PARENTAL PRESENCE DURING ANAESTHETIC INDUCTION: INVESTIGATIONS OF THE EFFECTS OF PARENT AND CHILD TRAITS AND PARENT-CHILD INTERACTIONS ON CHILD ANXIETY LEVELS

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Abstract

This dissertation examined a number of important issues regarding the impact of parental presence on child anxiety in the pediatric surgery context. A series of four investigations addressed: (1) the utility of a self-report measure of child anxiety in capturing the impact of parental presence in the preoperative context, (2) the main effects of child temperament and interactions with parental presence on preoperative child anxiety, (3) the influence of parental trait anxiety on child preoperative anxiety given parental presence, and (4) the influence of parent-child interactions on child anxiety given parental presence in the operating room (OR). These four investigations were conducted with two separate day surgery samples of children ages 3-6 years. Sample 1 (used in Studies 1 and 2) was from the IWK Health Centre in Halifax, Nova Scotia and was comprised of 63 children undergoing various day surgery procedures. Sample 2 (used in Studies 3 and 4) was from the Department of Dentistry, Royal University Hospital in Saskatoon, Saskatchewan and was comprised of 32 children undergoing dental surgery. Results suggested: (1) The Child Anxiety Pain Scale-Anxiety Scale measure was unable to appropriately measure child anxiety in the day surgery context; (2) Regardless of parental presence, parent-rated anxious/shy child temperament as measured by the Conners' Parent Rating Scales predicted increased observer-rated anxiety just prior to entering the OR and at anaesthetic induction; (3) Parental trait anxiety on the State-Trait Anxiety Inventory was associated with increased observer-rated child anxiety just prior to entering the OR; (4) Sequential analyses revealed that, at anaesthetic induction, there was a sequential relationship between child distress and parental provision of reassurance and child distress and parental provision of physical comfort. Practical and theoretical implications of the present results are discussed.

List of Abbreviations Used

CAMPIS	Child-Adult Medical Procedures Interaction Scale
CAMPIS-R	Child-Adult Medical Procedures Interaction Scale-Revised
CAMPIS-SF	Child-Adult Medical Procedures Interaction Scale-Short Form
CAPS-A	Child Anxiety Pain Scale-Anxiety Scale
CONNERS'	Conners' Parent Rating Scales-Revised Long Form
EASI	Emotionality, Activity, Sociability, and Impulsivity questionnaire
FPS-R	Faces Pain Scale-Revised
IWK	IWK Health Centre
mYPAS	Modified Yale Preoperative Anxiety Scale
OR	operating room
P-CAMPIS	Peri-Operative Child-Adult Medical Procedures Interaction Scale
PHBQ	Post-Hospitalization Behaviour Questionnaire
RUH	Royal University Hospital
SD	standard deviation
STAI	State-Trait Anxiety Inventory
U.S.	United States
VAS	Visual Analogue Scale
VPT	Venham Picture Task

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CHAPTER ONE: Introduction

The notion that surgery is a very stressful experience for children has piqued the interest of researchers since the early 1900s. Pearson (1941) observed significant emotional reactions in young children undergoing anaesthesia and surgery. Eckenhoff (1953), in a retrospective study of over 600 children, identified a link between 'unsatisfactory' anaesthetic inductions and postoperative negative personality changes. Acknowledgement of the importance of addressing childhood anxiety during the pre- and perioperative periods emerged from these initial observations and investigations. Subsequent research arising in the 1960s and 1970s examined the impact of parental presence and preparation of the child for surgery (i.e., Ferguson, 1979; Melamed & Siegel, 1975; Schulman, Foley, Vernon, & Allan, 1967; Visintainer & Wolfer, 1975). Unfortunately, as Watson and Visram (2003) point out, these initial investigations lacked the use of valid and reliable measures of childhood anxiety. While these initial investigations have provided us with a stepping stone from which we have been able to learn a great deal about the pre- and perioperative experiences of children, many questions remained unanswered.

Approximately 3 million children undergo anaesthesia and surgery annually in the United States (U.S.; Graves, 1993). It has been suggested that between 40% and 60% of children who undergo surgery experience anxiety (e.g., Corman, Hornick, Kritchman, & Terestman, 1958; Melamed & Siegel, 1975; Vernon, Foley, Sipowiwcz, & Schulman, 1965). The preanaesthetic management of young children has been identified as a difficult task (Beeby & Hughes, 1980). The difficulty of this task is not surprising given that children are aware that they are being separated from their parents, are not able to

fully understand the necessity for their surgery, coupled with the notion that young children may not be open to a reasoned explanation of their current situation (Korsch, 1975). The manifestation of preoperative anxiety in children can be observed verbally or behaviourally and may be subtle and/or explicit (Corman et al., 1958; Vernon et al, 1965). For example, children may look scared, become agitated, breathe deeply, tremble, stop talking or playing, and may start to cry. Other children may suddenly urinate, experience increased motor tone, and attempt to escape from the medical personnel (Burton, 1984). Up to 25% of children have been noted to require physical restraint to facilitate anaesthetic induction (Lumley, Melamed, & Abeles, 1993). These reactions are thought to be a reflection of the child's fear of separation from parents and home environment, loss of control, unfamiliar routines, surgical instruments, and hospital procedures (Corman et al., 1958; Kain & Mayes, 1996; Schwartz, Albino, & Tedesco, 1983; Vernon et al, 1965). Based upon behavioural and physiological responses, anaesthesia induction appears to be the most stressful procedure that a child experiences during the perioperative period (Kain et al., 1996a; Kain, Mayes, O'Connor, & Cicchetti, 1996b). These aforementioned "externalized" behaviours (e.g., agitation, crying, screaming, trying to escape medical personnel) are easily observed. However, children who internalize their anxiety may "suffer in silence" and this may lead to many more difficulties post-surgery. The latter speculation is based upon the notion that children with internalizing disorders (i.e., depression or anxiety) often are not identified as experiencing distress as quickly as a child with an externalizing disorder and thus may not be provided expedient treatment. Clinical symptoms of childhood anxiety, if left untreated, have a whole host of negative repercussions including poor academic

achievement (Ialongo, Edelsohn, Wertheramer-Larsson, Crockett, & Sheppard, 1994; 1995), adolescent depression (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998), and adult anxiety (Burke, Burke, Reiger, & Rae, 1990).

In addition to behavioural changes prior to and during anaesthetic induction, negative postoperative behaviour such as bad dreams/waking up crying, disobeying parents, separation anxiety, temper tantrums (Kain et al., 1996a; Kain, Wang, Mayes, Caramico, & Hofstadter, 1999a), and although less common, the new onset of enuresis (discharge of urine into bed or clothes whether involuntary or voluntary) (Kain et al., 1996b), have all been observed following surgery. The association between preoperative anxiety and negative postoperative behaviour after hospital discharge has been demonstrated in two studies completed by Kain and colleagues (Kain et al., 1996a; Kain et al., 1999a). Kain and colleagues examined 91 children aged 1-7 years who were undergoing day surgery. Preoperative anxiety was found to be an independent predictor of the presence of postoperative negative behaviour. Specifically, a child who displayed elevated anxiety prior to surgery was 3.5 times more likely to be at risk for the development of negative postoperative behaviour changes in comparison to a child who displayed lower levels of anxiety. In both investigations (Kain et al., 1996a; Kain et al., 1999a), the frequency of negative behaviours was found to decrease over time. Kain et al. (1999a) found that 67% of children had new negative behaviours on the day after surgery, 45% on day two, and only 23% at two weeks after surgery. Behaviour problems were found to persist for up to six months for 20% of children and up to one year for 7.3% of children (Kain et al., 1996a). That being said, some investigations (Kotiniemi, Ryhänen, & Moilanen, 1997; Lumley et al., 1993) have shown that some children

experience positive behaviour changes following surgery. Specifically, Kotiniemi and colleagues identified 17% (n = 90) of children who demonstrated beneficial changes following surgery when compared to a baseline assessment of behaviour including decreased avoidance or fear of new things, increased compliance with eating, increased compliance with parental requests. These researchers assessed behaviour pre- and post-surgery using a questionnaire comprised of 17 items adapted from the Post-Hospitalization Behavior Questionnaire (PHBQ; Vernon, Schulman, & Foley, 1966) and some additional related items.

These aforementioned negative behavioural changes post-surgery have been associated with anxiety and fear prior to surgery (Holm-Knudsen, Carlin, & McKenzie, 1998; Kain et al., 1999). Further, such preoperative anxiety and fear may have a long-term negative impact on children's responses to later medical care as well as potentially interfere with normal development (Vernon et al., 1966). Neuroendocrinologic changes such as increased serum cortisol, corticotrophin, and increased natural killer cell activity have also been associated with preoperative anxiety (Fell et al., 1985; Ramsay, 1972; Tonnesen, 1989).

Most recently, Kain et al. (2004a) examined the relationship between preoperative anxiety and emergence delirium (symptoms include crying, thrashing, need of restraint) and postoperative maladaptive behavioural changes. Kain et al. examined the relationship between these variables by using data obtained from their laboratory over the past six years that included 791 children (one through seven years old) who did not receive sedative premedication or participate in psychological preoperative preparation. Results indicated that the odds of having marked symptoms of emergence delirium increased by

10% as a result of an increment of 10 points in children's observer-rated anxiety score [as measured by the modified Yale Preoperative Anxiety Scale (mYPAS); Kain et al., 1997a]. Further, Kain et al. determined that the odds ratio of having one or more new-onset postoperative maladaptive behaviour change was 1.43 for children with marked emergence delirium as compared to children with no symptoms of emergence delirium. The characteristics of those children who were at risk of developing such difficulties included younger age, elevated emotionality and impulsivity, and being less social. Further, parents of these children also were observed to be significantly more anxious in the holding area and when separated from their children. Kain et al. suggested that the relationship between preoperative anxiety, emergence delirium, and postoperative behaviour changes were most likely related to an underlying temperament construct related to stress and adaptability such as "reactivity" (p. 1652). Kain et al. assert, "Perhaps this reactivity is the underlying causal substrate from which each of this study's three indicators (preoperative anxiety, emergence, and postoperative new-onset maladaptive behavioural changes) arise" (p. 1652). However, Kain et al. indicate that one of their most important findings was that parents of children who are high risk of developing preoperative anxiety, emergence delirium, and maladaptive behaviour changes were more anxious in the holding area. This finding highlights the importance of identifying or developing ways to address parental anxiety.

Risk Factors for Preoperative Anxiety

Throughout the literature a number of factors have been and continue to be examined as potential risk factors for the development of preoperative anxiety. These factors include age, gender, temperament, previous hospital experience, method of

anaesthetic induction, and surgery type. Investigations that have examined the effect of age on the anaesthetic induction experience have produced conflicting results. For example, Bevan et al. (1990) examined preoperative anxiety in 134 children ages 2 to 10 years in a pediatric day surgical centre. Bevan et al. found that younger children were more anxious at induction than older children. An additional investigation (Vetter, 1993) found children ages two to six years were significantly more likely to exhibit problematic behaviour upon separation from their parents than children seven to eight years of age. However, a large survey conducted by Holm-Knudsen et al. (1998) demonstrated that distress during anaesthetic induction was not associated with age. In turn, Kain, Mayes, O'Connor, and Cicchetti (1996a) found children older than seven years old were more anxious than children aged four to seven years in the preoperative holding area (day surgery room) based on an observer-rated visual analogue scale (VAS). Given that some studies have shown an association between child age and preoperative anxiety, Kain, Mayes, Weisman, and Hofstader (2000a) asserted that possibly age may in fact be a "surrogate marker" (p. 550) for other factors that may have an impact on a child's surgical experience. These factors include cognitive abilities, ability to draw on different coping strategies to help with anxious feelings, and social adaptive abilities (i.e., those behaviours that children use to respond to usual or daily experiences). In this particular investigation, Kain et al. (2000a) sought to examine the relationship between the cognitive abilities, emotions, and adaptive abilities and preoperative anxiety in 60 children ages 3 to 10 years undergoing elective surgery. Results showed that children's social adaptive capabilities (i.e., behaviours that children use to respond to usual or daily experiences) were an independent predictor of children's perioperative anxiety.

The relationship between gender and the development of preoperative anxiety and postoperative behaviour problems has also been examined. However, several investigations have shown that gender is neither predictive of preoperative anxiety (Kain et al., 1996b; Vetter, 1993) nor predictive of postoperative behaviour changes (Kain et al., 1996b; Kotiniemi et al., 1996; Vernon et al., 1966).

Childhood temperament is defined by Buss, Plomin, and Willerman (1973) as the hereditary characteristics of an individual's nature. Temperament factors have been found to be significant predictors of a child's reactions to a variety of potentially stressful situations (Kagan, Reznick, & Gibbons, 1989; Kagan, Reznick, & Snidman, 1987) as well as the development of psychopathology in adolescence and adulthood (for review, see Fox, Henderson, Marshall, Nichols, & Ghera, 2005). For example, children who are shy and inhibited tend to become increasingly anxious in novel settings as suggested by a heightened adrenocortical response and elevated heart rate (Kagan et al., 1987). Kain et al. (1996a) found shy, inhibited children, as indicated by a low score on the activity subscale of the Emotionality, Activity, Sociability, and Impulsivity (EASI; Buss et al., 1973) temperament questionnaire, displayed higher levels of anxiety (as measured by a child rated VAS) in the preoperative holding area and during separation from their parents. Impulsive children (i.e., high scores on the EASI impulsivity subscale) displayed an increased risk for the development of general anxiety and of separation anxiety postoperatively (measured by the PHBQ; Vernon et al., 1966). Kain et al. (2000a) also found sociability (as measured by the EASI sociability subscale) to be an independent predictor of higher levels of perioperative anxiety in 60 children ages four to eight years. For example, children who had a low sociability subscale score were more anxious in the

perioperative period. Most recently, Finley, Stewart, Buffett-Jerrott, Wright, and Millington (2006) examined possible differential temperamental predictors of anxiety at anaesthetic induction across groups of children randomly assigned to receive either midazolam (a benzodiazepine with anxiolytic and sedative properties) or placebo. They found that baseline levels of impulsivity, as measured by the EASI, were positively associated with adverse reactions at anesthesia induction in the midazolam-treated group, but not in children treated with placebo. Impulsivity is a temperamental factor which has been found to be a predictor of future problematic behaviour in children, including Oppositional Defiant Disorder (Burns, Leonard, James, 2002; Pardini, Obradovic, & Loeber, 2006). It is also possible that the behaviour difficulties impulsive children are more likely to exhibit at anesthetic induction are not a reaction to anxiety at all, and, therefore, are not responsive to anxiolytic treatment.

Previous distressing medical experiences have been shown to be related to elevated child anxiety in a number of investigations (Kotiniemi et al., 1996; Kain et al., 1996b; Lumley et al., 1993). Kotiniemi et al. (1996) and Lumley et al. (1993) both found that children who were more distressed or less cooperative at anaesthetic induction were more likely to have had a previous bad health care experience. Kain et al. (1996a) determined that elevated levels of anxiety (as measured by a VAS) in the preoperative holding area and separation from parents was significantly associated with previous poor quality of medical experiences.

The relationship between child anxiety and method of anaesthetic induction has been examined by two groups of researchers. Kotiniemi and Ryhänen (1996) examined behavioural changes in children after intravenous, inhalation, and rectal anaesthetic

inductions in 92 children ages two through seven years undergoing ear, nose, and throat (ENT) procedures. Patients were randomly assigned to one of three groups [intravenous (topical analgesic cream not used), inhalation, and rectal]. All patients were premedicated with midazolam and no parents were present for induction. Results indicated that the inhalation group displayed the least number of "stormy" inductions (i.e., indication of high levels of child distress), followed by the rectal group, and the most difficult inductions were in the intravenous group. Aguilera, Patel, Meakin, and Masterson (2003) examined perioperative anxiety and postoperative behaviour changes in 100 children ages 2 to 14 years undergoing intravenous induction with thiopental and inhalation induction with sevoflurane for ENT procedures. Aguilera et al. similarly found that children in the intravenous induction group were significantly more anxious than children in the inhalation induction group. However, there were no treatment group differences in the incidence of behavioural disturbances in the first two weeks following surgery. With respect to differences in pre- or perioperative anxiety as a function of surgery type (e.g., emergency versus elective), one large survey produced no significant differences in relation to surgery type (Holm-Knudsen et al., 1998).

Measurement of Childhood Preoperative Anxiety

The measurement of fear and anxiety in children, in general, covers a great spectrum of measures. Barrios and Hartmann (1997), in their chapter on fears and anxiety in childhood, examine over 160 measures of childhood fears and anxieties. These include self-report (e.g., interviews, global self-ratings, self-monitoring, questionnaires, think-aloud procedures, thought-listing procedures), observer-rated (behavioural avoidance tests, observational rating systems, checklists, global ratings, interviews), and

physiological measurements. In addition to the aforementioned types of measures, Barrios and Hartmann indicated that these 160 measures could be categorized into 13 different fear or anxiety stimulus categories (i.e., blood, darkness, fire, heights, illness, medical procedures, separation, small animals, social and stranger interaction, school-related events, travel, water, and general). Interestingly, the stimulus category that is comprised of the largest number of measures is the category of fear and anxiety of medical procedures. The latter is the stimulus category that is of particular interest in this dissertation, specifically with respect to those measures that assess anxiety during the pre- or perioperative period, and during anaesthetic induction. Within the context of this dissertation, two methods of assessment are of primary interest: self-report and observer-rated. Self-report and observer-rated measures of preoperative anxiety are widely used within the day surgery context and thus utilization of such measures in the soon-to-be-discussed investigations allow for better generalizability of these results to the current literature. These two general types of measures of preoperative anxiety are reviewed in detail below.

Observer-Rated Measures

As eluded to above, there a number of observer-rated measures of childhood anxiety regarding medical procedures [e.g., Observational Behavior Scale (Bradlyn, Christoff, Sikora, O'Dell, & Harris, 1986); Ratings of Anxiety and Cooperation (Bradlyn et al., 1986); Behavioral Avoidance Test; (Freeman, Roy, & Hemmick, 1976); Behavioral Profile Rating Scale-Revised (Gilbert, Johnson, Silverstein, & Malone, 1989); Global Anxiety Rating (Gilbert et al., 1982); Observational Scale of Behavioral Distress (Jay & Elliot, 1984); Procedure Behavioral Rating Scale (Katz, Kellerman, & Seigel, 1980);

Procedure Behavior Checklist (LeBaron & Zeltzer, 1984); Observer Ratings of Anxiety (LeBaron & Zelter, 1984)]. The psychometric properties for the aforementioned measures range from poor to excellent (for review, see Barrios & Hartmann, 1997). However, the majority of these measures provides a global measure of anxiety about medical procedures and was not specifically designed to assess the behaviours and interactions that are associated with anxiety in response to anaesthetic induction. An accurate assessment of anxiety during anaesthetic induction requires the use of tools that have been designed to measure the behaviours specifically associated with the preoperative period.

There also have been measures designed, albeit only a few, to specifically assess a child's anxiety prior to and during anaesthetic induction. Kain and colleagues are the researchers who developed these measures. One measure designed to examine compliance or cooperation during anaesthetic induction is the Induction Compliance Checklist (ICC; Kain, Mayes, Wang, Caramico, & Hofstadter, 1998a). The ICC is an observer-rated checklist that measures behaviours that could result from anxiety about the induction procedure (e.g., verbalization indicating fear or worry, "where's my mommy?" or "will it hurt?"). The ICC is comprised of 11 items and scores range from 0-10. A perfect induction is scored as a zero and indicates that no negative behaviours, fear, or anxiety were displayed. The ICC has demonstrated excellent inter- and intra-observer reliability when employed with a sample of 36 children aged 1-9 years undergoing a mask induction for elective outpatient surgery (Kain et al., 1998a). No information exists regarding the validity of the ICC.

Prior to the development of the ICC (designed to measure compliance with

anaesthetic induction), Kain et al. (1995) developed an observer-rated measure that was designed to assess the anxious distress exhibited by children during anaesthetic induction. This measure was named the Yale Preoperative Anxiety Scale (YPAS; Kain et al., 1995). The YPAS is comprised of five behavioural categories: activity, emotional expressivity, state of apparent arousal, vocalization, and use of parent(s), each scored from 1 to 4, with the exception of the vocalization subscale which is scored from 1 to 6. The items for each category were designed to be specific to behaviours that may occur precisely at the time of a child's anaesthetic induction. For example, a score of 1 in the state of apparent arousal category is "alert, looks around occasionally, notices or watches what anesthesiologist does". This scale has shown good intra- and inter-observer reliability as well as good validity against child-rated VAS anxiety scores (Kain et al., 1995). In order to assess a child's anxiety in the waiting area (e.g., to examine anticipatory anxiety or to have a pre-induction anxiety baseline against which to compare scores at anesthetic induction), Kain et al. (1997a) revised the YPAS. The revised version was named the modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a; see Appendix B). A widely used measure of preoperative anxiety, the mYPAS is comprised of the same five subscales and item content as the original YPAS. However, as mentioned above, the items were expanded to include information specific to a holding area. (See Chapter 2, Measures section, page 42 for psychometric properties of the mYPAS).

Self-Report Measures

In line with the discussion of observer-rated measures of anxiety, many self-report measures of anxiety exist as well. There are a number of ways to measure self-report anxiety in children. For example, child's self-reported anxiety can be assessed through

the completion of a questionnaire [e.g., Children's Fear Survey Schedule-Revised (Barrios, Replogel, & Anderson-Tisdelle, 1983); Children's Manifest Anxiety Scale-Revised [Reynolds & Richmond, 1978]; Fear Survey Schedule for Children-Revised (Ollendick, 1983)]. Another self-report measure of general anxiety for children is the State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973). This is a child version of the well-validated State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushere, 1970) for adults. The above self-report questionnaires have demonstrated good to excellent internal consistency, test-retest reliability, as well as convergent validity with other subjective and physiological measures (for review, see Barrios & Hartmann, 1997). However, these types of anxiety measures do have some drawbacks. First, in order to complete a self-report questionnaire a child must have acquired a particular reading level. Therefore, these types of anxiety measures may not be appropriate for younger children. Second, although self-report questionnaires are not typically very time consuming, they would be inappropriate for assessing anxiety within a matter of a couple of minutes prior to a medical procedure, such as the placement of an anaesthetic mask.

Self-report measures that employ pictures in order to assess levels of anxiety are another type of self-report measure that may lend themselves well to both younger children and to situations where there is a time constraint. Sattler (1992) explains that an abstract task such as describing subjective experiences using verbal language is difficult for children. However, Sattler suggests that children are more easily able to match internal states with pictorial representations of emotions. Chambers and Craig (1998) assert that within the pain literature, 'faces scales' have received a considerable amount

of attention. Further, a number of investigations have shown that children, parents, and nurses demonstrated a preference for faces pain scales over both visual analogue and word descriptor scales (Fogel-Keck, Gerkensmeyer, Joyce, & Schade, 1996; West et al., 1994; Wong & Baker, 1988). With respect to both pain and anxiety faces scales, when presented with the faces scale the child is required to point to the face displaying the emotion that best represents how he or she feels at present. One example of an anxiety faces scale is the Venham Picture Test (VPT; Venham, Bengston, & Cipes 1977; see Figure 1). The VPT will be described in detail here because it has been used previously in the preoperative and pediatric anxiety research from my research group (Finley, Buffett-Jerrott, Stewart, & Millington, 2002). The VPT was designed to measure anxiety in young children aged two to eight years. The scale consists of eight male cartoon character pairs. When the measure is presented, the child is required to point to the member of each pair that best represents how he or she is feeling right now. Each pair consists of an anxious child of varying levels of anxiety, and another child displaying a neutral emotion. Significant correlations between the VPT and other global behaviour rating scales of childhood anxiety have been observed (Winer, 1982). The VPT has also demonstrated moderate one-week test-retest reliability of 0.70 (Venham & Gaulin-Kremer, 1979). However, the VPT may be less well suited for the surgery context as it takes more time to complete than a briefer method such as the Children's Anxiety and Pain Scale (CAPS; Kuttner, & LePage, 1984), to be described shortly. In addition, results from a pilot study conducted in my lab (Finley et al., 2002) provided us with some concerns regarding the face validity of the VPT as a measure of anxiety as the measure depicts sad and angry

Figure 1. Venham Picture Task (Venham & Gaulin-Kremer, 1979; reproduction of VPT granted by the American Academy of Pediatric Dentistry).

faces, as well as anxious faces (see Figure 1).

The Children's Anxiety and Pain Scale (CAPS; Kuttner & LePage, 1984, 1989; see Appendix B) is another self-report measure of anxiety and pain that was developed after the VPT. The CAPS – Anxiety scale (CAPS-A) is comprised of five children's faces progressively ranging from a face with a neutral expression to one with a very anxious expression. Similar to the VPT, children are required to point to the one face that best expresses how they are presently feeling. The CAPS-A can be quickly administered and therefore may be better suited to the surgery context than that of the VPT. Further, the CAPS-A has demonstrated both good face as well as discriminant validity (Kuttner & Lepage, 1984). However, the CAPS-A has yet to be tested for test-retest reliability and concurrent validity.

