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Problems</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Survivor Reports</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Problems</td>
<td>-</td>
<td>ns</td>
<td>peaked</td>
</tr>
<tr>
<td><strong>Teacher Reports</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>-</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Problems</td>
<td>-</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

Note. ns = non-significant

Table 5.

Test for Violation of Homogeneity of Variance for Social Adjustment Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent Reports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Problems</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Survivor Reports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>violation</td>
<td>violation</td>
</tr>
<tr>
<td>Social Problems</td>
<td>violation</td>
<td>violation</td>
</tr>
<tr>
<td><strong>Teacher Reports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Social Problems</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. ns = non-significant

\(^a\) SSRS (Social Skills Rating System; Gresham & Elliott, 1990). \(^b\) PedsQL (Pediatric Quality of Life Index; Varni, 2002). \(^c\) CBCL (Child Behavior Checklist; Achenbach, 1991). \(^d\) YSR (Youth Self Report; Achenbach, 1991). \(^e\) TRF (Teacher Report Form; Achenbach, 1991).
3.2.1.2 Social performance. As with the data on social adjustment, tests were performed for social performance data on the conditions of the parametric statistical model that should be met before parametric statistics are used. Table 6 displays the violations to the normality assumptions at the level of social performance. For repeated measure analyses of variance without a within-group variable, Mauchley’s Test of sphericity can be used to assess homogeneity of variance. Similar to Levene’s Test for equality of variances, a non-significant Mauchley’s test suggests that the variance of scores is normally distributed. Table 7 contains a list of violations of homogeneity of variance for the social performance data used in analyses.

Given fairly substantial non-normality and the relatively small sample size, a decision was again made to conduct both parametric and non-parametric tests. No difference was found between parametric and non-parametric analyses so the following results are reported using parametric analyses. A repeated measures ANOVA was used to analyze the change across the three time points.

3.2.1.3 Social skills. As with the previous two outcome measures, tests were performed on the conditions of the parametric statistical model that should be met before parametric statistics are used. Table 8 displays the values for violations to the assumptions of normality for dependent variables at the level of social skills. The paired sample t-test, using Mauchley’s Test of sphericity, was calculated to assess the second assumption of the parametric model, homogeneity of variance. Table 9 contains a list of the violations of homogeneity of variance for the social skills data used in analyses.
Table 6.

Tests for Violation of the Assumption of Normality for Social Performance Outcomes

<table>
<thead>
<tr>
<th>Tests for Assumption of Normality</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Peer Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening to Others Speak</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Maintaining Facial Attention</td>
<td>peaked</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>-</td>
<td>skewed, peaked</td>
<td>peaked</td>
</tr>
<tr>
<td>Solitary Activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Task Behaviour</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Off-Task Behaviour</td>
<td>skewed, peaked</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Watching Peers</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Interactive Play</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative Play</td>
<td>-</td>
<td>skewed, peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Inappropriate Play</td>
<td>-</td>
<td>-</td>
<td>peaked</td>
</tr>
<tr>
<td>Verbalizations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraneous Verbal</td>
<td>peaked</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Conversations with Peers</td>
<td>peaked</td>
<td>skewed, peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Speaking When Someone Talking</td>
<td>ns</td>
<td>skewed, peaked</td>
<td>skewed, peaked</td>
</tr>
<tr>
<td>Interactions With Group Leader</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Conversation with Leader</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Non-Verbal with Leader</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

Note. ns = non-significant
Table 7.

Test for Violation of Homogeneity of Variance for Social Performance Outcomes

<table>
<thead>
<tr>
<th>Tests for Assumption of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adaptive Peer Interactions</strong></td>
</tr>
<tr>
<td>Listening to Others Speak</td>
</tr>
<tr>
<td>Maintaining Facial Attention</td>
</tr>
<tr>
<td>Eye Contact</td>
</tr>
<tr>
<td><strong>Solitary Activity</strong></td>
</tr>
<tr>
<td>On-Task Behaviour</td>
</tr>
<tr>
<td>Off-Task Behaviour</td>
</tr>
<tr>
<td>Watching Peers</td>
</tr>
<tr>
<td><strong>Interactive Play</strong></td>
</tr>
<tr>
<td>Cooperative Play</td>
</tr>
<tr>
<td>Inappropriate Play</td>
</tr>
<tr>
<td><strong>Verbalizations</strong></td>
</tr>
<tr>
<td>Extraneous Verbal</td>
</tr>
<tr>
<td>Social Conversations with Peers</td>
</tr>
<tr>
<td>Speaking When Someone Talking</td>
</tr>
<tr>
<td><strong>Interactions With Group Leader</strong></td>
</tr>
<tr>
<td>Social Conversation with Leader</td>
</tr>
<tr>
<td>Non-Verbal with Leader</td>
</tr>
</tbody>
</table>

Note. ns = non-significant
Table 8.

Test for Violation of the Assumption of Normality for Social Skills Outcomes

<table>
<thead>
<tr>
<th>Tests for Assumption of Normality</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>skewed, peaked</td>
<td>skewed, peaked</td>
</tr>
<tr>
<td>Verbal</td>
<td>peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Social/Emotional</td>
<td>skewed, peaked</td>
<td>-</td>
</tr>
<tr>
<td>Verbal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Command</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Request</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Seek Information</td>
<td>ns</td>
<td>skewed, peaked</td>
</tr>
<tr>
<td>Self Statement</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Supportive</td>
<td>peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Other</td>
<td>peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>ns</td>
<td>skewed, peaked</td>
</tr>
<tr>
<td>Non-Active</td>
<td>peaked</td>
<td>ns</td>
</tr>
<tr>
<td>Reappraisal</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wait</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Direct Action</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Vague</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Authority Intervention</td>
<td>peaked</td>
<td>ns</td>
</tr>
</tbody>
</table>
Table 8. (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclassified</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. *ns* = non-significant
There were no violations to the homogeneity of variance assumption for social skills outcomes. Again, both parametric and non-parametric tests were conducted and no difference in outcomes was found between the two. Outcomes based on parametric tests are reported in the section related to social skills.

3.2.1.4. Sense of self. Table 10 displays the violations to the tests of the normality assumption at the level of sense of self.

Homogeneity of variance was tested for sense of self data using Levene’s Test for equality of variances. Table 11 contains a list of violations of homogeneity of variance for the sense of self data used in analyses. Again, a decision was made to carry out both parametric and non-parametric tests and no difference in outcomes was found between the two. Outcomes based on parametric tests are reported in the sense of self section.

All sense of self data were normally distributed and there was only one violation to the assumption of homogeneity. Nevertheless, a decision was made to carry out both parametric and non-parametric statistics. As there was no difference in outcomes between the two sets of analyses, parametric statistics are reported in the section dedicated to sense of self outcomes.

3.2.2. Analyses of Missing Data

3.2.2.1 Social adjustment. For analyses at the level of social adjustment, a decision was made not to delete cases with missing data as a result of the small sample size. Missing data was handled differently depending on the measure in question. As aforementioned, some questionnaires included stipulations for accounting for missing data within their manuals, including the SSRS, the PedsQl, and the CBCL/YSR.
Table 9.

Test for Violation of Homogeneity of Variance for Social Skills Outcomes

<table>
<thead>
<tr>
<th>Tests for Assumption of Homogeneity of Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
</tr>
<tr>
<td>Physical</td>
</tr>
<tr>
<td>Verbal</td>
</tr>
<tr>
<td>Social/Emotional</td>
</tr>
<tr>
<td>Verbal</td>
</tr>
<tr>
<td>Command</td>
</tr>
<tr>
<td>Request</td>
</tr>
<tr>
<td>Seek Information</td>
</tr>
<tr>
<td>Self Statement</td>
</tr>
<tr>
<td>Supportive</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Passive</td>
</tr>
<tr>
<td>Active</td>
</tr>
<tr>
<td>Non-Active</td>
</tr>
<tr>
<td>Reappraisal</td>
</tr>
<tr>
<td>Wait</td>
</tr>
<tr>
<td>Direct Action</td>
</tr>
<tr>
<td>Vague</td>
</tr>
<tr>
<td>Authority Intervention</td>
</tr>
<tr>
<td>Unclassified</td>
</tr>
</tbody>
</table>

Note. ns = non-significant
Table 10.

Tests for Violation of the Assumption of Normality for Sense of Self Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Baseline</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Self-Efficacy(^a)</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social Self-Concept(^b)</td>
<td>ns</td>
<td>ns</td>
<td>Peaked</td>
</tr>
</tbody>
</table>

Note. ns = non-significant

\(^a\)CSPI (Children’s Self-Efficacy for Peer Interaction Scale; Wheeler & Ladd, 1982). \(^b\)SPP (Self Perception Profile; Harter, 1985).
Table 11.

Tests for Violation of Homogeneity of Variance for Sense of Self Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Self-Efficacy(^a)</td>
<td>violation</td>
<td>ns</td>
</tr>
<tr>
<td>Social Self-Concept(^b)</td>
<td>ns</td>
<td>ns</td>
</tr>
</tbody>
</table>

Note. ns = non-significant

\(^a\)CSPI (Children’s Self-Efficacy for Peer Interaction Scale; Wheeler & Ladd, 1982).\(^b\)SPP (Self Perception Profile; Harter, 1985).
Specifically, the SSRS dictates that missing data be coded as 1 for a maximum of two missing responses per questionnaire (Gresham & Elliott, 1990a). This resulted in a total of seven substitutions across intervention and control groups for the parent form and 12 substitutions for the child form. No form contained more than 2 missing responses at a time.

For the PedsQL (Varni et al., 1999) the mean is computed as the sum of the items over the number of items answered, thereby accounting for missing data. If more than 50% of the items in the scale are missing, however, the scale score is not computed. Three items were missing responses for the PedsQL parent form and for the child form.

For the CBCL/YSR/TRF, if more than 8 items are left blank, the respective scale is not scored.

3.2.2.2 Social performance. Two survivors missed more than two of the video taped session and therefore were excluded from further analyses. Four additional survivors missed one session each, with two of these absences occurring during the same session. A decision was made not to eliminate these participants given the already reduced sample size \((n = 13)\). Expectation maximization (EM) methods were used, therefore, to handle this missing data. EM forms a missing data correlation (or covariance) matrix by assuming the shape of a distribution (such as normal) for the partially missing data and basing inferences about missing values on the likelihood under that distribution (Tabachnick & Fidell, 2001). The EM method is favored as an approach to handling missing data because it produces realistic estimates of variance, not achieved by other approaches to handling missing data such as regression substitution (Howell, 2008).
3.2.2.3 Social skills. Of 15 potential participants, one participant completed only the pre-intervention assessment and therefore was removed from analyses. A total of 14 participants, therefore, completed two administrations of the SPSM. No interpolations, therefore, were required for missing data at the level of social skills.

3.2.2.4 Sense of self: Expectation maximization (EM) methods were used to handle randomly missing data from the CSPI. Using this approach to handle the missing data contained within the CSPI resulted in 3 insertions (1 at baseline, 1 at Time 1, and 1 at Time 2) each from different participants.

Missing data for the SPP followed the same procedure as the PedsQL. As scale scores for this measure are obtained by calculating an average of the items answered, responses left unanswered were not factored into the average. Of note however, in two control group cases, the SPP was not completed correctly and therefore was removed entirely from subsequent analyses.

3.3 Outcomes Related to Social Adjustment

3.3.1 Aim 1: Comparison of Intervention Group to Control group

3.3.1.1 Descriptive statistics. The means of social adjustment outcome measures distributed by intervention and control group can be found in Table 12. Paired sample t-tests were conducted to ensure that there were no change in scores for the intervention group from baseline to Time 1. As expected, there was no significant difference on all outcome measures from baseline to Time 1 (see Table 13).

3.3.1.2 Intervention and Control groups from Time 1 to Time 2. Hypothesis 1a stated that there would be a significant improvement in outcomes for survivors enrolled in the intervention group compared to the control group. Table 12 lists the means and
standard deviations of the intervention and control groups at Time 1 and Time 2. A repeated measures ANOVA with between subjects grouping variable revealed a significant Time X Group interaction for parent reported SSRS \( (F(1,21) = 5.05, p < .05, \eta^2 = .19) \) suggesting differences between the two groups on the SSRS scores. Analysis of means showed SSRS scores in the intervention group increased from Time 1 to Time 2 (96.07 vs. 103.33) whereas scores for those in the control group decreased from Time 1 to Time 2 (93.75 vs. 89.13) (see Figure 3). Scores of the intervention group at Time 1 were compared to the control group at Time 1 to ensure there were no differences between the two prior to the intervention and hence to enhance the validity of the results base on the control group. A one-way ANOVA confirmed no differences between groups at Time 1. Results at Time 2 were similarly compared and impressively, a significant difference in scores between the intervention and control group was found at Time 2 \( (F(1, 22) = 4.32, p = .05) \).

A significant Time X Group interaction was also found for parent reported social problems \( (F(1,21) = 6.39, p < .05, \eta^2 = .23) \), suggesting that the time X group interaction accounted for 23% of the variance in SSRS. Again, analysis of means showed a similar pattern to SSRS outcomes demonstrating improvement for the intervention group (65.00 vs. 63.20), compared to the control group (61.75 vs. 66.13) as a reduction in scores indicates fewer social problems (see Figure 4). Scores of the intervention group at Time 1 were compared to the control group at Time 2 and no significant differences were found. Comparison of groups at Time 2 similarly found no significant difference suggesting that despite the positive pattern of scores demonstrated by the significant interaction, there was no significant difference between groups after the intervention.
Table 12.

Means and Standard Deviations of Social Adjustment Outcomes for the Intervention and Control Groups

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Baseline</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 1</th>
<th>Time 2</th>
<th>TimeXGroup</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Group</strong></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Parent Reports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS*</td>
<td>101.63</td>
<td>96.07</td>
<td>103.33</td>
<td>93.75</td>
<td>89.13</td>
<td>5.05(1,21)</td>
</tr>
<tr>
<td></td>
<td>(17.02)</td>
<td>(16.64)</td>
<td>(16.92)</td>
<td>(13.85)</td>
<td>(12.64)</td>
<td></td>
</tr>
<tr>
<td>Social Functioningb</td>
<td>36.67</td>
<td>56.58</td>
<td>61.67</td>
<td>64.38</td>
<td>60.63</td>
<td>2.00(1,21)</td>
</tr>
<tr>
<td></td>
<td>(28.93)</td>
<td>(23.07)</td>
<td>(27.49)</td>
<td>(27.18)</td>
<td>(37.65)</td>
<td></td>
</tr>
<tr>
<td>Social Problems*c</td>
<td>67.63</td>
<td>65.00</td>
<td>63.20</td>
<td>61.75</td>
<td>66.13</td>
<td>6.39(1,21)</td>
</tr>
<tr>
<td></td>
<td>(10.42)</td>
<td>(9.07)</td>
<td>(9.97)</td>
<td>(12.13)</td>
<td>(12.76)</td>
<td></td>
</tr>
<tr>
<td><strong>Survivor Reports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRSa</td>
<td>116.75</td>
<td>116.53</td>
<td>117.47</td>
<td>100.29</td>
<td>96.57</td>
<td>0.54(1,20)</td>
</tr>
<tr>
<td></td>
<td>(10.08)</td>
<td>(15.38)</td>
<td>(15.68)</td>
<td>(20.97)</td>
<td>(21.70)</td>
<td></td>
</tr>
<tr>
<td>Social Functioningb</td>
<td>53.75</td>
<td>70.00</td>
<td>72.67</td>
<td>68.57</td>
<td>67.14</td>
<td>0.24(1,20)</td>
</tr>
<tr>
<td></td>
<td>(24.02)</td>
<td>(16.80)</td>
<td>(17.61)</td>
<td>(33.00)</td>
<td>(35.57)</td>
<td></td>
</tr>
<tr>
<td>Social Problemsd</td>
<td>59.00</td>
<td>60.43</td>
<td>53.29</td>
<td>62.75</td>
<td>62.25</td>
<td>4.56(1,9)</td>
</tr>
<tr>
<td></td>
<td>(5.66)</td>
<td>(6.80)</td>
<td>(4.57)</td>
<td>(15.95)</td>
<td>(15.76)</td>
<td></td>
</tr>
</tbody>
</table>

*aSSRS (Social Skills Rating System; Gresham & Elliott, 1990). bPedsQL (Pediatric Quality of Life Index; Varni, 2002). cCBCL (Child Behavior Checklist; Achenbach, 1991); dYSR (Youth Self Report; Achenbach, 1991). *p < .05.
Table 13.
Means and Standard Deviations of Social Adjustment Outcomes for Populations Norms and Intervention Group at Baseline, Time 1
and Time 2

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Population Norms</th>
<th>Intervention Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD) Baseline</td>
<td>Time 1</td>
</tr>
<tr>
<td>Parent Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>100 (15)</td>
<td>101.63 (17.02)</td>
</tr>
<tr>
<td>Social Functioning&lt;sup&gt;b&lt;/sup&gt;</td>
<td>91.56 (14.20)</td>
<td>36.67 (28.93)</td>
</tr>
<tr>
<td>Social Problems&lt;sup&gt;c&lt;/sup&gt;</td>
<td>50 (10)</td>
<td>67.63 (10.42)</td>
</tr>
<tr>
<td>Survivor Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>100 (15)</td>
<td>116.75 (10.08)</td>
</tr>
<tr>
<td>Social Functioning&lt;sup&gt;b&lt;/sup&gt;</td>
<td>76.84 (20.31)</td>
<td>53.75 (24.02)</td>
</tr>
<tr>
<td>Social Problems&lt;sup&gt;d&lt;/sup&gt;</td>
<td>50 (10)</td>
<td>59.00 (5.66)</td>
</tr>
</tbody>
</table>

<sup>a</sup>SSRS (Social Skills Rating System; Gresham & Elliott, 1990).
<sup>b</sup>PedsQL (Pediatric Quality of Life Index; Varni, 2002).
<sup>c</sup>CBCCL (Child Behavior Checklist; Achenbach, 1991).
<sup>d</sup>YSR (Youth Self Report; Achenbach, 1991).

*p < .05
Figure 3.

Parent Reported SSRS
Figure 4.

Parent Reported Social Problems
Hypothesis 1b stated that there would be no improvement in survivors self-reports of social adjustment in the intervention group compared to the control group over time, based on preliminary findings (Barrera & Schulte, 2009). There was a borderline Time X Group interaction ($F(1,9) = 4.56, p = .06, \eta^2 = .37$) and a significant effect of time ($F(1,9) = 6.03, p < .05, \eta^2 = .40$) for child reported social problems, where the main effect and interaction accounted for 40% and 37% of the variance in social problems respectively (see Figure 5). Analysis of the borderline interaction indicated an improvement for the intervention group (60.43 vs. 53.29) compared to the comparison group (62.75 vs. 62.25).

3.3.2 Aim 2: Comparison of Teacher Reports from Time 1 to Time 2.

3.3.2.1 Descriptive statistics. The means of teacher reports from Time 1 to Time 2 are reported in Table 14.

3.3.2.2 Teacher reports from time 1 to time 2. The Paired sample t-tests were used to assess change in teacher ratings from Time 1 to Time 2. A significant effect for SSRS total was found for teachers from Time 1 to Time 2 with a large effect size ($t = -2.74, p < .05, d = 1.12$) (see Figure 6). No significant findings were obtained for TRF social problem outcomes.
Figure 5.

Self-Reported Social Problems
Table 14.

Means and Standard Deviations of Population Norms and Teacher Reported Outcome Measures

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Population Norms M (SD)</th>
<th>Time 1 M (SD)</th>
<th>Time 2 M (SD)</th>
<th>t(df)</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSRS</td>
<td>100 (15)</td>
<td>91.00 (11.85)</td>
<td>94.00 (10.32)</td>
<td>-2.74(5)</td>
<td>1.12</td>
</tr>
<tr>
<td>Social Problems</td>
<td>50 (10)</td>
<td>58.83 (5.42)</td>
<td>59.17 (5.34)</td>
<td>-0.09(5)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*p < .05.
Figure 6.

Teacher Reported SSRS
3.4 Outcomes Related to Social Performance

3.4.1 Preliminary Analyses

Preliminary analysis of behaviour codings revealed some behaviour categories received no codings at all. These were: reprimand by adult group leader, from the Interactions with Group Leader category; solitary play, from the Solitary Active category; aggressive play, from the Interactive Play category; norm-setting statements, hostile verbalizations and support statements from the Verbalizations category; and cooperative physical contact from the Adaptive Peer Interactions category. These behaviours were eliminated from subsequent data analyses. Moreover, in an effort to reduce the potential for Type I error given the number of potential comparisons, variables that maintained a percent frequency of less than 1.00 at all three time points were also eliminated. These included: making eye contact, from the Adaptive Peer Interactions category (0.00 at Session 1, 0.24 at Session 4, and 0.01 at Session 8); inappropriate play, from the Interactive Play category (0.00 at Session 1, 0.00 at Session 4, and 0.01 at Session 8); and speaking when someone else was talking, from the Verbalizations category (0.72 at Session 1, 0.79 at Session 4, and 0.08 at Session 8). The elimination of the aggressive play and hostile verbalization categories prohibited examination of an ‘aggressive’ social categorization. This did not directly impact the hypothesis testing, however, as the hypotheses related to aggression postulated that there would be no change in this category.

While snack time was estimated to run for 10 minutes, there were minor variations in this length across videos. While a maximum of 10 minutes was allowed for coding, not all session lasted this entire length. These were: Group 1, Session 1; Group 1,
Session 8; Group 2, Session 8; and Group 2, Session 4. In order to correct for this discrepancy in time across sessions, the percent frequency of behaviours was calculated.

3.4.2 Aim 3: Comparison of Social Performance Changes During First, Fourth, and Eighth Sessions

3.4.2.1 Outcomes related to social performance categories. To test hypothesis 4a, that there will be a significant improvement in behavioural ratings on scores of prosocial behaviours over the course of the intervention, a repeated measures ANOVA was used to analyze the behaviour categories. The means of behaviour categories can be found in Table 15. A significant effect of time was found in Interactive Play, Adaptive Peer Relations and Verbalizations across sessions ($F(2, 24) = 3.44, p < .05; F(2,24) = 6.39, p < .01; F(2,24) = 4.31, p < .05$). These results indicate that the frequency of behaviour increased for interactive play and verbalizations across time but decreased in adaptive peer relations across time. Post-hoc comparisons revealed a significant increase for interactive play from Session 1 to Session 8 with a medium effect ($t = -2.33, p < .05, d = 0.65$) for adaptive peer relations with a large effect ($t = 3.37, p < .01, d = 0.93$) and for verbalizations with a medium effect ($t = -2.62, p < .05, d = 0.73$). Further analysis of the adaptive peer relations category to better understand why these behaviours decreased are described in a subsequent section.

3.4.2.2 Outcomes related to social performance behaviours. To further evaluate Hypothesis 3a, analyses of specific behaviours were conducted next. The means of behaviour frequencies can be found in Table 16. Again, a repeated measures ANOVA was conducted to assess change in behaviour across sessions. For behaviours falling within the adaptive peer interactions category, a significant difference across sessions
Table 15.

Means and Standard Deviations of Behaviour Categories Across Time

<table>
<thead>
<tr>
<th></th>
<th>Session 1</th>
<th>Session 4</th>
<th>Session 8</th>
<th>F(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Adaptive Peer Interactions*</td>
<td>24.60 (11.90)</td>
<td>19.22 (6.69)</td>
<td>14.96 (6.32)</td>
<td>6.39(2,24)</td>
</tr>
<tr>
<td>Solitary Active</td>
<td>35.02 (10.11)</td>
<td>44.02 (12.90)</td>
<td>39.08 (12.70)</td>
<td>0.90(2,24)</td>
</tr>
<tr>
<td>Interactive Play**</td>
<td>0.00 (0.00)</td>
<td>0.33 (0.63)</td>
<td>1.08 (1.67)</td>
<td>3.44(2,24)</td>
</tr>
<tr>
<td>Verbalizations*</td>
<td>4.15 (4.74)</td>
<td>6.63 (7.25)</td>
<td>12.07 (13.26)</td>
<td>4.31(2,24)</td>
</tr>
<tr>
<td>Interactions with Group Leader</td>
<td>36.23 (9.77)</td>
<td>32.80 (12.43)</td>
<td>32.81 (12.61)</td>
<td>0.40(2,24)</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01
was found for Listening to Others ($F(2,24) = 8.78, p < .01$). Post-hoc comparisons revealed a significant difference between Session 1 and Session 8 with a large effect ($t = 4.11, p < .01, d = 1.14$) with this behaviour decreasing between time points. Maintaining facial attention increased significantly across time ($F(2,24) = 4.17, p < .05$). Post-hoc comparisons revealed a borderline significant difference again from Session 1 to Session 8 with a medium effect ($t = -2.05, p = .06, d = 0.57$) (see Figure 7).

For solitary active behaviours, a significant effect of time was found for Off-Task behaviours ($F(2,24) = 3.64, p < .05$) with post-hoc comparisons revealing a borderline significant increase of off-task behaviour from Session 4 to Session 8 with a medium effect ($t = -2.48, p < .05, d = 0.69$). Of note, although not significant, Off-Task behaviour decreased from Session 1 to Session 4. A borderline significant effect was found for on-task behaviours ($F(2,24) = 2.98, p = .07$) with a significant increase found in on-task behaviour from Session 1 to Session 4 using post-hoc comparisons with a medium effect ($t = -2.62, p < .05, d = 0.73$). Interestingly, although not significant, on-task behaviour decreased again from Session 4 to Session 8.

Within the interactive play category, a borderline effect of time was found for cooperative play ($F(2,24) = 3.10, p = .06$). Post-hoc comparisons yielded a significant increase from Session 1 to Session 4 with a medium effect ($t = -2.19, p < .05, d = 0.61$) (see Figure 8). Finally, for Verbalization behaviours, a significant effect of time was found for social conversation with peers ($F(2,24) = 6.55, p < .01$), with post-hoc comparisons revealing a significant increase in social conversations between Session 1 and Session 8 ($t = -2.79, p < .05, d = 0.77$) Session 4 and Session 8 with a large effect size ($t = -2.93, p < .05, d = 0.81$) (see Figure 9).
Table 16.
Means and Standard Deviations of Behaviour Proportions Across Time

<table>
<thead>
<tr>
<th></th>
<th>Session 1</th>
<th>Session 4</th>
<th>Session 8</th>
<th>F(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Adaptive Peer Interactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening to Others Speak**</td>
<td>23.18 (12.52)</td>
<td>17.78 (7.15)</td>
<td>11.68 (6.33)</td>
<td>8.78(2,24)</td>
</tr>
<tr>
<td>Maintaining Facial Attention*</td>
<td>1.42 (2.33)</td>
<td>1.19 (1.34)</td>
<td>3.27 (3.42)</td>
<td>4.17(2,24)</td>
</tr>
<tr>
<td>Solitary Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Task Behaviour</td>
<td>19.47 (7.31)</td>
<td>30.60 (10.73)</td>
<td>21.30 (17.47)</td>
<td>2.98(2,24)</td>
</tr>
<tr>
<td>Off-Task Behaviour*</td>
<td>3.77 (5.57)</td>
<td>0.73 (0.88)</td>
<td>4.84 (6.02)</td>
<td>3.64(2,24)</td>
</tr>
<tr>
<td>Watching Peers</td>
<td>11.77 (6.89)</td>
<td>9.69 (6.91)</td>
<td>12.93 (5.42)</td>
<td>2.03(2,24)</td>
</tr>
<tr>
<td>Interactive Play</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative Play</td>
<td>0.00 (0.00)</td>
<td>0.33 (0.63)</td>
<td>1.07 (1.76)</td>
<td>3.10(2,24)</td>
</tr>
<tr>
<td>Verbalizations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Conversations with Peers**</td>
<td>2.44 (3.68)</td>
<td>3.97 (4.75)</td>
<td>9.01 (8.86)</td>
<td>6.55(2,24)</td>
</tr>
<tr>
<td>Interactions With Group Leader</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Conversation with Leader</td>
<td>14.76 (9.21)</td>
<td>15.23 (7.92)</td>
<td>11.83 (9.01)</td>
<td>1.15(2,24)</td>
</tr>
<tr>
<td>Non-Verbal with Leader</td>
<td>21.48 (8.04)</td>
<td>17.57 (8.07)</td>
<td>20.98 (9.45)</td>
<td>0.95(2,24)</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01
Figure 7.

Mean Adaptive Peer Interactions Across Time

- Adaptive Peer Interactions*
- Listening to Others Speak**
- Maintaining Facial Attention*
Figure 8

Mean Interactive Play Across time

Interactive Play**

Cooperative Play (p = .06)
Figure 9.

Mean Verbalizations Across Time
3.4.2.3 Outcomes classified according to prosocial, withdrawn and aggressive categories. Consistent with literature related to social performance data (Yeates et al., 2007) and in accordance with hypotheses related to the prosocial and withdrawal behaviours of childhood survivors of brain tumours, social performance data were categorized according to prosocial, withdrawal and aggressive behaviour categories. As aforementioned, given an absence of data for aggressive behaviours, no analysis of an aggressive behaviour category was conducted. Table 17 presents the means for total prosocial and withdrawal behaviours at Session 1, Session 4 and Session 8. Repeated measure analyses of variance revealed no significant change in either of these social categorizations across time.

3.5 Outcomes Related to Social Skills

3.5.1 Preliminary Analyses

Preliminary analysis of coding revealed some strategy codes were not used at all. These were: Passive-Reappraisal and Unclassified. These were eliminated from subsequent analyses. In addition, similar to analyses at the level of social performance, strategies that received a percent frequency of less than 1.00 were also eliminated in an effort to reduce the number of comparisons to be conducted. These included: physical (0.51 at Time 1 and 0.77 at Time 2) and social/emotional aggression (0.16 Time 1, 0.00 Time 2).

3.5.2 Aim 4: Comparison of Children’s Social Skills at Time 1 and Time 2

3.5.2.1. Outcomes related to content of strategies. To test hypothesis 4a, that there will be a significant improvement in social problem solving skills related to content of strategies offered to social dilemmas, quantity of responses, and quality of responses
Table 17.

Means and Standard Deviations of Prosocial and Withdrawal Behaviours Across Time

<table>
<thead>
<tr>
<th></th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>F(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Prosocial</td>
<td>28.06 (13.62)</td>
<td>24.39 (6.42)</td>
<td>22.37 (9.74)</td>
<td>0.71(2,16)</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>70.54 (12.59)</td>
<td>72.70 (8.58)</td>
<td>73.55 (14.38)</td>
<td>0.14(2,16)</td>
</tr>
</tbody>
</table>
based on interview outcomes from Time 1 to Time 2, the percentage of strategies offered were first calculated (see Table 18). Paired sample t-tests were conducted to see if there were any significant differences in proportion of scores from Time 1 to Time 2. No significant differences were found in any of the strategies.

Proportion of strategies for conflict vs. non-conflict scenarios were calculated next. These are displayed in Table 19. Again, paired sample t-tests were conducted to see if there were any significant differences among proportions and no significant differences were found.

3.5.2.2 Outcomes related to quantity. The number of strategies that received different categories of content codes were tallied for Time 1 and Time 2, separately, to yield total scores for Time 1 and Time 2. Subgroup scores for conflict vs. non-conflict scenarios were also calculated. These can be found in Table 20. Paired sample t-tests were conducted to determine whether a significant difference existed between total and subgroup scores from Time 1 to Time 2. A borderline significant difference was found for the difference in total scores from Time 1 to Time 2 ($t = -2.08, p = .06, d = 0.55$) with the number of strategies offered increasing at Time 2. Borderline significance was also found for the quantity of strategies offered in conflict scenarios from Time 1 to Time 2 ($t = -1.96, p = .07, d = 0.52$), with the number of solutions offered for conflict solutions increasing post-intervention. No significant differences were found for non-conflict subgroup scores (see Figure 10).
### Table 18.
Means and Standard Deviations of Proportion of Strategies Offered at Time 1 vs. Time 2

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>t(df)</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aggressive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>1.49 (3.07)</td>
<td>1.35 (2.34)</td>
<td>0.32(13)</td>
<td>0.08</td>
</tr>
<tr>
<td>Verbal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Command</td>
<td>12.95 (7.92)</td>
<td>11.20 (7.45)</td>
<td>0.64(13)</td>
<td>0.17</td>
</tr>
<tr>
<td>Request</td>
<td>17.89 (10.85)</td>
<td>16.04 (7.80)</td>
<td>0.99(13)</td>
<td>0.26</td>
</tr>
<tr>
<td>Seek Information</td>
<td>4.37 (4.80)</td>
<td>4.72 (7.08)</td>
<td>-0.20(13)</td>
<td>0.05</td>
</tr>
<tr>
<td>Self Statement</td>
<td>4.77 (4.32)</td>
<td>5.00 (7.05)</td>
<td>-0.12(13)</td>
<td>0.03</td>
</tr>
<tr>
<td>Supportive</td>
<td>4.78 (5.85)</td>
<td>4.56 (3.49)</td>
<td>0.16(13)</td>
<td>0.04</td>
</tr>
<tr>
<td>Other</td>
<td>7.19 (6.62)</td>
<td>9.01 (8.64)</td>
<td>-0.64(13)</td>
<td>0.17</td>
</tr>
<tr>
<td><strong>Passive</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Active</td>
<td>9.12 (8.81)</td>
<td>9.80 (10.19)</td>
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</tr>
<tr>
<td>Non-Active</td>
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<td>3.66 (3.33)</td>
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</tr>
<tr>
<td>Wait</td>
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<td>3.47 (4.13)</td>
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<td>0.12</td>
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<tr>
<td>Direct Action</td>
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</tr>
<tr>
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</tr>
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<td>Authority Intervention</td>
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### Table 19.
Means and Standard Deviations of Proportion of Conflict vs. Non-Conflict Strategies Offered at Time 1 vs. Time 2

<table>
<thead>
<tr>
<th></th>
<th>Conflict</th>
<th></th>
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<th></th>
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<tr>
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<td>d</td>
<td>Time 1</td>
<td>Time 2</td>
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<td>(SD)</td>
<td>%</td>
<td>%</td>
<td>(SD)</td>
<td>(SD)</td>
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<tr>
<td>Verbal</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.78</td>
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<td>1.59</td>
<td>(2.71)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.35(13)</td>
<td>0.09</td>
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<td>0.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>(0.00)</td>
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<td>Command</td>
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<td>0.86(13)</td>
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</tr>
<tr>
<td></td>
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<td>(8.97)</td>
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<td>(5.44)</td>
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<td>Request</td>
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<td>0.46(13)</td>
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<td>24.88</td>
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<td></td>
<td>(11.93)</td>
<td>(7.95)</td>
<td>(33.91)</td>
<td>(21.49)</td>
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Table 19. (cont.)

<table>
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<th>t (df)</th>
<th>d</th>
<th>Time 1</th>
<th>Time 2</th>
<th>t (df)</th>
<th>d</th>
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</thead>
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<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>(SD)</td>
<td>(SD)</td>
<td>%</td>
<td>%</td>
<td>(SD)</td>
<td>(SD)</td>
</tr>
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<td>3.97</td>
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<td>(4.61)</td>
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<td>(14.85)</td>
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<td>(10.87)</td>
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<td>Supportive</td>
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<tr>
<td>(7.76)</td>
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<td>(5.64)</td>
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<td>Other</td>
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<td>7.76</td>
<td>-0.01(13)</td>
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<td>(7.74)</td>
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<td>(14.97)</td>
<td>(20.39)</td>
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<tr>
<td>Passive</td>
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Table 19. (cont.)

<table>
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<th>t (df)</th>
<th>d</th>
<th>Time 1 %</th>
<th>Time 2 %</th>
<th>t (df)</th>
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<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
<td>(SD)</td>
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<tr>
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<td>-0.95(13)</td>
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<td>(0.00)</td>
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<tr>
<td>Wait</td>
<td>4.18</td>
<td>4.23</td>
<td>-0.03(13)</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td></td>
<td>(7.08)</td>
<td>(5.04)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Action</td>
<td>11.04</td>
<td>11.94</td>
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<td>0.09</td>
<td>50.48</td>
<td>42.72</td>
<td>0.85(13)</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>(9.15)</td>
<td>(7.01)</td>
<td>(41.63)</td>
<td>(34.63)</td>
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<td></td>
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</tr>
<tr>
<td>Vague</td>
<td>1.67</td>
<td>1.77</td>
<td>-0.16(13)</td>
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<td>0.00</td>
<td>0.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(2.33)</td>
<td>(2.72)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
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<td>-0.17(13)</td>
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<td>0.71</td>
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<td>1.00(13)</td>
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</tr>
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<td>(2.67)</td>
<td>(0.00)</td>
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Table 20.

Means and Standard Deviations Of Total Original Strategies

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>t(df)</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total*</td>
<td>14.29 (5.32)</td>
<td>16.39 (4.41)</td>
<td>-2.08(13)</td>
<td>0.55</td>
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<td>Conflict*</td>
<td>12.25 (4.67)</td>
<td>13.79 (3.99)</td>
<td>-1.96(13)</td>
<td>0.52</td>
</tr>
<tr>
<td>Non-Conflict</td>
<td>2.07 (1.07)</td>
<td>2.61 (1.08)</td>
<td>-1.36(13)</td>
<td>0.36</td>
</tr>
</tbody>
</table>

*p ≤ .07
Figure 10.

Quantity of SPSM Solutions
3.5.2.3 Outcomes related to quality. Each solution was coded for quality in terms of how prosocial they were on a scale of 1 to 5 with 1 being not at all prosocial and 5 being very prosocial. Ratings of the two coders were then averaged across strategies to obtain total prosocial scores for each of the two time points. A paired sample t-test was conducted to determine whether there was a significant difference in quality of responses from Time 1 to Time 2. No significant difference was found for quality of strategies from Time 1 to Time 2 (see Table 21).