Interventions for Preoperative Anxiety

In order to alleviate preoperative anxiety in children, a number of interventions have been employed. Both pharmacological (e.g., sedative) and behavioural (e.g., parental presence, preparation programs, music therapy) interventions have proven useful. Midazolam, a benzodiazepine with anxiolytic and amnestic properties, has proved to be effective in reducing anxiety in the preoperative setting (for review see Watson & Visram, 2003). However, the use of midazolam is not without disadvantages. Midazolam has been found to delay emergence and recovery (e.g., Lapin, Auden, Goldsmith, & Reynolds, 1999; Viitanen, Annila, Viitanen, & Tarkkila, 1999a; Viitanen, Annila, Viitanen, Yli-Hankala, 1999b) as well as discharge from hospital (i.e., McGraw & Kendrick, 1998; Kain et al., 2000c). In turn, increased incidence of maladaptive behavioural changes has been observed post-surgery (e.g., McGraw & Kendrick, 1998).

Given these disconcerting findings, behavioural interventions may be more optimal. For the purposes of this investigation, the efficacy of the use of parental presence will be explored in greater detail.

Parental Presence

The issue of parental presence during anaesthetic induction with children is a hotly debated topic with some favoring the benefits of parental presence and some arguing it is harmful or at least not necessary (McCann & Kain, 2001). With respect to the "pro" side of this argument, results from surveys of parents' and professionals' attitudes regarding parental presence at anaesthesia induction suggest that most parents prefer to be present during their child's induction and that they feel that their presence is of benefit to their child (Bauchner, Vinci, & Waring, 1989; Braude, Ridley, Sumner, 1990; Henderson, Baines, & Overton, 1993; Ryder & Spargo, 1991). Kain et al. (2003a) examined parental intervention choices for children undergoing repeated surgeries. More than 80% of all parents of children undergoing a current surgery chose to be present during anesthetic induction (regardless of whether the child was receiving midazolam premedication). This parental preference to be present at induction occurred regardless of the intervention that the child had received previously (i.e., parental presence, sedative premedication, or no intervention). Of those parents who were present during anesthetic induction at the initial surgery, 70% chose to be present during anesthetic induction again. However, only 23% of the parents whose children received midazolam at the initial surgery requested midazolam at the subsequent surgery and only 15% of the patients who received no intervention at the initial surgery requested no intervention at the subsequent surgery. Nevertheless, data obtained from a 1995 survey of U.S. hospitals

indicated that parental presence during induction of anaesthesia was allowed in 26% of hospitals and encouraged in only 8% of hospitals (Kain et al., 1997b). Further, while 28% of hospitals had no formal policy on the issue, in 32% of hospitals in the U.S. it was against hospital policy to have parents present in the operating room (OR) likely for the reasons to be reviewed next (see Page 20). It also appears that anaesthesiologists from Great Britain encourage parental presence significantly more than those from the U.S. (Kain et al., 1996c; Kain et al., 1997b). Kain et al. (2004b) recently completed a follow-up survey to examine the trends in practice of parental presence and sedative premedication across the U.S. Overall, results indicated that parents were more frequently allowed to be present during induction more used of sedative premedication in 2002 as compared to 1995. Specifically, parental presence was allowed in 32% of hospitals and encouraged in 11% of hospitals. Twenty-three percent of hospitals had no formal policy for parental presence. However, 26% of those surveyed indicated that their hospital had a formal policy precluding parental presence. The use of sedative premedication also increased over this same period. Kain et al. (2004b) indicated that the significant increase in sedative premedication and parental presence may be associated with the increased research efforts regarding interventions for preoperative anxiety and the resulting medical literature. It may also be the case that more anaesthesiologists are knowledgeable about the benefits of reducing preoperative anxiety and were acting based upon their knowledge. Similar Canadian statistics do not exist.

A recent investigation was conducted to examine the impact of ethnicity on parent preference to be present during painful medical procedures (Jones, Qazi, & Young, 2005). The impetus behind this investigation was the notion that ethnicity and cultural

beliefs often impact parenting beliefs and health-related beliefs coupled with findings from Bauchner, Vinci, and Waring's (1989) pain research. Bauchner et al. found that parents who wished to be present when their child underwent a painful medical procedure were more likely to have other children who had undergone painful medical procedures, were more educated, and were more likely to be black (versus white or Hispanic). Jones et al. surveyed 300 parents from four ethnic groups (black, white, and Hispanic [divided into English-speaking Hispanic and Spanish-speaking]) regarding their preference for being present during five hypothetical painful procedures (venipuncture, laceration repair, lumbar puncture, fracture reduction, and critical resuscitation). Overall, Jones et al. found few ethnic differences in parental preference to be present during painful medical procedures. The only significant difference found was that English-speaking Hispanic parents were significantly less likely to desire to be present during a critical resuscitation. African American parents were less likely, and English-speaking Hispanic parents were more likely, to want physicians to decide whether they should remain present. Overall, most parents (regardless of ethnicity) preferred to be active participants by coaching and soothing their child rather than simply observing. The notion behind this investigation was interesting and novel. However, it appears that limited useful information can be gleaned from the results. A specific downfall of the investigation was that the research methodology used hypothetical scenarios. Jones et al. point out that parents may not respond in a similar manner to both hypothetical and *in vivo* situations. Additional research involving the querying of an ethnically diverse sample of parents regarding their preference to be present during their child's actual procedure would provide us with richer results.

Numerous benefits have been put forth for having parents present during medical procedures (i.e., anaesthetic induction) (McCann & Kain, 2001). These benefits include eliminating separation anxiety (Gonzalez et al., 1989; Kain et al., 2000b), minimization of premedication use (Hannallah & Rosales, 1983; Cameron, Bond, & Pointer, 1996), increasing child cooperation (Doctor, 1994), enhancing parental satisfaction (Doctor, 1994; Haimi-Cohen, Amir, Harel, Straussberg, Varsano, 1996; Powers & Rubenstein, 1999), fulfilling parents' perceived sense of duty to be present (Ryder & Spargo, 1991), and enhancing parental satisfaction with the medical care (Kain et al., 2000b). Conversely, objections to parental presence have included the possibility of elevation of parental anxiety (e.g., Johnston, Bevan, Haig, Kirnon, & Tousignant, 1988; Bevan et al., 1990; Cameron et al., 1996), the potential of cardiac rhythm abnormalities and myocardial ischaemia among parents (Lerman, 2000), increasing staff workload in caring for the parent as well as the child (Doctor, 1994), concern about disruption of the OR routine (Pond & Aiken, 1996), increasing child behavioural problems (Foertsch, O'Hara, Stoddard, & Kealey, 1996; Gross, Stern, Levin, Dale, & Wojnilower, 1983), and legal implications of having a parent present in the treatment room (Murphy, 1992).

Given the potential advantages/disadvantages of parental presence, researchers have sought to definitively confirm/disconfirm the efficacy of this intervention to alleviate preoperative anxiety for children (for a review, see Palermo, Drotar, & Tripi, 1999; Piira, Sugiura, Champion, Donnelly, & Cole, 2005; Watson & Visram, 2003). The most recent review conducted by Piira et al. (2005) identified 13 investigations that examined the impact of parental presence on childhood preoperative anxiety. In such studies, measures of child anxiety, distress, and co-operation were the outcome measures

typically employed. Interestingly, positive effects for parental presence, including lower levels of child anxiety and distress studies, were reported in studies in which parents were not randomly assigned to condition but were permitted to self-select presence or absence (Hannallah & Rosales, 1983; Cameron et al., 1996). On the other hand, studies that systematically or randomly assigned parents to presence or absence conditions typically report less encouraging results. Palermo, Tripi, and Burgess (2000) examined the impact of parental presence during anaesthetic induction on 73 infants aged 1 through 12 months. Results demonstrated no impact of parental presence on the infants' behavioural distress. Further, Hickmott, Shaw, Goodyer, and Baker (1989) examined the effects of maternal presence on mood and postoperative behaviour in 49 children ages one through to nine years undergoing elective surgery. Results indicated that children's moods and cooperation during waiting and anaesthetic induction periods and incidence of technical problems did not differ significantly as a function of parental presence/absence. However, anaesthetic induction took longer in the parental presence group.

Results extending from a series of randomized controlled studies conducted by Kain and colleagues suggest that parental presence during anaesthesia induction is not beneficial (Kain et al., 1996b; Kain et al., 1998a; Kain et al., 2000b). Kain et al. (1996b) randomly assigned 84 children between the ages of one and six years to either a parental presence or parental absence condition. Behavioural (i.e., EASI, mYPAS, PHBQ, STAI, Clinical Anxiety Rating Scale [Venham, Gaulin-Kremer, Munster, Bengston-Audia, & Cohan, 1980], and VAS) and physiological (i.e., cortisol levels) measures were used to assess the children's anxiety and distress. Overall, there were no significant differences between the groups on any of the outcome measures. However, Kain et al. (1996b)

identified three groups of children who showed a diminished stress response with parental presence: children older than 4 years of age, children whose parents had low trait anxiety, and children who were more temperamentally inhibited. Supplementary research has shown that child anxiety and distress during anaesthetic induction has been associated with parents' level of anxiety (e.g., Johnston et al., 1988; Bevan et al., 1990; Glazebrook, Lim, Sheard, & Standen, 1994; Cameron et al., 1996). For example, Bevan et al. (1990) found that children with parents with elevated anxiety, which were present during anaesthetic induction, displayed more distress than children with parents with elevated anxiety that were not present during anaesthetic induction. In contrast, parental presence had no impact on child anxiety among non-anxious parents. This study suggests that not only is parental presence generally not beneficial, it may actually have an adverse effect on child anxiety when the accompanying parents have elevated anxiety themselves. Very recently Kain, Caldwell-Andrews, Maranets, Nelson, and Mayes (2006) sought to examine whether parental presence during anaesthetic induction is useful in reducing child anxiety based upon the interaction between children's and parents' baseline anxiety using data obtained over the course of their research (586 children with ages ranging from 2-12 years). Findings suggested that the presence of a calm parent demonstrated benefit for an anxious child during anaesthetic induction in alleviating anxiety while the presence of an anxious parent had no benefit. Chambers (2003) asserted that the research to date suggests individual child and parent factors may play an important role in predicting positive or negative response to parental presence during anaesthesia induction. The aforementioned findings from Kain et al. (2006) appear to support Chambers' (2003) assertion.

Over the course of the research conducted by Kain et al. examining parental presence, many parents commented on their perioperative experience (Caldwell-Andrews et al., 2005a). Caldwell-Andrews et al. explained that these comments highlighted parents' experience of tension about weighing their anxiety about being in the OR, their desire to be present when their child under goes anaesthetic induction, and their beliefs about how necessary or helpful their presence might be. Based on these comments, it was postulated that parental motivation might explain why parental presence may reduce anxiety in some children and not in others. In an effort to explore this notion, Caldwell-Andrews et al. (2005a) explored the motivation behind mothers wanting to be present during their child's anaesthetic induction in 289 dyads (mother-child) undergoing outpatient, elective surgery. The children in this investigation were aged 2 through 12 years. Caldwell-Andrews et al. found that children of mothers who were highly motivated to be present during anaesthetic induction were more anxious than children of mothers who were less motivated to enter the OR. Further, the group of mothers who highly desired to be present in the OR reported higher state anxiety. Caldwell-Andrews et al. indicated that they were surprised about their findings as they had hypothesized that the children of parents who highly desire to be present in the OR would be less anxious. Caldwell-Andrews et al. speculated that their findings could be explained by three mechanisms: (1) some anxious mothers have a high desire to be present during anesthetic induction as a way to manage their own anxiety, and these mothers' anxiety may elevate their children's anxiety; (2) some mothers may have less desire to be present in the OR as a function of their confidence in their child's ability to cope with the experience; (3) mothers who valued preparation and coping had children who were significantly less

anxious during anesthetic induction and these mothers also were significantly less anxious themselves in comparison to mothers who did not value preparation and coping.

Kain and colleagues (1998) compared the effectiveness of parental presence during anaesthetic induction with midazolam premedication in 93 children ages two through eight years undergoing elective surgery. Children were randomly assigned one of three groups: (1) parental presence (n = 29), (2) 0.5mg/kg oral midazolam (n = 33), or (3) no intervention control (n = 26). Results suggested that children in the midazolam group were significantly less anxious at anaesthetic induction than both the parental presence and the no intervention control groups. The difference in anxiety between the parental presence and placebo groups was not significant. Kain and colleagues (2000b) subsequently examined the effects of oral midazolam alone versus oral midazolam plus parental presence during anaesthetic induction in 103 children ages two through eight years. Children were randomly assigned to 0.5 mg/kg oral midazolam alone group, or to a 0.5 mg/kg oral midazolam and parental presence group, or to a no-intervention control group. Results suggested that parental presence had no additional effects in reducing children's preoperative anxiety over and above the effect of the 0.5 mg/kg dose of midazolam. With respect to parents, however, parents who were present during anaesthetic induction reported less anxiety after separation (i.e., leaving their child in the OR), and more satisfaction with the overall care provided and separation process, relative to parents in the midazolam only group. (Separation occurred with both groups; for the parental presence group the parents separated from their child after child was asleep in the OR and the no-parental-presence group separated from their child prior to entering the OR.) More recently, Kain et al. (2003b) examined the physiological effects on parents

of parents being present during anaesthetic induction in 80 children ages one through eight years undergoing elective surgery. They used a design identical to the one mentioned above for the Kain et al. (2000b) study. Specifically, children were randomly assigned to one of three groups: (1) parental presence (n = 29), (2) parental presence and 0.5 mg/kg oral midazolam (n = 27), or (3) no intervention control (n = 24). Kain et al. (2003b) found no significant group differences in parental self-reported anxiety or electrocardiogram abnormalities. However, increased parental heart rate and skin conductance levels were observed for parents who were present during anaesthesia induction.

The accumulated findings suggest that parents prefer to be present during anaesthetic induction and often believe that they are helpful during this period. Parental presence during anaesthetic induction has been associated with increased satisfaction with the separation process and overall child care and self-reported parental anxiety has been shown to not differ as a function of parental presence. However, parents do report being upset when being present during anaesthetic induction (Vessey, Bogetz, Caserza, Liu & Cassidy, 1994). Further, Kain et al. (2003b) suggests that increased parental heart rate and skin conductance was observed for parents present during anaesthetic induction. These findings appear contradictory to findings that suggest no increased self-reported parental anxiety associated with parental presence. These seemingly contradictory findings could be reconciled by considering the notion that people may experience physiological symptoms of anxiety (i.e., increased heart rate, increased skin conductance) and yet not interpret these symptoms as associated with anxiety or as providing a cue that they are anxious. The latter is also consistent with Beck and Emery's (1985) cognitive

theory of anxiety that emphasizes importance of cognitions and perceptions in the development and maintenance of anxiety. Given the above findings, it appears that while parental presence during anaesthetic induction may be preferred by parents and associated with decreased levels of self-report parent anxiety, parental presence may not directly benefit the child (Chambers, 2003).

Chambers (2003) notes that there has been a surprising lack of coordination between investigations that examine parental presence during medical procedures and those that describe and quantify what parents actually do during these procedures. It has been speculated that what a parent says and does while being present during medical procedures may be the critical component, not necessarily whether the parent was physically present or absent *per se* (von Baeyer, 1997). Valuable information regarding parental behaviour during children's medical procedures has been obtained via interviews and questionnaires (e.g., Caty, Ritchie, & Ellerton, 1989; Kazak, Penati, Waibel, & Blackall, 1996). However, significant discrepancies have been identified between what parents report that they do during procedures and what they actually do as determined by behavioral observation procedures (Cohen, Manimala, & Blount, 2000). Cohen et al. found that parents were poor reporters of their own behaviour in that no association was observed between self-reported and observed parent behaviours during medical procedures. Further, parents overestimated the quantity of therapeutic behaviours that they engaged in.

In fact, von Baeyer (2001) and Chambers (2003) suggests that a better alternative to parent self-report and interview would be to use behavioural observation scales as such measures would provide us with a more accurate assessment of parent, medical staff, and

child behaviours during anaesthetic induction. Such measures include the Revised (CAMPIS-R; Blount et al., 1997), Short Form (CAMPIS-SF; Blount, Bunke, Cohen, & Forbes, 2001), and most recently Peri-Operative (P-CAMPIS; Caldwell-Andrews, Blount, Mayes, & Kain, 2005b) versions of the Child-Adult Medical Procedure Interaction Scale (CAMPIS; Blount et al., 1989). The CAMPIS measures were designed by Blount and colleagues to examined parent-child interactions during painful procedures (with the exception of the most recent P-CAMPIS which will be discussed below). In their first study, Blount et al. (1989) examined the behaviours of pediatric oncology patients (5 to 13 years old) undergoing bone marrow aspirations and lumbar punctures, their parents, and medical staff. The procedures were audiotaped and later transcribed by a group of trained raters. The original CAMPIS (Blount et al., 1989) was employed to code child and adult behaviours, which includes codes for 19 adult behaviours and 16 child behaviours (described below). Results from this initial investigation suggested that adult behaviours such as reassuring comments, apologies to the child, indicating empathy, giving control to the child, and criticism of the child often preceded child distress. Further, child coping was often preceded by adult commands to engage in coping procedures, non-procedural talk to the child, and humour directed to the child.

A revised version of the CAMPIS, the CAMPIS-R (Blount et al., 1997), was developed. The revised measure grouped the CAMPIS codes into six categories. For children, codes included: Child Coping (e.g., making coping statements, nonprocedural talk by the child); Child Distress (e.g., crying, verbalizing pain); and Child Neutral (e.g., requests for relief from non-procedural discomfort). For adults, codes included: Coping Promoting (i.e., nonprocedural talk to the child, commands to use coping strategy, use of

humour); Distress Promoting (i.e., reassuring comments, criticism, apologies, giving control, empathy); and Adult Neutral (e.g., checking child's status). As described by Cohen and colleagues (1999), behaviours of children, parents, and medical staff can be videotaped and later coded when employing the CAMPIS-R. The presence/absence of CAMPIS-R codes can be recorded over 5-second increments during specific phases of interest throughout medical procedures (e.g., baseline, pre-injection, post-injection). Observable nonverbal behaviours have been added to the CAMPIS-R including reading, playing with toys (Child Coping behaviours), flailing and restraint (Child Distress behaviours), nonverbal attempts to distract the child, pointing to things (Adult Coping Promoting behaviours) and these modifications of this measure have been incorporated into several treatment outcome studies (e.g., Blount, Bunke, & Zaff, 2000; Cohen, Blount, Cohen, Schaen, & Zaff, 1999; Manimala, Blount, & Cohen, 2000). The role of parental Distress Promoting and Coping Promoting behaviours in influencing child distress and coping has been supported by a number of researchers (e.g., Kleiber & McCarthy 1999; Miller et al. 2001; Salmon & Pereira, 2002).

The CAMPIS-SF is a more efficient and less time consuming than earlier CAMPIS versions. The behaviours of parent, medical staff, and child are videotaped and later coded in accordance with a 5-point Likert scale on six the dimensions discussed above. The adult scales are coded separately for parents and medical staff (i.e., nurse). The Likert scale anchors are *none or one* = 1, *minimal or few* = 2, *moderate or adequate* = 3, *substantial or considerable* = 4, and *maximum or nearly continuous* = 5.

The CAMPIS observation scales have not been employed as an observational tool during anaesthetic induction until very recently. The P-CAMPIS was very recently

developed (Caldwell-Andrews et al., 2005b). In the planning stages of the present dissertation research, this research group was contacted to obtain this measure; however, the P-CAMPIS was unavailable for distribution to other research groups at that time as its psychometric properties were being examined. According to Caldwell-Andrews et al. (2005b), the P-CAMPIS consists of 40 codes that describe verbal and nonverbal interactions between children, parents, and medical personnel in the perioperative setting. The P-CAMPIS was developed by modifying the original CAMPIS; this modification included the addition of codes to accommodate specific behaviours unique to the perioperative setting as well as the deletion of codes that were not appropriate or applicable in this setting. The P-CAMPIS demonstrated good convergence with child preoperative anxiety as measured by the mYPAS.

Given that the P-CAMPIS was unavailable during the planning stages of the present research, it appeared that the CAMPIS-R, with the addition of a number of non-verbal behaviours tailored to examine behaviours that typically are observed during anaesthetic inductions, would have good utility within the anaesthetic induction context. Many of the behaviours that are rated by the CAMPIS-R are those that have been found to be associated with child anxiety in other contexts. I reasoned that this observational method would allow me to systematically identify child and parent behaviours that take place when parents accompany children into the anaesthetic induction context, and to conduct a preliminary examination of how these behaviours are associated with child preoperative anxiety.

As indicated above, the CAMPIS measures were developed to measure behaviour of children and the adults that accompany them during a medical procedure (Blount, Seri,

Benoit, & Simons, 2003). Blount et al. indicated that coping with the pain associated with disease, injury, and medical procedures is important for children. It seems that although it is generally understood that all children must cope with pain at some point in their life, coping is an area of pediatric research that is neglected. Blount et al. assert that not only is important to assess for coping behaviours of children but also for the adults (e.g., parents) that accompany during a medical procedure. Blount and colleagues have trained adults to use coping promoting behaviours (as described above) such as prompting children to blow party blowers during bone marrow aspirations and lumbar punctures (Blount, Powers, Cotter, Swan, & Free, 1994), injections for chemotherapy (Powers, Blount, Bachanas, Cotter, & Swan, 1993), and during immunizations (Blount et al., 1992). Interactive parent-child play with toys, games, reading books, and talking about fun topics (Blount et al., 1994) has been encouraged prior to injections for local anaesthesia for bone marrow aspirations and lumbar punctures. Adults have also been trained to encourage counting as needed prior to and during intravenous injections for chemotherapy (Powers et al., 1993). Preschool children have also been prompted by nurses (Cohen, Blount, Cohen, Schaen, & Zaff, 1999) or by parents and nurses (Cohen, Blount, & Panopoulos, 1997) to watch appealing videotaped cartoons before and during immunization injections. Blount et al. (2003) assert that promptings from adults have been found to be pivotal for helping children engage in coping behaviours. Blount et al. (2003) suggest that without these prompts, the most likely reaction for many children prior to and during medical treatments would be distress (e.g., screaming, crying). Throughout their research, Blount et al. found that once a child becomes highly distressed, he or she tends to remain that way throughout the duration of the medical

procedure. In an earlier study, Blount, Sturges, and Powers (1990) found a significant positive correlation ($r = .86$) between anticipatory, pre-painful phase distress and distress during the painful phases of the medical procedure. In turn, Blount et al. (2003) assert that it is important to "prompt children to use effective coping behaviours prior to the painful medical procedures" (p. 5). These findings and assertions suggest that during the "anticipatory phase" (p. 5), prior to the more frightening and painful parts of a medical procedure, distress is easier to manage. The reduction in fear and distress during the anticipatory phases can in turn lead to less experienced pain during the medical procedure itself. The frequency of parent coping promoting behaviours have been found to be positively associated with children's use of coping behaviours and inversely related to children's distress behaviours and self-reported levels of pain (Blount et al., 1990; Blount et al., 1997). The relationship between parental distress promoting behaviours and child distress has been shown (Blount et al., 1989; Bush, Melamed, Sheras, & Greenbaum, 1986; Manimala et al., 2000). For example, reassurance (a distress promoting behaviour) was experimentally examined. It was found that parental use of reassurance resulted in minor increases in child "Verbal Fear" and "Restraint" but not overall CAMPIS-R Child Distress (Manimala et al., 2000). Gonzalez, Routh, and Armstrong (1993), on the other hand, found no relation between parental reassurance and child distress when compared to control conditions. However, Gonzalez et al. instructed parents to reassure their child at least every 10 seconds rather than in response to procedural events or distress. McMurtry, McGrath, and Chambers (2006) speculate that the manner in which the parents were instructed to reassure their child in combination with a small sample size may have impacted the results. Further, Chambers, Craig, and Bennett (2002) examined

the relation of CAMPIS coded Adult Distress Promoting behaviours and Child Distress behaviours in an experimental cold-pressor task with healthy children ages 8 to 12 years. Findings suggested a causal relationship between Adult Distress Promoting and Child Distress behaviours only with girl participants and only on pain intensity and not other measures of pain (i.e., tolerance, physiology, facial expressions).