3.6 Outcomes Related to Sense of Self

3.6.1 Aim 5: Comparison of Intervention Group to Control group

3.6.1.1. Descriptive statistics. The means of sense of self outcome measures distributed by intervention and control group can be found in Table 22. Again, in order to ensure that there was no change in scores of self-efficacy and social self-concept from baseline to Time 1, paired sample t-tests were conducted to compare outcomes at baseline and Time 1 in the intervention group (see Table 22). There was a significant increase in scores for the CSPI ($t = -2.67, p < .05$) from baseline to Time 1. As a result, the baseline assessment was used as a covariate in subsequent analyses. No significant difference was found for social self-concept from baseline to Time 1.

3.6.1.2 Intervention and control groups from time 1 to time 2. Hypothesis 5a stated that there will be a significant improvement in outcomes for survivors enrolled in the intervention program compared to those enrolled as comparison families. A repeated measure ANOVA with a between subjects factor was conducted and no significant difference was found between the two groups on either of these outcome measures.
Table 21.
Means and Standard Deviations of Quality of Responses from Time 1 to Time 2

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>t(df)</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Rating</td>
<td>3.64 (.30)</td>
<td>3.68 (.23)</td>
<td>-0.55(13)</td>
<td>0.15</td>
</tr>
</tbody>
</table>
Table 22.

Means and Standard Deviations of Sense of Self Outcomes

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Intervention</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Time 1</td>
</tr>
<tr>
<td></td>
<td><em>M (SD)</em></td>
<td><em>M (SD)</em></td>
</tr>
<tr>
<td>Social Self-Efficacy</td>
<td>65.89 (8.19)</td>
<td>70.00 (9.21)</td>
</tr>
<tr>
<td>Social Self-Concept</td>
<td>2.54 (0.82)</td>
<td>2.98 (0.70)</td>
</tr>
</tbody>
</table>

*aCSPI (Children’s Self-Efficacy for Peer Interaction Scale; Wheeler & Ladd, 1982).  
*bSPP (Self Perception Profile; Harter, 1985).
4. Discussion

The evidence for social difficulties in survivors of childhood brain tumours is now well established (Fuemmeler et al., 2002). Research related to neurocognitive deficits resulting from the diagnosis and treatment of a childhood brain tumour (Copeland, deMoor, & Moore, 1999; Reddick et al., 2003), is bolstered by investigations attempting to rehabilitate cognitive outcomes (Butler & Mulhern, 2005). There is insufficient effort, however, directed to improving social outcomes among this population by way of specifically designed interventions. Moreover, research to date has remained largely atheoretical with respect to conceptualizing social competence and has failed to consider other relevant contextual factors that may be related to social competence outcomes, such as sense of self.

The specific aim of the current project, therefore, was to foster and improve the development of social competence among this population through a structured program designed to facilitate and enhance social competence and sense of self. Based on the manualized group social skills intervention program for childhood brain tumours (Barrera et al., 2004), research was conducted to validate this program at three hypothesized levels of social competence: social adjustment; social performance; and social skills (Cavell, 1990); and to consider impact on sense of self.

Within this chapter, there will be a summary of all the major findings obtained from this study. These findings will be related to the various hypotheses and objectives stipulated for this research and will be discussed as they pertain to related literature and research. There will also be considerations for the limitations to this study both within each level of assessment (i.e. social adjustment, social performance, social skills, sense of
self) and more broadly. Following this, consideration will be given to the future directions for this area of research and specifically to the group social skills program for childhood brain tumour survivors.

4.1 Social Adjustment

In accordance with hypotheses related to parent reports of survivors’ social adjustment, and consistent with results from the feasibility study (Barrera & Schulte, 2009), a significant increase in parent reported SSRS was found after the intervention. Furthering earlier research, and even more impressive, these results were substantiated when the intervention group was compared to a control group. In the intervention group SSRS scores improved, whereas the scores in the control group actually decreased over the same time period. This is an important finding because not only has it replicated previous research, but it has also done so in the context of a control group. This provides a significant contribution to the current literature.

In addition to significant improvements in SSRS for the intervention group compared to the control group over time, parents reported decreased social problems over the course of the intervention compared to the control group. Significant findings based on outcomes using the CBCL have not been shown before. This provides additional support for the efficacy of the social skills intervention program.

The effect of the intervention was further bolstered by teacher reports which demonstrated a significant improvement from Time 1 to Time 2 for SSRS scores. In addition to supporting parent reported changes, this represents compelling preliminary evidence for the generalization of the social skills program to other environments. Specifically, social skills training programs have typically been found to be successful in
discrimination, that is the demonstration of appropriate social behaviours at the right time, in the right place, and with the right people (Gresham, 1994). Less success however, has been found for the ability of intervention programs to lead to generalization, or getting social behaviours to occur in more than one place for an extended period of time. These findings, therefore, have important implications for the literature related to social skills intervention programs and their success in generalization.

Although child reports of social adjustment outcomes were somewhat in line with hypotheses, these results remain somewhat disappointing, with one important exception. A significant main effect of was found for the social problems subscale of the YSR. These results are encouraging as they are the first survivor reported outcome to demonstrate change over the course of the intervention. As predicted, however, no significant improvement in SSRS, or social functioning were found, which is consistent with, and substantiates findings obtained from the feasibility study (Barrera & Schulte, 2009).

It should be noted that, with respect to social adjustment data, survivors report their social adjustment behaviour to be within the normal range, or higher, on assessments conducted prior to the intervention. This was similarly noted in the previous study (Barrera & Schulte, 2009). The tendency for survivors of childhood cancer to underreport difficulties and symptoms of distress has been well documented in the cancer literature (Canning et al., 1992) as well as among other chronic illness populations (Canning, 1994). This phenomenon has also been widely demonstrated in the ADHD literature (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). While the reasons behind the discrepancy in parent and child reports are unclear, there are several
hypotheses regarding the observed discrepancies in child and parent responses. Firstly, some have suggested that parental reports may be a reflection of their concerns for the child rather than their objective evaluation of the child (Phipps, 2007). This may be particularly true when dealing with a child with a devastating disease such as a brain tumour or even other chronic illness, where parent reports may be subject to inflation due to parental distress (Meeske, Katz, Palmer, Burwinkle & Varni, 2004). This hypothesis seems unlikely in the current study, however, as teachers’ scores on the SSRS prior to the intervention were actually worse than those of the parents. Alternatively, as also suggested by others, the discrepancy in reporting between parents and survivors may be due to childhood cancer survivors’ tendency to minimize negative psychosocial effects of the cancer experience or social desirability (Barakat et al., 2003; Barrera & Schulte, 2009; Phipps & Srivastava, 1997). Children may actually learn to conceal their true perceptions of their social adjustment from parents and caregivers (Binger, Ablin, Feverstein, Kushner, Zoger & Mikkelson, 1969). Alternatively, children with brain tumours may not be aware of changes in their social adjustment and changes in their social status that have occurred since their diagnosis and treatment. Uncovering the nature of these discrepancies would certainly shed some light on the way in which survivors process their social experiences. Examination of sense of self data may help generate an understanding of this phenomena.

4.1.1 Limitations of Assessment of Social Adjustment.

Each of the measures employed at the level of social adjustment were originally developed for use in a population of healthy children and there have been no reliability or validity studies conducted to verify their use among brain tumour survivors. Interestingly,
however, results related to the SSRS replicate findings from the earlier study (Barrera & Schulte, 2009), and lend some support to the reliability of this measure within this population. Nevertheless, future research should attempt to validate the use of these tools in a childhood brain tumour population.

This study was underpowered due to a small sample size. Yet, promising results were obtained when results from the intervention group were compared to results from the control group and for the teacher reports, pre-post intervention for the intervention group. Nevertheless, some revisions to the teacher recruitment process should be considered. For example, in the current study, parents were relied upon to deliver teacher packages to the schools and no attempt was made on the part of the investigator to gather access to schools directly. This would have allowed follow-up from the investigator to encourage teachers to complete their questionnaire packages and perhaps improve recruitment results. Finally, teacher reports for the control group would have contributed substantially to these findings.

4.2 Social Performance

Hypotheses related to social performance outcomes stipulated that there would be a significant increase in frequency of prosocial behaviours over the course of the intervention and a subsequent decrease in withdrawal behaviour. Behaviours elicited from the observational coding scheme of Dodge and colleagues (1983) were categorized into these differing social classifications. In general, no significant change was found for overall prosocial or withdrawal behaviours from Session 1 to Session 4 to Session 8. With respect to individual prosocial behaviours, however, some support for this hypothesis was found. Specifically, a significant increase in cooperative play was found.
This is an important finding given that the frequency of cooperative play has been positively related to peer acceptance, resulting from its prosocial nature (Marshall & McCandless, 1957). Developmentally, the increase in cooperative play has important implications. As has been discussed, cooperative play has been identified as the end result of competent entry into a peer group, preceded by solitary play, watching peers, and parallel play (Robinson et al., 2003). In this sense, therefore, it may be argued that the intervention might have advanced the developmental trajectory of play behaviours among group participants.

In addition, maintaining facial attention was found to significantly increase over the course of the intervention. Moreover, there was a significant increase in the frequency of social conversations with peers occurring over the course of the intervention. These findings were significant not only between Session 1 and Session 8, but also between Session 4 and Session 8. Taken together with the results obtained from cooperative play, these behaviour specific findings lend support to the hypothesis related to improved prosocial behaviour over the course of the intervention.

Listening to others speak, however, significantly decreased. There are a few potential reasons for these findings. First, the coding scheme devised by Dodge and colleagues (1983) and implemented in the current study was originally developed for a population of aggressive-rejected boys. Among the population for which the coding scheme was originally derived, therefore, one can acknowledge the importance of emphasizing listening to others. With the current population of brain tumour survivors, however, already socially reticent, emphasis instead should have been placed on more
assertive and outgoing social behaviours. Implementation of this coding system in future research with our brain tumour population, therefore, may require some modification.

Viewing these results in the context of other findings related to social performance may also serve to explain the unanticipated decline of listening to others speak. As already highlighted, behaviours such as social conversations with peers increased over the course of the intervention, which may in fact explain why listening to others decreased over time. In other words, as social conversations among peers increased, there was less opportunity for active listening to take place, which may in fact be a positive outcome. In this light, arguably, the decrease in listening to others over the course of the intervention may be perceived as more typical of a withdrawal behaviour, lacking in more of the assertive outgoing nature of some of the other identified prosocial behaviours (e.g. cooperative play, social conversations). As has been demonstrated, the primary determinants of peer liking are positive social behaviours including, congeniality, conversation skills, and cooperative behaviours (Coie et al., 1990), but not specifically listening to others. This represents a conceptual flaw in the coding system. Indeed, the conceptualization and subsequent operationalization of this specific behaviour within the coding scheme warrants further attention.

Methodologically, there may have been a flaw in the coding system. Listening to others speak operationally was similar in definition to the behaviour ‘watching others’ from the solitary active category. Specifically, listening to others speak was defined as “behaviours that demonstrate active listening to a peer who is speaking” whereas watching others was defined as “behaviour that involves observation of other peers non-speaking without being directly involved in the interaction”. Perhaps the similarities of
these two behaviours may have contributed to subjective judgements in coding. In fact the kappa reliability coefficients for these two behaviours was .65 for listening to others speak and .48 for watching others, both below the desired .70. Future work employing this coding scheme needs to better clarify the operationalization of these two behaviours.

Taken together, while specific evidence for the increase in prosocial behaviours as categorized herein was not obtained, improvement was noted for prosocial specific behaviours which points to some improvement in social competence at the level of social performance overtime in the intervention group.

With respect to withdrawal behaviours, interesting findings were obtained for the frequency of off-task behaviour over the course of the intervention, although this was not reflected in significant changes for the solitary active behaviour category. Specifically, a borderline increase in off-task behaviour was found from session 4 to session 8. At first glance, this is contrary to hypotheses related to frequency of solitary or withdrawal behaviours, which were expected to decrease over the course of the intervention. To better understand these outcomes, therefore, re-examination of the observational data was conducted. Off-task behaviour was operationalized as behaviour in which the child was not engaged in goal directed behaviours (such as staring out the window, gazing around the room, or walking about the room). Re-examination of behaviours categorized as ‘off-task’, however, revealed a qualitative difference in off-task behaviour during Session 1 and 4 as compared to Session 8. Specifically, in Session 1 and Session 4 participants mainly engaged in behaviours consistent with the operational definition (e.g., gazing around the room). In Session 8, similarly characterized behaviours were consistent with the operational definition (e.g., the child was not engaged in goal-directed behaviours;
e.g. not sitting still in their chair) but were more playful and active (e.g. hiding underneath a sweater and giggling) as opposed to in-active (e.g., gazing around the room) in nature. This is reflected empirically by the mean frequency of off-task behaviours decreasing from Session 1 to Session 4 (3.77 vs. 0.73) but then increasing again from Session 4 to Session 8 (0.73 vs. 4.84). It may be therefore, that the off-task behaviour code also requires future modifications in conceptualization and operationalization.

Although snack time was targeted as an appropriate period for behaviour coding to take place as it was hypothesized to serve as ‘un-structured’ time, in fact, snack time was more structured than initially anticipated and opportunity for free play was more limited than expected. Specifically, when snack was initiated, group members all took chairs and sat in a circle. Moreover, perhaps as a reflection of some of the ‘group rules’ that were established for each group emphasizing raising hands to speak, not talking when others were talking, and listening to others, group members all typically took turns speaking. Unstructured conversations and free movement around the room, therefore, did not occur. As a result, solitary behaviours that were consistent with the primary objective of snack-time (i.e. eating snack) were always coded as ‘on-task’ behaviour whereas solitary behaviours that were outside the realm of eating snack (e.g. solitary play) were most often considered off-task.

Off-task behaviour occurring in Session 8 may have perhaps been better categorized as solitary active play (as a specific behaviour as opposed to a category label) or parallel play. This also warrants greater attention in future research. If indeed the behaviour occurring from Session 4 to Session 8 is increasingly playful, but still lacking the active involvement of other group members, this is consistent with developmental
considerations of play behaviour. Specifically, the notion that parallel and solitary play often serve as entry into more cooperative, complex activity (Robinson et al., 2003) suggests that steps were being made toward group interaction. As has been discussed, a significant increase in cooperative play was noted over the course of the intervention confirming these developmental hypotheses.

With respect to supporting hypotheses regarding the withdrawn rejected classification of these children, social performance findings provide evidence supporting withdrawal behaviours but no specific evidence for rejection. First, aggressive behaviour categories did not receive any codings during any session and therefore were eliminated all together from analyses. Instead, there was confirmatory evidence for the withdrawal behaviours of these children (e.g. solitary active behaviours, interactions with group leaders). Moreover, it has been demonstrated that the frequency of prosocial behaviours among these children, as operationalized herein was in fact relatively low to nil at Session 1 particularly compared to the frequency of withdrawal behaviours. Even where improvements were noted in prosocial behaviours over the course of the intervention, the frequency of these behaviours never surpassed the withdrawal behaviours by Session 4 or Session 8. Thus, while a higher frequency of withdrawal behaviours, was demonstrated, the lack of evidence to support the ‘rejected’ component of the withdrawn rejected distinction warrants further research into the social performance of childhood brain tumour survivors.

4.2.1 Limitations of Assessment of Social Performance.

There are some limitations with the social performance assessments. As aforementioned, although snack time was selected as the optimal time for behaviour
coding as it was identified as ‘un-structured’ social time within the group setting, in fact, snack time remained relatively structured and limited the relative ability of group members to play freely. In addition, while these results suggest improvement in prosocial behaviours as a result of the intervention itself, it may be that behaviours that were found to improve over the course of the intervention did so simply by virtue of the fact that the group members became increasingly more comfortable with each other over the 8-week program. Unfortunately, the potential effect of time was not controlled for and future research may try to account for this by implementing an ‘attention control’ group, a group in which survivors would participate in a group but group activities would be structured by participants’ choice of activities as opposed to being structured according to a specific session outline and theme as is the case in the social skills group intervention program. In fact, results of a meta-analysis on the effectiveness of psychosocial interventions in pediatric oncology concluded that increased use of attention control groups need to be utilized in the testing of interventions for pediatric oncology populations to increase experimental control (Pai et al., 2006). This would demonstrate that the intervention was effective above and beyond the nonspecific effects associated with therapeutic interventions.

Nevertheless, certain behaviours, such as maintaining facial attention, were targeted specifically during the intervention program. Maintaining facial attention was a social skill discussed and practiced during Session One: “Initiating Conversations with Peers”. Significant improvement in maintaining facial attention over the course of intervention, therefore, arguably more of a specific social skill as opposed to more interactive, social performance behaviours, such as cooperative play, lends support to the
intervention specific effect of improving such skills. Moreover, the social performance results in conjunction with those obtained at other levels of social competence (i.e. social adjustment) present a case for the efficacy of the intervention over and beyond the effect of time.

4.3 Social Skills

The fourth hypothesis related to analyses at the level of social skills was that outcomes related to the content, quantity and quality of strategies offered to solve hypothetical social dilemmas would improve from pre- to post-intervention. As expected, the total quantity of strategies increased from Time 1 to Time 2, although this effect was only borderline significant, likely due to limited power. In addition, after subcategorizing total strategies into conflict and non-conflict responses, a borderline significant effect was found for increased responses to conflict dilemmas. These findings suggest an improvement in social knowledge and social problem-solving skills over the course of the intervention. That an improvement in response was found specifically for conflict strategies is also important as these survivors have been found to struggle with conflict resolution and assertion (Barakat et al., 2003; DieTrill et al., 1996). Moreover, as hypothetical dilemmas were selected specifically for their relevance to skills targeted within the social skills intervention program (i.e initiating conversation and friendship making, managing teasing and bullying, conflict resolution) (Barrera et al., 2004), this suggests direct impact of the skills taught within the context of the group for improving social knowledge and problem-solving around these skills.

There were no significant findings with respect to the content of specific strategies. Although a somewhat disappointing finding, this may be explained by
insufficient power to detect small or moderate results. Similarly, no significant change was found in the quality of responses from pre- to post-intervention. In the context of demonstrating efficacy of the social skills intervention to improve prosocial behaviour, these findings are somewhat disappointing. Of note, however, scores for quality of responses were already relatively high at Time 1 (3.64/5) and similarly so at Time 2 (3.68/5). In light of a need to generate an understanding of the social competence of these survivors, these results may provide some interesting insight.

It has been suggested based on research related to the outcomes of brain tumour survivors that these children are socially isolated and victimized (Upton & Eiser, 2006; Vannatta, Gartstein et al., 1998) and therefore may tend to fall within the ‘withdrawn rejected’ social categorization as opposed to the ‘aggressive rejected’ classification put forth by researchers interested in assessment at level the of social performance (Yeates et al., 2007). Children who are withdrawn rejected frequently display lower levels of prosocial behaviour (Newcomb, Bukowski, & Pattee, 1993). On the surface, therefore, these relatively high levels of prosocial behaviour at Time 1 and Time 2 are in contrast to what might be expected for withdrawn rejected children. Perhaps then, at this level of social competence, our brain tumour survivors differ from the typical characterizations of withdrawn children. The brain tumour survivors in the current study do not appear to have difficulties in generating competent solutions to interpersonal dilemmas at the level of social skills. Their problem instead, seems to be in the enactment of socially competent behaviours at the level of social performance. Perhaps then, the results related to the level of social skills should be interpreted differently. Childhood brain tumour survivors may possess the social knowledge and social problem-solving skills required to appropriately
react in certain situations. Their deficits instead may lie in the actual engagement of social interactions.