The aforementioned findings may be relevant for the anxiety and fear associated with anaesthetic induction via mask placement. Research has shown that anaesthetic induction is the most distressful time-point during the day surgery process (Kain et al., 1996a). It can be speculated that children who are anxious or worried about anaesthetic induction via mask placement may be fearful about what is going to happen (e.g., Will it hurt?) and in response engage in similar behaviours that have been seen within the context of painful medical procedures. Similarly, addressing the fear prior to the distressful event (i.e., anaesthetic induction) via the practice of coping strategies appears to be advantageous to reduce anxiety during the day surgery process. These speculations require systematic examination within children undergoing anaesthetic induction. The CAMPIS-R (with modifications) appears to be an appropriate measure to employ in this initial examination of child and parent behaviours individually as well in the study of the interaction between parent and child behaviours during the day surgery process.

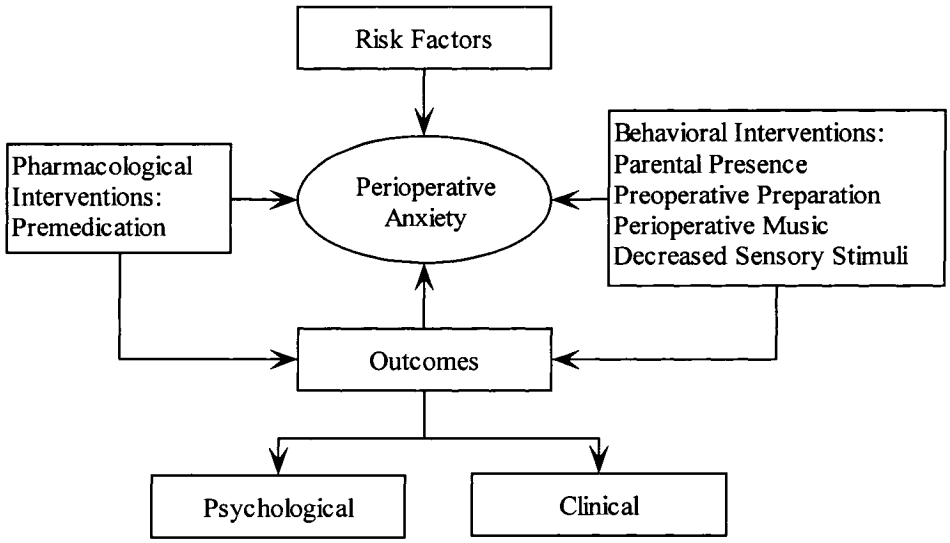
The most recent review of the literature examining parental presence during medical procedures was conducted by Piira et al. (2005). Piira et al. pointed out that, for the most part, parents were not routinely informed about what they could do to help their child if they were going to be present during the procedure. Other investigations have shown that parents desire information regarding how they could best help their child

(Neill, 1996; Simons, Franck, & Robertson, 2001). Given this, Piira et al. assert that the combination of information provision and parental presence could further improve parent and child outcomes when parents are present during medical procedures (i.e., anaesthetic induction). Unfortunately, however, there is currently a gap in the evidence base to indicate which types of behaviors would be most useful for parents to employ in the operating room context (i.e., limited knowledge of which particular parental behaviors are associated with decreased child anxiety and distress in the context of anesthetic induction).

Chapter Summary

Preoperative anxiety in children is a common occurrence. McCann and Kain (2001) conceptualized pre- or perioperative anxiety in an epidemiological framework, emphasizing risk factors, interventions, and outcomes (see Figure 2). This conceptual framework highlights the impact that risk factors and efficacy of interventions (pharmacological versus behavioural) have on the aetiology, exacerbation, and maintenance of pre- and perioperative anxiety as well as subsequent outcomes (psychological versus clinical) that were addressed throughout this chapter. The common occurrence of preoperative anxiety, coupled with its substantial repercussions, has lead researchers to develop and examine the efficacy of several anxiety reducing interventions. Both oral midazolam and parental presence are interventions that have been examined in that regard. Oral midazolam has been found to be an efficacious intervention for preoperative anxiety in children. However, there is a negative side to the use of this intervention which includes longer recovery times, greater anxiety just after leaving the recovery room, delay in hospital discharge, and the development of

Figure 2. Conceptual framework of perioperative anxiety from McCann and Kain (2001).



postoperative maladaptive behavioural changes. Investigations examining the utility of parental presence have produced conflicting results. Some investigations have shown parental presence to be effective and others have found no differences between parental presence and absence groups during anaesthetic induction. Parental presence and midazolam have also been directly compared in a number of investigations. Results from such investigations have demonstrated that midazolam is significantly more effective in reducing children's preoperative anxiety than parental presence. That being said, results from recent surveys of U.S. anaesthesiologists suggest that the use of both premedication (i.e., midazolam) and parental presence during anaesthetic induction has increased significantly since 1995. Given the side effects of midazolam, the lack of established negative effects of parental presence, and the increasing use of parental presence in hospitals, it would be advantageous to provide parents with guidance on how to best support their child if they are to be present during anaesthetic induction. In order to do so, further evaluation of the child-parent interactions during anaesthetic induction is necessary using measures such as the CAMPIS-R.

The following chapters represent a series of investigations examining a number of important issues regarding the impact of parental presence on child anxiety in the pediatric surgery context. A series of four investigations addressed: (1) the utility of a self-report measure of child anxiety in capturing the impact of parental presence in the preoperative context, (2) the main effects of child temperament and interactions with parental presence on preoperative child anxiety, (3) the influence of parental state and trait anxiety on child preoperative anxiety given parental presence, and (4) the influence of parent-child interactions on child anxiety given parental presence in the operating

room (OR). These four investigations were conducted with two separate day surgery samples of children ages 3-6 years. Sample 1 (used in Studies 1 and 2) was from the IWK Health Centre in Halifax, Nova Scotia and was comprised of 63 children undergoing various day surgery procedures. Sample 2 (used in Studies 3 and 4) was from the Department of Dentistry, Royal University Hospital in Saskatoon, Saskatchewan and was comprised of 32 children undergoing dental surgery. The methodology associated with Studies 1 and 2 and Studies 3 and 4 are identical and, in an effort to reduce redundancy, the reader may be referred to earlier chapters to acquire pertinent information (i.e., participant or demographic information). Findings from these investigations will be subsequently summarized in the final chapter, and their practical implications considered.

CHAPTER TWO: Study 1

Examination of the Psychometric Properties of the Children's Anxiety and Pain Scale-Anxiety Scale

Introduction

Preoperative anxiety in children is a common phenomenon. In fact, up to 60% of children receiving surgery with general anaesthetic are anxious prior to the surgery in the holding area (e.g., day surgery room) and during the induction (e.g., Corman et al., 1958; Melamed & Siegel, 1975; Vernon et al., 1965). For many children, the combination of being away from their familiar environment and the uncertainty about what may happen during surgery can be very scary (Kain et al., 1996a; Kain et al., 1998). More specifically, younger children (i.e., children aged 1-3 years) have been found to be frightened of separating from their parents on the way to the operating room (OR), whereas older children (i.e., children aged 4-12 years) have been found to have more knowledge about what is happening and are more afraid of the surgery itself (Kain et al., 1998). Not only is preoperative anxiety distressing for the child and his or her parent(s), it has also been associated with problems pre- and post-surgery (e.g., Burton, 1984; Kain et al., 1996b; Kain et al., 1993), including prolonged anaesthetic induction (Kain et al., 1999), and post-emergence distress (Kain et al., 2004). In addition, the onset of maladaptive postoperative behavioural problems (e.g., general anxiety, nighttime crying) have been reported to occur in up to 50% of children undergoing general surgery procedures and to be linked with the degree of preoperative anxiety (Kain et al., 1996b; Kain et al., 1999a). Thus, interventions to reduce preoperative anxiety are important for at least some children and families.

In turn, a reliable and valid method of anxiety measurement is required to accurately assess a child's need for an anxiety reducing intervention. There are a number of methods employed to assess childhood anxiety in general and pediatric preoperative anxiety in particular (e.g., observer-rated, self-report, parental report, physiological measurement). Within the context of the present study, two measures were of particular interest: modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a) and Children's Anxiety and Pain Scale-Anxiety Scale (CAPS-A; Kuttner & LePage, 1984). The mYPAS was employed as an observer-rated measure of preoperative anxiety because it is widely used and possesses good psychometric properties (discussed more thoroughly below). The CAPS-A was chosen as there are limited number of pictorial, self-report anxiety scales designed for the day surgery setting and my research group raised concerns (Finley et al., 2002) about the use of an alternative measure (i.e., Venham Picture Task; Venham & Gaulin-Kremer, 1979) on the basis of issues of its face validity.

Kain et al. (1995) developed an observer-rated measure designed to assess the anxious distress exhibited by children during anaesthetic induction. This measure was named the Yale Preoperative Anxiety Scale (YPAS; Kain et al., 1995). Later, a modified version of the YPAS was developed (mYPAS; Kain et al., 1997a; see Appendix B). The mYPAS is a widely used measure of preoperative anxiety in children. Akin to the original YPAS, the measure has five subscales which include activity, emotional expressivity, state of apparent arousal, vocalization, and use of parent(s), each scored from 1 to 4, with the exception of the vocalization subscale which is scored from 1 to 6. The items for each category were designed to be specific to behaviours that may occur precisely at the time of a child's anaesthetic induction. For example, a score of 1 in the

state of apparent arousal category is "alert, looks around occasionally, notices or watches what anesthesiologist does". In order to assess a child's anxiety in the waiting area (e.g., to examine anticipatory anxiety or to have a pre-induction anxiety baseline against which to compare scores at anesthetic induction), Kain et al. (1997a) revised the original YPAS to include items that are applicable to a holding area. The mYPAS has demonstrated good psychometric properties. (See page 42, this chapter, for psychometric properties of the mYPAS).

The CAPS-A (Kuttner & LePage, 1984, 1989; see Appendix B) is a self-report measure that employs pictures in order to assess levels of childhood anxiety in medical contexts. The CAPS-A is comprised of five children's faces progressively ranging from a face with a neutral expression to one with a very anxious expression. Children are required to point to the one face that best expresses how they are presently feeling. The CAPS-A can be quickly administered and has demonstrated both good face validity as well as discriminant validity (Kuttner & Lepage, 1984). However, the CAPS-A has yet to be tested for test-retest reliability and convergent validity with other anxiety measures.

It would be advantatgeous to have a reliable and valid self-report, pictoral measure of preoperative anxiety as these measures (e.g., CAPS-A) do not require time-intensive training nor necessitate a lengthy administration. The latter information alone, makes the CAPS-A an attractive option in the assessment of preoperative anxiety within a busy day surgery department. However, as mentioned above, the concurrent validity and test-retest reliability of the CAPS-A remain to be assessed. The primary purpose and hypotheses are itemized below.

Purpose and Hypotheses

The purpose of Study 1 was to validate a self-report measure of anxiety, the CAPS-A, against a widely used observer-rated measure of preoperative anxiety, the mYPAS. This investigation was exploratory in nature and therefore no specific hypotheses were identified (i.e., whether or not the CAPS-A would show good concurrent with the mYPAS). However, I reasoned that if the CAPS-A did show good concurrent validity with the mYPAS, then the measure could be used in future research on preoperative anxiety and in selecting children for anxiety reduction interventions. If the CAPS-A did not show good concurrent validity with the mYPAS, then perhaps there is a similar self-report measure that would be more appropriate for use in this context and with this age range (e.g., the VPT).

Method

Participants

Sixty-three children ages three through six (mean age 5.20 years; *SD* = 1.03 years) scheduled to receive a day surgery procedure at the IWK Health Centre in Halifax, Nova Scotia, Canada (referred to as the IWK herein) participated in this investigation. This sample was also employed for a subsequent study that involved the randomization of parents to parental presence/absence groups (see Chapter 3). Two participants' data were not used in analyses as a result of missing data. Data for these two particular participants was not completely obtained; specifically observer-rated anxiety (as measured by the mYPAS) was not recorded for two of the time-points for these two participants due to observer error. Therefore, the analyzed sample consisted of 35 males (mean age = 5.04 years; *SD* = 1.00 years) and 26 females (mean age = 5.41 years; *SD* = 1.06 years). Ethnicity in the sample was primarily Caucasian (91.8%). Mothers primarily

participated (n = 59; 97%) and the average parent age was 33.61 years (SD = 5.27 years). Any child aged three to six years who was scheduled for a day surgery procedure at the IWK was considered, unless he or she met one of the following exclusionary criteria. A child was excluded if he or she had been diagnosed with central nervous system disease, psychiatric disease, liver disease, renal disease, or cancer, since this study sought a generally healthy sample of children. In addition, if a child was cognitively impaired he or she was excluded since the researchers needed to be able to communicate with him or her. Also, if the child had been diagnosed with having gastroesophageal reflux disease they were excluded, since anyone with this condition must be anaesthetized with an intravenous as opposed to a mask induction (Cheong et al., 1999), and it was necessary to standardize the method of anaesthetic induction. A potential participant was also excluded if the procedure he or she was scheduled to receive was cardiac, neurosurgery, or orthopedic surgery, or cases expected to require intensive care, because these procedures are more complicated, longer in duration, and often require additional hospital stay. The information relating to these criteria were obtained either from the child's parent and/or from their case file (with the parent's consent). The percentages of types of surgical procedures utilized were as follows: Ear, nose and throat (ENT; 80.3%), Urology (8.2%), General Surgery (e.g., hernia repair; 8.2%), Gastroenterology (1.6%), and Plastice (1.6%).

Finally, this study had a 76% participation rate from all of the potential participants contacted. If a parent was not interested in participating, the researcher would ask if the parent would provide an explanation for their decision. The most common reason for unwillingness to participate (i.e., 24%) was that the parent did not want to add

anything additional to the day that might upset their child, despite their being informed that the study protocol would not involve many additional demands on either the parent(s) or child.

Measures (see Appendix B)

Children's Anxiety and Pain Scale (CAPS; Kuttner & LePage, 1984, 1989; see Appendix B). The CAPS is a self-report measure developed to measure children's levels of anxiety and pain (Kuttner & LePage, 1984). However, given the focus of the present study, only the anxiety scale was administered (i.e., CAPS-A). The CAPS-A scale consists of five drawings of children's faces exhibiting increasing levels of anxiety, beginning from a neutral expression. The CAPS-A scores range from 1-5. When tested on a group of children aged 4-10 years, 77% were able to identify that the faces were conveying the emotion of fear, providing evidence of the scale's good face validity (Kuttner & LePage, 1984). The CAPS has been shown to possess good discriminant validity (Kuttner & LePage, 1984). Data on test-retest reliability and convergent validity are not available from previous research.

Modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a; see Appendix B). The mYPAS is a 22-item observer rated scale designed to measure a child's level of anxiety (Kain et al., 1997a). The mYPAS has five subscales: activity, vocalizations, emotional expressiveness, state of apparent arousal, and use of parents. Each scale is scored from 1 to 4, with the exception of vocalizations, which is scored from 1 to 6, to give a total score that can range from 5 to 22. The mYPAS has shown good concurrent validity ($r = 0.79$) in predicting children's State Trait Anxiety Inventory for Children – State subscale scores (Spielberger, 1973), good construct validity as scores

have been shown to increase from baseline to anaesthetic induction, and good internal consistency (Kain et al., 1997a). Since there was an inconsistency as to the availability of a parent to the child throughout the five time-points in the current study (i.e., only half of the parents went in with the child during the induction), the use of parents scale was dropped for the present study (cf. Finley et al., 2006). Thus a minimum total score of 4 was possible at each time-point (rather than 5 if the use of parent scale was included). The first rater was present during the induction and the second rater coded the mYPAS via videotape. For this investigation, inter-class correlations were computed for 20% of the participants between two raters (the second rater was blind to the investigation hypotheses) and yielded $r = .89$.

Procedure (see Appendix C)

When a child meeting the age criterion was scheduled for day surgery at the IWK the child's parents were contacted via mail to inform them of the study and provide them with a letter describing the study. One week after the letter was mailed to the parents, the parents were contacted by phone and asked if they were willing for their child to participate in the study.

Preoperative Holding Area

Ninety minutes before the child's surgery (a point in time that was chosen to ensure no interruption of normal routine of surgery by the study), written informed consent was obtained from the child's parent for the child's and parent's participation. The child's verbal assent was also obtained. Parents were asked to consent to the use of the data that was collected over the phone, and necessary data from their case file at the IWK (e.g., number of previous surgeries). If the parent consented and the child provided

verbal assent, the child was asked to rate their current level of anxiety (using the CAPS-A; Kuttner & Lepage, 1984) to assess their baseline anxiety. Children's baseline anxiety levels were also observer-rated, using the mYPAS (Kain et al., 1997a). The anaesthesiologist then performed a pre-anaesthetic assessment to determine medical eligibility for the study.

At the following 5 specific time-points, the researcher assessed self-report anxiety and observer-rated anxiety: (1) When the child was in the waiting room (baseline 1); (2) 5 minutes prior to leaving the day surgery room (baseline 2); (3) When the child was separated from their parents (or at similar time point if separation did not occur) (stress 1); (4) When the anaesthetic mask was being placed on the child's face (stress 2); and (5) When the child returned to day surgery after the surgery (day surgery). (Stress 1 was conceptualized as potentially stressful for both groups of children [even those whose parents accompanied them into the OR] becase it involved leaving the day surgery room for the OR to begin the impending surgery.)

Anaesthetic Induction

The anaesthetic technique was standardized, with mask inhalation induction.

Post-Surgery

The recovery room nurse rated the child's awakening as smooth, restless, or stormy based on criteria that are currently used clinically at the IWK. They also noted if any difficulties arose in the recovery room (e.g., nausea or dizziness) and if any medications were administered. The time elapsing from surgery to the transfer of the child to the day surgery room was recorded. The child was provided with a sticker as a token of thanks for their participation in the study.

Results

Descriptive Statistics

Descriptive statistics were computed with respect to the file information obtained. The average time for a child to return from the recovery room to day surgery where they were discharged was 80.92 minutes (*SD* = 39.39 minutes; range 13 to 170 minutes). The start point for timing was when the child was brought to the recovery room from the OR and the end point was the time when they returned to the day surgery room. Approximately 79% (*n* = 48) of children were given pain medication after surgery. The most common pain medications administered included: Tylenol and codeine (*n* = 28), codeine (*n* = 11), Tylenol (*n* = 5), morphine (*n* = 2), and Tylenol and morphine (*n* = 2). In the recovery room, 70.5% of children were rated as having a smooth awakening from the anaesthetic (restless 19.7% and stormy 6.6%). Two reports were not available from nursing staff, as such the total percentage does not add up to 100%. There were very few post-operative problems reported, with the exception of one child who was described by the nurses as "hysterical" and one child who experienced nausea and vomiting.

Mean, standard deviation (*SD),* and range of mYPAS and CAPS-A scores across the five time-points are presented in Table 1. In order to investigate whether demographic information influenced CAPS-A and mYPAS scores, a series of univariate analyses of variance (ANOVA) were performed for the two stressful time-points (i.e., stress 1 and stress 2). The focus was placed upon these two stressful time-points as these time-points are of most clinical interest and in an effort to reduce the overall number of analyses. The results of these analyses indicated that CAPS-A scores at stress 1 did not differ significantly as a function of gender, $F[1,54] = 1.47$, ns, type of surgery, $F[3,52] = 0.23$,

Table 1.

Mean, SD, and range for mYPAS and CAPS-A scores across five time-points.

Assessment	CAPS-A		mYPAS	
time-point	Mean(SD)	score range	Mean(SD)	score range
baseline 1	1.38(0.76)	1-5	4.77(1.08)	4-8
baseline 2	1.17(0.41)	1-4	4.80(1.24)	4-9
stress 1	1.43(0.79)	1-3	5.95(3.37)	4-18
stress 2	1.48(0.76)	1-5	9.49(4.65)	4-18
day surgery	1.52(1.09)	1-5	5.91(1.84)	4-17

Note: CAPS-A = Child Anxiety Pain Scale-Anxiety subscale (Kuttner & LePage, 1984); mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); baseline 1 = child in the waiting room; baseline 2 = 5 minutes prior to leaving the day surgery room; stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement; day surgery = child returned to day surgery; CAPS-A total score ranges from 1-5; mYPAS total score ranges from 4-18.

ns, or previous surgery, $F[1,50] = 0.31$, ns.[1] The results of these analyses similarly indicated that CAPS-A scores at stress 2 did not differ significantly as a function of gender, $F[1,50] = 0.04$, ns, type of surgery, $F[3,48] = 1.58$, ns, or previous surgery, $F[1,50] = 0.31$, ns. The results of these analyses also indicated that mYPAS scores at stress 1 did not differ significantly as a function of gender, $F[1,54] = 1.47$, ns, type of surgery, $F[3,52] = 0.23$, ns, or previous surgery, $F[1,50] = 0.31$, ns. The results of these analyses similarly indicated that mYPAS scores at stress 2 did not differ significantly as a function of gender, $F[1,50] = 0.04$, ns, type of surgery, $F[3,48] = 1.58$, ns, or previous surgery, $F[1,50] = 0.31$, ns.

In order to examine whether age had a significant association with anxiety scores, a bivariate correlation was computed between age and CAPS-A and mYPAS scores at the two stressful time-points. No significant correlations were found between age and CAPS-A scores ($r = .10$ [stress 1] and $r = .13$ [stress 2], respectively, both ns) or mYPAS scores ($r = -.03$ [stress 1] and $r = -.13$ [stress 2], respectively, both ns). The non-significant correlations suggest that CAPS-A and mYPAS scores do not vary as a result of age, at least within the age range tested in the present study. They further suggest that the outcome measures were not impacted by any of the measured demographic or surgery variables, indicating that these did not need to be included as covariates in any subsequent analyses/hypothesis tests.

[1] The types of surgeries included: ENT (tonsillectomies, adenoidectomies, myringotomies, ear debridements, laryngoscopies, release of tongue tie), Urology (circumcisions, orchidopexies, or ovchidectomies); General Surgery (herniorraphies); Gastroenterology (gastroscopy with biopsy); and Plastice (lesion excision).

Examination of the Psychometric Properties of the CAPS-A

Test-retest Reliability of the CAPS-A. No previous data was available on the test-retest reliability of the CAPS-A. In order to examine the test-retest reliability of the CAPS-A, bivariate correlations were computed between the CAPS-A scores across the time-points. A significant relationship was observed between baseline 1 and stress 1 (r = .41, $p < .01$), baseline 2 and stress 1 ($r = .40$, $p < .01$), and self-report anxiety at the two stressful time-points ($r = .36$, $p < .05$). Because these values are statistically significant, they might be taken as evidence for the adequate test-retest reliability of the CAPS-A. Nonetheless, they are not especially high, particularly considering the short test-retest intervals involved.

Concurrent Validity of the CAPS-A. In order to assess the concurrent validity of the CAPS-A, it was compared with the widely used observer-rated anxiety measure, the mYPAS. There are several types of validity, each of which I will describe briefly. Concurrent validity refers to how well a new or unvalidated measure is associated with another measure of established validity (Jensen, 1980). Construct validity refers to how well a test measures the construct it purports to measure (Cronbach & Meehl, 1955). Convergent validity (a type of construct validity) refers to how well a test demonstrates similar findings to other tests. In order to assess the concurrent validity of the CAPS-A, bivariate correlations were computed between CAPS-A and mYPAS across all time-points (see Table 2). Results showed no significant correlations between measures, with one exception. A significant relationship was observed between CAPS-A and mYPAS at time 5 [day surgery], $r = .44$, $p = .001$. When a Bonferroni correction is used, this correlation is no longer significant. Furthermore, bivariate correlations were also

Table 2.

Correlations between CAPS-A and mYPAS across 5 time-points.

	mYPAS baseline 1	mYPAS baseline 2	mYPAS stress 1	mYPAS stress 2	mYPAS day surgery
CAPS-A baseline 1	.120	.158	.143	.035	-.054
CAPS-A baseline 2	.106	-.050	-.124	.134	-.065
CAPS-A stress 1	.201	-.050	.057	.046	.044
CAPS-A stress 2	.245	.043	-.001	.176	-.110
CAPS-A day surgery	.204	.054	.017	-.068	.439*

Note: CAPS-A = Child Anxiety Pain Scale-Anxiety subscale (Kuttner & LePage, 1984); mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); baseline 1 = child in the waiting room; baseline 2 = 5 minutes prior to leaving the day surgery room; stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement; day surgery = child returned to day surgery.
* $p = .001$

computed between CAPS-A and mYPAS change scores (i.e., change from baseline to the two stressful time- points). No significant correlations were revealed (r = -.09 [stress 1] and r = .07 [stress 2], respectively, both ns). Overall these results suggest poor concurrent validity of the CAPS-A.

In order to examine the clinical utility of the CAPS-A further, it would be important to determine if CAPS-A scores at baseline are predictive of mYPAS scores during anxiety provoking or distressful time-points (i.e., separation from parents or anaesthetic induction). In other words, are children who are identified as anxious on the CAPS-A on the day of surgery but prior to the more stressful surgery events, those who display the most anxious reactivity at the more stressful time points such as separation from parents or anaesthetic induction? A direct entry procedure was utilised in order to determine whether CAPS-A baseline 1 or 2 predicted a unique amount of variance in the criterion variables (mYPAS stress 1 and stress 2). Four regression analyses were computed (two with mYPAS stress 1 as the criterion variable and two with mYPAS stress 2 as the criterion variable) with either CAPS-A baseline 1 or baseline 2 entered into the regression equation. With respect to the predictive utility of the CAPS-A baseline 1 to mYPAS stress 1, the R^2 indicated that the amount of variance accounted in mYPAS stress 1 was 2.0% and the model was not significant, F[1,59] = 1.23, ns. With respect to the predictive utility of CAPS-A baseline 2, the R^2 indicated that the amount of variance accounted in mYPAS stress 1 was 1.5% and the model was not significant, F[1,53] = 0.88, ns. With respect to the predictive utility of CAPS-A baseline 1 to mYPAS stress 2, the R^2 indicated that the amount of variance accounted in mYPAS stress 2 was 0.1% and the model was not significant, F[1,59] = 0.07, ns. With respect to the predictive utility of

CAPS-A baseline 2, the R^2 indicated that the amount of variance accounted in mYPAS stress 2 was 1.8% and the model was not significant, F[1,57] = 1.05, ns. Results indicate that neither CAPS-A baseline 1 and 2 are useful predictors of anxiety measured at mYPAS stress 1 (separation from parents, if applicable, and leaving day surgery for OR) or 2 (anaesthetic induction).

In order to assess the concurrent validity of the CAPS-A further, it was important to determine whether both measures increased and decreased in the same way and whether the CAPS-A (like the mYPAS) was sensitive to expected increases from baseline in response to the two stressful time-points. To assess this, a 2 (measure: CAPS vs. mYPAS) x 5 (assessment time: baseline 1 vs. baseline 2 vs. stress 1 vs. stress 2 vs. day surgery) repeated measures ANOVA was calculated. Results showed main effects both for measure, $F[1,43] = 467.17, p < .001$, and time-point, $F[4,172] = 19.09, p < .001$, as well as a measure x time-point interaction, $F[4,172] = 19.22, p < .001$. Visual examination of the means involved in the interaction showed that only the mYPAS but not the CAPS-A was sensitive to the expected increases in anxiety at stress 2 – anaesthetic induction. Simple effects analyses were performed in order to further examine the measure x time interaction. Specifically of interest was the simple effect of time for each measure separately. Results demonstrated no significant simple main effect of time for the CAPS-A, $F[4,172] = 1.38$, ns, indicating that the self-report measure failed to show sensitivity to the expected increases in anxiety at the two stressful time-points. In contrast, there was a highly significant simple main effect of time for the mYPAS, $F[4,220] = 30.84, p < .001$. To further examine the simple main effect of time for the mYPAS, dependent sample t-tests were performed between means at successive time-

points to determine where the significant differences lay. There was a significant increase in observer scores from baseline 2 (5 minutes before leaving day surgery) to stress 1 (separation from parent- if applicable), $t[59] = -2.80, p < .05$, stress 1 (separation form parent- if applicable) to stress 2 (anaesthetic induction), $t[60] = -6.12, p < .001$, and a significant decrease from stress 2 (during the induction) to day surgery, $t[56] = 5.76, p < .001$. There was no significant increase from baseline 1 (waiting room) and baseline 2 (5 minutes before leaving day surgery).

Both correlational and repeated measures ANOVA analyses were re-run by comparing two groups: younger children and older children. The rationale for this analysis was that the CAPS-A was designed for children aged 4 or older and since the present sample included children aged 3 years, it was of interest to examine whether the inclusion of younger children in the present study adversely influenced the results for the CAPS-A. Participants were categorized in the younger group if they were 3 or 4 years old ($n = 26$)[2] and participants were categorized in the older group if they were 5 or 6 years old ($n = 35$). Then, bivariate correlations were computed between CAPS-A and mYPAS at the two stressful time-points separately for the younger and older groups. Results showed no significant correlations between measures for both the younger ($r = -.03$ [stress 1] and $r = .30$ [stress 2], respectively, ns) and older ($r = .20$ [stress 1] and $r = .06$ [stress 2], respectively, both ns) groups, suggesting poor convergent validity in both age groups. Furthermore, bivariate correlations were computed between the CAPS-A and mYPAS change scores (i.e., change from baseline 1 to the two stressful time-points).

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[2] There were too few 3 year olds to permit separating out their data relative to the 4-6 year olds. Thus, the comparison was completed between 3-4 year olds and 5-6 year olds.

Results showed no significant correlations between measures for both the younger (r = -.21 [stress 1] and r = .21 [stress 2], respectively, both ns) and older (r = .16 [stress 1] and r = -.06 [stress 2], respectively, both ns) groups, again suggesting poor concurrent validity in both age groups.

Results from a 2 (age group: younger vs. older) x 2 (measure: CAPS vs. mYPAS) x 5 (assessment time: baseline 1 vs. baseline 2 vs. stress 1 vs. stress 2 vs. day surgery) repeated measures ANOVA showed main effects both for measure, $F[1,42] = 450.29$, $p <$ .001, and time-point, $F[4,168] = 18.62$, $p < .001$, but not for age group. The only interaction observed was the previously-reported measure x time-point interaction, $F[4,168] = 18.44$, $p < .001$. These analyses are consistent with the above findings and demonstrate that the CAPS-A was no more valid (in terms of sensitivity to the expected increases in anxiety at the more stressful time-points) for the older than for the younger children in the study.

Feasibility. Finally, the feasibility of employing the CAPS-A in the day surgery process was examined, including at the point of anaesthetic induction. In order to do so the frequency of children that refused to point to a face at the two stressful time-points was examined. In total, 8.2% (n = 5) of the children did not point to a face prior to going into the OR and 14.8% (n = 9) of the children did not point to a face at anaesthetic induction. In contrast, no children refused to point during baseline 1 and 3.3% (n = 2) two children refused to point at baseline 2. A larger number of children refused to point at return to day surgery 8.2% (n = 5), however it was not unusual for the children to not feel entirely like themselves following surgery (e.g., sore, sleepy, groggy) and may have not pointed for these reasons. Further, this study examined whether the pointing varied as a

function of age. A univariate ANOVA (pointers vs. non-pointers at the anaesthetic induction) revealed a trend toward significance with respect to age, $F[1,59] = 3.27, p = .08$.[3] Those who refused to point at the anaesthetic induction tended to be younger than those who agreed to point (see Figure 3). Finally, an important question to address was whether the children who refused to point to a face had higher observer-rated anxiety than those who completed the task by pointing. Results of a univariate ANOVA (pointers vs. non-pointers at the anaesthetic induction) demonstrated a significant effect of pointing, $F[1,59] = 13.18$, $p < .05$,[4] in that children who refused to point to a face had a significantly higher observer- rated score of anxiety at anaesthetic induction (see Figure 4). This is concerning because it suggests that we are missing self-report data for the very children who may be most anxious at induction.

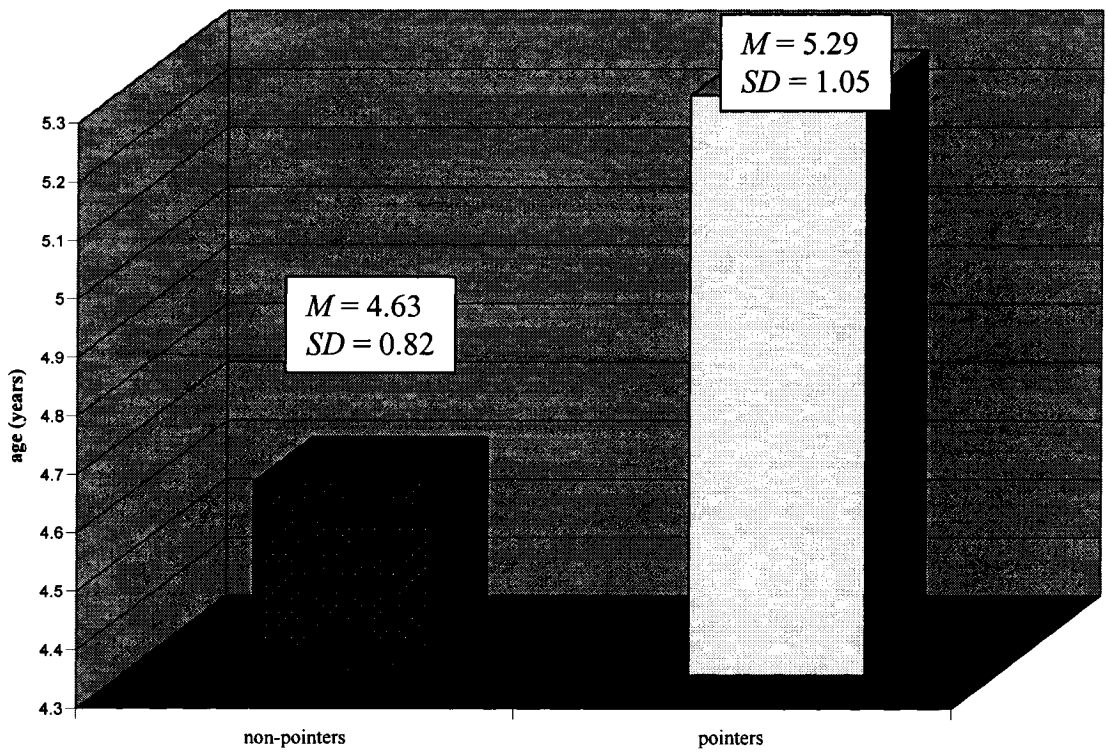
Discussion

Accurate measurement of anxiety is important in the pediatric day surgery setting as high levels of anxiety can lead to adverse consequences both during (i.e., anaesthetic induction) and post-surgery (e.g., Kain et al., 1999). In order to determine if an anxiety-reducing intervention (e.g., preoperative sedative medication or parental presence during anaesthetic induction) is appropriate to employ with a given child, a valid way to measure the child's level of anxiety is required. Although the mYPAS offers a valid observer-rated measure of anxiety, it is also important to have a valid self-report measure of anxiety, as self-report measures requires less training for staff and are less subject to

[3] Due to the different group sizes it was necessary to test for violations to the assumption of homogeneity of variance. This test was completed and the results suggested that the assumption was not violated.

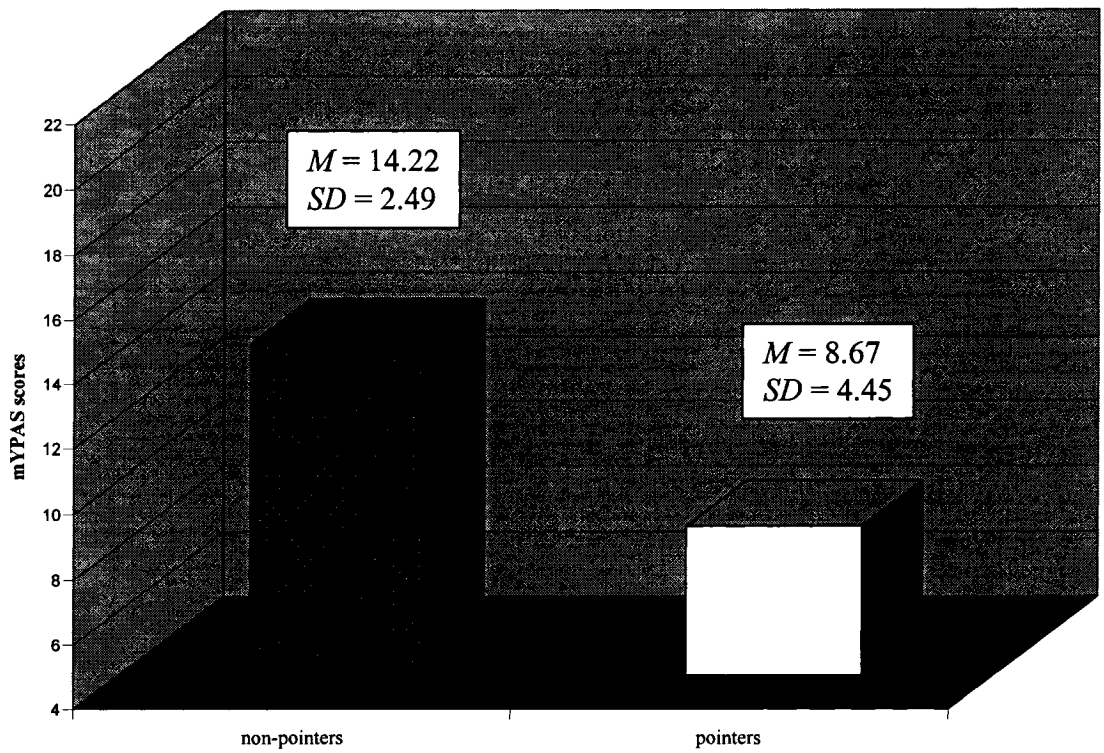
[4] Due to the different group sizes it was necessary to test for violations to the assumption of homogeneity of variance. This test was completed and the results suggested that the assumption was not violated.

Figure 3. Distribution of pointers and non-pointers for the CAPS-A as a function of age.



Note: CAPS-A = Child Anxiety Pain Scale-Anxiety subscale (Kuttner & LePage, 1989).

Figure 4. Mean anxiety scores for the mYPAS at stress 2 for pointers (n = 52) vs. non-pointers (n = 9).



Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a).

inter-observer variability. The ideal self-report measure would be quick and easy to administer, given the time-constraints associated with the day surgery setting.

Examination of demographic statistics suggested that sex, type of surgery, and whether or not they had previously undergone a surgical procedure, did not significantly impact the child's level of anxiety. In addition, ratings of anxiety did not differ as a function of age.

Since anticipating entering the OR and separation from parents (if applicable) and the anaesthetic induction itself are both stressful events in the day surgery context, a measure of anxiety should reflect similar ratings at these two time-points. Children who score high at one of these stressful time-points would be expected to score high at the other stressful time-point. The first objective of this investigation was to examine whether the CAPS-A is a reliable measure of preoperative anxiety in children aged three to six years. Therefore we were interested whether CAPS-A scores at the two stressful time-points (stress 1 and stress 2) would be associated. Analyses revealed that indeed that these two were significantly correlated with one another, although only moderately, thus providing some albeit limited evidence for short-term test-retest reliability for the CAPS-A. This is an important finding since previous research had yet to examine this aspect of the CAPS-A's psychometric properties.

It was also speculated that such ratings should correlate with the well-validated observer-rated measure of anxiety, the mYPAS (concurrent validity), in addition to increasing and decreasing in a similar manner across different testing points during the day surgery process (convergent validity). However, the results of this study did not entirely follow this speculation. For example, a low and non-significant degree of

correlation was observed between the observer-rated and self-report measures of anxiety at either stressful time-point. Baseline 1 and 2 CAPS-A scores were also not found to be predictive of mYPAS stress 1 or stress 2 scores. In addition, the CAPS-A scores did not vary significantly across the five study time-points and thus the measure failed to demonstrate sensitivity to the expected increases in anxiety at the two stressful time-points. In contrast, the mYPAS scores did vary significantly across time-points, and specifically showed an increase from baseline 1 to stress1, stress 1 to stress 2, then a decrease in anxiety from stress 2 to day surgery. This sensitivity of the mYPAS was expected (Kain et al., 1998)

I entertained the possibility that the lack of concurrent validity of the CAPS-A with the mYPAS may have been due in part to younger children (i.e., 3 years olds) not understanding what was being asked of them, as the CAPS-A was originally designed for children 4 years or older. Further analyses revealed that even when the ratings of younger (i.e., 3-4 year olds) and older (i.e., 5-6 year olds) children were isolated, the CAPS-A ratings did not converge with those of the mYPAS even in the older children. However, it should be noted that the sample size in this study was not large enough to compare 3 year olds to the rest of the children. Nonetheless, these findings do not suggest that the validity of the CAPS-A would be improved based on testing only children aged 5 or older.

It was also important to assess whether it is even feasible to use a measure such as the CAPS-A in this context. In order to evaluate this issue, this study examined the frequency of a child's unwillingness or inability to point to a face at the two time-points that were considered most likely to be stressful for the child. The results showed that refusal to point to any of the faces occurred fairly often (6.5% of time for stress 1 and

12.9% of the time for stress 2). These statistics mean that 6-13 children out of 100 children tested with this measure will demonstrate difficulty completing this measure at these stressful time-points. These results raise the issue of the feasibility of using this measure in the preoperative context. Further, results indicated that the children who did point to a face at stress 2 tended to be older than the non-pointers (see Figure 3). One possible explanation for this marginal effect is that older children tend to have more understanding of their surroundings and what is happening than younger children (Kain et al., 1998), and that the anxiety and the OR environment could impede the younger children's willingness to reflect on how they are feeling. The present results appear consistent with findings from Stanford, Chambers, and Craig (2006). Stanford and colleagues examined young children's ability to use the Faces Pain Scale-Revised (FPS-R; Hicks, von Baeyer, Spafford, van Korlaar, & Goodenough, 2001) in a sample of children 3-6 years. Their findings suggested that substantial number of young children experienced difficulty using the FPS-R in response to hypothetical vignettes depicting pain scenarios common in childhood. Results suggested that 5- and 6-year-old children were significantly more accurate in using the FPS-R than 4-year-olds and 4-year-olds were significantly more accurate than 3-year-olds. That being said, over half of the 6-year-olds demonstrated difficulty using the FPS-R.

Even more importantly, results from the present study further demonstrated that children who refused to point to a face during the induction had significantly higher observer-rated anxiety than those children who were compliant about pointing. This is unfortunate as it indicates that the CAPS-A has limited feasibility amongst those children who have the greatest need for assessment. It would be interesting for future research to

investigate the possibility that the CAPS-A might have potential as an anxiety measure if it were somehow possible to code non-pointing as an indicator of the presence of child anxiety.

Although this investigation yielded a number of interesting findings, there are a number of limitations that deserve attention. First, this study used an observer-rated measure of anxiety as the standard against which to assess a self-report measure. It may be the case that these two types of measures tap into different aspects of anxiety (Kuttner & LePage, 1989). From this perspective, the finding that the CAPS-A and mYPAS do not correlate highly would not be not surprising, and should not be interpreted as evidence of lack of validity for the CAPS-A. That being said, the correlations between the CAPS-A and mYPAS do not even approach significance. One would surmise that that if these two measures do tap different aspects of the anxiety experience, there would be a low to moderate correlation between the two at the very least (i.e., that the two should at least be considered lower-order components of the higher-order construct of anxiety and should correlate moderately accordingly).

A second limitation to consider is with respect to the faces depicted on the CAPS-A. A general observation is that the faces depicting high levels of anxiety are somewhat frightening themselves. It is conceivable that a child may have misinterpreted the question asked (Please point to the face that shows how you feel.) and chose the face that resembled himself or herself the most (rather than reflecting his or her current emotional state the most), instead of choosing the appropriate corresponding face. Although there is no evidence that the child's responses were impacted in this fashion, as they were not questioned about their feelings toward the faces, it is possible. Additionally, frightening

faces may have been avoided by children. Re-evaluation of the faces themselves and possibly making some adjustments may improve the utility of the CAPS-A in this setting.

Third, it is also important to note that a larger sample size would have been more optimal. It was anticipated that the sample size would be larger as the two samples from Halifax and Saskatoon were originally to be combined or pooled together. Unfortunately, the sample characteristics of the second sample were so different from those of the first sample that this negated such a combination. Subsequent research should seek to re-examine the psychometric properties of the CAPS-A with a larger sample. A larger sample would allow for better comparison across age groups and allow us to examine any developmental effects in the measurement of child anxiety employing the CAPS-A.

Fourth, these results may have also been affected by range restriction. Examination of the CAPS-A means on Table 1 demonstrates that most children selected the first face (corresponding to a score of 1) across the measurement time-points. That being said, the scores did range from 1-5 (the largest range possible). Subsequent research employing a larger sample size will allow this issue to be evaluated further.

Fifth, in completing the observer-rated anxiety measure (mYPAS), our first rater was not blind to the study hypotheses. This may have impacted the direction of the findings. That being said, good inter-rater reliability was observed between first and second raters, and the second rater was hypothesis-blind. This may have been more of a concern had our hypotheses been supported.

Overall, the results suggest that the CAPS-A was unable to appropriately measure child anxiety in the context of the day surgery experience, at least when compared to the mYPAS. It may be the case that behavioural measures (e.g., mYPAS) of anxiety have

better utility with this age group and within this context. However, given that this is a preliminary investigation of the validity of the CAPS-A, a subsequent investigation comparing the CAPS-A to another pictorial self-report measure of anxiety (i.e., VPT) in a larger sample with equal numbers of participants across age groups (i.e., 3-, 4-, 5-, and 6-year olds) is warranted.

CHAPTER THREE: Study 2

The Impact of Parental Presence During Anaesthetic Induction on Preoperative Anxiety: Which Children Benefit Most?

Introduction

Parental presence is utilized with the aim to alleviate preoperative anxiety in children. The efficacy of this strategy has been explored within the literature (for a review, see Piira et al., 2005), and findings have not been entirely consistent. It appears that when parents individually decide whether they would like to be present/absent during anaesthetic induction, reductions in child anxiety are observed with parental presence (Cameron et al., 1996; Hannallah & Rosales, 1983). However, investigations where parents are randomly assigned to be present/absent during anaesthetic induction have not been as positive. In some investigations no differences in child anxiety was observed across parental presence/absence groups (e.g., Hickmott et al., 1989; Kain et al., 1998a; Kain et al., 2000b; Palermo et al., 2000), while others (Kain et al., 1996b) found elevated child anxiety in parental presence groups as compared to parental absence groups. To date, no randomized studies have found parental presence to be an effective anxiety-reducing intervention.

Kain et al. (2003a) determined that parents often prefer to be present during anaesthetic induction and believe that they are helpful during this procedure. Further, Kain et al. found that parents are more satisfied with the separation process and hospital procedure when they are allowed to be present during anaesthetic induction. Although parents may believe that they are helpful and indicate that they are more satisfied with medical care when this option is provided, a number of concerning drawbacks have been

associated with this intervention strategy including elevation of parental anxiety (e.g., Bevan et al., 1990; Cameron et al., 1996; Johnston et al. 1988), the potential of cardiac rhythm abnormalities and myocardial ischaemia among parents (Lerman, 2000), increasing staff workload in caring for the parent as well as the child (Doctor, 1994), and legal implications of having a parent present in the treatment room (e.g., a parent passing out and injuring him or herself; Murphy, 1992), to list a few.

Previous research has identified child temperament as a significant predictor of child reactions to a variety of potentially stressful situations (Kagan et al., 1989; Kagan et al., 1987). Shy, inhibited children, as indicated by a low score on the activity subscale of the EASI (Buss et al., 1973) temperament questionnaire, displayed higher levels of child rated anxiety (i.e., VAS) in the preoperative holding area and during separation from their parents (Kain et al., 1996a). Further, impulsive children (i.e., high scores on the EASI impulsivity subscale) were identified to be at an increased risk of the development of general anxiety and of separation anxiety postoperatively (measured by the PHBQ; Vernon et al., 1966). Sociability (as measured by the EASI sociability subscale) was identified to be an independent predictor of higher levels of perioperative anxiety in 60 children ages four to eight years (Kain et al., 2000a). Specifically, children who had a low sociability subscale score were more anxious in the perioperative period. Most recently, temperamental predictors of anxiety at anaesthetic induction across groups of children randomly associated to receive either midazolam (a benzodiazepine with anxiolytic and sedative properties) or placebo was examined by Finley et al. (2006). Baseline levels of impulsivity, as measured by the EASI, were positively associated with adverse reactions at anesthesia induction in the midazolam-treated group, but not in

children treated with placebo. These results suggest that high levels of impulsivity may contraindicate the use of midazolam as a preoperative sedative/anxiolytic medication in children. What remains to be examined is whether temperament may be a useful construct to predict which children may benefit from parental presence during anaesthetic induction as a method to alleviate preoperative anxiety. The purpose and hypotheses are itemized below.

Purposes and Hypotheses

The purposes of Study 2 include: (1) determine whether children differ on observer-rated anxiety as a function of group membership (i.e., parents are randomized to parental presence versus parental absence groups), (2) identification of the children who would benefit the most/least from parental presence for the reduction of preoperative anxiety based upon parent-rated child temperament.