4.3.1 Limitations of Assessment of Social Skills.

There were several limitations to the assessment of social skills. First, methodologically, the SPSM, employed to assess social skills, has not been empirically validated or standardized for use in the current population. Although development of this measurement tool was based on other standardized social-problem solving tools (S. R. Asher et al., 1980; Lochman & Lampron, 1986; Rubin & Mills, 1988) evidence of its psychometric properties such as test-retest reliability and validity is in progress and relevant norms have not yet been established. Nevertheless, the interrater reliability in the current study was found to be high, suggestive of psychometric strength. While comparison to population norms was not an objective of the current investigation, it may have been helpful to evaluate the current findings within the context of how other children typically perform on the SPSM. Moreover, with respect to hypotheses related to the social status of childhood brain tumour survivors, comparative evidence with prosocial, aggressive, or withdrawn populations of children would have strengthened this argument.

4.4 Summary of Social Competence Findings

As has been discussed, social competence as a whole should be conceived as a child’s ability to engage successfully at each of our targeted levels of analysis, that is, social adjustment, social performance and social skills (Cavell, 1990). This study provides support at the level of social adjustment. Specifically, parents reported improvement in SSRS, replicating previous results, but substantiated in the current study
after comparison to a control group. As well, a decrease in social problems was found after the group intervention.

Teachers’ findings of social adjustment further supported the effect of intervention using pre-post comparisons. This is particularly impressive given what is known about social skills training programs in healthy children. Interestingly, there has been less support in the literature for the ability of social competence intervention programs to successfully promote generalization of intervention gains to real-life environments (Gresham, 1994). The results gleaned from teacher reports in the current study suggest some preliminary success in the generalization of the skills learned in the program, but replication of these findings is warranted.

Although replicating results from the previous study (Barrera & Schulte, 2009), survivors’ reports at the level of social adjustment are still disappointing. These findings should be viewed, however, with respect to the social competence hierarchy as proposed by Cavell (1990). At the level of social skills, to some extent it has been suggested that the social difficulties evidenced by brain tumour survivors do not originate at this level of social competence. For the most part, survivors exhibited social knowledge and social problem-solving skills and offered prosocial strategies to hypothetical social dilemmas both pre and post intervention. Whereas at the level of social performance, improved outcomes were demonstrated, suggesting the potential for rehabilitation at this point in the hierarchy. Specifically, over the course of the intervention, gains were obtained for cooperative play, social conversations with peers, and maintaining facial attention. As a whole, therefore, it may be that intervention efforts may need to focus more at the level
of social performance. Consistent with the social competence hierarchy, affecting change at the level of social performance will lead to changes at the level of social adjustment.

It may also be, however, that we still do not know enough about survivors’ tendency to underreport difficulties and symptoms of distress. More information is required to discern whether at the level of social adjustment survivors are actually unaware of their actual levels of social functioning, are unwilling to acknowledge their level of social functioning or are consciously attempting to minimize deficits on standardized questionnaires. Indeed, given the well known deficits in neurocognitive functioning among this population (Mulhern et al., 2004; Reddick et al., 2003), the role of neurocognitive status may be important in this context. Although an examination of the impact of a brain tumour diagnosis on neurocognitive status was beyond the scope of this project, it is possible that neurocognitive outcomes are positively related to social competence. Future research is needed to better understand the impact of neurocognitive status at the varying levels of social competence.

4.5 Sense of Self

Hypothesis five stated that there would be change in self-concept and self-efficacy scores over the course of the intervention compared to a control group. The results of this study did not support this hypothesis.

There are both conceptual and methodological considerations for why no improvement in sense of self scores were found over the course of the intervention. Methodologically, this is the first attempt to incorporate sense of self measures as an index of change in the context of a social skills intervention program for childhood brain tumour survivors. There may be aspects of the measures employed in this study,
therefore, such as certain psychometric properties, deeming them inappropriate as measures of change, or insensitive to change for these purposes in the brain tumour population. This has been found for other standardized measures implemented in populations other than for which the measure was designed (Perrin, Stein, & Drotar, 1991). This requires further investigation. In addition, the lack of sufficient power for statistical analyses may have also hindered the ability to detect change where it may have occurred.

Conceptually, sense of self constructs may be too stable and resistant to change over an eight-week intervention program. Supporting this hypothesis, theoretical models of self-system development suggest that social belief systems may not be easily changed (Piers & Harris, 1969). Given the developmental processes associated with the construction of self-system processes and their roots in past and present experiences (e.g. mastery experience, social comparison) (Bierman, 2004), this is a plausible explanation. Nevertheless, it was believed that by providing mastery experience and social comparison opportunities with a group of similar others, as well as by targeting domain specific sense of self constructs (i.e. social self-efficacy and social self-concept), more flexibility in these constructs would be demonstrated.

As has already been discussed, sense of self is a cognitive construct, which serves as a means through which one’s social world may be interpreted. Self conceptions, therefore, represent expectations about how one is likely to be treated by particular social partners and how one is likely to behave, together with associated thoughts and feelings based upon repeated patterns of interactions and experiences (Baldwin, 1992; Markus & Wurf, 1987). Based on this notion, perhaps sense of self may be used as an adaptive
function. Not surprisingly, negative self-perceptions are associated with psychological distress including depression, anxiety and loneliness in a general population (Boivin & Begin, 1989). This has also been demonstrated in one of the few previous studies that examined sense of self in a population of childhood brain tumour survivors (Barrera et al., 2008). In this study, depression was found to be related to sense of self and it was hypothesized that whether or not these children develop symptoms of depression may be related to how well they are able to maintain their sense of identity and social contact with others (Barrera et al., 2008). By ‘distorting’ ones self-perception, therefore, one may be protecting oneself from associated feelings of negativity.

This notion of ‘protectionism’ has been hypothesized to exist among aggressive rejected children. For example, aggressive children tend to overestimate the extent to which they are accepted and are unaware of the degree to which they are disliked by their peers (Cillessen, van IJzendoorn, van Lieshout, & Hartup, 1992; Hughes, Cavell, & Grossman, 1997). Moreover, compared to children of average sociometric status, aggressive children do not differ on reported levels of loneliness and self-esteem (Boivin, Poulin, & Vitaro, 1994; Parkhurst & Asher, 1992). Interestingly, this is not the case for withdrawn children (Boivin et al., 1994; Parkhurst & Asher, 1992). Instead, socially withdrawn children have been found to believe they have poor social skills and relationships and attribute social failures to internal, stable, sense of self characteristics (Hymel, Bowker, & Woody, 1993). Although brain tumour survivors have been hypothesized to fall within the withdrawn categorization, based on the current study, these survivors do not seem to share the characteristic of reporting low sense of self.
Perhaps the distinction of childhood brain tumour survivors from withdrawn rejected children in this regard may be explained by the developmental differences between these two groups. The developmental trajectory of brain tumour survivors specific to the growth of social competence and sense of self may be unique compared to healthy peers, as their social development may be interrupted by the disease and its treatment. Prior to this diagnosis, these children may have in fact possessed the social competencies required for successful social interactions and a positive sense of self as opposed to enduring chronic social difficulties. Following their diagnosis and treatment perhaps these sense of self structures are resistant to change as a positive sense of self serves as a protective mechanism and children are resistant to accept their ‘new’ selves. Thus, these survivors may form a separate category of withdrawn children, therefore, unique as a result of their different developmental trajectories.

Hughes and colleagues (1997) raised critical questions about the degree to which an inflated sense of self represents a risk or protective factor. On the one hand, brain tumour survivors who are unaware of the degree to which their peers like or dislike them, and who fail to recognize their own contribution to changes in their social difficulties, may have little motivation to change. According to the health behaviour literature, for behaviour change to succeed, individuals must feel threatened by their current behavioural patterns, but also competent to overcome perceived barriers to change (Baranowski et al., 2002). In contrast, it may be suggested that an inflated sense of self among brain tumour survivors is needed to buffer the survivor from the low regard with which others may hold them. When levels of perceived competence are very low, affect is depressed, and motivation for coping is compromised (Skinner, 1995). Survivors may
be dissuaded, therefore, from continuing efforts at social relationships (Cairns, 1991). In the context of the current study, therefore, as opposed to attempting to dismantle the protective wall that supports childhood brain tumour survivors’ social experiences, behaviour change efforts should target the promotion of new prosocial goals and strategies to supercede old ones.

Indeed, habitual patterns of social responding are not easy to change, particularly when they have served adaptive functions in the past and have become an established part of a child’s affective, cognitive, and behavioural orientation toward his/her social world and sense of self. Certainly this may be the case in the context of an eight-week intervention program. Rather, in order to rework internal schemas, intervention strategies introducing new ways of looking at and interpreting social interactions may be required.

4.5.1 Limitations of Assessment of Sense of Self

As has already been alluded to, validation of the use of sense of self measures in a population of childhood brain tumour survivors is required before definitive conclusions about the sense of self in this population can be made.

While theoretical models and research linking self-system development to the quality of children’s social adjustment have begun to emerge, such theoretical suppositions have been slow to influence intervention strategies to improve peer relations (Bierman, 2004). Certainly, this is the first study to conduct this type of evaluation in a population of brain tumour survivors.
4.6 Limitations

4.6.1 Methodological Limitations

4.6.1.1 Sample size. As was discussed, resulting from a relatively small sample size, the power to detect change where change may have occurred was limited. Borderline effects found for some of our outcomes therefore (e.g. Social Skills: total original strategies), may have reached significance had the sample size been larger. In spite of this limitation, significant effects were found in some cases (e.g. Social Performance: social conversations with peers) suggesting the findings were strong. In addition, the smallest samples comprised the control group and teacher cohort, yet significant findings were obtained from both of these groups. Nevertheless, as aforementioned, future research may focus on refining the recruitment procedures for these two samples.

4.6.1.2 Related factors. A limited sample size also precluded examination of factors that may have been related to intervention outcomes. Specific personal (e.g. age, gender) and clinical factors (e.g. age at diagnosis, diagnosis, treatment) may impact outcomes of the intervention. Moreover, IQ and other neurocognitive processes such as executive function, and memory, were not assessed in the current sample. Given the current population of childhood brain tumour survivors and the well known neurocognitive deficits that have been found to result from a brain tumour diagnosis and treatment (Butler & Mulhern, 2005; Reddick et al., 2003), IQ and neurocognitive functions could have been important variables to consider in the context of the intervention program. As aforementioned, this may be particularly true in the assessment of social cognitive constructs. Finally, assessment of parenting variables may also be
critical to understanding intervention effects or social competence outcomes. As has been
discussed, there has been a paucity of research attempting to uncover the mechanisms
underlying decreased social competence and sense of self, and research that has been
conducted has yielded inconsistent findings. An examination of neurocognitive variables
such as IQ and other related factors in the context of an intervention program, therefore,
could provide more insight into related factors and answer some important questions
about the nature of social difficulties in this group of children. Ultimately, this may serve
to provide more specific targets for intervention programs.

4.6.1.3 Study design. This study has improved significantly upon previous
research that has investigated intervention programs for childhood brain tumours by
employing a control group (Barakat et al., 2003; Barrera & Schulte, 2009; DieTrill et al.,
1996). It should be noted, however, that the control group was a convenience sample
rather than a randomized control group. While no differences were found between the
intervention group and control group in disease, treatment, and demographic variables,
motivation for either participating in the group or not, could not be assessed. There may
have been some inherent bias therefore between families who participated in the social
skills program versus those who only participated in the assessments. Future research
would be better served by employing a randomized control group.

In addition to the aforementioned lack of a randomized control study design, lack
of follow-up after the intervention restricted our ability to make stronger conclusions
about sustainability of the program. Sustainability of intervention effects, however, have
been demonstrated in a previous study (Barrera & Schulte, 2009).
4.6.1.4 Assessment tools. Within each of the already discussed levels of social competence and sense of self, specific methodological limitations have been highlighted. For the most part these have centred on the psychometric properties of the measures that have been employed at each level. To summarize, greater work needs to be done to validate the use of assessment measures among a childhood brain tumour population. This is a body of research that is severely lacking and before any conclusions can be made with confidence about social outcomes or the impact of a social skills intervention program, the methodology needs to be sound.

4.6.1.5 Type I and type II errors. As a result of the many tests that were performed on this data set, it is acknowledged that there was an increased probability of having conducted a Type I error. That is, significant relationships between variables might have been detected falsely given the increased probability of rejecting the null hypothesis. Nevertheless, several of the statistical analyses conducted were considered exploratory and where possible, attempts were made to reduce the number of comparisons carried out. Finally, while statistical corrections such as the Bonferroni adjustment exist to correct for the change of making Type I errors, as has already been discussed, such an adjustment was deemed unnecessary given the quantity of comparisons that were actually conducted (Iobst et al., 2009). As discussed, the probability of having conducted a Type II error was also inflated in the current study given the small sample size.

4.7 Future research

Preliminary results obtained from a feasibility study were replicated in the current study with the social adjustment outcomes (Barrera & Schulte, 2009). Moreover, the
current study further expanded on initial social adjustment findings by incorporating a control group and eliciting teacher reports, which further validated parent-reported social adjustment outcomes.

Social adjustment data was further bolstered in the current study through the inclusion of a control group. Results obtained with respect to the control group were promising and warrant further investigation. There were some limitations, with the nature of the control group however, and future research would be best served by the implementation of a randomized control design. A randomized control design is the gold standard for evaluating the efficacy of medical and psychological interventions. Specifically, a randomized trial with a waitlist control group should be implemented. Employing this methodology, survivors would be randomized to either a ‘waitlist’ or to the intervention and those on the waitlist would be compared to those who participate in the intervention. Those randomized to the waitlist control group, however, would eventually be offered participation in the intervention group.

Moreover, efforts should also be made to enhance the recruitment of teachers as informants. Specifically, as opposed to relying on parents to enlist teachers to the study, the research team should instead communicate with teachers directly after parents consent to allow contact. This would afford greater control over recruitment of teachers and hopefully result in a greater sample size.

It would also be important to incorporate yet another important informant in the child’s social world, their peers. Inclusion of peer perspectives would contribute additional critical information about how these survivors are viewed in their immediate social worlds prior to and after group intervention and provide the ultimate support for
the generalization of skills learned within the group intervention. This may be accomplished through the implementation of sociometric methods similar to those employed by Vannatta and colleagues (1998). This sociometric information would be used to determine peer perceptions of the social status of brain tumour survivors among their peers and to compare whether their status changes following the intervention. Incorporating peer reports to the existing social skill evaluation would also allow us to draw a healthy comparison group. In addition, by incorporating a greater number of informants (intervention participants, control group, parents, peers, teachers) it is hoped a balanced perspective of survivors’ outcomes may be achieved.

Although improving this methodology would contribute substantially to the empirical validity of the group evaluation, developing and testing innovative interventions to improve the chances of living a better life for these survivors is costly and may take an unreasonably long time to achieve in only one site. Although SickKids is the largest pediatric centre in Canada, this research would be greatly bolstered by involving multiple sites in the research plan. A multi-site project would allow for a greater sample size that would further validate current and future findings.

A larger sample size would also permit exploration of critical factors related to: a) intervention effects; and b) social competence in childhood brain tumour survivors. For example, brain tumours in and of themselves are largely heterogeneous and warrant further investigation as separate entities. This would allow greater understanding of the impact of specific tumours and perhaps shed some light into which children are more at risk for social skills deficits and receptive to the social skills intervention. Similarly examination of this factor may shed some light on areas of the brain that may be critical
to social functioning. Evaluation of this combined with other potential treatment and personal variables would be important to understanding the multitude of factors that may be related to social competence outcomes.

The ultimate goal of pursuing further empirical validation of the intervention program and seeking greater insight into the factors that may be related to social outcomes is to demonstrate the efficacy of a program that may not only serve the needs of brain tumour survivors but also children with other cancers and other chronic illnesses.

With respect to the level of social performance and social skills, attempts should be made to replicate results obtained at these levels of social competence. Although the results obtained in the current study are promising, given the completely innovative nature of this research, these findings would be more convincing if replicated among the same population, with a larger sample size.

Although results related to sense of self assessments were exploratory, some considerations from these findings can be made. On the one hand it was argued that these survivors already had high self-perceptions. On the other hand, it was also argued that sense of self structures may be resistant to change particularly after an eight week intervention program. Perhaps, then, consideration should be given to other potentially related factors that may be associated with sense of self. For example, as already discussed, an earlier study looking at self-concept in childhood brain tumour survivors demonstrated an important relationship between self-concept, depression and social adjustment (Barrera et al., 2008). While no results were obtained looking at sense of self on its own in the current project, findings obtained in the aforementioned study suggest that sense of self in conjunction with emotional status may have a more significant
impact on social adjustment outcomes. Future research should continue to explore the sense of self of these survivors in the context of the intervention by addressing more of the emotional content surrounding the social skills taught in the intervention program.

4.8 Conclusions

The current study has shown evidence for outcomes related to social adjustment assessments, which replicated results obtained in an earlier study (Barrera & Schulte, 2009) confirming initial findings. Specifically, parents have been consistent in their reports of improvement following the intervention. These findings were further strengthened when compared to a control group and through the elicitation of teacher reports, validating parent perspectives. Results at the level of social adjustment were similarly replicated with respect to survivor reported outcomes although these results remain somewhat disappointing.

This study has also shown some evidence for the efficacy of the social skills intervention program for survivors of childhood brain tumours at the level of social skills and social performance. Based on these outcomes it has been suggested that perhaps difficulties do not exist for these survivors at the level of social skills with respect to possessing the social knowledge required to interact in social situations, but instead, in the enactment of these skills at the level of social performance. Indeed, the intervention was successful in enacting change at this level of social competence.

The combined results at the level of social adjustment and social performance suggest that intervention programs should continue to focus on both of these levels of assessment with the ultimate goal of affecting change in social adjustment thereby enhancing social competence as a whole.
Beyond the demonstrated effects of the intervention program, this study has contributed to a conceptual advancement over previous research with this population. Assessments at the level of social skills and social performance have not been assessed previously in this light and offer new insight into the social competence of childhood brain tumour survivors. Specifically, these findings have contributed to understanding the objective manifestations of social behaviour. By assessing these survivors at varying levels of social competence, some evidence regarding the nature of these deficits have been established. Certainly, further attention to these constructs are warranted in future studies related to the social outcomes of this unique population.