There were four hypotheses:

(1) participants would systematically vary on observer-rated (mYPAS) anxiety as a function of group membership (i.e., children in the parental presence group will have lower mYPAS anxiety scores than children in the parental absence group) at stressful time-points (Note: It was hypothesized that participants in the parental presence group would have lower observer-rated anxiety scores because parental presence is an intervention method to reduce preoperative anxiety. However, this hypothesis is in contrast to the available literature that has demonstrated that parental presence is not an effective anxiety-reducing intervention within randomized controlled investigations.);

(2) participants would systematically vary on observer-rated (mYPAS) anxiety as a function of degree of anxious temperament (i.e., children with high anxious

temperament would have signficantly higher observer-rated anxiety than children with low anxious temperament) as measured by (Conners' Parent Rating Scales-Revised Long Form [CPRS-R-LP, Conners, 1997] and EASI [Buss et al., 1973]) at stressful time-points;

(3) children with higher scores on impulsivity, activity, impulsive-hyperactive, and shy/anxious parent-rated measures of temperament (CPRS-R-LP and EASI) would display more "anxious" behaviours in the acting out domain (e.g., fighting mask placement), as measured by the mYPAS, at stressful time-points than children scoring lower in impulsivity activity, impulsive-hyperactive, and shy/anxious;

(4) children that were the most temperamentally anxious as measured by (Conners' Parent Rating Scales-Revised Long Form [CPRS-R-LP, Conners, 1997] and EASI [Buss et al., 1973]) at stressful time-points would benefit most from parental presence.

Method

Participants

The participants utilized in this investigation are the same that were employed in Study 1 which examined the psychometric properties of a self-report anxiety measure (please see Chapter 2, Participants Section, page 40). Participants were randomly assigned to parental presence (n = 30; mean age = 5.22; SD = 1.03) and parental absence (n = 31; mean age = 5.17; SD = 1.06) conditions. Prior to the present study, Kain et al. (1998) conducted a randomized, control study examining the effect of parental presence on child anxiety during anaesthetic induction. Kain et al. found that a sample size of 30

participants in each group was sufficient to detect a 35-40% difference in anxiety level with a power of 0.8 and an $\alpha = 0.05$. Thus, we chose the same sample size. No significant between-condition differences were found across demographic variables.

Measures (see Appendix B)

The CAPS-A was not utilized in the present study as it demonstrated poor psychometric properties (at least when compared to the mYPAS) in Study 1. The primary dependent measure of child anxiety employed in the present study was the observer-rated mYPAS (Kain et al., 1997a).

Measures of Child Temperament

Conners' Parent Rating Scales-Revised Long Form (CPRS-R-L; Conners, 1997; see Appendix B). The CPRS is a 93-item parent-rated scale designed to measure children's temperament. Each scale item is rated on a four-point Likert scale ranging from 0 (not true at all) to 3 (very much true). Factor analysis indicates that the 93 items can be broken down into eight subscales: Conduct Disorder, Anxious-Shy, Restless-Disorganized, Learning Problems, Psychosomatic, Obsessive-Compulsive, Antisocial, and Hyperactive/Impulsive (Conners, 1989). The CPRS-R-L has been shown to possess good psychometric properties (Conners, Sitarenios, Parker, & Epstein, 1998). For example, test-retest reliabilties of the CPRS-R-L subscales range from .55 to .85 over a six to eight week period. Excellent internal reliability has been noted with coefficient alphas ranging from .75 to .94. The Anxious-Shy and Hyperactive/Impulsive subscales are the subscales of interest in the present study. In the present study, both the Anxious/Shy and Hyperactive/Impulsive showed internal consistencies of .81. The

Conners' was included in the present study due to the limitations in EASI psychometric properties (i.e., poor internal consistency of some subscales; Finley et al., 2006).

EASI (Buss et al., 1973). The EASI is a 20-item parent-rated scale designed to measure children's temperaments. The EASI items are rated on a on a five-point scale ranging from 1 (a little) to 5 (a lot). The 20 items comprise four subscales: Emotionality, Activity, Sociability, and Impulsivity. Subscale scores range from 5 to 25. The EASI total score has been shown to possess good convergent validity ($r = 0.77$) when compared to other measures of temperament (Buss & Plomin, 1975; Buss & Plomin, 1984). Good test-retest reliability ($r = 0.83$) has also been demonstrated (Buss & Plomin, 1975; Buss & Plomin, 1984). The Emotionality and Impulsivity subscales are subscales of interest in the present study. In the present study, the Emotionality and Impulsivity subscales of the EASI showed internal consistencies of .54 and .51, respectively, that fall slightly short of the values typically considered acceptable for short scales. These values are similar to those reported by Finley et al. (2006).

Measure of Children's Pre- and Peri-operative Anxiety

Modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a; see Appendix B). The mYPAS is a 22-item observer rated scale designed to measure a child's level of anxiety (Kain et al., 1997a). The mYPAS has five subscales: activity, vocalizations, emotional expressiveness, state of apparent arousal, and use of parents. Each scale is scored from 1 to 4, with the exception of vocalizations, which is scored from 1 to 6, to give a total score that can range from 5 to 22. (Please see Chapter 2, Measures Section, page 42 for mYPAS psychometric properties).

Procedure (see Appendix C)

When a child meeting the age criterion was scheduled for day surgery at the IWK, the child's parents were contacted via mail to inform them of the study and provide them with a letter describing the study. Parents were also provided with the following measures during the initial mail contact: the Conners' (Conners, 1997) and the EASI (Buss et al., 1973) for assessing child temperament. One week after the letter was mailed to the parents, the parents were contacted by phone and asked if they were willing for their child to participate in the study. The Conners' and EASI were completed by one of the child's parents (i.e., whichever parent was accompanying the child to the hospital). Parents completed these scales on their own.

Preoperative Holding Area

Ninety minutes before the child's surgery (a point in time that was chosen to ensure no interruption of normal routine of surgery by the study), written informed consent was obtained from the child's parent for the child's and parent's participation. The child's verbal assent was also obtained. Parents were asked to consent to the use of the data that was collected over the phone, and necessary data from their case file at the IWK (e.g., number of previous surgeries). If the parent consented and the child provided verbal assent, children's baseline anxiety levels was observer-rated, using the mYPAS (Kain et al., 1997a). The anaesthesiologist then performed a pre-anaesthetic assessment to determine medical eligibility for the study.

At the following 5 specific time-points, the researcher assessed observer-rated the child's anxiety: (1) When the child was in the waiting room (baseline 1); (2) 5 minutes prior to leaving the day surgery room (baseline 2); (3) When the child was separated from their parents (or at similar time point if separation did not occur) (stress 1); (4) When the

anaesthetic mask was being placed on the child's face (stress 2); and (5) When the child returned to day surgery after the surgery (day surgery).

Randomization

Immediately prior to the child's leaving the day surgery room, the researcher opened an envelope that contained a randomization code that indicated whether or not the child's parent would accompany him/her to the operating room. The OR nurse was provided the randomization information. The randomization results were provided by the researcher to the parents with the OR nurse present. At the point of randomization, parents were told if they were randomized into the parental presence group they may experience anxiety or distress as they would be observing their child in an anxiety-provoking situation. Parents were again reminded that they can discontinue their participation at any time.

Anaesthetic Induction

The anaesthetic technique was standardized, with mask inhalation induction.

Post-Surgery

The recovery room nurse rated the child's awakening as smooth, restless, or stormy based on criteria that are currently used clinically at the IWK. The nurse also noted if any difficulties arose in the recovery room (e.g., nausea or dizziness) and if any medications were administered. The time elapsing from surgery to the transfer of the child to the day surgery room was recorded. The child was provided with a sticker as token of thanks for his or her participation in the study.

Results

Descriptive Statistics

The participants utilized in this investigation are the same that were employed in Study 1. Therefore, the same descriptive statistics apply here as previously described for Study 1. (see Chapter 2, Descriptive Statistics Section, page 45)

Impact of Parental Presence on Children's Preoperative Anxiety

Mean, standard deviation (*SD),* and range of mYPAS scores across the five time-points are presented in Table 3. Results from a 2 (group: parental presence vs. parental absence) x 5 (mYPAS assessment time: baseline 1 vs. baseline 2 vs. stress 1 vs. stress 2 vs. day surgery) repeated measures ANOVA showed a main effect for time-point, $F[4,216] = 29.93, p < .001$, but not for parental presence group, $F[1,58] = 1.23$, ns. No interaction was observed, $F[4,58] = 0.02$, ns. To further examine the simple main effect of time for the mYPAS, dependent sample t-tests were performed between means at successive time-points to determine where the significant differences lay. There was a significant increase in observer scores from baseline 2 (5 minutes before leaving day surgery) to stress 1 (separation from parent- if applicable), $t[59] = -2.80, p < .05$, stress 1 (separation form parent- if applicable) to stress 2 (anaesthetic induction), $t[60] = -6.12, p < .001$, and a significant decrease from stress 2 (during the induction) to day surgery, $t[56] = 5.76, p < .001$. There was no significant increase from baseline 1 (waiting room) to baseline 2 (5 minutes before leaving day surgery).

Upon visual examination of Table 3 it appears that there may be a significant difference between parental presence/absence groups at mYPAS stress 1 (i.e., separation from parent, if applicable). Give that directional predictions were made *a priori*, a one-tailed independent sample t-tests was used to examine this visual difference. Results suggest that mYPAS stress 1 scores were indeed significantly different, $t[59] = -1.83, p =$

Table 3.

Mean, SD, and range for mYPAS scores for parental presence/absence groups.

Assessment time-point	Parental Presence Mean(*SD*)	score range	Parental Absence Mean(*SD*)	score range
mYPAS baseline 1	4.63(1.00)	4-7	4.90(1.16)	4-8
mYPAS baseline 2	4.69(1.26)	4-9	4.90(1.22)	4-9
mYPAS stress 1	5.03(2.67)	4-18	6.84(3.77)	4-17
mYPAS stress 2	9.53(4.99)	4-18	9.45(4.38)	4-18
mYPAS day surgery	5.93(2.42)	4-17	5.89(1.04)	4-8

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); baseline 1 = child in the waiting room; baseline 2 = 5 minutes prior to leaving the day surgery room; stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement; day surgery = child returned to day surgery; mYPAS total score ranges from 4 to 18.

.035, with children in the parental absence group having significantly higher mYPAS scores at separation from the parent immediately prior to entry into the OR, than those children in the parental presence group.

Predictive Utility of Temperament

To evaluate whether temperament constructs were associated with preoperative anxiety during separation from parents/entry into the OR (mYPAS stress 1) and anaesthetic induction (mYPAS stress 2), two sets of bivariate correlations were computed. The first set of bivariate correlations were computed between emotionality and impulsivity subscales of the EASI and mYPAS stress 1 and stress 2 (see Table 4) and the second set of bivariate correlations were computed between anxious/shy and hyperactive/impulsive subscales from the Conners' (see Table 5). Give that directional predictions were made *a priori*, one-tailed tests were used. Results suggest that emotionality and impulsivity subscales of the EASI were not significantly associated with mYPAS scores at stress 1 and stress 2. However, the anxious/shy subscale of the Conners' was significantly positively associated with both mYPAS at stress 1 ($r = .23, p < .05$) and mYPAS at stress 2 ($r = .25, p < .05$).

Two additional sets of bivariate correlations were computed. The first set of bivariate correlations were computed between emotionality and impulsivity subscales of the EASI and mYPAS change scores (i.e., mYPAS change score 1 = change from baseline 1 to stress 1; mYPAS change score = change from from baseline 1 to stress 2; see Table 6) and the second set of bivariate correlations were computed between anxious/shy and hyperactive/impulsive subscales from the Conners' (see Table 7). Given that directional predictions were made *a priori*, one-tailed tests were used. Results

Table 4.

Correlations between the Emotionality and Impulsivity Subscales of the EASI and mYPAS stress 1 and 2.

	EASI Emotionality	EASI Impulsivity	mYPAS stress 1	mYPAS stress 2
EASI Emotionality	1.00			
EASI Impulsivity	.509***	1.00		
mYPAS stress 1	.139	.161	1.00	
mYPAS stress 2	.015	-.109	.437***	1.00

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement.

* $p = .05$

** $p = .01$

*** $p = .001$

Table 5.

Correlations between the Anxious/Shy and Hyperactive/Impulsive Subscales of the Conners' and mYPAS stress 1 and 2.

	Conners' Hyperactive/ Impulsive	Connors Anxious/ Shy	mYPAS stress 1	mYPAS stress 2
Conners' Hyperactive/Impulsive	1.000			
Conners' Anxious/Shy	.441***	1.000		
mYPAS stress 1	.204	.227 *	1.000	
mYPAS stress 2	-.003	.251*	.437***	1.000

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement.

* $p = .05$

** $p = .01$

*** $p = .001$

Table 6.

Correlations between the Emotionality and Impulsivity Subscales of the EASI and mYPAS change scores 1 and 2.

	EASI Emotionality	EASI Impulsivity	mYPAS change score 1	mYPAS change score 2
EASI Emotionality	1.00			
EASI Impulsivity	.509***	1.00		
mYPAS change score 1	.129	.132	1.00	
mPAS change score 2	.007	-.129	.454***	1.00

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement.

* $p = .05$

** $p = .01$

*** $p = .001$

Table 7.

Correlations between the Anxious/Shy and Hyperactive/Impulsive Subscales of the Conners' and mYPAS change scores 1 and 2.

	Conners' Hyperactive/ Impulsive	Connors Anxious/ Shy	mYPAS change score 1	mYPAS change score 2
Conners' Hyperactive/Impulsive	1.000			
Conners' Anxious/Shy	.441***	1.000		
mYPAS change score 1	.188	.229*	1.000	
mYPAS change score 2	-.016	.246*	.454***	1.000

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); stress 1 = separation from parents (or at similar time point if separation did not occur); stress 2 = anaesthetic mask placement.

* $p = .05$

** $p = .01$

*** $p = .001$

suggest that emotionality and impulsivity subscales of the EASI were not associated with mYPAS change scores at stress 1 and stress 2. Again, the anxious/shy subscale from the Conners' was significantly positively associated with both mYPAS change score at stress 1 ($r = .23, p < .05$) and mYPAS change score at stress 2 ($r = .25, p < .05$).

To evaluate whether temperament constructs were predictive of preoperative anxiety during separation from parents/entry into the OR (mYPAS stress 1) and anaesthetic induction (mYPAS stress 2), four hierarchical regressions were performed. Two regression models were examined for each stressful time-point, one examining the emotionality and impulsivity subscales from the EASI and one examining the subscales from the anxious/shy and hyperactive/impulsive subscales from the Conners'. In the four hierarchical regressions, group membership and either the subscale scores from the EASI (emotionality and impulsivity) or the Conners' (hyperactive/impulsive and anxious/shy) were entered into the first level of the regression equation. The second purpose of this set of analyses was to determine whether temperament interacted with parental presence to influence child anxiety levels. Thus, on the second level of each hierarchical regression, interaction terms (i.e., group x respective EASI or Conners' subscale score) were entered. According to Baron and Kenny (1986) this procedure is necessary to examine the moderator effects of parental presence on the relations of temperament to anxiety. For example, this would test if anxious/shy children would do better (or worse) with parental presence. A direct entry procedure was utilised in order to determine which variables predicted a unique amount of variance in the criterion variable (mYPAS stress 1 or stress 2). The variables included in the regression equation for each of the criterion variables of

interest are listed in Tables 8 through 11 along with their respective Unstandardized and Standardized Regression Coefficients (β) and zero-order correlations.

With respect to the predictive utility of the EASI subscales, the R^2 indicated that the amount of variance accounted in stress 1 was 7.1% and model 1 was not significant, $F[3,57] = 1.45$, ns. For model 2, the amount of variance accounted in stress 1 was 10.7% and the model was not significant, $F[5,55] = 1.32$, ns. Table 8 illustrates that none of the variables entered into either model were identified as significant predictors of stress 1. The interaction variables were not significant predictors.

Again, with the EASI, the R^2 indicated that the amount of variance accounted for in stress 2 was 1.9% and the model 1 was not significant, $F[3,57] = 0.36$, ns. For model 2, the amount of variance accounted in stress 2 was 5.2% and the model was not significant, $F[5,55] = 0.60$, ns. Table 9 illustrates that none of the variables entered into either model was identified as significant predictors of stress 2. The interaction variables were not significant predictors.

With respect to the predictive validity of the Conners' subscales, the R^2 indicated that the amount of variance accounted in the stress 1 was 9.7% and model 1 was not significant, $F[3,57] = 2.05$, ns. For model 2, the amount of variance accounted in stress 1 was 10.5% and the model was not significant, $F[5,55] = 1.29$, ns. Table 10 illustrates that none of the variables entered into either model was identified as significant predictors of stress 1. The interaction variables were not significant predictors.

Again with the Conners', the R^2 indicated that the amount of variance accounted in stress 2 was 8.0% and model 1 was not significant, $F[3,57] = 1.65$, ns. For model 2, the amount of variance accounted in stress 2 was 9.7% and the model was not significant,

Table 8.

Regression Model for Stress 1: EASI Subscales and Interaction Terms.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Model 1				
Group	1.492	0.946	0.207	0.232
EASI Emotionality	0.081	0.152	0.080	0.139
EASI Impulsivity	0.076	0.156	0.074	0.161
Model 2				
Group	3.752	4.029	0.520	0.232
EASI Emotionality	0.752	0.477	0.733	0.139
EASI Impulsivity	-0.400	0.518	-0.387	0.161
Interaction Term E	-0.451	0.305	-1.117	0.222
Interaction Term I	0.304	0.315	0.770	0.253

Note: Interaction Term E = Group x EASI Emotionality subscale score; Interaction Term I = Group x EASI Impulsivity subscale score.

Table 9.

Regression Model for Stress 2: EASI Subscales and Interaction Terms.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Model 1				
Group	0.058	1.265	0.006	-0.019
EASI Emotionality	0.127	0.203	0.095	0.015
EASI Impulsivity	-0.214	0.209	-0.159	-0.109
Model 2				
Group	-2.159	5.402	-0.230	-0.019
EASI Emotionality	0.678	0.639	0.508	0.015
EASI Impulsivity	-1.115	0.695	-0.830	-0.109
Interaction Term E	-0.359	0.409	-0.683	-0.012
Interaction Term I	0.574	0.422	1.117	-0.053

Note: Interaction Term E = Group x EASI Emotionality subscale score; Interaction Term I = Group x EASI Impulsivity subscale score.

Table 10.

Regression Model for Stress 1: Conners' Subscales and Interaction Terms.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Model 1				
Group	1.354	0.944	0.187	0.232
Conners' Hyperactive/Impulsive	0.059	0.106	0.081	0.204
Conners' Anxious/Shy	0.135	0.114	0.166	0.227
Model 2				
Group	2.287	2.054	0.317	0.232
Conners' Hyperactive/Impulsive	0.279	0.353	0.381	0.204
Conners' Anxious/Shy	0.077	0.362	0.094	0.227
Interaction Term HI	-0.140	0.216	-0.392	0.236
Interaction Term AS	0.039	0.232	0.088	0.277

Note: Interaction Term HI = Group x Conners' Hyperactive/Impulsive subscale score; Interaction Term AS = Group x Conners' Anxious/Shy subscale score.

Table 11.

Regression Model for Stress 2: Conners' Subscales and Interaction Terms.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Model 1				
Group	-0.236	1.240	-0.025	-0.019
Conners' Hyperactive/Impulsive	-0.128	0.139	-0.135	-0.003
Conners' Anxious/Shy	0.332	0.150	0.314*	0.251
Model 2				
Group	-2.700	2.683	-0.287	-0.019
Conners' Hyperactive/Impulsive	-0.420	0.461	-0.442	-0.003
Conners' Anxious/Shy	0.124	0.473	0.117	0.251
Interaction Term HI	0.182	0.282	0.391	0.017
Interaction Term AS	0.141	0.302	0.243	0.224

Note: Interaction Term HI = Group x Conners' Hyperactive/Impulsive subscale score; Interaction Term AS = Group x Conners' Anxious/Shy subscale score.
* $p = .05$

$F[5,55] = 1.19$, ns. Table 11 illustrates that although model 1 was not significant, one variable entered into model 1 was identified as a significant predictor of stress 2 – the anxious/shy subscale of the Conners'. The interaction variables were not significant predictors.

According to Baron and Kenny (1986), if the interaction terms do not add significantly to the prediction of the criterion variable (i.e., mYPAS score at stress 1 and stress 2) over the main effects, the interaction terms can be dropped. Therefore, the analyses were re- run without the interaction terms entered on the second level. The variables included in the regression equation for each of the criterion variables of interest are listed in Tables 12 through 15 along with their respective Unstandardized and Standardized Regression Coefficients (β) and zero-order correlations.With respect to the predictive utility of the EASI subscales, the R^2 indicated that the amount of variance accounted in the stress 1 was 7.1% and the model was not significant, $F[3,57] = 1.69$, ns. Table 12 illustrates that none of the variables entered into the model were identified as significant predictors of stress 1. The R^2 indicated that the amount of variance accounted in the stress 2 was 1.9% and the model was not significant, $F[3,57] = 0.63$, ns. Table 13 illustrates that none of the variables entered into the model were identified as significant predictors of stress 2.

With respect to the predictive validity of the Conners' subscales, the R^2 indicated that the amount of variance accounted in the stress 1 was 9.7% and the model was not significant, $F[3,57] = 2.05$, ns. Table 14 illustrates that none of the variables entered into the model were identified as significant predictors of stress 1.The R^2 indicated that the amount of variance accounted in the stress 2 was 8.0% and the model was not

Table 12.

Regression Model for Stress 1: EASI Subscales.

Variables	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Group	1.492	0.946	0.207	0.232
EASI Emotionality	0.082	0.152	0.080	0.139
EASI Impulsivity	0.076	0.156	0.074	0.161

Table 13.

Regression Model for Stress 2: EASI Subscales.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Group	0.058	1.265	0.006	-0.019
EASI Emotionality	0.127	0.203	0.095	0.015
EASI Impulsivity	-0.214	0.209	-0.159	-0.109

Table 14.

Regression Model for Stress 1: Conners' Subscales.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Group	1.354	0.944	0.187	0.232
Conners' Hyperactive/Impulsive	0.059	0.106	0.081	0.204
Conners' Anxious/Shy	0.135	0.114	0.166	0.227

Table 15.

Regression Model for Stress 2: Conners' Subscales.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
Group	-0.236	1.240	-0.025	-0.019
Conners' Hyperactive/Impulsive	-0.128	0.139	-0.135	-0.003
Conners' Anxious/Shy	0.332	0.150	0.314*	0.251

* $p = .05$

** $p = .01$

*** $p = .001$

significant, $F[3,57] = 1.65$, ns. Table 15 illustrates that although the overall model was not significant, one variable entered into model 1 was identified as a significant predictor of stress 2 – that is, the anxious/shy subscale of the Conners'.

Discussion

Anaesthetic induction has been identified as the most anxiety provoking procedure that a child experiences during the perioperative period (Kain et al., 1996a). Elevated levels of preoperative anxiety have been associated with difficulty in anaesthetic induction and the development of postoperative maladaptive behavioural changes (Kain et al., 1999; McCann & Kain, 2001). Given this association, accurate measurement of anxiety is particularly important. The modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a) offers a valid observer-rated measure of anxiety and, as such, the mYPAS was the anxiety measure employed in the current study.

In order to alleviate such anxiety the efficacy of a number of interventions has been explored. Parental presence during anaesthetic induction is one such intervention. This utilization of this intervention is controversial as research has produced conflicting results (e.g., Cameron et al., 1996; Hannallah & Rosales, 1983; Hickmott et al., 1989; Kain et al., 1996; Kain et al., 1998a; Kain et al., 2000b; Palermo et al., 2000). Given this, it is necessary to examine some potential variables (i.e., temperament) that may impact the suitability of certain children for this type of intervention. The primary purpose of this investigation was to examine whether child anxiety would vary as a function of group membership (i.e., parental presence versus parental absence). A secondary purpose of this investigation was to identify the children who would benefit the most/least from parental presence for the reduction of preoperative anxiety based upon parent-rated child

temperament. The specific findings will be discussed in accordance with the order in which the purposes were previously itemized.

It was hypothesized that child anxiety would vary as a function of group membership (parental presence versus parental absence). Specifically, I had expected that children in the parental presence would have lower mYPAS scores than children in the parental absence group at stressful time-points (i.e., separation from parents and anaesthetic induction). The results were partially consistent with the hypotheses. Child anxiety was significantly higher in the parental absence group than the parental presence group at the time-point when children are typically separated from parents. However, no significant difference in anxiety scores was noted at anaesthetic induction. Previous research in which parental presence was randomly assigned has demonstrated no differences in anxiety scores or higher levels of anxiety at anaesthetic induction (Kain et al., 1996b; Kain et al., 1998a; Kain et al., 2000b). In an effort to identify a potential explanation for the divergence of these findings, the methodologies of the aforementioned investigations were examined. One particular difference was age distribution. The age of children in the current investigation ranged from 3 years 1 month to 6 years 11 months. However, the participants in aforementioned investigations ranged from 1 to 10 years. This age distribution may have influenced the results. However, my findings were consistent with previous findings that parental presence did not exert any effects on child anxiety at anaesthetic induction; rather, I observed effects only at stress 1 – when children in the parental absence group were separated from their parents. This elevated anxiety in the parental absence group was short-lived however, as it did not persist at anesthetic induction only a few minutes later.

It was also hypothesized that child temperament would be associated with observer-rated anxiety at stressful time-points. Specifically, I had expected that children with higher scores on impulsivity, emotionality, impulsivity/hyperactivity, and shy/anxious subscales of parent-rated measures of temperament would display more "anxious" behaviour at the two stressful time-points. The results showed that child temperament (as measured by the EASI) was neither associated with (in bivariate correlations) nor predictive of observer-rated anxiety at separation from parent or anaesthetic induction. However, the anxious/shy subscale of the Conners' was significantly associated with mYPAS stress 1 ($r = .23$) and mYPAS stress 2 ($r = .25$). In turn, the anxious/shy subscale was found to be a significant predictor of mYPAS scores at stress 2 in the context of other predictors. The results are consistent with previous investigations that have shown temperament to be associated with anxiety-related behaviours at anaesthetic induction (e.g., Finley et al., 2006; Kain et al., 1996a). Previous investigations utilized the EASI as a method to assess temperament. However, the Conners' was employed as an additional measure of relevant child characteristics in the present investigation, since preliminary investigations from my lab questioned the psychometric properties of the EASI (i.e., poor internal consistency of certain subscales; Finley et al., 2006) – a finding that was replicated herein. The findings suggest that anxious/shy subscale of the Conners' represents a set of questionnaire items that may be useful in identifying children who may benefit from an anxiety-reduction intervention. Items from this subscale could be completed by the parent prior to the day of surgery, quickly scored on day of surgery, yielding a score that could aid in determining if parental presence could facilitate anxiety reduction. Future examination of the utility of

the Conners' anxious/shy subscale is warranted. It contrast to hypothesis, the anxious children who participated in this investigation did not benefit from parental presence as an intervention. Future research is needed to determine what particular interventions are most helpful for this group now that we know they are in particular need of assistance.

Although these findings are interesting, there were a number of limitations that deserve attention. All medical personnel that were involved in this investigation were extremely helpful. However, at times there were some instructions made to the parents that may have impacted the results. When a parent came into the OR they were often instructed to sit on a chair beside their child and told that they could hold their child's hand. These instructions may have directed the behaviour of the parents (e.g., may not have been the natural choice of behaviour of parent) as well as possibly impacted child anxiety during anaesthetic induction. Parental presence might have been effective if parents had been allowed to use their own coping strategies.

Examination of the association between the provision of physical comfort and anxiety during anesthetic induction deserves further examination. Selection bias deserves some attention as well. Participation in this investigation was quite good (76%); however, it is important to consider that there may be a reason why some parent-child dyads did not participate. For example, it could be the case that parents who chose not to participate were ones whose children were typically very anxious and very anxious parents may have also been more likely to refuse to participate. In turn, parents may have also not wanted to chance being randomized to the parental absence group and thus refused. Therefore, we may have missed an entire group of very anxious children and/or parents. This group of missing parent-child dyads may have resulted in the lack of differences we

observed between the two groups in terms observer-rated anxiety at anaesthetic induction. Also, in completing the observer-rated anxiety measure (mYPAS) our first rater was not blind to the study hypotheses. This may have impacted the direction of the findings; however the rater was blind to the child's temperament at the time-points when the anxiety ratings were made. That being said, good inter-rater reliability was observed between first and second raters and the second rater was hypothesis-blind.

The results suggest that anxiety levels in children undergoing day surgical procedures differs as a function of parental presence at the point when children are separated from parents. Specifically, children in the parental presence group had significantly lower anxiety scores than the parental absence group at this time-point. It would be interesting to know what types of interactions take place during this time-point that may explain this finding. However, it may be difficult to record (e.g., videotape) what takes place during this time-point as the day surgery room is quite busy and many people are quickly entering and exiting this room.

In turn, the association between anxious/shy temperament (as measured by the Conners' anxious/shy subscale) and anxiety during the stress time-points during day surgery experience was evident. Anxious/shy children appear to represent a group of children in need of effective intervention.

Anaesthesiologists attempt to make the anaesthetic induction experience as easy as possible for the patient. The knowledge that parents are effective in reducing anxiety at separation and not anaesthetic induction may decrease the likelihood that anaesthesiologists would allow parents to be present during the anaesthetic induction. However, this conclusion could be made in haste and, instead, these findings may be

useful in another direction. These findings could provide a basis for subsequent research designed to identify or clarify the particular behaviours that parents should engage in while being present during anaesthetic induction in an effort to alleviate child anxiety and distress at anaesthetic induction.

CHAPTER FOUR: STUDY 3

Examination of the Influence of Parental Characteristics on Preoperative Anxiety.

Introduction

In an effort to identify predictors of child preoperative anxiety, the relationship between parental anxiety and child anxiety prior to and during anaesthetic induction has been explored. Researchers have found that children of anxious parents who were present during induction displayed more anxiety at induction than children of anxious parents who were not present during induction (Bevan et al., 1990) and that parental anxiety was a significant predictor of child anxiety at induction (Cameron et al., 1996). Kain et al. (1996b) determined that the interaction between parental trait anxiety and parental presence was a significant predictor of child serum cortisol concentrations (a physiological correlate of anxiety) in children over 4 years of age. Further analysis of this interaction showed that child serum cortisol concentrations were lower in the parental presence group for children who have a parent with low trait anxiety. In turn, recent findings from Caldwell-Andrews et al. (2005a) suggested that children of mothers who were highly motivated to be present during anaesthetic induction were more anxious than children of mothers who were less motivated to enter the OR and the group of mothers who highly desired to be present in the OR reported higher state anxiety. The latter findings suggest that maternal state anxiety is associated with elevated preoperative anxiety at induction in children.

There is one particular drawback to the aforementioned research. Two of the investigations (Bevan et al., 1990; Cameron et al., 1996) did not use the widely used and well validated State-Trait Anxiety Inventory (STAI; Speilberger et al., 1970) to measure

parent anxiety. Specifically, Bevan et al. employed the Parent Questionnaire (Melamed, Meyer, Gee, & Soule, 1976) and Cameron et al. employed a visual analogue scale (VAS) to evaluate parental anxiety. This investigation seeks to examine the relationship between parental state and trait anxiety via the STAI (Speilberger et al., 1970), a well-validated measure of adult anxiety, and child anxiety in a sample of children undergoing day surgery procedures. The primary purpose of this investigation is itemized below.

Purpose and Hypothesis

The purpose of Study 3 was to determine whether parental state and/or trait anxiety (as measured by the STAI) was associated with (in bivariate correlations) and predictive of child anxiety (in the context of other predictors) when a child leaves the day surgery room and at anaesthetic induction, in the case of parental presence at induction. There is one hypothesis:

(1) state and trait anxiety (STAI) in the parent will be associated with and predictive of observer-rated child anxiety (mYPAS; i.e., higher parental anxiety will be associated with and predictive of higher observer-rated child anxiety) at the two stressful time-points.

Method

Participants

Thirty-two children ages three through six years (mean age 4.56 years; *SD* = 1.06 years) scheduled to receive dental surgery as a day surgery procedure at the Department of Dentistry and Oral Maxillary Surgery, Royal University Hospital (RUH) in Saskatoon, Saskatchewan, Canada (referred to as the RUH herein) participated in this investigation. This sample was also employed for a subsequent study that involved the examination of parent-child interactions during anaesthetic induction (see Chapter 5).

Two participants' data were not used in analyses. One participant's parent was not present during anaesthetic induction. Therefore, we were unable to examine the relationship between parent and child behaviours during anaesthetic induction and had to disregard the data as a result. The second child whose data were not used had a visual impairment. The child was unable to participate fully, so we had to disregard this participant's data as well. The analyzed sample consisted of 16 males (mean age = 4.52 years; *SD* = 1.04 years) and 14 females (mean age = 4.65 years; *SD* = 1.14 years). Ethnicity in the sample was primarily Aboriginal (53.3%) and Caucasian (43.3%). Mothers participated primarily ($n = 25$) and the average parent age was 30.27 years (*SD* = 5.65 years). Any child aged three to six years who was scheduled for dental surgery as a day surgery procedure at the RUH Department of Dentistry was considered, unless he or she met one of the following exclusionary criteria. A child was excluded if he or she had been diagnosed with central nervous system disease, psychiatric disease, liver disease, renal disease, or cancer, since this study sought a generally healthy sample of children. If a child was cognitively impaired he or she was excluded as the researchers needed to be able to communicate with him or her. Also, if the child had been diagnosed with having gastroesophageal reflux disease they were excluded, since anyone with this condition must be anaesthetized with an IV induction as opposed to a mask (Cheong et al., 1999), and it was necessary to standardize the method of induction. The information relating to these criteria were obtained either from the child's parent and/or from their case file (with the parent's consent). Finally, this study had an 83% participation rate from all of the potential participants contacted. The most common reason for unwillingness to participate was that the parent did not want to add anything additional to the day that

might upset their child, despite their being informed that the study protocol would not involve many additional demands on either the parent(s) or child.

Measures (see Appendix B)

Measure of Children's Pre- and Perioperative Anxiety

Modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a; see Appendix B). The mYPAS is a 22-item observer rated scale designed to measure a child's level of anxiety (Kain et al., 1997a). The mYPAS has five subscales: activity, vocalizations, emotional expressiveness, state of apparent arousal, and use of parents. Each scale is scored from 1 to 4, with the exception of vocalizations, which is scored from 1 to 6, to give a total score that can range from 5 to 22. (Please see Chapter 2, Measures Section, page 42 for mYPAS psychometric properties). For this investigation, inter-class correlations were computed between two raters (the second rater was blind to the investigation hypotheses) and yielded $r = .72$. Both raters were blind to the parents' STAI scores at the time of making the mYPAS ratings.

Parental Anxiety Measure

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970, see Appendix B). The STAI is a 40-item measured designed to assess state and trait anxiety in adults. The psychometric properties of the STAI have been shown to be strong (Spielberger, Gorsuch, Luschene, Vagg, & Jacobs, 1993). For example, the test-retest reliability for the STAI has been found to range from .73 to .86 over a one hour period. The STAI also demostrated good construct validity with validity coefficients ranging from $r = .83$ to .94. The STAI was used to assess parent trait anxiety prior to the surgery date as well as parent state anxiety on the day of child's surgery.

Procedure (see Appendix C)

When a child meeting the age criterion was scheduled for dental surgery at the RUH Department of Dentistry the child's parents were contacted via mail to inform them of the study and provide them with a letter describing the study, as well as some of the study measures including the trait version of the STAI (Spielberger et al., 1970) for the parent. One week after the letter was mailed to the parents, the parents were contacted by phone and asked if they were willing for their child to participate in the study. If the parent was willing, the STAI was completed by the parent on their own, specifically the parent who was to be present during the procedure.

Preoperative Holding Area

Sixty minutes before the child's surgery (a point in time that was chosen to ensure no interruption of normal routine of the surgery by the study), written informed consent was obtained from the child's parent for his/her participation and that of the child. The child's verbal assent was also obtained. Parents were asked to consent to the use of the data that was collected over the phone, and necessary data from their case file at the RUH Department of Dentisty (e.g., number of previous surgeries). If the parent consented and the child provided verbal assent, the parent was asked to complete a self-report measure of their current state anxiety levels: STAI-S (Spielberger et al., 1970). Children's anxiety levels was also observer-rated, using the mYPAS (Kain et al., 1997a). The anesthesiologist performed a pre-anaesthetic assessment to determine medical eligibility for the study.

At the following 5 specific time-points, the researcher assessed observer-rated child anxiety: (1) When the child was in the waiting room (baseline 1); (2) 5 minutes

prior to leaving day surgery room (baseline 2); (3) Leaving the day surgery room to enter the OR (stress 1); (4) When the anaesthetic mask was being placed on the child's face (stress 2); and (5) When the child returned to day surgery (day surgery).

Anaesthetic Induction

The anaesthetic technique was standardized, with mask inhalation.

Post-Surgery

The recovery room nurse rated the child's awakening as smooth, restless, or stormy based on criteria that are currently used clinically at the IWK. Recovery room nurses at RUH Department of Dentistry agreed to follow the same criteria used at IWK for the purposes of this investigation. They also noted if any difficulties arose in the recovery room (e.g., nausea or dizziness) and if any medications were administered. The time elapsing from surgery to the transfer of the child to the day surgery room was recorded. After arrival in the day surgery room, observer ratings of anxiety were be made again. The child was provided with a sticker as token of thanks.

Results

Descriptive Statistics

Descriptive statistics were computed with respect to the file information obtained.[5] The average time for a child to return from the recovery room to day surgery where they were discharged was 32.13 minutes (SD = 11.78 minutes; range 15 to 58 minutes). The start point for timing was when the child was brought to the recovery room from the OR and the end point is the time when the child returned to the day surgery

[5] There were no ethnic differences in terms of parental anxiety. However, Aboriginal children demonstrated significantly higher observer-rated anxiety scores than Caucasian children just prior to entering the OR $t[27] = -2.58, p > .05$, and at anaesthetic induction, $t[27] = -2.26, p > .05$. The small sample size may limits the generalizability of these findings.

room. Approximately 8% (n = 2) of children were given pain medication after surgery. The two types of medication administered included morphine and meperidine. In the recovery room, 33.3% of children were rated as having a smooth awakening from the anaesthetic (restless 40.0% and stormy 26.7%) and there were no post-operative problems reported.

Mean, standard deviation (*SD),* and range of mYPAS scores across the four time-points are presented in Table 16. (Only four time-points appear in Table 16 as there were a significant number or children who were not awake during the fifth and final time-point.) In order to investigate whether demographic information influenced mYPAS scores, a series of univariate analyses of variance (ANOVA) were performed for the two stressful time-points (i.e., stress 1 and stress 2). The focus was placed upon these two stressful time-points as these time-points are of most clinical interest and in an effort to reduce the overall number of analyses. The results of these analyses indicated that mYPAS scores at separation from parent (if applicable) (i.e., stress 1) did not differ significantly as a function of gender, $F[1,28] = 0.55$ ns, previous surgery, $F[1,28] = 1.47$, ns, or number of dental procedures completed, $F[13,16] = 0.98$, ns. The results of these analyses similarly indicated that mYPAS scores at anaesthetic induction (stress 2) did not differ significantly as a function of gender, $F[1,28] = 0.34$, ns, previous surgery, $F[1,28] = 0.31$, ns, or number of dental procedures completed, $F[13,16] = 0.98$, ns.

In order to examine whether age had a significant association with anxiety scores, a bivariate correlation was computed between age and mYPAS scores at the two stressful time-points. No significant correlations were found between age and mYPAS scores (r = .19 [stress 1] and r = .03 [stress 2], respectively, both ns). The non-significant

Table 16.

Mean, SD, and range for mYPAS scores across four time-points.

Assessment time-point	mYPAS Mean(SD)	score range
baseline 1	6.90(1.92)	5-12
baseline 2	6.93(2.30)	5-15
stress 1	8.97(4.14)	5-18
stress 2	12.77(6.37)	5-22

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); baseline 1 = child in the waiting room; baseline 2 = 5 minutes prior to leaving the day surgery room; stress 1 = leaving the day surgery room; stress 2 = anaesthetic mask placement; mYPAS total scores range from 5 to 22..

correlations suggest that mYPAS scores do not vary as a result of age, at least within the age range tested in the present study. They further suggest that the outcome measure was not impacted by any of the measured demographic or surgery variables, indicating that these did not need to be included as covariates in any subsequent analyses/hypothesis tests.

Predictive Utility of Parental Characteristics

To evaluate whether parental characteristics were associated with preoperative anxiety as children left the waiting area to enter the OR (mYPAS stress 1) and at anaesthetic induction (mYPAS stress 2), bivariate correlations were computed (see Table 17). Results suggest that parental trait anxiety (as measured by STAI) was associated with mYPAS stress 1; however, neither parental state or trait anxiety were associated with mYPAS stress 2.

To evaluate whether parental characteristics were predictive of preoperative anxiety during separation from parents and anesthetic induction, two linear regressions were completed. One regression model was examined for each stressful time-point (mYPAS stress 1 and stress 2). In the two linear regressions, the two subscale scores from the STAI (state and trait anxiety) were entered. A direct entry procedure was utilised in order to determine which variables predicted a unique amount of variance in the criterion variable (mYPAS stress 1 or stress 2). The variables included in the regression equation for each of the criterion variables of interest are listed in Tables 18 through 19 along with their respective Unstandardized and Standardized Regression coefficients (β) and zero-order correlations. With respect to the predictive utility of the parental characteristics for stress 1, the R^2 indicated that the amount of variance

Table 17.

Correlations between Parental Characteristics and mYPAS stress 1 and 2.

	STAI-state	STAI-trait	mYPAS stress 1	mYPAS stress 2
STAI-state	1.00			
STAI-trait	.567**	1.00		
mYPAS stress 1	.199	.444*	1.00	
mYPAS stress 2	.048	.256	.624***	1.00

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); STAI-state = State-Trait Anxiety Inventory (Spielberger et al., 1970) state form; STAI-trait = State-Trait Anxiety Inventory (Spielberger et al., 1970) trait form; stress 1 = leaving the day surgery room; stress 2 = anaesthetic mask placement.

* $p = .05$

** $p = .01$

*** $p = .001$

Table 18.

Regression Model for Stress 1: Parental Characteristics.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
STAI-state	-0.023	0.077	-0.066	0.199
STAI-trait	0.185	0.090	0.461*	0.444

Note: STAI-state = State-Trait Anxiety Inventory (Spielberger et al., 1970) state form; STAI-trait = State-Trait Anxiety Inventory (Spielberger et al., 1970) trait form.
* $p = .01$

Table 19.

Regression Model for Stress 2: Parental Characteristics.

Model	Unstandardized Coefficients		Standardized Coefficients	Zero-order Correlations
	(β)	Std. Error	*(β)*	
STAI-state	-0.079	0.124	-0.142	0.048
STAI-trait	0.208	0.138	0.337	0.256

Note: STAI-state = State-Trait Anxiety Inventory (Spielberger et al., 1970) state form; STAI-trait = State-Trait Anxiety Inventory (Spielberger et al., 1970) trait form.

accounted in the stress 1 was 20.2% and the model was significant, $F[2,27] = 3.41, p < .05$. Table 18 illustrates that one of the variables entered into the model was identified as a significant predictor of stress 1: trait anxiety. The R^2 indicated that the amount of variance accounted in the stress 2 was 7.9% and the model was not significant, $F[2,27] = 1.16$, ns. Table 19 illustrates that none of the variables entered into either model was identified as a significant predictor of stress 2.

Discussion

Researchers have identified parental anxiety to be a factor that might impact a child's level of anxiety at anaesthetic induction. For example, children of anxious parents who were present during induction have been shown to display more anxiety at induction than children of anxious parents who were not present during induction (Bevan et al., 1990). In addition, parental anxiety has been identified as a significant predictor of child anxiety at induction (Cameron et al., 1996). The primary purpose of this investigation was to determined whether parental state and/or trait anxiety (as measured by the STAI) was associated with and predictive of child anxiety when a child leaves the day surgery room and anaesthetic induction, in the situation where the parent accompanies the child into the OR. The specific findings will be subsequently discussed.

In an effort to further examine the impact of parental presence on child anxiety, the association between parental characteristics (i.e., state and trait anxiety) and observer-rated child anxiety at induction was explored. Results suggested a significant association between parental trait anxiety (as measured by STAI) and child anxiety at the time-point just prior to entering the OR. Specifically, higher parental trait anxiety was associated with higher observer-rated child anxiety just prior to entering the OR. These results

suggest that parental trait anxiety may be a useful construct to assess as a predictor of child anxiety during the day surgery procedure, specifically at this time-point.

Although these findings are interesting, there were a number of limitations that deserve attention. First, all the medical personnel that were involved in this investigation were extremely cooperative. That being said, at times some instructions were made to the parents when they came into the OR that may have impacted the results. Parents were often instructed to sit on a chair beside their child and told that they could hold their child's hand. These instructions may have directed the behaviour of the parents (e.g., may not have been the natural choice of behaviour of parent) as well as possibly impacted child anxiety during anaesthetic induction. Specifically, the instructions given to parents at stress 2 may have influenced the expected association between parental anxiety and child anxiety at stress 2 (may have changed anxious parents' behaviour or minimized differences between anxious and non-anxious parents that would have otherwise influenced children's anxiety at stress 2). Examination of the association between the provision of physical comfort and anxiety during anesthetic induction deserves further examination.

Second, selection bias deserves some attention as well. Participation in this investigation was quite good (83%); however, it is important to consider that there may be a reason why some participants did not participate. For example, it could be the case that parents who chose not to participate were ones whose child was typically very anxious or parents with high state and/or trait anxiety ay have been less willing to participate themselves. Therefore, we may have missed an entire group of very anxious children and/or parents.

Third, the physical set up of the RUH Department of Dentistry may have impacted anxiety ratings and/or behaviour. The OR is down the hall from the waiting room and recovery room is beside the OR. Often one could hear children in distress (i.e., crying or screaming). Hearing other children's distress may have elevated individual children's ratings of anxiety or possibly impacted levels of participation. In order to examine the impact of this variable, it may be necessary for future investigations in this type of setting to inquire if the participants are bothered by hearing other children in distress and if so did this experience impact their anxiety ratings or behaviour. This variable could be examined experimentally as well. While it is important to acknowledge the possible impact of this variable, one cannot change the physical set up of this particular location for research purposes; essentially this is simply an aspect of conducting research in the real world.

Fourth, as noted in Footnote 5, no ethnic differences were noted across parental anxiety. However, differences were observed across observer-rated child anxiety, with Aboriginal children having significantly higher mYPAS scores just prior to entering the OR and during anaesthetic induction than Caucasian children. As a result of the small sample size, these ethnic differences may have limited generalizability. Subsequent research examining potential differences in preoperative anxiety across Aboriginal and Caucasian children is warranted.

Fifth, in completing the observer-rated anxiety measure (mYPAS), our first rater was not blind to the study hypotheses. This may have impacted the direction of the findings. That being said, good inter-rater reliability was observed between first and second raters (second rater was blind to STAI anxiety scores on day of surgery).

The primary finding of this investigation is that higher parental trait anxiety was associated with higher observer-rated child anxiety at the time-point when the child is about to enter the OR. These results suggest that parental trait anxiety may be a useful concept to employ as a predictor of child anxiety during the day surgery procedure, specifically at this time-point. In turn, the STAI-trait form would be an easily administered measure that may be useful in identifying anxious parents who could benefit from training in what to do at the time-point when the child is about to leave the day surgery room to enter the OR, to minimize their child's anxiety at this period. While these findings are interesting, it would be advantageous for future research to actually examine what types of behaviours parents are engaging in during this time-point. In order to do so, it would be necessary to video the interactions that take place during this time-point. Practically speaking, this may be difficult to execute given the set up of typical day surgery rooms, fast-paced environment, and the numerous individuals that come and go throughout the day surgery process. Findings that may be elicited from such an investigation may clarify the observed relationship between elevated parental trait anxiety and elevated child anxiety at this time-point just prior to entering the OR.

CHAPTER FIVE: Study 4

Parent-Child Interactions and their Influence on Child Anxiety at Anaesthetic Induction.

Introduction

According to Piira et al. (2005), it appears that parents are not routinely informed about what they could do to improve their child's experience when parents are present during a medical procedure (e.g., anaesthetic induction) and desire information regarding how they could best help their child in such a situation. The combination of parental presence, coupled with information provision, may further improve parent and child outcomes when parents are present during medical procedures (e.g., anaesthetic induction). Nevertheless, the current literature lacks evidence to suggest which types of behaviors would be most useful for parents to employ in the OR context (i.e., limited knowledge of which particular parental behaviors are associated with decreased child anxiety and distress in the context of anaesthetic induction). Similarly, there is limited evidence on which behaviors parents should avoid in this context (i.e., which particular parental behaviors are associated with increased child anxiety and distress in this context). In order to better understand parent-child interactions and their relationship to anxiety in this setting, the use of an observational tool is required. von Baeyer (2001) and Chambers (2003) identified behaviour observational tools, such as the Child Adult Medical Procedures Interaction Scale-Revised (CAMPIS-R; Blount et al., 1997), as being potentially useful in this setting. The CAMPIS-R (Blount et al., 2001) is employed to record children's procedural distress and coping, as well as the coping promoting behaviours and distress promoting behaviours of their parents and the medical personnel who are present during medical procedures. The CAMPIS-R has not previously been

used as an observation tool during anaesthetic induction and is used more typically during painful medical procedures (i.e., immunizations). Very recently, the Peri-Operative version of the CAMPIS (Blount et al., 1989) (P-CAMPIS; Caldwell-Andrews et al., 2005b) was developed. The research group that developed the P-CAMPIS was contacted in an attempt to obtain this measure during the planning stages of the present research; however, the P-CAMPIS was unavailable at that time as its psychometric properties were being examined by its developers. The P-CAMPIS consists of 40 codes that describe verbal and nonverbal interactions between children, parents, and medical personnel in the perioperative setting (Caldwell-Andrews et al., 2005b). The P-CAMPIS was developed by modifying the original CAMPIS; this modification included the addition of codes to accommodate specific behaviours unique to the perioperative setting as well as the deletion of codes that were not appropriate or applicable in this setting. The P-CAMPIS demonstrated initial good convergence with child preoperative anxiety as measured by the mYPAS (Caldwell-Andrews et al. 2005b).