With respect to sense of self assessments, the thought processes or feelings related to social behaviour are still not as well understood. Generating a deeper understanding of these processes may further contribute to a greater insight into the processes that may be potentially maintaining socially maladaptive behaviours.
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A Group Social Skills Intervention Program for Survivors of Childhood Brain Tumors

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Objective The purpose of this study was to evaluate the feasibility and preliminary outcomes of a social skills group intervention program for child brain tumor survivors. Methods Participants were 32 survivors (14 females) aged 8–18 years. Medulloblastoma (28%) was the main diagnosis. The intervention consisted of eight 2-hr weekly sessions focused on social skills including friendship making and assertion. Survivors and parents completed measures of social skills, quality of life, behavior and depression, at baseline, pre- and post-intervention, and 6 months later. Results Feasibility analyses revealed promising acceptability, retention, recruitment, and treatment fidelity. Significant improvement was found after intervention based on parents’ reports of self-control $[F(1,27) = 5.97, p < .05]$, social skills $[F(1,28) = 5.70, p < .05]$, and quality of life $[F(1,15) = 17.98, p < .01]$. Conclusions The intervention is feasible and outcomes based on parental reports provide preliminary support for the efficacy of the program.

Key words pediatric brain tumors; social skills; intervention.

Children and adolescents who have been treated for brain tumors are at risk for neurocognitive and academic difficulties (Butler & Mulhern, 2005; Reddick et al., 2003). Consequently, efforts for developing cognitive rehabilitation strategies to address these deficits have been a major focus of research (Butler & Copeland, 2002; Butler & Mulhern, 2005; Copeland, deMoor, & Moore, 1999; Reddick et al., 2003). Evidence is similarly mounting for social difficulties among this population, including social skills (Carpentieri, Mulhern, Douglas, Hanna, & Fairclough, 1993; DieTrill et al., 1996; Radcliffe, Bennett, Kazak, Foley, & Phillips, 1996; Vannatta, Gartstein, Short, & Noll, 1998). Social skill difficulties among brain tumor survivors have been associated with a greater risk for decreased self-confidence and more symptoms of depression compared to norms (Barrera, Schulte, & Spiegler, 2008). More troubling, however, is evidence suggesting these social skill difficulties persist into late adolescence and adulthood further compromising functioning (Barrera, Shaw, Speechley, Maunsell, & Pogany, 2005; Hudson et al., 2003; Zebrack et al., 2004). Less attention, however, has focused on developing interventions to address these social deficits. This study aimed to address this gap.

The source of social competency deficits among a brain tumor population is unclear. Direct treatment effects such as surgery and/or cranial radiation therapy (CRT) are known to impact cognitive abilities (Mulhern & Butler, 2004; Reddick et al., 2003), which may thereby affect social understanding and subsequently social competence (Crick & Dodge, 1994; Lemerise & Arsenio, 2000). There are some reported associations between neurocognitive status and social functioning (Carey, Barakat, Foley, Gyato, & Phillips, 2001; Holmquist & Scott, 2003), but elsewhere no significant relationships have been found (Poggi et al., 2003). Even where present, however, these associations do not provide evidence of causality. Indirect consequences of a brain tumor diagnosis may also impact levels of social functioning. For example, due to prolonged school absences, children are not only deprived of academic learning opportunities in the classroom, but also opportunities for social learning with peers (La Greca, 1990; Wiener, Hersh, & Kazak, 2005).
Regardless of the etiology, there have been some efforts to address social deficits by providing social skills training to childhood brain tumor survivors. Of the two previously published studies on social skill interventions for this population, the first one targeted a small group of boys with social skill deficits including assertiveness, and handling teasing by peers (DiTrill et al., 1996). Using satisfaction questionnaires devised by the authors, boys and parents reported improvements in social skills after completion of the program, but with no systematic assessment, little can be derived from these results. In the second social skills intervention, assessments were conducted for 13 children using standardized scales of social skills and behavior administered 1 month prior and 10 months following the intervention (Barakat et al., 2003). Although social skills changed in the direction of improved functioning, the small sample employed in this study limits the generalizability of these results.

Individual social skills training has also been evaluated in newly diagnosed children with cancer, excluding those with brain tumors (Varni, Katz, Colegrove, & Dolgin, 1993). Compared to controls, participants reported greater perceived social support from peers and teachers and parents reported decreased internalizing and externalizing behavior problems and increased social competence. In this study, however, children themselves were not evaluated on their perceived social competency and since the social skills training was conducted individually rather than in a group, it is questionable whether these findings can be generalized to a social environment with peers. Finally, given that children with brain tumors were excluded in this study, it is also questionable whether these findings can be generalized to this population.

Preliminary research initiated by Barrera and colleagues (Barrera, Spiegler, & Baruchel, 2000) began to examine the social competence of childhood brain tumor survivors. A focus group with a convenience sample of these survivors was conducted first to obtain views about their needs (Barrera et al., 2000). The major themes that emerged during the group discussion included being made fun of by peers and a lack of friendships with classmates, replicating other findings in this area (Upton & Eiser, 2006). The decision to focus on social skills, as a critical source of social competence outcomes, was guided by findings in which social skills training has been found to not only positively affect social acceptance among healthy children, (Asher, Oden, & Gottman, 1977; Coie & Kupersmidt, 1983; Dodge, 1983; Newcomb, Bukowski, & Pattee, 1993; Putallaz & Gottman, 1981), and peer status as determined by sociometric methodologies (Bierman & Furlong, 1984) but is also argued to be central to social reintegration among childhood cancer patients (Katz & Varni, 1993).

Recent conceptualizations of the social competence construct have also guided the current research. Specifically, social competence has been conceptualized as the umbrella under which social skills exist at the bottom of a hierarchy followed by social performance and subsequently social adjustment (Cavell, 1990). Social adjustment is defined by the quality of social interactions and the extent to which individuals are achieving developmentally appropriate, societally determined goals (Cavell, 1990). The key to influencing change in social adjustment, therefore, lies in the ability to affect social skills.

Integrating the findings from the focus group, previous literature findings, and the aforementioned conceptual framework, a social skills intervention was developed and a manual written as a guide. (The manual is available by request from the Principal Investigator, Dr Maru Barrera, Department of Psychology, SickKids, 555 University Ave., Toronto, ON, M5G1X8, Email: maru.barrera@sickkids.ca) The format of the Social Skills Group intervention was based on previous work (e.g. Elliott & Gresham, 1991; Varni et al., 1993) and work by the same research team with the Siblings Coping Together Program (Barrera, Chung, & Fleming, 2004; Barrera, Chung, Greenberg, & Fleming, 2002). The selection of specific social skills was based on previous intervention work (Barakat et al., 2003; DiTrill et al., 1996; Varni et al., 1993) and included assertiveness, handling teasing by peers, making new friends, cooperation, empathy and conflict resolution.

The primary objective of this study was to test the feasibility of this manualized social skills intervention with children and adolescents who had been treated for a brain tumor. Program acceptability, recruitment and retention, treatment fidelity, and preliminary evidence of intervention outcomes were assessed utilizing feasibility criteria established by Kazak and colleagues (2005). For intervention outcomes, social skills were the primary outcome measure. Quality of life and behavior problems were also assessed as social competence has been found to affect psychological function and childhood adaptation to chronic illness (La Greca, 1990). Finally, survivors’ depressive symptomatology was assessed given previous findings with this population (Barrera et al., 2008). It was hypothesized that: (1) the program would be found to be feasible and (2) there would be improvements after the intervention in social skills, quality of life, behavior, and depression outcomes.
Methods
Participants
In total, 32 children (≤ 12 years; n = 17) and adolescents (> 12 years, n = 15) (19 males, 14 females) participated. Inclusion criteria required survivors: (1) had a diagnosis of a brain tumor; (2) were between 8 and 18 years of age; (3) were on follow-up after the end of treatment; (4) did not present with severe cognitive or communication impairments as determined by full-time enrollment in a special education program; and (5) were English-speaking. Table I presents the sample characteristics. Briefly, survivors’ mean age at enrollment was 12.7 years. The mean age at diagnosis was 7.31 years. Mean time since diagnosis ranged from 1.5 years to 16 years; mean time off treatment ranged from 0.42 years to 15 years. Sixty-five percent of families were White, 13% were Asian, 7% were Hispanic and 16% classified themselves as “Other,” representing a diverse group. Based on the Hollingshead Scale of Occupations (Hollingshead, 1975), the majority of survivors came from low middle class families with occupations including skilled manual workers, clerical workers, and semiprofessionals.

Recruitment
Most participants were referred by the Neuro-oncology team at a large pediatric center based on concerns reported by parents including being socially withdrawn, having no friends, and being teased or bullied by peers.

Design and Procedure
The study was approved by the institutional ethics review board. Referred families were contacted by telephone. After obtaining verbal consent, one parent of each available participant was interviewed by telephone to verify inclusion criteria and to obtain personal information.

Written consent and child assent were obtained prior to the completion of the baseline assessment.

The design consisted of a repeated measures methodology using each participant as his/her own control. Included were two pre-intervention assessments (controlling for the passage of time before intervention): baseline; and pre-intervention; and one post-intervention assessment, immediately after the intervention had ended. The mean time between baseline and pre-intervention was 70.56 days (SD = 106.31) ranging from 20 to 150 days. This wide range reflects constraints imposed by the formation of age appropriate groups based on available referrals. Four of six groups (19 families) were invited to complete follow-up assessments 6 months after the intervention was completed. This study design was similar to that used in a group intervention for siblings of children with cancer (Barrera, Chung et al., 2004). Each of six groups consisted of four to seven children close in age (8–12 years of age, 13–16 years of age) (Group 1, n = 6; Group 2, n = 7; Group 3, n = 5; Group 4, n = 6, Group 5, n = 4, Group 6, n = 4).

Clinically trained graduate or post-doctoral students and/or a clinical assistant with Master’s level training in clinical psychology served as group facilitators under the supervision of a registered psychologist. Facilitators’ training involved reading the manual, observing group sessions through a one-way mirror and assisting facilitators prior to running groups.

Intervention fidelity was insured by using the intervention manual, and meeting with facilitators and the supervisor before and after every intervention session for

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<th>Table I. Sample Characteristics</th>
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*bHollingshead Scale of Occupations (Hollingshead, 1975).
planning the incoming session and debriefing about the previous session. In addition, facilitators completed “session logs” describing group participation, cooperation and engagement as well as the group process. A research assistant blind to the details of the group intervention and study purpose coded the logs for adherence to session plan and group objectives according to three criteria: (1) facilitators adhered to session outline; (2) facilitators adhered to session theme; and (3) survivors successfully engaged in session activities. A five-point Likert scale ranging from “goal completed not at all” to “goal completed completely” was used to rate each of the criteria. Criteria were scored by adding the totals from each session of each group and averaging the totals across groups. Percentages were then calculated. Finally, to prevent contamination, none of the other trained facilitators were involved in data management and statistical analysis for this study, except for one.

**Group Intervention Program**

The intervention program consisted of a 2-hr group session once a week for 8 weeks. The program was supervised by a psychologist with a total of eight clinically trained graduate students or clinical assistants with graduate level training, out of which two facilitated each of the six groups. Each session followed a specific structure including: (a) Pre-Activities, which served to keep participants occupied upon arrival and provided the opportunity for informal verbal interaction among facilitators and participants; (b) Review, which served to help refresh the learning acquired in the previous session through discussion of the homework, and re-involving any participant who might have missed the previous session; (c) Mental Set Activity, the first specific activity of each session that addressed the theme/social skills of that session and aimed to focus participants’ attention, interest, motivation and curiosity into thinking about the session’s theme and social skill; (d) Social Skills, where each skill was taught by implementing the “Tell” phase, in which the facilitator introduced the skills by describing it and asking questions, involved the group participants, provided rationale for the importance of the skills, and outlined the specific skills steps, followed by the “Show” phase, which involved the facilitators’ modeling the behavior positively and negatively by role-playing with active involvement of group participants, followed by role-playing of positive or negative behavior by participants and finally a discussion of the role-play; (e) Snack, a 10-min break allowing for spontaneous social interactions among group participants; (f) Main Activity, designed to consolidate the social skill learned in the session; and finally; (g) Homework, to practice at home and school the social skill learned in the session to facilitate generalization to participants’ everyday lives. More details can be found in the manual created for this purpose (Barrera, Fleming et al., 2004).

The intervention focused on six specific skills based on previous intervention work (Barakat et al., 2003; DieTrill et al., 1996; Varni et al., 1993): social initiation and friendship making; cooperation; managing teasing and bullying; conflict resolution; empathy; and assertion with self-confidence building (Barrera, Fleming et al., 2004). Each of these skills were taught during the first six sessions using a variety of fun activities and games guided by cognitive behavior strategies and expressive therapies such as music, art, and drama. A collection of activities designed for different developmental levels and age ranges are included within the intervention manual. Activities for each session were carefully selected by facilitators and the supervisor based on the different age and skill levels of the group members during the planning and supervision meeting. The seventh session was a review of all previous skills both in the regular structured setting (the first hour) and in an unstructured (new) setting (second hour). The unstructured setting consists of a large children’s play area contained within the hospital where children are free to play a variety of games. This setting provides children with opportunities for practicing their social skills in a new setting to facilitate generalization. The final session provided additional opportunity to practice skills and put closure on the group experience by preparing for the graduation ceremony, which included describing to parents what was learned. As well, children completed the post intervention assessments. The group facilitators ensured that children participated in every activity and assisted those who needed extra help either understanding the activities or engaging with others.

**Measures**

Parents and survivors completed the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), the Pediatric Quality of Life (PedsQL) Cancer Module (Varni, Burwinkle, Katz, Meeske, & Dickinson, 2002), and the Child Behavior Checklist (CBCL; Achenbach, 2001)/Youth Self Report (YSR; Achenbach, 2001) (for survivors aged 11 years and older). Survivors also completed the Child Depression Inventory (CDI) (Kovacs, 1992).

The SSRS assesses social skills with versions to be completed by children (Elementary, grades 3–6; Secondary, grades 7–12) and parent proxies. The various forms range in number of items from 34 to 57. Four social skills subscales are derived: cooperation; assertion; self-control; and responsibility (empathy for the child form);
and a total score. Raw scores are computed to a standard score with a mean of 100 and SD of 15. Higher scores represent better social skills. Internal consistency estimates for the SSRS ranged from .83 to .94 (Gresham & Elliott, 1990). Test-retest reliability was assessed over a 4-week interval and was .68 for the child self-report, and .87 for the parent reported total score. Subscale reliability estimates ranged from .77 to .84 for parents and .52 to .66 for children (Gresham & Elliott, 1990). Internal consistency for this measure in our sample was .71 for the parent report and .90 for the child self-report with Cronbach’s alpha ranging from .58 to .90 for subscale scores.

The PedsQL Cancer Module is a 27-item measure designed to assess cancer specific health related quality of life (HRQL). The module includes both parent proxy reports (aged 2–18 years) and self-report forms (aged 5–18 years). The measure derives eight subscales of HRQL: pain; nausea; procedural anxiety; treatment anxiety; physical attractiveness; worry; communication; and cognitive function. For the purposes of this study, we calculated a total HRQL score which has been conducted elsewhere (Meeske, Katz, Palmer, Burwinkle, & Varni, 2004). Only the total score is reported here. Scores range from 0 to 100 with higher scores reflecting better reported HRQL. In the current study 18 parents and children completed the PedsQL cancer module as this measure was introduced after three groups were completed. The internal consistency reliability for the PedsQL was .72 for the child form and .87 for the parent form (Varni et al., 2002). Test–retest reliability was not conducted in the initial development paper of this scale as short-term fluctuations in functioning are likely given the variability of disease and treatment factors among this population (Varni et al., 2002). In our sample, internal consistency estimates for parent report were .77 and .91 for the child self-report.

The CBCL parent form is a standardized 118-item inventory summarized into total, internalizing and externalizing scores, as well as three different competence scales (social, academic, activities). Internal consistency reliability ranges for the CBCL from .57 to .71 for internalizing, .70 to .86 for externalizing, and .69 to .82 for total Problem Behaviors, across ages (Achenbach, 1991). Test-retest reliability was calculated at a mean interval of seven days, using Intraclass Correlation Coefficients, ranged from .82 to .95 (Achenbach, 1991). The YSR is the self-report version of the CBCL that is completed by youth 11 years and older. It provides similar scores as the CBCL. For the YSR reliability is reported to range from .47 to .79 (Achenbach, 1991). Twenty-two survivors were old enough (> 11 years) to complete the YSR. Raw scores of these measures are transformed to standardized T scores with higher scores reflecting more behavioral difficulties (Achenbach, 1991). In this study we examined the total, externalizing and internalizing T scores from the CBCL and YSR as well as the social problems subscale and the social competency scale.

The Children’s Depression Inventory is a 27-item inventory for children aged 6–17 years of age, yielding a total depression score. Test–retest reliability has been evaluated over a 2-week period and found to be .82 (Finch, Saylor, Edwards, & McIntosh, 1987). The internal consistency coefficients range from .71 to .89 and the test-retest coefficients range from .74 to .83 (Kovacs, 1992). The total depression T scores are reported in this study.

Upon completion of the intervention program, survivors and parents completed group evaluation forms, which were constructed by our research team to assess acceptability and has been described in more detail elsewhere (Barrera, Fleming, & Al-Khali, 2004). The version completed by the survivors consists of seven questions, and the parent version is five items including: “How useful was the group in helping you/your child improve your/his/her relationships with your/his/her friends and peers?” Each question was rated on a scale ranging from 1 (not helpful/useful) to 5 (very helpful/useful).

To describe the sample, data pertaining to cognitive functioning was retrieved from psychological records. Medical and demographic data were obtained from parents or from medical files. Patients were assessed using various Wechsler tests, including the WISC III (Wechsler, 1991) (45%), WISC IV (Wechsler, 2003) (30%), WASI (Wechsler, 1999) (15%), WAIS III (Wechsler, 1997) (5%), WAIS IV (5%). The average time lapse between cognitive assessment and pre-intervention was 14.04 months (SD = 10.11 months).

**Statistical Analyses**

Descriptive statistics to assess feasibility of the group intervention were conducted first. Subsequently, baseline data for parents and survivors were compared. To test intervention effect, baseline, pre- and post-intervention data for each outcome measure were subjected to a repeated measure analysis of variance (ANOVA). Where significant or borderline time effects were found, post-hoc pairwise comparisons were conducted between baseline and pre-intervention and pre- and post-intervention to determine the location of effect. A Bonferroni correction was employed to control for the number of comparisons. Finally, given the reduced sample at follow-up (\(n = 17; \leq 12\) years, \(n = 11; > 12\) years, \(n = 6\), separate
analyses were conducted to assess change from post-intervention to follow-up 6 months later, using one sample t-tests.

**Results**

**Feasibility**

**Acceptability**

Based on satisfaction questionnaires, all survivors and parents found the group to be very helpful or somewhat helpful for: Improving relationships with friends and peers (survivors: 55%, 35%; parents: 30%, 60%; respectively); improving relationships with family/parents (survivors: 55%, 30%; parents: 25%, 45%; respectively); helping to express feelings about experiences with peers (survivors: 55%, 30%; parents: 45%, 30%; respectively); helping to express feelings about experiences with parents/family (survivors: 60%, 30%; parents: 38%, 38%; respectively). Survivors and parents provided the same ratings for “Informal group discussions” and “Discussions about social skills and problem solving”; 67% very useful and 33% as somewhat useful. Finally, all survivors reported meeting other kids with similar experiences as very beneficial (67%) or somewhat beneficial (33%).

**Recruitment**

Fifty-eight brain tumor survivors were referred due to social difficulties. Forty were referred by members of the neuro-oncology team based on reports made by parents and 16 by research staff from a previous study with this population, as determined by parent reported social skills falling at or below the 25th percentile on the SSRS.

Figure 1 shows the flow chart of the potential participants (CONSORT; www.consort-statement.org). Seven families did not meet the inclusion criteria. Of the seven participants who were found to be ineligible, one was non-English speaking and the remainder were excluded based on their cognitive impairments (being in a special education classroom full-time). Eighteen families refused participation because of lack of interest, transportation problems, or scheduling difficulties. Thirty-three families were allocated to the intervention, representing a participation rate of 65%. One participant dropped out half way through the program due to scheduling difficulties. In addition, 19 families were scheduled for follow-up. Of these, two could not be contacted.

The final sample was compared to the greater brain tumor population at the hospital diagnosed between 2000 and 2006 (n = 127) based on demographic and disease variables. There was no significant difference for age at diagnosis \[F(1,151) = 2.46, p > .05\] or gender \[\chi^2 = .83, p > .05\]. A significant difference, however, was found for diagnosis \[\chi^2 = 6.66, p < .05\]. The referred population included more survivors of Medulloblastoma or PNET tumors (28% vs. 13.5%) and Astrocytoma tumors (28.1% vs. 25.4%) and fewer tumors categorized as “other” (40.6% vs. 61.1%).

**Retention**

There were no dropouts except for one survivor who completed only four sessions. This survivor was excluded from analyses because of incomplete data. Attendance averaged 90% ranging from 89.63% to 91% across the six groups. In addition, of the 19 survivors who participated in the last four groups and were offered follow-up, 17 successfully completed follow-up assessments. There were no significant differences between those who completed follow-up and those who did not on personal and medical variables with age being the only exception \[F(1,31) = 4.64, p < .05\]. The group who completed follow-up were slightly

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**Figure 1.** Flow chart summarizing recruitment of study participants (adapted from http://www.consort-statement.org).
younger than those who did not (mean age of 11.71 years vs. 13.80 years).

**Treatment Fidelity**

The scores for adherence to session and group objectives yielded the following results: 88% adherence to session outline, 87% adherence to session themes and 83% successful engagement in the activities by participants.

**Intervention Outcomes**

Table II shows the means and standard deviations of the outcome measures. At baseline, parents reported significantly more social skills problems than survivors ($t = -3.94, p < .01$), whose scores were equivalent to normative values (i.e., mean = 100.73, SD = 18.12). Also for behavior scores, parents reported significantly more total ($t = 3.36, p < .01$), internalizing ($t = 4.01, p < .01$), externalizing ($t = 2.63, p < .05$), and social problems ($t = 2.15, p = .05$). This was not surprising given that participants were considered eligible for the social skills intervention based on parental reported concerns of social skills difficulties. Finally, parents reported lower quality of life than survivors but this result was of borderline significance ($t = -1.97, p = .07$).

**Social Skills**

A repeated measure ANOVA using total parent social skills scores yielded a borderline main effect of time [$F(2, 54) = 3.06, p = .06$]. Post-hoc pairwise analyses revealed a significant change from pre- to post-intervention with a Bonferroni correction and a moderate to large effect size [$F(1,28) = 5.70, p = .024, d = -0.68$], suggesting improvement in social skills over the course of intervention and indicative of a clinically significant change (Cohen, 1988). Observed power based on an alpha of .05 was 0.64. No significant differences were found between baseline and pre-intervention scores. Of the subscale scores, self-control yielded a borderline time effect [$F(2,52) = 2.50, p = .09$] using a Bonferroni correction to account for four comparisons ($p = .0125$). Post-hoc analyses again revealed a significant improvement in self-control scores from pre- to post-intervention, after Bonferroni correction [$F(1,27) = 5.97, p = .021, d = -.70$], with a medium to large effect size (mean 11.26 vs. 12.75). Again, this was suggestive of a clinically significant change (Cohen, 1988). Observed power with an alpha of .05 was 0.65. Again, no significant differences were found between baseline and pre-intervention. Survivors’ total social skills scores did not show significant time changes.

**Quality of Life**

Analysis of parent reported PedsQL total scores yielded a significant time effect [$F(2,28) = 16.58, p < .001$]. Post-hoc comparisons with a Bonferroni correction revealed a significant increase between pre- and post-intervention scores with a strong effect size [$F(1,15) = 17.98, p = .001, d = -2.03$] indicating a clinically significant change in HRQL after intervention (Cohen, 1988). Observed
Behavior
Analysis of CBCL total change scores using a Bonferroni correction \((n=4; \ p=.0125)\) revealed a borderline main effect for time \(F(2,52) = 3.29, p < .05\). Examination of these effects indicated that survivors, in general, improved their behavior, however post-hoc pairwise comparisons found no significance between baseline and pre-intervention or pre- and post-intervention with a Bonferroni correction. Similar analyses using the CBCL social problems scores also yielded a borderline effect of time \(F(2,52) = 2.53, p = .09\) but again, post-hoc pairwise comparisons revealed no significant differences. Survivors’ reports of internalizing behavior revealed no significant effects except for a borderline time change \(F(2,24) = 3.89, p < .05\). This change was significant from baseline to pre-intervention \(F(1,13) = 11.25, p < .01\) with survivors scores decreasing from baseline to pre-intervention. There was no significant effect from pre- to post-intervention.

Depression
Survivors’ scores on the CDI revealed no significant time differences. Survivors’ scores at baseline were not significantly different from normative values and remained consistent across assessments.

Follow-Up
One sample t-test comparisons between change scores calculated for post-intervention and 6-month follow-up were conducted for those outcomes that yielded significant main effects at the end of intervention (parent reported SSRS total scores and assertion, parent reported PedsQL). A Bonferroni correction was added to account for the number of comparisons \((n = 3; \ p = .017)\). No significant differences were found for any of the outcomes.

Discussion
The current study tested the feasibility of a social skills group intervention for children and adolescents who were treated for brain tumors, yielding promising results. With respect to the acceptability of the program, survivors and parents consistently reported substantial benefits on the satisfaction questionnaire suggesting strong acceptability. In terms of recruitment, there was a relatively large participation rate, which compares favorably with participation rates in other interventions with families of children with cancer (Kazak et al., 2005). The main obstacles to participation included transportation and scheduling difficulties. Future research may improve recruitment, therefore, by offering parking or transportation costs to families. As well, intervention programs could be run from locally based community centers depending on the geographic population distribution. Although the groups were run either on weeknights or weekends based on families’ preferences, this may not always work for all families. Once enrolled in the program, however, only one participant dropped out while the sessions were ongoing. Only two of the 19 participants who were contacted for follow-up dropped out, indicative of a high retention rate. Finally, analysis of the session logs indicate that treatment fidelity was maintained.

Based on parental reports, participants’ social skills, self-control and HRQL improved after the group intervention. Considering that participants were enrolled in the social skills group based on parental concerns about their children’s social difficulties, it is encouraging to see that parents reported improvements on standardized measures of social skills, including self-control. That these improvements were maintained after 6-month follow-up is also encouraging, given the importance of social skills for long-term social reintegration. Parents also reported beneficial effects on the satisfaction questionnaire.

That social skills training also resulted in improvement in HRQL as reported by parents, supports the argument that social skills training is central for overall improvement of the well-being of childhood brain tumor survivors (Varni et al., 1993). Again, these results were maintained at 6-month follow-up. These promising findings warrant further examination.

In contrast, although participants reported beneficial effects of the social skills program on the satisfaction questionnaire, they did not report significant improvement on any of the standardized outcome measures. This is not surprising given that the means of survivors’ self-reports at baseline on all outcome measures were within the normal range. Considering the consistence of the beneficial effects reported by youth and parents on the satisfaction questionnaires and the participants’ self-reports of social isolation (limited or no friends, being teased and bullied at school) during the actual group sessions, we suspect that the survivors’ responses to standardized questionnaires may not adequately reflect their social experiences or the effects of the social skills intervention. Certainly, the CBCL has been criticized for its use among children with chronic illness particularly as a measure of social
competence (Drotar, Stein, & Perrin, 1995). It is plausible that the SSRS has similar deficiencies among this population.

Based on parental reports, therefore, the results of this study expand earlier reports of the effect of social skills training in children and adolescents treated for brain tumors (Barakat et al., 2003, DieTrill et al., 1996). There is no literature, however, linking social skills deficits based on parent report with problematic peer relationships, and therefore further examination of intervention outcomes is warranted using other informants such as teachers and classmates, as well as alternate methods of measurement such as sociometry. Additional information using sociometric methodologies would enhance the validity of the intervention evaluation. Establishing the effect of social skills training in childhood brain tumor survivors will also help to better understand the conceptual relationship between social skills and social competence as postulated by Cavell (1990).

There are some limitations with this study. The use of each child as his/her own control in this time series design prior to, and after intervention, controlled for the passage of time and maturation, but cannot rule out other threats to validity. Lack of a control group prevented our ability to rule out threats to validity or potential sample biases such as parental reports reflecting commitment to the group as opposed to actual change. Nevertheless, we have reason to suspect the results obtained in the current study may indeed be valid, given that not all outcome measures showed change after the intervention. Parental reports of behavior, for example, showed no change, whereas parental reports of social skills, self-control and HRQL showed improvement, suggesting that parents were not discriminatory in their reports of improvement after intervention.

A relatively small sample size limited the power of our statistical analyses to assess the efficacy of the intervention, particularly with regards to youth self-reports and the HRQL data. In addition, the lack of reports from additional informants (teachers, peers) to assess change in social behavior in other settings limits the generalizability of the findings.

Despite its limitations, the current study presents compelling evidence of feasibility and preliminary empirical evidence of program efficacy, which represents major improvements over previous work. In addition to testing feasibility, the study included a manualized intervention, an examination of several outcomes with standardized questionnaires completed by parents and survivors, a larger sample size than in previous studies, and tested sustainability of intervention effects 6 months later.

The empirical evidence of feasibility and efficacy of the intervention offers clinicians and parents new hope for improving the lives of pediatric brain tumor survivors, using a manualized group social skills intervention. In terms of clinical implications, these preliminary results highlight the need to identify social skills difficulties, such as having no friends and being teased at school, in children and adolescents who are treated for a brain tumor. At the very least, clinicians should address these issues with parents and youth to ensure that these problems do not go unnoticed. Ideally, the beneficial effects of the social skills training program could be offered to these families.

Although the evidence for intervention effect in this study is modest, it should be considered in light of the constraints of working with children who have rare and challenging medical conditions. Certainly, these findings are promising and warrant further investigation using a larger sample size, a control group, additional informants, including teachers and peers, and alternative data gathering tools, such as sociometric techniques and behavioral observations. Yet, developing and testing innovative interventions to improve the chances of living a better life for these survivors is costly and may take an unreasonably long time to achieve in only one site. Nevertheless, future research validating the effect of the social skills program, across other sites and via a randomized control trial, will contribute to the development of evidence-based interventions for this high-risk population. This will contribute to greater improvements in their quality of life and will prepare young survivors to better succeed in the future.

Funding

Funding for this research was provided by B.R.A.I.N. Child, SickKids Foundation, and the Canadian Institutes of Health Research (CIHR).

Conflict of Interest: None declared.

Received July 31, 2008; revisions received and accepted February 24, 2009

References


Hollingshead, A. B. (1975). Four factor index of social status. Department of Sociology, Yale University, New Haven, CT.


Social Skills Group for Survivors of Childhood Brain Tumors

Group Goals: Learning Social Skills as children or teens have fun relating with other kids who have similar experiences

Who may participate?: Kids between the ages of 8-16 years old (8-12 years old & 13-16 years old) and who are or have been treated for a brain tumor or leukemia, are medically stable, mobile, and able to communicate verbally, who are experiencing social difficulties at school

Duration: The group runs once a week for 8 weeks

Time: Wednesdays 6:00pm – 8:00pm or Saturdays 10:00am-12:00pm

Place: SickKids Hospital

Start Date: October, 2008

For more information, call the number below.

Please call Fiona Schulte at 416-813-5397
Social Skills Intervention for Brain Tumor Survivors – Recruitment Phone Call

Hello, my name is Fiona Schulte and I am calling from the Department of Psychology at SickKids.

I received your name from __________ who suggested that you might be interested in participating in our social skills group intervention evaluation project. Do you have a minute for me to tell you a little bit more about the project?

The social skills group intervention project was designed for children and adolescents like _____ who had been treated for a brain tumor. The actual intervention consists of eight weekly sessions. Each week kids learn a new social skill such as, how to initiate conversations and make friends, managing teasing and bullying, assertion and conflict resolution. In addition, the weekly group sessions give kids the opportunity to meet others who have had similar diagnoses and experiences with peers. Prior to and after the intervention, kids and one parent are ask to complete a couple of questionnaires, to ensure that the group intervention in helping. The sessions are scheduled at a time that is most convenient for families, typically on a weeknight during the early evening or Saturday mornings. In addition, to reduce family burden, we provide $11 to cover the cost of parking at the hospital for each visit.

We would love to have __________ participate in this program. Do you think that this is something you might be interested in?

IF YES: We are so happy that you are interested. (Review eligibility criteria- see attached sheet).

We would like to begin by scheduling the initial assessment, which will allow us to get to know you and _____a little better before the group begins. On the day the sessions start and the day the sessions end and then 6 months later we will also ask you to complete the same questionnaires. This way we can assess if there are any changes in _____behavior related to the group intervention.

IF NO: Would you mind sharing with me why you don’t think this would be something _____ would like to be involved in? We are sorry that _____ won’t be able to participate. I understand that _(reason for declining). There is another way you may be able to participate without having to come to the hospital. As part of our ongoing evaluation of the group we are looking to compare the children who participate in the intervention to children who do not. We would love to have you and __________ participate as one of our comparison families. As one of our comparison families we would ask you to complete questionnaires at 2 time points, eight weeks apart. To make this as convenient for you we would be happy to mail you the questionnaires with a return addressed stamped envelope. After we received the second evaluation questionnaires, we will send a gift certificate. Alternatively, if there is a chance you may be making a visit to the hospital, we would be happy to meet with you then and would be able to compensate you for your parking costs.

IF YES: Thank you so much for agreeing to participate as our comparison family. I will be in contact with you prior to sending out the first questionnaire package.
# Appendix D

Social Skills Intervention for Brain Tumor Survivors – Disease Information Form

## DISEASE INFORMATION FORM

<table>
<thead>
<tr>
<th>ID NO.</th>
<th>HSC NO.</th>
<th>NAME</th>
<th>D.O.B.</th>
<th>Type of tumor</th>
<th>Date of diagnosis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site of tumor</td>
<td>Responsibe MD</td>
<td>Protocol</td>
<td>Treatment</td>
<td>Surgery</td>
<td>Radiation</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>Start date:</td>
<td>End date:</td>
<td>Type(s):</td>
<td>Total Dose(s):</td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td>Date(s):</td>
<td>Treatment of hydrocephalus:</td>
<td>a) Ventriculoperitoneal Shunt</td>
<td>Yes / No Date:</td>
<td>b) Third Ventriculostomy</td>
</tr>
<tr>
<td>Complete / Partial Resection</td>
<td>Reason(s) for partial resection:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation</td>
<td>Start date:</td>
<td>End date:</td>
<td>Site: focal OR craniospinal</td>
<td>whole brain OR boost</td>
<td></td>
</tr>
<tr>
<td>Total Dose(s):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Treatments</td>
<td>(i.e. laser therapy; growth hormone; homeopathic therapy; hormone therapy (i.e. DDAVP, levothyroxin))</td>
<td>Date(s)/Type(s):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td>(i.e. life threatening infections; graft vs. host disease)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONSENT FORM
(Parent Form)

Title of Research Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416) 813-5397

Purpose of Research:
Children and adolescents who survive brain tumors, leukemia or lymphoma are faced with a variety of problems that affect the way they live their lives; one of the most difficult roadblocks is limited contact with friends and peers. The purpose of this project is to offer a group social skills program for children and adolescents who have survived brain tumors, leukemia or lymphoma and then to evaluate if the social skills group program is beneficial.

Description of The Research:
This study involves an evaluation of the social skills group program designed for children and adolescents who have been treated for a brain tumor, leukemia or lymphoma at Sick Kids, and their families. The study includes the following:

1) With your permission, you and your child will complete questionnaires which ask about your child’s feelings, actions, how they get along with others, and some general information about your family twice before and twice after the group participation. In addition, for one questionnaire, we will record your answers with a tape recorder. The questionnaires take approximately 30 minutes to complete.
2) You and your child will each complete a 15-minute interview focusing on your child’s social skills.
3) Your child will participate in the group program that teaches social skills for 8 sessions. Each session is held once a week for 2 hours.
4) With your permission, we will ask you to provide information about the child’s school and teacher and will request that you contact the child’s teacher to complete one questionnaire before and after group participation.
5) With your permission, we will review the hospital record to assess your child’s physical health.

**Potential Harms:**
We know of no harm that taking part in this study could cause you or your child. You or your child may feel some discomfort when thinking about issues of limited contact with peers or loneliness. If specific concerns/issues arise, we will help you get the support you or your child may need. Please call your social worker or the study coordinator - Fiona Schulte (813-5397) - if you require any help.

**Potential Inconvenience:**
You may experience some inconvenience by traveling to the hospital for the required 8 weekly group sessions.

**Potential Benefits:**
- If your child is found to have major socio-emotional or behavioural difficulties, you will be informed and suggestions for assistance will be provided.
- Children who participate in the social skills intervention group program may benefit by improving their social skills and getting support from other group members
- This group intervention program may benefit other children who survive brain tumors, leukemia or lymphoma in the future.

**Confidentiality:**
We will respect your privacy. No information about who you or your child is will be given to anyone or be published without your permission, unless the law requires us to do this. For example, the law requires us to give information about you (your child) if a child has been abused, if your child has an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers.

Sick Kids Clinical Research Monitors, employees of the funder or sponsor of the study “Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma”, or the regulator of the study may see your (your child’s) health record to check on the study. For example, people from Health Canada Health Products and Food Branch, (or) U.S. National Institutes of Health, (or) U.S. Food and Drug Administration, if necessary, may look at your records.

By signing this consent form, you agree to let these people look at your child’s records. We will put a copy of this research consent form in your child’s patient health records. We will give you a copy for your files.

The data produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe those individuals described above) will have access to the data. This
could include external research team members. Following completion of the research study, the data will be kept as long as required and then destroyed as required by Sick Kids policy. Published study results will not reveal your identity.

The results of the tests we describe in this form will be used only for this study. If another health care professional caring for your child needs to see these results, you will have to give us your permission. We will ask you to sign a form saying that you agree that this person can see your child’s results. We recommend that only a registered psychologist or doctor tell you what the results of these tests mean.

During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group. But we cannot be sure that information about your child will be kept private. People in groups may share information about you with others outside the group.

**Reimbursement:**
We will provide your family with compensation for parking, $11, for each visit to the hospital related to your child’s participation.