Given the status of the current literature it appears that exploration of parent-child behaviour and the impact of this interaction on child anxiety during anaesthetic induction is warranted. The CAMPIS-R (with some modifications to make appropriate for the OR context) presents itself as a measure that could potentially be readily applied to this setting. It is anticipated that its use may shed some light on why empirical investigations into the effectiveness of parental presence to reduce child preoperative anxiety has produced inconsistent results. The specific purposes of this investigation are itemized below.

Purposes and Hypotheses

The purposes of Study 4 were threefold: (1) to examine the validity of the use of the modified CAMPIS-R in the OR setting, (2) to examine the association between parental distress promototing behaviours and child distress during anaesthetic induction, and (3) examine the association between parental coping promoting behaviours and child coping during anaesthetic induction.

There were two hypotheses:

(1) adult distress promoting behaviours (e.g., reassuring comments, apologies to the child, indicating empathy, giving control to the child, and criticism of the child; as coded by the modified CAMPIS-R) would be associated with higher child distress on the modified CAMPIS-R and higher levels of observer-rated child anxiety on the mYPAS;

(2) adult coping promoting behaviours (e.g., commands to engage in coping behaviors, non-procedural talk to the child, and humour directed to the child; as coded by the modified CAMPIS-R) would be associated with child coping behaviours (as identified by the modified CAMPIS-R) during anaesthetic induction.

Method

Participants

The participants utilized in this investigation are the same that were employed in Study 3 (please see Chapter 4, Participants Section, page 96). Study 3 examined the association between parental anxiety (state and trait) and child preoperative anxiety.

Measures (see Appendix B)

Measure of Children's Pre- and Perioperative Anxiety

Modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a; see Appendix B). The mYPAS is a 22-item observer rated scale designed to measure a child's level of anxiety (Kain et al., 1997a). The mYPAS has five subscales: activity, vocalizations, emotional expressiveness, state of apparent arousal, and use of parents. Each scale is scored from 1 to 4, with the exception of vocalizations, which is scored from 1 to 6, to give a total score that can range from 5 to 22. (Please see Chapter 2 Measures Section, page 42 for mYPAS psychometric properties)

Measure of Child-Adult Behaviours

Modified Child-Adult Medical Procedure Interaction Scale-Revised (Modified CAMPIS-R; see Appendix B). The CAMPIS-R (Blount et al., 1997) is an observational behaviour rating scale of children's procedural distress and coping, and coping promoting behaviours and distress promoting behaviours of their parents and medical personnel who are present during medical procedures. Typically, the behaviours of parent, medical staff, and child are videotaped and later coded in accordance with a dichotomous rating (present/absent) on six dimensions: Child Coping, Child Distress, Child Neutral, Adult Coping Promoting, Adult Distress Promoting, and Adult Neutral. Child and Adult Neutral behaviours were not considered in the present study (for identification of these behaviours see Blount et al., 1997). Behaviours previously coded as 'Child Coping behaviours' (based on research using the CAMPIS-R in other contexts) include audible deep breathing, nonprocedural talk by child, humor by the child, and making coping statements. Behaviours previously coded as 'Child Distress behaviours' include crying, screaming, verbal resistance, request of emotional support, verbal fear, verbal pain, verbal emotion, and information seeking. Behaviours previously coded as 'Adult Coping

Promoting behaviours' include nonprocedural talk or humor to child and commands to use coping strategies. Finally, behaviours previously coded as 'Adult Distress Promoting behaviours' include reassuring comments, apologies, empathic statements to child, giving control to child, and criticism. In the present study, the coding system was expanded by including additional potential Child Coping behaviours (i.e., reading books, pointing to medical charts or other decorations on wall, playing, and watching TV) and additional potential Child Distress behaviours (i.e., physical request of support, restraint of child, flail, and physical resistance). These behaviours were included as they are behaviours that were specific to this particular context and it was felt that the other codes did not adequately capture these behaviours (see Table 21 for description of behaviours). They were classified based on face validity for inclusion in the two categories of interest (i.e., Child Coping vs. Child Distress, respectively). Additionally, as it is typically used, the adult dimensions are coded separately for parents and medical staff (e.g., nurse). In the present study, only parent behaviours were coded for the adult behavior dimensions, rather than both parents and medical staff, as parent behavioural was the key focus of this investigation.

Two coders, blind to the study hypotheses, coded the tapes. Raters coded the videotapes in two passes: child codes were rated first and then parent codes. Behaviours were coded as being present or absent during 5 second increments for 1.5 minutes during baseline (waiting room) and 1.5 minutes during anaesthetic induction. Inter-rater reliabilities were calculated on 20% of the participant tapes at anaesthetic induction. Most codes had highly skewed distributions. Kappa measurements are extremely sensitive and do not accurately reflect inter-rater agreement (Bakeman & Gottman, 1997; Conger,

1980; Light, 1971; Zwick, 1988) and are overly punishing for low base rate behaviour (Feinstein & Cicchetti, 1990). Thus, percent agreement was used. For anaesthetic induction, the inter-rater reliabilities were as follows: child coping behaviours = 97%, child distress behaviours = 97%, adult coping behaviours = 100%, and adult distress behaviours = 95%.

Procedure (see Appendix C)

When a child meeting the age criterion was scheduled for dental surgery at the RUH Department of Dentistry, the child's parents were contacted via mail to inform them of the study and provide them with a letter describing the study. One week after the letter was mailed to parents of eligible children, the parents were contacted by phone and asked if they were willing for their child to participate in the study.

Preoperative Holding Area

Sixty minutes before the child's surgery (a point in time that was chosen to ensure no interruption of normal routine of the surgery by the study), written informed consent was obtained from the child's parent for his/her participation and that of the child. The child's verbal assent was also obtained. Parents were asked to consent to the use of the data that was collected over the phone, and necessary data from their child's case file at the RUH Department of Dentisty (e.g., number of previous surgeries). If the parent consented and the child provided verbal assent, children's anxiety levels were also observer-rated, using the mYPAS (Kain et al., 1997a). The anesthesiologist performed a pre-anaesthetic assessment to determine the child's medical eligibility for the study.

At the following 5 specific time-points, the researcher assessed observer-rated child anxiety: (1) When the child was in the waiting room (baseline 1); (2) 5 minutes

prior to leaving day surgery room (baseline 2); (3) Leaving the day surgery room to enter the OR (stress 1); (4) When the anaesthetic mask was being placed on the child's face (stress 2); and (5) When the child returned to day surgery (day surgery).

The child's behaviour was videotaped at two time-points (same time-points observer-rated anxiety was measured): (1) prior to surgery in the waiting room (baseline 1, above) and (2) at anaesthetic induction (stress 2, above). The modified CAMPIS-R (Blount et al., 1997) was used at a later date to code the behaviour of child and parent as a method to systematically examine parent-child behaviour observed in the videotapes.

Anaesthetic Induction

The anaesthetic technique was standardized, with mask inhalation induction.

Post-Surgery

The recovery room nurse rated the child's awakening as smooth, restless, or stormy based on criteria that are currently used clinically at the IWK. Recovery room nurses at RUH Department of Dentistry agreed to follow the same criteria used at IWK for the purposes of this investigation. They also noted if any difficulties arose in the recovery room (e.g., nausea or dizziness) and if any medications were administered. The time elapsing from surgery to the transfer of the child to the day surgery room was recorded. After arrival in the day surgery room, observer ratings of anxiety were made again. The child was provided with a sticker as token of thanks for his/her participation in the study.

Results

Descriptive Statistics

Mean, standard deviation (*SD),* and range of mYPAS scores across the four time-points are presented in Table 20. (Only four time-points appear in Table 20 as there were a significant number or children who were not awake during the fifth planned data collection time-point.). For additional descriptive statistics please see Chapter 4, Descriptive Statistics Section, page 100.

Relationship between Child and Adult Behaviours

A modified CAMPIS-R was employed to examine the specific behaviours that children and their parents engaged as well as their interactions during anaesthetic induction (see Table 21 for description of child and adult behaviours). The child was video-taped at two time-points: (1) baseline 1 (waiting room) and (2) stress 2 (anaesthetic induction) (see Tables 22 through 25 for proportion of behaviours observed). Tables 22 through 25 show that certain behaviours were simply not observed in this setting. Those behaviour codes that were not observed were dropped from further analyses. These observations impact the number of behaviour codes that make up the overall behaviour categories (i.e., Child Coping, Child Distress, Adult Coping Promoting, and Adult Distress Promoting). Therefore, it was necessary to examine the association between the observed individual behaviour codes. It was additionally important to examine their association because this measure has not been previously used within the pediatric day surgery context and it is unknown what behaviours actually constitute the constructs of child coping, child distress, adult coping promoting, and adult distress promoting behaviour and thus which behaviours belong in each of these categories. Bivariate correlations were computed separately for child and adult behaviour codes for only the behaviours that were observed during baseline and anaesthetic induction (see Tables

Table 20.

Mean, SD, and range for mYPAS scores across four time-points.

Assessment time-point	mYPAS Mean(SD)	score range
baseline 1	6.90(1.92)	5-12
baseline 2	6.93(2.30)	5-15
stress 1	8.97(4.14)	5-18
stress 2	12.77(6.37)	5-22

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a); baseline 1 = child in the waiting room; baseline 2 = 5 minutes prior to leaving the day surgery room; stress 1 = leaving the day surgery room; stress 2 = anaesthetic mask placement. Range of possible scores is 5-22.

Table 21.

Modified CAMPIS-R Child and Adult Behaviour Descriptions.

Behaviours	Description of Behaviour	Examples
Child Coping Behaviours		
Nonprocedural talk, behaviour, distraction	The child engages in talk, behaviour, or distraction that is not related to his or her current physical condition or the procedure.	1. "My dog's name is Benji." 2. "I am in grade 1."
Coping Statements	The child makes some statements that indicates courage or attempts to soothe himself or herself verbally.	1. "I'll be OK." 2. "It won't last long."
Deep breathing	Deep breathing that is used to cope with the procedures.	NA
Reading books	The child engages in reading books by him or herself or with parent.	NA
Pointing to medical charts, or other decorations on wall	The child points to medical charts or other decorations on the wall.	NA
Playing (toys,	The child plays with toys,	NA

puzzles)	puzzles etc.	
Watching TV	The child watches TV.	NA
Humour	The child makes a statement that is clearly intended to be humorous and is primarily lighthearted in tone.	1. Out right jokes of the "one-liner" variety. 2. Statements that emphasize the humorous aspects of the situation or problem.
Child Distress Behaviours		
Cry	The child makes crying sounds.	1. "Sobbing" 2. Crying sounds.
Scream	The child makes a vocal expression of pain or fear at high pitch/intensity.	1. Sharp, shrill, harsh, high tones 2. Shrieks
Verbal resistance	The child makes a verbal expression of delay, termination, or resistance.	1. "Stop!" 2. "Don't!"
Verbal Request of Support	The child engages in verbal solicitation of hugs, hand holding, physical or verbal comfort.	1. "Hold me." 2. "Help me."
Physical Request of Support	The child engages in physical solicitation of physical or verbal	1. Grabbing or holding parent's hand.

	comfort.	2. Reaching for parent.
Verbal Fear	The child makes a statement of being apprehensive or in fear.	1. "I am afraid." 2. "I am scared."
Verbal Pain	The child makes a statement of experiencing pain, damage, or being hurt.	1. "That hurts." 2. "It stings."
Negative emotion	The child makes a statement other than verbal fear or verbal resistance that expresses a negative emotional state.	1. "I hate doctors." 2. "I don't like doing this."
Information Seeking	The child asks a question about the medical procedures.	1. "Will you let me know when you're ready to start?" 2. "What does that balloon do?"
Restraint of child	The child has to be held down or restrained by medical staff.	NA
Flail	The child throws his or her arms around and kicks his or her legs in an effort to get away from medical staff.	NA
Physical Resistance	The child actively tries to push away medical staff and anaesthetic equipment (i.e., face	NA

	mask).	
Adult Coping Promoting Behaviours		
Nonprocedural talk, behaviour, distraction	The parent engages in talk, behaviour, or distraction with the child that is not related to his or her current physical condition or the procedure.	1. Conversations about the child's pet, siblings, school, trip to the beach, toys etc. 2. Questions or conversations unrelated to the child's illness or treatment.
Humour	The parent makes a statement that is clearly intended to be humorous and is primarily lighthearted in tone.	1. Out right jokes of the "one-liner" variety. 2. Statements that emphasize the humorous aspects of the situation or problem.
Command to cope	The parent makes an order, suggestion, or statements of a rule, which direct the child to engage in a coping behaviour. These strategies are generally issued immediately prior to a painful event, and may suggest one (but not exclusively one) of	1. "Use your deep breathing now." 2. Imagine you are Superman and this is your test of strength."

	the following: relaxation, distraction, use of coping statements, or deep breathing.	
Adult Distress Promoting Behaviours		
Reassure	The parent makes procedure related comments that are directed toward the child with the intent of reassuring the child about his/her condition, or the course of the procedure.	1. "You're Ok." 2. "You'll be awake before you know it."
Empathy	The parent makes statements which show an appreciation for the frame of reference of the child being spoken to.	1. "I know this is hard." 2. "I know it hurts."
Physical comfort	The parent provides physical comfort for the child.	1. The parent holds the child's hand. 2. The parent hugs the child.
Giving control	The parent makes a statement to the child denoting that the child has control over some event to occur with relation to the	1. "Which way do you want to lay?" 2. "Where do you want your toy?"

	procedure.	
Apology	The parent makes any statement relating a sense of sorrow or a sense of responsibility for the pain/anxiety the child is expressing.	1. "I am sorry you have to go through this." 2. "Jaime, we don't like doing this either."
Criticism	The parent makes a statement that finds fault or implies fault with the (a) activities, (b) products, or (c) attributes of the child. Criticisms include negatively evaluative adjectives or adverbs referring to the child, statements of disapproval, statements pointing out something wrong about the child or the child's behaviour, statements pointing out that the child is not doing something positive, and obvious sarcastic statements (if unaccompanied by laughter). Criticism is usually accompanied by a harsh voice	1. "Timmy, you are not being a big boy." 2. "You didn't use your breathing that time like I told you to."

tone.

Table 22.

Proportion of observed Child Coping behaviours over a 1.5 minute time-period.

Behaviours	Baseline (waiting room)	Anaesthetic Induction
Nonprocedural talk, behaviour, distraction	51.8%	29.9%
Coping Statements	0%	0%
Deep breathing	0%	0%
Reading books	0%	0%
Pointing to medical charts, or other decorations on wall	0%	0%
Playing (toys, puzzles)	36.8%	70.1%
Watching TV	11.4%	0%
Humour	0%	0%
Total Behaviours	508	134

Table 23.

Proportion of observed Child Distress behaviours over a 1.5 minute time-period.

Behaviours	Baseline (waiting room)	Anaesthetic Induction
Cry	0%	13.6%
Scream	0%	2.2%
Verbal resistance	0%	4.2%
Verbal Request of Support	0%	0%
Physical Request of Support	97.5%	58.9%
Verbal Fear	0%	4.5%
Verbal Pain	0%	0.6%
Negative emotion	2.5%	2.5%
Information Seeking	0%	0%
Restraint of child	0%	1.7%
Flail	0%	0.2%
Physical Resistance	0%	13.8%
Total Behaviours	40	528

Table 24.

Proportion of observed Adult Coping Promoting behaviours over a 1.5 minute time-period.

Behaviours	Baseline (waiting room)	Anaesthetic Induction
Nonprocedural talk, behaviour, distraction	100%	100%
Humour	0%	0%
Command to cope	0%	0%
Total Behaviours	26	22

Table 25.

Proportion of observed Adult Distress Promoting behaviours over a 1.5 minute time-period.

Behaviours	Baseline (waiting room)	Anaesthetic Induction
Reassure	0%	5.9%
Empathy	0%	0%
Physical comfort	100%	89.8%
Giving control	0%	4.3%
Apology	0%	0%
Criticism	0%	0%
Total Behaviours	29	371

26 through 28). No correlation table exists for adult behaviours during baseline as only two behaviours were observed during this period. With respect to child codes during baseline, the only behaviours that were found to be significantly associated were Nonprocedural Talk and Playing (two purported Child Coping behaviors which were unexpectedly negatively intercorrelated; $r = -.73, p < .001$) and Negative Emotion and Physical Request of Support (two purported Child Distress Behaviours which were positively intercorrelated, as expected; $r = .42, p < .05$). No adult codes were associated during baseline (although Nonprocedural Talk and provision of Physical Comfort were the only two parental behaviors that were observed during the baseline period). The negative correlation between Nonprocedural Talk and Playing codes suggests that these two child behaviour codes do not tap the same construct in the day surgery context. During anaesthetic induction, all Child Distress codes with the exception of three (i.e., Physical Request of Support, Verbal Fear, and Negative Emotion) demonstrated significant positive associations with one another with correlations ranging from .51 ($p <$ .01) (correlation between Cry and Verbal Resistance) to 1.00 ($p < .001$) (correlation between Verbal Pain and Restraint). No Child Coping codes were found to be associated during anaesthetic induction. Also, no Child Coping codes were significantly associated with Child Distress codes at anaesthetic induction. With respect to adult codes, only one set of behaviour codes were significantly associated, Physical Comfort and Giving Control ($r = -.41, p < .05$); these have been classified as distress promoting behaviours in previous research. This association was in the negative direction, which suggests that they are not tapping the same construct.

Table 26.

Correlations between Child Coping and Distress behaviours during baseline.

	Nonprocedural talk	Playing	Watching TV	Physical Request of Support	Negative Emotion
Nonprocedural talk	----------				
Playing	-.725***	----------			
Watching TV	-.225	-.033	----------		
Physical Request of Support	-.286	-.132	.121	----------	
Negative Emotion	.006	-.151	-.073	.419*	----------

* $p = .05$
** $p = .01$
*** $p = .001$

Table 27.

Correlations between Child Coping and Distress behaviours during anaesthetic induction.

	Nonpro	Playing	Cry	Scream	VerbalR	PhysR	VFear	VPain	Nege	Rest	Flail	Physres
Nonpro	--------											
Playing	-.060	--------										
Cry	-.068	-119	--------									
Scream	-.155	-.156	.777***	--------								
VerbalR	-.113	-.145	.506**	.792***	--------							
PhysR	.128	-.023	-.155	.005	-.245	--------						
VFear	-.166	-.167	.356	.080	-.097	-.167	--------					
VPain	-.092	-.093	.640***	.890***	.871***	-.105	-.062	--------				
Nege	.218	-.116	-.064	-.073	-.068	.200	-.078	-.043	--------			
Rest	-.092	-.093	.640***	.890***	.871***	-.105	-.062	1.00***	-.043	--------		
Flail	-.092	-.093	.640***	.890***	.871***	-.105	-.062	1.00***	-.043	1.00***	-------	
Physres	-.256	-.151	.712***	.398*	.053	-.117	.565***	.122	.-.146	.122	.122	--------

Note: Nonpro = Nonprocedural Talking; VerbalR = Verbal Request of Support; PhysR = Physical Request of Support; VFear = Verbal Fear; VPain = Verbal Pain; Nege = Negative Emotion; Rest = Restraint; Physres = Physical Resistance.

* $p = .05$

** $p = .01$

*** $p = .001$

Table 28.

Correlations between Adult Coping Promoting and Distress Promoting behaviours during anaesthetic induction.

	Nonprocedural talk	Reassurance	Physical Comfort	Giving Control
Nonprocedural talk	----------			
Reassurance	-.075	----------		
Physical Comfort	.053	-.181	----------	
Giving Control	-.052	.015	.-.408*	----------

* $p = .05$

** $p = .01$

*** $p = .001$

Given these findings, the individual behaviour codes that comprise the overall child and adult code categories were modified. It appears that only one overall behaviour category deserves composite scoring: Child Distress. Examination of the correlation matrix shows that Cry, Scream, Verbal Resistance, Verbal Pain, Restraint of Child, Flail, and Physical Resistance are all significantly positively intercorrelated. Verbal Fear only correlated well with some of these behaviour codes. In order to determine whether Verbal Fear should be included in this behaviour category, bivariate correlations were computed between a Child Distress category total with and without the Verbal Fear code included and the mYPAS. Results demonstrated that removing the Verbal Fear code did not significantly improve the correlation of the overall Child Distress composite with the mYPAS at induction ($r = .71$, $p < .001$) relative to when the Verbal Fear code was included ($r = .70$, $p < .001$; see Table 29). Moreover, the Verbal Fear code has high face validity for inclusion in a Child Distress composite score. For these reasons, I decided to include Verbal Fear in the overall Child Distress behaviour category. The remaining behaviours had to be examined on an individual basis since there was not evidence from the intercorrelations that I was justified in combining any into composite codes.

The Child Distress behaviour composite score was coded by re-examining the data coding sheets and providing only 1 agreement point for any Child Distress behaviour that occurred during each 5-second interval. Bivariate correlations were then computed between the Child Distress behaviours composite score and the following: Child Nonprocedural Talk, Child Playing, Nonprocedural Talk by Adult, Adult provision of Physical Comfort, Adult provision of Reassurance, and Adult Giving Control at anaesthetic induction (see Table 29). As mentioned previously, results suggest that the

Table 29.

Correlations between mYPAS stress 2 and modified CAMPIS-R observed behaviours at anaesthetic induction.

	Nonprocedural Talk by Child	Playing by Child	Nonprocedural Talk by Adult	Reassurance by Adult	Physical Comfort by Adult	Giving Control by Adult	Child Distress Total	mYPAS
Nonprocedural Talk by Child	----------							
Playing by Child	-.060	----------						
Nonprocedural Talk by Adult	-.140	.002	----------					
Reassurance by Adult	-.110	.000	-.075	----------				
Physical Comfort by Adult	.135	-.026	.053	-.181	----------			
Giving Control by Adult	-.092	-.093	-.052	.015	-.408*	----------		
Child Distress Total	-.184	-.209	.165	.495**	-.235	.413*	----------	
mYPAS	.054	-.203	.228	.223	-.063	.274	.711***	----------

Note: mYPAS = modified Yale Preoperative Anxiety Scale (Kain et al., 1997a).
* $p = .05$

** $p = .01$
*** $p = .001$

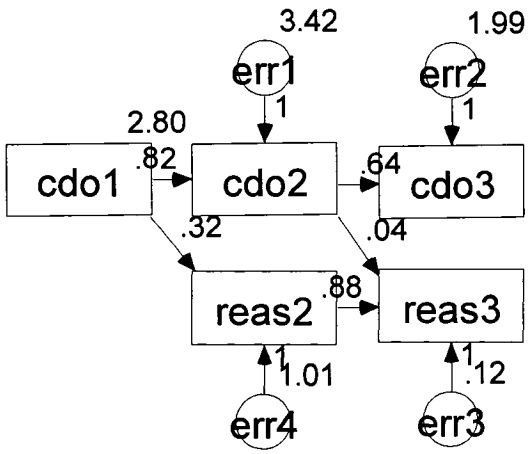
association between mYPAS and Child Distress behaviours was highly significant (r = .71, p = .000). This association provides initial evidence of concurrent validity between modified CAMPIS-R and mYPAS, both of which are intended to tap similar constructs (child distress and child anxiety, respectively). The association between parental provision of Reassurance and Child Distress behaviours was also significant (r = .50, p < .01). The association between Reassurance and Child Distress was in the positive direction suggesting that child distress may 'pull for' parents to provide reassurance to the child, or that parents who provide reassurance to their children cause increased distress in the child. This correlation is consistent with the notion of parental provision of Reassurance to the child as a parental Distress Promoting behaviour as suggested by previous work with the CAMPIS is other contexts. The association between parental provision of Giving Control to the child and Child Distress behaviours was also significant (r = .41, p < .05). Giving Control and Child Distress was positive in direction similarly suggesting that child distress may 'pull for' parents to pass over control to the child, or that parents who give control over to their children cause increased distress in the child. Akin to the above association, this finding is consistent with the notion of parental Giving Control to the child as a parental Distress Promoting behavior as suggested by previous work with the CAMPIS in other contexts.