**Participation:**
If you choose to let your child take part in this study you can take your child out of the study at any time. The care your child gets at SickKids will not be affected in any way by whether or not your child takes part in this study. New information from this study or other studies may affect whether you and your child want to continue to take part in the study. If this happens, we will tell you about this new information.
Appendix E

Consent:

1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of having my child take part in this study. I understand that I have the right to refuse to let my child take part in the study. I also have the right to take my child out of the study at any time. My decision about my child taking part in the study will not affect my child’s health care at SickKids.
4) I am free now, and in the future, to ask questions about the study.
5) I have been told that my child’s medical records will be kept private. You will give no one information about my child, unless the law requires you to.
6) I understand that no information about my child will be given to anyone or be published without first asking my permission. ”
7) I have read and understood pages 1 to 4 of this consent form. I agree, or consent, that my child___________________ may take part in this study.

______________________________________                 _________________________________
Printed Name of Parent/Legal Guardian                            Parent/Legal Guardian’s signature & date

______________________________________
Printed Name of person who explained consent                     Signature & date

______________________________________
Printed Witness’ name (if the subject/legal Guardian does not read English) Witness’ signature & date

If you have any questions about this study, please call Fiona Schulte (Project Coordinator) at 416-813-5397

If you have questions about your rights as a subject in a study or injuries during a study, please call the Research Ethics Manager at (416) 813-5718.
Title of Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416) 813-5397

Purpose of Research:
Children and adolescents who survive brain tumors, leukemia, or lymphoma are faced with a variety of problems that affect the way they live their lives. One of the most difficult problems is little contact with friends and peers. The purpose of this study is to give you opportunities to meet with other kids with similar experiences by participating in a social skills group program and to assess if this program is beneficial to kids like you.

Description of the Research:
This study involves an assessment of the social skills group program designed for children and adolescents who have been treated for a brain tumor, leukemia, or lymphoma at the Sick Kids, and their families. The study involves the following:
1) With your permission, you and your parent(s) will complete questionnaires which ask about your feelings, actions, how you get along with others and some general information about your family. We will ask you to complete these questionnaires twice before and twice after the group. The questionnaires take approximately 30 minutes to complete. For one questionnaire, we will record your answers with a tape recorder.
2) You and your parent will each complete a 15 minute interview focusing on your social skills.
3) You will participate in the group program that teaches social skills for 8 sessions. Each session is held once a week for 2 hours.
4) With your permission, we will review the hospital record to assess your physical health

Potential Harms:
We know of no harm that taking part in this study could cause you. You may feel some discomfort when thinking about issues of limited contact with peers or loneliness. If specific concerns/issues arise, we will help you get the support you need. Please call your
social worker or the study coordinator- Fiona Schulte (813-5397) - if you require any help.

**Potential Inconvenience:**
You may experience some inconvenience by traveling to the hospital for the required 8 weekly group sessions.

**Potential Benefits:**
- If you are found to have major socio-emotional or behavioural difficulties, suggestions for assistance will be provided.
- Children who participate in the social skills intervention group program may benefit by improving their social skills and getting support from other group members.
- This group intervention program may benefit other children who survive brain tumors, leukemia or lymphoma in the future.

**Confidentiality:**
We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless the law requires us to do this. For example, the law requires us to give information about you if a child has been abused, if you have an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers.

Sick Kids Clinical Research Monitors, employees of the funder or sponsor of the study “Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma”, or the regulator of the study may see your health record to check on the study. For example, people from Health Canada Health Products and Food Branch, (or) U.S. National Institutes of Health, (or) U.S. Food and Drug Administration, if necessary, may look at your records.

By signing this consent form, you agree to let these people look at your records. We will put a copy of this research consent form in your patient health records. We will give you a copy for your files.

The data produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe those individuals described above) will have access to the data. This could include external research team members. Following completion of the research study, the data will be kept as long as required and then destroyed as required by Sick Kids policy. Published study results will not reveal your identity.

The results of the tests we describe in this form will be used only for this study. If another health care professional caring for you needs to see these results, you will have to give us your permission. We will ask you to sign a form saying that you agree that this person can see your results. We recommend that only a registered psychologist or doctor tell you what the results of these tests mean.
During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group. But we cannot be sure that information about you will be kept private. People in groups may share information about you with others outside the group.

**Reimbursement:**
We will provide your family with compensation for parking, $11, for each visit to the hospital related to your child’s participation.

**Participation:**
It is your choice to take part in this study. You can stop at any time. The care you get at SickKids will not be affected in any way by whether or not you take part in this study. New information from this study or other studies may affect whether you want to continue to take part in the study. If this happens, we will tell you about this new information.
Consent:

By signing this form, I agree that:
1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my health care at SickKids.
4) I am free now, and in the future, to ask questions about the study.
5) I have been told that my medical records will be kept private. You will give no one information about me, unless the law requires you to.
6) I understand that no information about who I am will be given to anyone or be published without first asking my permission.
7) I have read and understood pages 1 to 4 of this consent form. I agree, or consent, to take part in this study.

________________________  __________________________
Printed Name of Subject & Age  Subject’s signature & date

________________________  __________________________
Printed Name of person who explained consent  Signature & date

________________________  __________________________
Printed Witness’ name (if the subject/legal guardian does not read English)  Witness’ signature & date

If you have any questions about this study, please call Fiona at 416-813-5397.

If you have questions about your rights as a subject in a study or injuries during a study, please call the Research Ethics Manager at (416) 813-5718.
Title of Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
               Miss Fiona Schulte (416)813-5397

Why are we offering this group?
Children who have brain tumors, leukemia or lymphoma sometimes wish they could spend more time with other kids their own age. We want to help children like you deal well with friends and with other kids your age. In this group, we will try to help you and other kids with brain tumors, leukemia or lymphoma learn how to get along better with other kids. We also want to find out how much our group will help you.

What will happen during this group?
This group is for kids who have been treated for a brain tumor, leukemia or lymphoma at SickKids, and their families. Here is what going to happen if you agree to join the group:

1) You and your mom or dad will answer questionnaires about your feelings and actions, and some information about your family. For one questionnaire, we will record your answers with a tape recorder.
2) You and your mom or dad will have an interview asking about how you get along with others.
3) You will be a part of a group with other kids around your age and we will talk about how to get along better with others and enjoy many fun activities.
4) The group will meet once a week for 2 hours for 8 weeks.
5) We will check your hospital charts to find out about your health.

Are there good things and bad things about the study?
There are no problems that we know of that could hurt you by joining the group. However, the group can help you learn how to get along better with kids and grown-ups and also allow you to meet other children who may be having the same problems you are going through.
Who will know about what I do during this group?
If you participate in this group, your name and address will not be given to anyone. Only the staff and students working with the group will know what you and your parent said during the group program. The only time we would tell anyone else about what you did in this group, is if you tell us something that is dangerous to you or someone else. Also, if we feel your health may be in danger, we may have to report your results to your doctor.

Can I decide if I don't want to join the group?
If you do not want to join the group, this is O.K. Nobody will be angry or upset if you do not want to be in the study. If you say yes now, but change your mind later, you can tell us, and that will be O.K. Your mother or father is also reading information about this group. They will talk to you about it. Ask them any questions that you do not understand from what you have read or heard. They will help you to understand. Please also ask us any questions, we will also help you to understand.

ASSSENT:
I was present when __________________ read this form and said that he or she agreed or assented, to take part in this study.

_____________________________
Name of person who obtained assent

__________________________________________
Signature

__________________________________________
Date
Date:

Re: “Group Social Skills Intervention for Survivors of Brain Tumors, Leukemia or Lymphoma”

Children and adolescents who survive brain tumors, leukemia or lymphoma are faced with a variety of problems that affect the way they live their lives; one of the most difficult roadblocks is limited contact with friends and peers. The purpose of this project is to offer a group social skills program for children and adolescents who have survived brain tumors, leukemia or lymphoma and to evaluate if this social skills group program is beneficial.

The family of child’s name have agreed to participate in the social skills group and have given us permission to contact you. With your permission, we would like to ask you, the child’s teacher, to complete two questionnaires which ask about how the child behaves and gets along with others. The questionnaires will take approximately 15 minutes to complete. Your help in completing this questionnaire is vitally important as it will help us to assess whether this program helps child’s 1st name and other children like him/her.

The first questionnaire is a Teacher Report Form (TRF). It examines the child’s behaviour (Achenbach, 1991). The second form is the Social Skills Rating Scale (SSRS) Teacher Questionnaire. This measure examines social behaviour (Gresham & Elliott, 1990). Please find enclosed copies of the TRF and the SSRS for your completion. We will ask you to complete these questionnaires again in about ten weeks.

As well, we have included two copies of a consent form. One is for you to read, sign and return to us in the addressed, stamped envelope and the other is for you to keep for your records. Please be assured that all information collected in the pursuit of this research will be kept strictly confidential. Once data have been collected, no names of institutions or individuals will be disclosed. Only the project coordinator will have access to identifying information and all of this information will be kept locked in research files at Sickkids.

Please return the completed questionnaires to us using the addressed and stamped envelope that has been provided. If you have any questions or concerns about the study, please feel free to contact Fiona Schulte by phone (416-813-5397) or by e-mail (fiona.schulte@sickkids.ca).

Thank you for your kind assistance.
Sincerely,

_________________________  ____________________________
Maru Barrera, Ph.D., C. Psych.  Fiona Schulte, Ph.D. (candidate)
Department of Psychology  Department of Psychology
Haematology/Oncology Program  SickKids Hospital
Sickkids Hospital
Appendix I

Name:
D.O.B.:
HSC#:

CONSENT FORM
(Teacher Form)

Title of Research Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416) 813-5397

Purpose of Research:
Children and adolescents who survive brain tumors, leukemia or lymphoma are faced with a variety of problems that affect the way they live their lives; one of the most difficult roadblocks is limited contact with friends and peers. The purpose of this project is to offer a group social skills program for children and adolescents who have survived brain tumors, leukemia or lymphoma and then to evaluate if the social skills group program is beneficial.

Description of The Research:
This study involves an evaluation of the social skills group program designed for children and adolescents who have been treated for a brain tumor, leukemia or lymphoma at SickKids, and their families. The study includes the following:

1) Each child will participate in the group program that teaches social skills for 8 sessions. Each session is held once a week for 2 hours.

2) Each child and one of his/her parents will complete several questionnaires before and after participation in the social skills group. Parents will provide information about the child’s school and teacher and will agree to ask the child’s teacher to complete one questionnaire before and after group participation.

3) With your permission, we would like to ask you, the child’s teacher, to complete a questionnaire which asks about how the child gets along with others once before their group participation and once after. The questionnaire will take approximately 10 minutes to complete.
Appendix I

Potential Harms:
We know of no harm that taking part in this study could cause you. If specific concerns/issues arise, please contact the study coordinator- Fiona Schulte (813-5397).

Potential Inconvenience:
You may experience some inconvenience in the time required to complete the questionnaire.

Potential Benefits:
You will not benefit directly from participating in this study. The participating child will likely benefit from the social skills training.

Confidentiality:
We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless required by law. For example, the law could make us give information about you if a child has been abused, if you have an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers.

The data produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe those individuals described above) will have access to the data. This could include external research team members. Following completion of the research study the data will be kept as long as required then destroyed as required by Sick Kids policy. Published study results will not reveal your identity.

The results of the tests we describe in this form will be used only for this study. If another doctor or caregiver caring for you needs to see these results, you will have to give us your permission. We will ask you to sign a form saying that you agree that this person can see your results. We recommend that only a registered psychologist tell you what the results of these tests mean.

Participation:
It is your choice to take part in this study. You can stop at any time. The care you get at Sick Kids will not be affected in any way by whether you take part in this study.

New information that we get while we are doing this study may affect your decision to take part in this study. If this happens, we will tell you about this new information. And we will ask you again if you still want to be in the study.

During this study we may create new tests, new medicines, or other things that may be worth some money. Although we may make money from these findings, we cannot give you any of this money now or in the future because you took part in this study.

Sponsorship:
The sponsor/funder of this research is the SickKids B.R.A.I.N.Child Foundation.
**Conflict of Interest:**
I, and the other research team members have no conflict of interest to declare.

**Consent:**
By signing this form, I agree that:

1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my health care at Sick Kids.
4) I am free now, and in the future, to ask questions about the study.
5) I have been told that my medical records will be kept private except as described to me.
6) I understand that no information about who I am will be given to anyone or be published without first asking my permission.
7) I agree, or consent, to take part in this study.

_____________________________________                 _________________________________
Printed Name of Parent/Legal Guardian                            Parent/Legal Guardian’s signature & date

_______________________________________                 _________________________
Printed Name of person who explained consent               Signature & date

_________________________________________               __________________________
Printed Witness’ name (if the subject/legal Guardian does not read English)   Witness’ signature & date

If you have any questions about this study, please call Fiona Schulte (Project Coordinator) at 416-813-5397

If you have questions about your rights as a subject in a study or injuries during a study, please call the Research Ethics Manager at (416) 813-5718.
Date:
Re: “Group Social Skills Intervention for Survivors of Brain Tumors, Leukemia or Lymphoma”

Children and adolescents who survive brain tumors, leukemia or lymphoma are faced with a variety of problems that affect the way they live their lives; one of the most difficult roadblocks is limited contact with friends and peers. The purpose of this project is to offer a group social skills program for children and adolescents who have survived brain tumors, leukemia or lymphoma and to evaluate if this group program is beneficial.

In order to test if the group is beneficial we need to compare responses of children who participate in the program to those of children who do not participate. Your participation is vitally important as it will help us to assess how good the program is for children who survive pediatric brain tumours, leukemia and lymphoma. We are asking you to complete several forms. The Child Behavior Checklist to assess child’s behaviour, the Social Skills Rating Scale, to assess social behaviour, and the Pediatric Quality of Life Index (PedsQL), to assess health related quality of life. Your child will be asked to complete the same questionnaires, in their child versions. As well, your child will be asked questions regarding perceived general and social competence (“People in my Life” and Children’s Self-Efficacy (CSPI)).

Instructions are included at the beginning of each questionnaire. As much as possible, we ask you to complete these questionnaires separately so we can ensure confidentiality between you and your child. We will call you in a few days to find out if your child needs help with these questionnaires and we can arrange for help over the phone at a convenient time for your child. Please find enclosed copies of the questionnaires for you and your child to complete. It is estimated that it will take approximately 30 minutes to complete these forms. As well, we have included two copies of a consent form. One is for you to read, sign and return to us in the addressed, stamped envelope and the other is for you to keep for your records.

All information collected for this study will be kept strictly confidential. Once data have been collected, no names will be disclosed. Only the project coordinator will have access to identifying information and all of this information will be kept locked in research files at Sickkids.

Please return the completed questionnaires to us using the addressed and stamped envelope that has been provided. If you have any questions or concerns about the study, please feel free to contact Fiona Schulte by phone (416-813-5397) or by e-mail (fiona.schulte@sickkids.ca).

As a token of our appreciation we have included a gift card for you and your family to share at Chapters/Indigo. Please sign the receipt included in this package to acknowledge your received the gift card and include this in the questionnaire package you mail back to us.

Thank you for your kind assistance.
Sincerely,

Maru Barrera, Ph.D., C. Psych.  Fiona Schulte, Ph.D. (candidate)
Department of Psychology  Department of Psychology
Haematology/Oncology Program  SickKids Hospital
Sickkids Hospital

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CONSENT FORM
(Comparison Parent Form)

Title of Research Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416) 813-5397

Purpose of Research:
Children and adolescents who survive brain tumors, leukemia or lymphoma are faced with a variety of problems that affect the way they live their lives; one of the most difficult roadblocks is limited contact with friends and peers. The purpose of this project is to offer a group social skills program for children and adolescents who have survived brain tumors, leukemia or lymphoma and then to evaluate if the social skills group program is beneficial.

Description of The Research:
This study involves an evaluation of the social skills group program designed for children and adolescents who have been treated for a brain tumor, leukemia, or lymphoma at Sick Kids, and their families. In order to test if the group is beneficial we require responses from children not involved in the program so that we may compare outcomes. We have asked you and your child to serve as a comparison group. The study includes the following:

1) With your permission, you and your child will complete questionnaires which ask about your child’s feelings, actions, how your child gets along with others, and some general information about your family at two time points each 8 weeks apart. The questionnaires take approximately 30 minutes to complete.

Potential Harms:
We know of no harm that taking part in this study could cause you or your child. If specific concerns/issues arise, please call the study coordinator- Fiona Schulte (813-5397) - if you require any help.

Potential Inconvenience:

Name:
D.O.B.:
Appendix K

You may experience some inconvenience in taking the time required to complete the questionnaires.

**Potential Benefits:**
- You or your child will not benefit directly from participating in this study
- This group intervention program may benefit other children who survive brain tumors, leukemia or lymphoma in the future.

**Confidentiality:**
We will respect your privacy. No information about who you or your child is will be given to anyone or be published without your permission, unless the law requires us to do this. For example, the law requires us to give information about you (your child) if a child has been abused, if your child has an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers.

Sick Kids Clinical Research Monitors, employees of the funder or sponsor of the study “Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma”, or the regulator of the study may see your (your child’s) health record to check on the study. For example, people from Health Canada Health Products and Food Branch, (or) U.S. National Institutes of Health, (or) U.S. Food and Drug Administration, if necessary, may look at your records.

By signing this consent form, you agree to let these people look at your child’s records. We will put a copy of this research consent form in your child’s patient health records. We will give you a copy for your files.

The data produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe those individuals described above) will have access to the data. This could include external research team members. Following completion of the research study, the data will be kept as long as required and then destroyed as required by Sick Kids policy. Published study results will not reveal your identity.

The results of the tests we describe in this form will be used only for this study. If another health care professional caring for your child needs to see these results, you will have to give us your permission. We will ask you to sign a form saying that you agree that this person can see your child’s results. We recommend that only a registered psychologist or doctor tell you what the results of these tests mean.

During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group. But we cannot be sure that information about your child will be kept private. People in groups may share information about you with others outside the group.
Appendix K

**Participation:**
If you choose to let your child take part in this study you can take your child out of the study at any time. The care your child gets at SickKids will not be affected in any way by whether or not your child takes part in this study. New information from this study or other studies may affect whether you and your child want to continue to take part in the study. If this happens, we will tell you about this new information.
Appendix K

**Consent:**

1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of having my child take part in this study. I understand that I have the right to refuse to let my child take part in the study. I also have the right to take my child out of the study at any time. My decision about my child taking part in the study will not affect my child’s health care at SickKids.
4) I am free now, and in the future, to ask questions about the study.
5) I have been told that my child’s medical records will be kept private. You will give no one information about my child, unless the law requires you to.
6) I understand that no information about my child will be given to anyone or be published without first asking my permission.”

7) I have read and understood pages 1 to 3 of this consent form. I agree, or consent, that my child___________________ may take part in this study.

______________________________________                 _________________________________
Printed Name of Parent/Legal Guardian                            Parent/Legal Guardian’s signature & date

______________________________________
Printed Name of person who explained consent                     Signature & date

______________________________________
Printed Witness’ name (if the subject/legal Guardian does not read English)     Witness’ signature & date

If you have any questions about this study, please call Fiona Schulte (Project Coordinator) at 416-813-5397

If you have questions about your rights as a subject in a study or injuries during a study, please call the Research Ethics Manager at (416) 813-5718.
CONSENT FORM
(Comparison Child Form)

**Title of Project:** Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

**Investigators:**
Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416)813-5397

**Purpose of Research:**
Children and adolescents who survive brain tumors, leukemia, or lymphoma are faced with a variety of problems that affect the way they live their lives. One of the most difficult problems is little contact with friends and peers. The purpose of this study is to give these children opportunities to meet with other kids with similar experiences by participating in a social skills group program and to assess if this program is beneficial to these kids.

**Description of the Research:**
This study involves an assessment of the social skills group program designed for children and adolescents who have been treated for a brain tumor, leukemia, or lymphoma at SickKids, and their families. In order to test if the group is beneficial we need to compare the responses of children who participate in the group to responses of children who do not participate in the program. We have asked you to serve as a comparison group. The study includes the following:

1) With your permission, you and your parent(s) will complete questionnaires which ask about your feelings and actions, how you get along with others and some general information about your family, at two different time points. The questionnaires take approximately 30 minutes to complete.

**Potential Harms:**
We know of no harm that taking part in this study could cause you. If specific concerns/issues arise, please call the project coordinator- Fiona Schulte (813-5397) - if you require any help.

**Potential Inconvenience:**
Appendix L

You may experience some inconvenience in taking the time required to complete the questionnaires.

**Potential Benefits:**

- You will not benefit directly from participating in this study.
- This group intervention program may benefit other children who survive brain tumors, leukemia or lymphoma in the future.

**Confidentiality:**

We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless the law requires us to do this. For example, the law requires us to give information about you if a child has been abused, if you have an illness that could spread to others, if you or someone else talks about suicide (killing themselves), or if the court orders us to give them the study papers.

Sick Kids Clinical Research Monitors, employees of the funder or sponsor of the study “Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma”, or the regulator of the study may see your health record to check on the study. For example, people from Health Canada Health Products and Food Branch, (or) U.S. National Institutes of Health, (or) U.S. Food and Drug Administration, if necessary, may look at your records.

By signing this consent form, you agree to let these people look at your records. We will put a copy of this research consent form in your patient health records. We will give you a copy for your files.

The data produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe those individuals described above) will have access to the data. This could include external research team members. Following completion of the research study, the data will be kept as long as required and then destroyed as required by Sick Kids policy. Published study results will not reveal your identity.

The results of the tests we describe in this form will be used only for this study. If another health care professional caring for you needs to see these results, you will have to give us your permission. We will ask you to sign a form saying that you agree that this person can see your results. We recommend that only a registered psychologist or doctor tell you what the results of these tests mean.

During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group. But we cannot be sure that information about you will be kept private. People in groups may share information about you with others outside the group.
Appendix L

**Participation:**
It is your choice to take part in this study. You can stop at any time. The care you get at SickKids will not be affected in any way by whether or not you take part in this study. New information from this study or other studies may affect whether you want to continue to take part in the study. If this happens, we will tell you about this new information.
Appendix L

Consent:

By signing this form, I agree that:
1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my health care at SickKids.
4) I am free now, and in the future, to ask questions about the study.
5) I have been told that my medical records will be kept private. You will give no one information about me, unless the law requires you to.
6) I understand that no information about who I am will be given to anyone or be published without first asking my permission.

7) I have read and understood pages 1 to 3 of this consent form. I agree, or consent, to take part in this study.

_________________________________  ______________________________
Printed Name of Subject & Age  Subject’s signature & date

__________________________________  ______________________________
Printed Name of person who explained consent  Signature & date

__________________________________  ______________________________
Printed Witness’ name (if the subject/legal guardian does not read English)  Witness’ signature & date

If you have any questions about this study, please call Fiona at 416-813-5397.

If you have questions about your rights as a subject in a study or injuries during a study, please call the Research Ethics Manager at (416) 813-5718.
Appendix M

Name:
D.O.B.:

ASSENT FORM
(Comparison Child Form)

Title of Project: Group Social Skills Intervention for Children and Adolescents with Brain Tumors, Leukemia or Lymphoma Study

Investigators: Dr. Maru Barrera (416) 813-6784
Miss Fiona Schulte (416)813-5397

Why are we offering this group? Children who have brain tumors, leukemia or lymphoma sometimes wish they could spend more time with other kids their own age. We want to help these children deal well with friends and with other kids your age so we have a group that will try to help kids with brain tumors, leukemia or lymphoma learn how to get along better with other kids. We want to find out how much our group will help these kids. To do this, we need to also have a group of peers who do not participate in the group. That is why we requested your participation in the study.

What will I have to do? This group is for kids who have been treated for a brain tumor, leukemia or lymphoma at SickKids, and their families. These kids and their parents will complete questionnaires before and after the participation in the group. The questionnaires will ask questions about feelings, actions and getting along with others. Kids who are not part of the group will be asked to complete the same questionnaires twice so we can compare the responses of the two groups of kids. This will help us see if the group is working.

Are there good things and bad things about the study? There are no problems that we know of that could hurt you by answering our questions.
Appendix M

**Who will know about what I do during this study?**
If you participate your name and address will not be given to anyone. The only time we would tell anyone else about what you said, is if you tell us something that is dangerous to you or someone else. Also, if we feel your health may be in danger, we may have to report your results to your doctor.

**Can I decide if I don't want to join the study?**
If you do not want to join this study, this is O.K. Nobody will be angry or upset if you do not want to be in the study. If you say yes now, but change your mind later, you can tell us, and that will be O.K. Your mother or father is also reading information about this study. They will talk to you about it. Ask them any questions that you do not understand from what you have read or heard. They will help you to understand. Please also ask us any questions, we will also help you to understand.

**ASSSENT:**
I was present when ___________________read this form and said that he or she agreed or assented, to take part in this study.

____________________________
Name of person who obtained assent

____________________________
Signature

____________________________
Date
Operational Definitions and Responses

10. **Physical Aggression** – The act of using physical force to induce bodily harm (to themselves or someone else), or threaten physical harm to another. (Nonverbal).

   He should just punch the kids calling him names.

   She should kick that girl and grab her ball really quick.

   He should pick up the pieces of that game and throw them in their faces.

   She could shove those kids calling her friend names into the lockers.

20. **Verbal Aggression** – Verbal communication (speak, shout, yell) directed toward someone that scares, threatens, or insults them. Examples of this could be name calling, teasing, intimidation, threaten violence or authority intervention.

   If you don’t give me my ball back I’m going to get my big brother to beat you up.

   She could tell the new girl that she hates her.

   He could say, “You guys would probably cheat anyway”.

30. **Social/Emotional Aggression** – A verbal or nonverbal action that attempts to hurt others by excluding them, turning others against them, or otherwise harming their social standing or relationships with others. Can be the relationship between target and other person.

   If she’s coming toward her, she could tell her friends “Come on y’all, just forget her”.

   He could say bad things about the new boy to other people.

   She could just look at her friends and roll her eyes, like to say boy, is he stupid.

   She could just give the girl who teased her a look that says ‘you’re stupid’ and then laugh with her friends about it.
40. **Verbal Assertion** – Verbal communication with others that tries to meet the goals/needs of yourself or others. This may be accomplished by giving orders, making requests, seeking information, making statements about oneself, offering support to compromises. Key words = say, invite, tell, ask.

41. **Commands** – Ordering someone to do something.

*Say to that other kid, “Change the channel”.*

*Tell them, “Give me my ball back now”.*

*Tell them, “O.K., you finish, then I’m playing the winner”.*

42. **Requests** – Ask, invite, or seek permission from someone to do something.

*She should ask them if she can play.*

*Ask if they could bring the soccer ball by his house.*

*Invite someone over to his house.*

*“Do you want to play outside instead of watching T.V.”?*

43. **Seek Information** – Gathering information about the environment/situation, a person or their opinions, what they’re doing or why they’re doing it.

*Ask her, “How are you?”, “Where are you from?”* 

*Ask those boys how to play the game.*

*Ask the other kids when the soccer game will be over.*

*Ask her why she is teasing her.*

44. **Self Statement** – Statements about who you are, your preferences, what belongs to you, or feelings.

*Introduce herself. (i.e. tell her her name)*

*Say to them, “I’d like to play”.*

*Tell his friend, “I’m good in English”.*

*Tell those kids that she has to go home right after school.*
45. **Offer Support, Advice, Compliments** – Includes verbally offering instrumental (offer possession) or emotional aid, suggesting strategies or explanations, compliments.

Tell her you’ll go with her to talk to the teacher.

Tell her to go tell the teacher.

Tell the other boys that they can keep the soccer ball another day of they want.

She could tell her friend, “Just ignore them (kids teasing her), they don’t really know you”.

Tell that other kid “It isn’t nice to tease other people because you wouldn’t like it if they teased you.

Tell him he’s got a cool jacket.

Offer to share.

46. **Other** – Nonaggressive verbal responses that don’t fit types 41-45. Examples might include 1.) simple utterances or those without sufficient detail to categorize, 2.) statements of fact that do not fit the other categories. **Do not use this code if further explanation by the child allows you to apply another Verbal Assertion category.**

Start a conversation.

Say “Hi”.

Say “It’s going to get dark soon” or “You might lose that ball if I let you keep it”.

50. **Passive** – To withdraw from a situation or not engage in action that could change the current situation or resolve it.

51. **Active** – Engage in another activity and/or take steps to retreat from the situation.

He could play another game with other friends.

She could walk home with another friend.

She could walk away and try to stay away from the girls making fun of her friend.

Card 9 – Plays with kids.
52. **Non-active**

She could ignore them.

Go ahead and let them play with his ball or just watch them.

She could just let the other girl watch what she wants.

Card 10 – Keep talking with friends.

53. **Reappraisal** – Cognitively change the meaning of the situation for oneself so it is less distressing.

Tell myself it doesn’t matter, I have other friends anyway.

Think that it is a stupid game anyway and I didn’t really want to play.

Tell himself that maybe he’d like that kid if he got to know him.

54. **Delayed Response/Wait** – Response that receives another code (e.g. direct action or verbal assertion), but involves waiting until a later point in time for action.

*Please note, such responses receive a double code, 54 for the delay and whatever code is appropriate for the action taken.*

Ask again the next day if he can play the game with them. (54, 42)

60. **Direct Action** – To engage in a definite action that involves altering/entering the current situation. The actions are not purely verbal in nature (more than just speaking to other children in the picture). *If this serves as a functional piece toward doing another action such as walking toward the principals office to get the principal, it would be coded an 80.*

He could grab the ball and take it home.

She could just sit down and start playing.

He could walk with the new kid to each class that day.

Go around the neighborhood looking for new friends.

He could tutor him in English.

Introduce her to your friends.
70. **Vague** – An incomplete strategy or sometimes wishful statement about the end result or the way a situation should go without clear means for attaining this goal. Get statements.

*He could get his ball back and they could all play tomorrow.* (How does he get the ball back?)

*She could watch the other show (that she wanted to watch).* (How can she watch the other show when the channel has already been changed.)

*He could get some kids to play with him.*

*He could be best friends with the new kid.* (How?)

*They could all have a good time together.* (How? When?)

*Have the other girl go home and then walk with her friend.*

*Stop being her friend.* (How?)

*Help him out.* (How?)

80. **Authority Intervention** – To seek the help of some outside person with more power such as a teacher, parent, or older child. **Note: not just threatening to get someone.** Actually getting someone to intervene in the situation.

*He could go tell the principal.*

*She could tell her mom so that she’d call the other girls’ mothers.*

*He could tell his friend who’s bigger that “That kid keeps teasing me”.*

90. **Unclassified** – Response does not fit into any of the other classes.
Social Rating: Definitions and Point Breakdown

**Prosocial:**
An interaction between two people, or an act by one person, done in order to achieve an altruistic or benevolent goal. It is done with regard for the feelings of and impact on others.

**Neutral:**
An act that falls neither into a prosocial nor an antisocial framework.

**Antisocial:**
An interaction between people or an act by one person, that meets a personal goal. It is done without regard for the feelings of or the impact on others. In the extreme it intentionally seeks to harm others, either physically or emotionally.

**Point Breakdown**

**A Score of 5:**
Awarded when a person extends an extraordinary effort to help, aid, or befriend another. At times this may include putting themselves at risk or putting someone else’s goals ahead of their own.

**A Score of 4:**
Awarded when an effort is made to help, aid, or befriend another, but it does not extend past a simple effort.

**A Score of 3:**
Awarded either when a response is neutral or when part of the response is positive and part of the response is negative so as to cancel each other out. It can also be awarded for not doing anything.

**A Score of 2:**
Awarded when an act is done inadvertently with little or without any thought of how others might feel and is aversive in nature. The individual may be seeking a personal goal and inadvertently harm another.

**A Score of 1:**
Awarded when an act is done to meet a personal goal and/or it intentionally seeks to harm another. This harm can be physical, emotional, or psychological.
**Examples**

**Card 1:** There's a new kid in Michelle/Mike's class at school. This is the new kid's first week at the new school. What should Michelle/Mike do or say?

5: *S/he could ask if s/he wants to be best friends and sleep over at her/his house this weekend.

4: *S/he could tell her/him that s/he has nice hair or say hi.

3: *S/he could continue working.

2: *If the new girl/boy asks her/him a question, s/he should ignore the new kid because s/he may get in trouble for talking.

1: *S/he could trip him/her and make him/her fall when s/he walks past his/her desk.  
*S/he could make fun of the clothes s/he is wearing.

**Card 2:** These two girls/boys are playing a game. Genesia/James is watching, s/he thinks the game looks like a lot of fun. What should s/he do or say?

5: *S/he could ask if they could all play the next game.

4: *S/he could go play another game with someone else.  
*S/he could ask to play the winner.

3: *S/he could go play another game by herself.  
*S/he could tell them "I'll play the winner."

2: *S/he could go tell the teacher she wants to play and they won't let him/her.  
*S/he could just pick up one of the pieces and take a turn.

1: *S/he could throw the game on the floor.  
*S/he could tell them "I'll tell the teacher if you don't let me play."
Card 3: Theresa/Thomas has lived in her/his new neighborhood for a couple of months and hasn’t gotten to know anyone yet. What should Theresa/Thomas do or say?

5: *S/he could throw a pizza party for all the kids in the neighborhood at his/her house.
   *S/he could have a lemonade stand.

4: *S/he could meet somebody at the bus stop and invite them over to play after school.

3: *S/he could sit on his/her stoop and say hello to anyone that passes by.

2: *S/he could invite his/herself over to a neighbor’s house if h/she knows other kids will be there.

1: *S/he could go around egging peoples houses and toilet papering their yard.

Card 4: Karen/Mark sees a bunch of kids teasing a friend of hers/his. What should Karen/Mark do or say?

5: *S/he could go up to his/her friend, pull her/him away, and tell the other kids to leave his/her friend alone.

4: *S/he could go tell his/her friend it’s ok and not to listen to those kids.

3: *If they don’t stop, tell the teacher.
   *S/he could go tell the principal or a teacher.

2: *S/he could help her/his friend figure out a way to get them back.
   *S/he could ignore the kids and her friend.

1: *S/he could beat the other kids up.
**Card 5:** Jessica/John usually hangs out with one particular friend after school. One day after school, s/he sees her/his friend with another kid s/he dislikes. What should John/Jessica do or say?

5: *S/he could go over to them and try to get to know her/him and see if they can all hang out together.

4: *S/he could walk home with them anyway.  
   *S/he could walk home with a different friend and try to understand that the friend can do what he/she wants.

3: *S/he could walk home alone.

2: *S/he could wait for a chance to see the other kid alone and tell him/her that that was his/her friend first.

1: *(S/he should stay away from saying things like) “I hate you” and “Why do you hang around with my friends?”

**Card 6:** These two boys/girls know each other from class. One boy/girl says “I’m really having trouble with my English teacher.” What should this other boy/girl do or say?

5: *The boy/girl could go with the one boy/girl to talk with the teacher and see if he/she can help them work it out.

4: *H/she could suggest the other boy/girl go talk with the teacher about the problems they are having because maybe they could work it out.

3: *Tell her/his friend to tell the principal. (Helping the friend, but may get teacher in trouble).

2: *Advise the friend to get back at the teacher.

1: *Help his/her friend to get some tacks and put them on the teacher’s chair.
**Card 7:** One free period, Darian/Jasmine has nothing to do. S/he sees two boys get out a deck of cards and thinks that looks like fun. Darian/Jasmine goes over to see if s/he can play, and they say “We already started.” What should Darian/Jasmine do or say?

5: *S/he should offer to keep score for them and help them play.

4: *S/he could ask to play the winner.
   S/he could go play something else with another friend.

3: *S/he could just wait and watch until the game is over.

2: *S/he could tell the teacher they won’t let him/her play and they’ll get in trouble.

1: *S/he could knock over their table and the cards so they can’t play anymore.

**Card 8:** Tamara/Anthony is watching T.V. at his/her house one day with a kid who is new to his/her neighborhood. After about 10 minutes, the other kid gets up and says “I want to watch something else” and changes the channel. What should Tamara/Anthony do or say?

5: *Since s/he is the guest s/he could just let him/her watch the program s/he wants.
   *S/he could suggest some other things that they could do that the other kid might really enjoy.

4: *S/he could tell the new kid that they really want to watch the first show, but he/she can pick what they watch next.

3: *Say “I was watching that, can you turn it back?”
   *Let him/her watch that and start doing something else.

2: *Tell him/her “You can go home if you’re going to be a jerk.”
   *Let him/her watch it but never invite him/her over again.
   *Tell mom.

1: *Punch him.
Card 9: Some of Kate/Richard’s friends borrowed his/her soccer ball during the lunch period, but didn’t return it. When Kate/Richard came out after school at the end of the day, the other kids had already started playing with it again. Kate/Richard was supposed to go home right after school. What should Kate/Richard do or say?

5: *S/he could go up to the other kids and say “I need my ball back and you can play with it tomorrow.”
*Ask someone to bring it to your house when they are finished because you have to go home.

4: *S/he could go home and say that a friend borrowed it at school and just let them keep it for the day.

3: *S/he could tell the other kids that his/her mom wanted it home and that she said to come home right after school.
*Wait until the game is over.

2: *S/he could just take the ball and walk home.

1: *S/he could go out and find the kid s/he lent it to and push them down and say “Give me my ball back.”

Card 10: One day Rachel/George was standing around with some other kids when a boy/girl walking by yelled and called Rachel/George names. What should Rachel/George do or say?

5: *S/he could ask them why they calling him/her names.

4: *S/he could ignore them.

3: *S/he could tell them I don’t care what you think.

2: *S/he could tell the teacher.
* S/he could think of ways to get back at them.

1: *S/he could start calling them names back.

***For authority intervention responses, you need to look at intent:

If the intent is to get the intervention to help remedy the situation, it would receive a 3 or 2 depending on the risk of harm to others.

If the intent is to get the intervention to get the other kids in trouble, it would receive a 1.