Given the observed correlational associations between both parental provision of Reassurance and Giving Control with Child Distress, an examination of potential sequential associations were explored. Additionally, the potential sequential association between parental provision of Physical Comfort and Child Distress was also examined. Although a significant relationship was not observed between the Physical Comfort and

Child Distress total scores (collapsed across observation intervals), this does not negate a potential sequential relationship(s) at certain observation intervals. To examine the sequential relationship between Child Distress behaviours and these three potential adult Distress Promoting behaviours, AMOS 5.0 (Arbuckle, 1993-2003) was employed. Behaviours were recorded during 5-second intervals for 1.5 minutes during baseline and anaesthetic induction. For analyses, the 18 5-second intervals during anaesthetic induction were collapsed into 3 30-second segments to accommodate the small sample size (n = 30). Using AMOS, six models were built to examine the sequential relationship between child and parent behaviours during anaesthetic induction. The sequential association between Giving Control and Child Distress was not able to be explored due to low base rate of observation of this behaviour (see Table 25). Specifically, this behaviour was absent from one of the three 30-second observation intervals during anaesthetic induction, resulting in no variability in one of the observation intervals. The latter impacted the ability of AMOS to run sequential analyses with this variable.

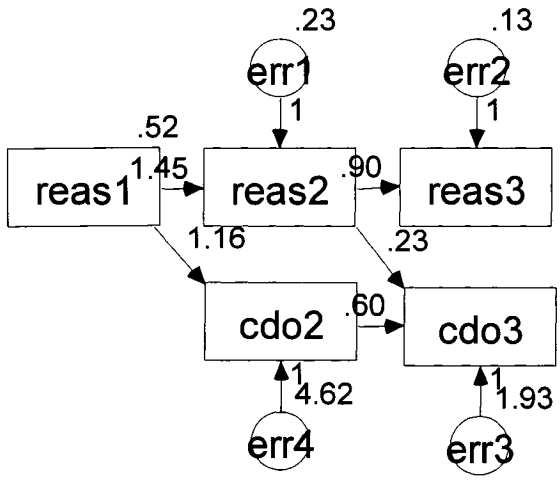
Next, the sequenital association between parental provision of Reassurance and Child Distress was explored. The first model examined the association between child and parent behaviours with child behaviours preceding parent behaviours: Model 1: Child Distress and Reassurance (see Figure 5). The second model examined the association between child and parent beahviours with parent behaviours preceding child behaviours: Model 2: Reassurance and Child Distress (see Figure 6). Lastly, the sequential association between parental provision of Physical Comfort and Child distress was explored. The third model examined child and parent behaviours with child behaviours preceding parent behaviours: Model 3: Child Distress and Physical Comfort (see Figure

Figure 5. Model 1: Child Distress and Reassurance.



Note: cdo1 = child distress behaviours in the OR (1-30 seconds); cdo2 = child distress behaviours in the OR (31-60 seconds); cdo3 = child distress behaviours in the OR (61-90 seconds); reas2 = reassurance in the OR (31-60 seconds); reas3 = reassurance in the OR (61-90 seconds).

Figure 6. Model 2: Reassurance and Child Distress



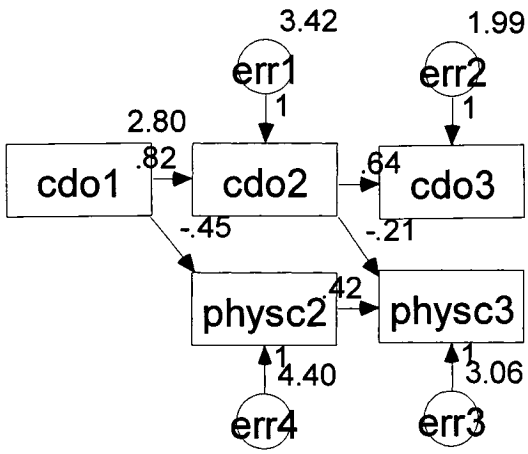
Note: reas1 = reassurance in the OR (1-30 seconds); reas2 = reassurance in the OR (31-60 seconds); reas3 = reassurance in the OR (61-90 seconds); cdo2 = child distress behaviours in the OR (31-60 seconds); cdo3 = child distress behaviours in the OR (61-90 seconds).

7). The fourth model examined the association between child and parent behaviours with parent behaviours preceding child behaviours: Model 4: Physical Comfort and Child Distress (see Figure 8). Following the recommendations of Hu and Bentler (1998), multiple indices of model fit were used: χ^2/df (values should be < 2.0), Comparative Fit Index (CFI; values should be close to .95), Root Mean Square Error of Approximation (RMSEA; values should be around .05), and Standardized Root Mean Square Residual (SRMR; values should be around .08). In addition to the aforementioned fit indices, the individual models were examined for theoretical fit. For fit statistics see Table 30.

Results for Model 1, examing the sequential association between Child Distress and Reassurance with child distress preceding parental reassurance, suggested that the model fit the data, $\chi^2(5) = 7.00$, $p = .221$. The fit statistics were good (χ^2/df = 1.40; CFI = .98; SRMR = .05), with the exception of RMSEA =.12. Results for Model 2, examining the sequential association between Reassurance and Child Distress with parental provision of reassurance preceding child distress, suggested that the model did not fit the data, $\chi^2(5) = 61.28$, $p = .000$. All fit statistics were poor (χ^2/df = 12.26; CFI = .71; RMSEA = .62) with the exception of SRMR =.04.

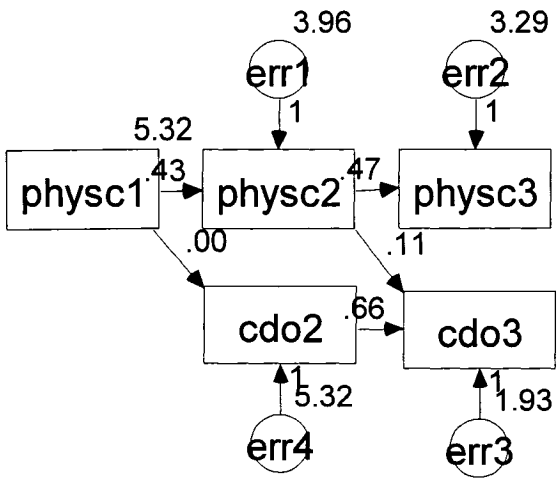
Results for Model 3, examing the sequential relationship between Child Distress and Physical Comfort with child distress preceding parental provision of physical comfort to the child, suggested that the model did fit the data, $\chi^2(5) = 1.44$, $p = .009$. The fit statistics were all excellant (χ^2/df = 0.29; CFI = 1.00; RMSEA = .00; SRMR = .04). Results for Model 4, examing the sequential relationship between Physical Comfort and Child Distress, suggested that the model did fit the data, $\chi^2(5) = 4.44$, $p = .488$. The fit statistics were all excellent (χ^2/df = 0.88; CFI = 1.00; RMSEA = .00) with the exception

Figure 7. Model 3: Child Distress and Physical Comfort.



Note: cdo1 = child distress behaviours in the OR (1-30 seconds); cdo2 = child distress behaviours in the OR (31-60 seconds); cdo3 = child distress behaviours in the OR (61-90 seconds); physc2 = physical comfort in the OR (31-60 seconds); physc3 = physical comfort in the OR (61-90 seconds).

Figure 8. Model 4: Physical Comfort and Child Distress.



Note: physc1 = physical comfort in the OR (1-30 seconds); physc2 = physical comfort in the OR (31-60 seconds); physc3 = physical comfort in the OR (61-90 seconds); cdo2 = child distress behaviours in the OR (31-60 seconds); cdo3 = child distress behaviours in the OR (61-90 seconds).

Table 30.

Fit statistics for sequential models.

Model	χ^2	*DF*	X^2/df	CFI	RMSEA	SRMR
Model 1: Child Distress and Reassurance	7.00	5	1.40	.98	.12	.05
Model 2: Reassurance and Child Distress	61.28	5	12.26	.71	.62	.04
Model 3: Child Distress and Physical Comfort	1.44	5	0.29	1.00	.00	.03
Model 4: Physical Comfort and Child Distress	4.44	5	0.88	1.00	.00	.13

Notes: χ^2 = chi-square; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Residual.

of SRMR = .13.

Results suggest that three of the four models fit the data. Model 1 demonstrated a moderate positive association between initial child distress (interval 1) and increased parental reassurance (interval 2), with later child distress (interval 2) only mildly associated with subsequent increased parental reassurance (interval 3). Model 2 did not fit the data suggesting that parental provision of reassurance is neither helpful nor harmful in this context. The direction of the relation between initial child distress and provision of later physical comfort by the parent in Model 3 suggests that increased child distress is associated with less parental provision of physical comfort. In Model 4, there was no relation between initial parental provision of physical comfort (interval 1) and child distress (interval 2), but later parental provision of physical comfort to the child (interval 2) was mildly associated with increased child distress (interval 3). This latter sequential relation is consistent with the classification of parental provision of physical comfort to the child just prior to mask placement as a distress promoting behavior.

I had also planned to examine the potential sequential relations between potential parental coping promoting behaviors and child coping behaviors in this study. However, examination of the potential sequential associations between Child Coping behaviours (i.e., Nonprocedural Talk and Playing) and Adult Coping Promoting behaviours (i.e., Nonprocedural Talk by adult) was not permitted due to the low base rate of Nonprocedural Talk by adult. Specifically, this behaviour was absent from one of the three 30-second observation intervals during anaesthetic induction, resulting in no variability in one of the observation intervals. The latter impacted the ability of AMOS to run sequential analyses with this variable.

Discussion

Parental presence is utilized as an intervention strategy to alleviate preoperative anxiety in children. The efficacy of this strategy has been explored within the literature (for review see Piira et al., 2005); however, the findings have not always been entirely consistent. It has been speculated that the actual behaviours that parents engage while being present during anaesthetic induction may be of critical importance as opposed simply whether a parent is present or not. The types of behaviours that parents actually engage in and the impact that these behaviours have on children's anxiety and behaviour during anaesthetic induction has yet to be systematically explored within the literature prior to the present study. von Baeyer (2001) and Chambers (2003) identified the CAMPIS scales (e.g., CAMPIS-R; Blount et al., 1997) as observation tools that could be readily adapted for use in this setting. The CAMPIS-R (Blount et al., 1997) is a behaviour rating scale used to evaluate children's procedural distress and coping, as well as of coping promoting behaviours and distress promoting behaviours of adults and medical personnel who are present during medical procedures. Prior to this investigation, the CAMPIS-R had not been used as an observation tool during anaesthetic induction and more typically was used during painful medical procedures (i.e., immunizations). It was thought that the CAMPIS-R (with modifications) presented itself as a measure that could be readily applied to the pediatric day surgery setting and it is was anticipated that its use might shed some light on why empirical investigations into the effectiveness of parental presence to reduce child preoperative anxiety have produced inconsistent results.

Therefore, one of the purposes of the present investigation was to utilize a modified version of the CAMPIS-R to systematically examine the behaviours that parents

and children engage in during anaesthetic induction and to examine its validity in the OR setting. A secondary purpose was to examine the association between child distress and parental distress promototing behaviours during anaesthetic induction. The third purpose was to examine the association between child coping and parental coping promoting behaviours during anaesthetic induction. The findings are addressed in relation to each of these purposes in turn.

The CAMPIS-R was modified to include behaviours codes that appeared to not be appropriately captured by the existing codes. The coding system was expanded by including additional potential Child Coping behaviours (i.e., reading books, pointing to medical charts or other decorations on wall, playing, and watching TV) and additional potential Child Distress behaviours (i.e., physical request of support, restraint of child, flail, and physical resistance). The modified CAMPIS-R was used to examine the types of behaviours that children and parents were engaged in during baseline (behaviour in waiting room) and during anaesthetic induction. Examination of the proportion of child behaviours previously considered coping behaviors (Blount et al., 1997) observed during the baseline period (see Table 22) showed that the highest proportion of such behaviours observed were nonprocedural talk (51.8%) and playing (36.8%). Examination of the proportion of behaviors previously considered child distress behaviors (Blount et al., 1997) observed during the baseline period (see Table 23) showed that physical request for support was the primary distress behaviour observed (58.9%). Examination of the proportion of potential adult coping promoting behaviours observed during the baseline period (see Table 24) showed that parents were engaged only in nonprocedural talk (100%). With respect to potential adult distress promoting behaviours, the only behaviour

observed was provision of physical comfort (100%) (see Table 25). During anaesthetic induction, the highest proportion of potential child coping behaviours observed were playing (70.1%; i.e., holding or looking at toy) and nonprocedural talk (29.9%; see Table 22). Playing possibly appears to be mismatched with the particular situation (i.e., anaesthetic induction). However, this potential "mismatch" may be a function of semantics. The same codes were used during baseline and anaesthetic induction. Thus, if a child was holding a toy or looking at a toy during anaesthetic induction this behaviour was coded as "playing". At anesthetic induction, this behaviour could be recorded under a code with a different name, since it could be that children used the toy as a method of distraction. Future research may want to ask children and their parents why they decided to bring toys or particular toys into the OR in an effort to understand this behaviour more thoroughly. With respect to potential child distress behaviours at induction, physical request for support (58.9%), physical resistance (13.8%), and crying (13.6%) comprised the majority of behaviours observed (see Table 23). With respect to potential adult coping promoting behaviours during anaesthetic induction, parents were only involved in engaging in nonprocedural talk (100%), a behaviour that has been associated with decreased child distress in the pain literature (see Table 24). Parents were also involved in providing physical comfort (89.8%; see Table 25) at anaesthetic induction, which is purported to be an adult distress promoting behaviour within the conceptualization of the CAMPIS scales. It is important to note that this behaviour may have been confounded because the staff often encouraged the parents to hold their child's hand. This was not controlled for as we wanted to observe what typically happens within the OR context. Nonetheless, the fact that some parents were instructed by staff to engage in this

behaviour while others were not does impact our ability to make statements about the occurrence and impact of this particular behaviour as naturally employed by parents. Findings revolving around this issue will be discussed subsequently.

Overall, a number of behaviours codes included in the modified CAMPIS-R were not observed, and thus were dropped from scoring in the present study. These codes could be dropped from the modified CAMPIS-R when it is used in the pediatric day surgery context in future work. As mentioned earlier, the modified CAMPIS-R has not previously been used in the pediatric surgery context and thus the validity of each chosen behaviour code as a measure of the construct it was intended to tap was not known. Therefore, in order to evaluate the utility of the overall modified CAMPIS-R codes, bivariate correlations were computed between each of the behaviour codes for the child and adult behaviours (separately) in an effort to determine which behaviours were statistically associated, only including the behaviours that were observed (i.e., dropping all of those that did not occur from scoring). Results suggested that child codes such as Nonprocedural Talk and Playing (Child Coping Behaviours) and Negative Emotion and Physical Request of Support (Child Distress Behaviours) were associated at baseline. However, the association between Nonprocedural Talk and Playing was negative, suggesting that, although both were purported child coping behaivors, these two behaviours do not tap the same construct at baseline in the pediatric day surgery context. No adult codes were found to be associated during baseline. During anaesthetic induction (the time point of most interest in the current study investigation because prior research has shown this to be the most stressful period in the day surgery context; Kain et al., 1996a), all Child Distress codes with the exception of two were significantly associated.

However, the purported Child Coping codes of nonprocedural talk by the child and playing by the child were not found to be associated during anaesthetic induction. Thus, these two observed child coping behaviors were examined separately in the present investigation. With respect to adult codes during anaesthetic induction, only one set of behaviour codes were significantly associated, Physical Comfort and Giving Control. Unexpectedly, these were negatively intercorrelated suggesting that they are, in fact, not tapping the same intended construct of Adult Distress Promoting behaviour. Instead, it seems that the parents who are providing more physical comfort are those that also provide the least giving of control to the child, and vice versa. Thus, these two parent behaviors were examined separately in the present study.

The relationship between observed behaviours during anaesthetic induction are of most importance and therefore the intercorrelations yielded during this time-point were examined further. The findings suggest that there is only one overall behaviour category that could be identified: Child Distress. The following behaviours comprised this category because they were significantly intercorrelated: Cry, Scream, Verbal Resistance, Verbal Pain, Verbal Fear, Restraint of Child, Flail, and Physical Resistance. The other purported Child Distress behaviours were not intercorrelated with the other Child Distress behaviours and were therefore dropped from further analyses. The remaining behaviours of interest included: Nonprocedural Talk (by child), Playing (by child), Nonprocedural Talk (by adult), Reassurance (by adult), Physical Comfort (by adult), and Giving Control (by adult).

In order to further examine the validity of the modified CAMPIS-R, bivariate correlations were computed between mYPAS score at anaesthetic induction and the

modified Child Distress composite code from the modified CAMPIS-R (see Table 29). Results suggested a substantial association between Child Distress and mYPAS, suggesting that the Child Distress behaviour category has excellent concurrent validity with a well-established measure of child distress that is commonly used in this context.

As discussed earlier, the P-CAMPIS (Caldwell-Andrews et al., 2005b), the CAMPIS behavioural observation measure adapted to code behaviours during anaesthetic induction, was recently developed. The research group that developed the P-CAMPIS was initially contacted to obtain this measure; however, it was unavailable for distribution to other research teams at that time. Thus, the present investigation utilized a modified version of the CAMPIS-R where the modifications were specifically aimed to make the tool as relevant as possible to the pediatric day surgery context (e.g., through the addition of supplementary behavior codes for child behaviors observed in this context). It would be interesting to re-code the present investigations raw data using the P-CAMPIS coding scheme in order to compare results across coding systems. According to the developers of the P-CAMPIS (Caldwell-Andrews et al., 2005b), their new tool demonstrated good convergence with child preoperative anxiety as measured by the mYPAS. Specifically, Caldwell-Andrews et al. split their participants into one of two groups. Group 1 exhibited at least one of the following behaviour codes Verbal Fear, Verbal Resistance, and Crying and Group 2 exhibited none of these behaviour codes. These two groups were compared based upon mYPAS scores. Findings suggested that children demonstrating these three behaviours were significantly more anxious (as measured by mYPAS scores) than children who did not demonstrate these behaviours. The present findings also showed an association of the modified CAMPIS-R

(specifically, the child distress composite) with the mYPAS (albeit examined in a different manner). Caldwell-Andrews et al. anticipate designing future studies examining the sequential relationships between parent and child behaviour during anaesthetic induction using the newly designed P-CAMPIS, as we did in the present investigation with the modified CAMPIS-R.

Child distress was also positively associated with parental provision of Giving Control and Reassurance (behaviours previously considered Distress Promoting behaviours in prior work in other contexts; Blount et al., 1997). These associations suggest that child distress increases in relation to the provision of more giving of control and reassurance from parents and vice versa. Given these associations, I wanted to examine potential sequential associations between the parental provision of Reassurance and Giving Control with Child Distress to determine whether these parental behaviors preceded and possibly contributed to child distress and/or whether they were parental responses to child distress. Unfortunately, parental Giving Control behavior was absent from one of the three 30-second observation intervals during anaesthetic induction, resulting in no variability in one of the cells. The latter impacted the ability of AMOS 5.0 (Arbuckle, 1993-2003) to run sequential analyses with this variable. Future, experimental work should explore whether parental provision of giving control is causally-related to child distress in this context.

The planned sequential analyses were permitted in the case of parental provision of reassurance with child distress. Furthermore, I also examined the possible sequential relations between parental provision of physical comfort and child distress because there was the possibility of sequential relations even though the overall correlation (collapsed

across recording intervals) was not statistically significant. To examine the sequential relationship between Child Distress with the parental behaviors of Reassurance and Physical Comfort, respectively, during anaesthetic induction, AMOS was employed. Behaviours were recorded during 5-second intervals for 1.5 minutes during baseline and at anaesthetic induction. For analyses, the 18 5-second intervals were collapsed into 3 30-second segments to accommodate the small sample size ($n = 30$). Using AMOS, four models were built to examine the sequential associations between Child Distress and parental provision of Reassurance (2 models), and between Child Distress and parental provision of Physical Comfort (2 models). The first set of analyses examined the sequential association between Child Distress and Reassurance (by parent). The first model examined the association between child and parent behaviours with child behaviours preceding parent behaviours: Model 1: Child Distress and Reassurance (see Figure 5). The second model examined the association between child and parent beahviours with parent behaviours preceding child behaviours: Model 2: Reassurance and Child Distress (see Figure 6). The second set of analyses examined the sequential association between parental provision of Physical Comfort and Child Distress. The third model examined child and parent behaviours with child behaviours preceding parent behaviours: Model 3: Child Distress and Physical Comfort (see Figure 7). The fourth model examined the association between child and parent behaviours with parent behaviours preceding child behaviours: Model 4: Physical Comfort and Child Distress (see Figure 8).

Three of the four models demonstrated good fit with the data, suggesting both parental provision of reassurance and physical comfort are sequentially associated with

child distress. Model 2, the model in which parental provision of reassurance preceded child distress, did not fit the data. This suggests that parental reassurance is neither helpful nor harmful in this context. Rather, Model 1 demonstrated a moderate positive association between initial child distress (interval 1) and increased parental reassurance (interval 2), with later child distress (interval 2) only mildly associated with subsequent increased parental reassurance (interval 3). Results examining the fit of Model 3 to the data suggested that increased child distress is associated with *less* subsequent parental provision of physical comfort. Model 4 also showed a relatively good fit with parental provision of physical comfort preceding child distress. The direction of the relations suggested that early parental provision of physical comfort had no impact on child distress in the subseqent interval. However, provision of physical comfort by parents in the second interval was positively associated with child distress. This suggests that parental physical comfort is neither helpful nor harmful when provided early on in the sequence of events in the OR, but that this parental behavior might actually have harmful effects in increasing child distress if provided relatively close to anesthetic induction. This latter finding supports the classification of parental provision of physical comfort to the child just prior to mask placement as a parental Distress Promoting Behavior.

Future investigations should seek to examine the association between parental provision of physical comfort and child distress further. For example, a subsequent investigation could experimentally manipulate the provision of physical comfort (e.g., parents would be randomly assigned to either provide physical comfort such as instructions to hold a child's hand, or to not provide physical comfort but still be present within the OR during anaesthetic induction). Such investigations would provide us with a

better understanding of the impact that provision of physical comfort has on child distress at anaesthetic induction.

Findings from the procedural pain research suggest that reduction in fear and distress during the anticipatory phases can lead to less experienced pain during medical procedure (Blount et al., 1990). In turn, Blount et al. (2003) assert that it is important to "prompt children to use effective coping behaviours prior to the painful medical procedures" (p. 5). These findings and assertions suggest that during "anticipatory phase" (p. 5), prior to the more frightening and painful parts of a medical procedure, distress is easier to manage. The reduction in fear and distress achieved by effective child coping during the anticipatory phases can lead to less experienced pain and distress during the actual medical procedure. Parental behaviour and parent-child interactions should be examined in the future at stress 1 (just prior to entering the OR).

The present investigation was also interested in child coping as well as child distress and how parent's engaging in coping promoting behaviours at anaesthetic induction impacts on child coping. No purported Adult Coping Promoting behaviours were associated with any purported Child Coping behaviours (i.e., nonprocedural talk by child, playing) in bivariate correlations. Sequential analyses were not permitted between these behaviours due to the limited observation of this adult behaviour (specifically, non-occurrence of the behavior creating empty cells which precluded sequential analyses in AMOS). Subsequent research is required to determine which adult behaviours are associated with increased child coping. It terms of the OR context, it may be advantageous to train parents to practice coping strategies with their children prior to the day of surgery in order to determine the types of parent-initiated coping strategies which

are helpful to children in this context.

Although the present investigation's findings are interesting, there were a number of possible limitations that deserve mention. First, all the medical personnel involved with this investigation were very cooperative. Nevertheless, at times there were some instructions made to the parents that may have impacted the results reported herein. When a parent came into the OR they were often instructed to sit on a chair beside their child and hold their child's hand. My intent was to observe natural behaviours between parent and child during anaesthetic induction; however it appears that behaviours that take place within the OR, as commonly directed by medical staff, were observed instead. Parents may have behaved differently without the direction of medical personnel. These instructions may have increased parental provision of physical comfort when parents may have normally engaged in a different behaviour. It is also not known what variables influenced medical staff to instruct some parents to engage in provision of physical comfort (e.g., Did the parent appear particularly distressed? Or did the child? Or was this instruction simply more likely to occur when there was more time for the medical staff to focus on assisting the parent such as in the case of a cooperative child?). My data appear to suggest that provision of physical comfort may not be helpful, at least within this sample. The correlational and sequential findings seem to suggest that the provision of physical comfort may increase child distress, at induction, at least when this parental behavior occurs right before induction of anaesthesia. It should be noted that there are some limitations to inferring causation from sequential analyses. Specifically, the sequential analyses demonstrated that there is a confirmed directionality within the relationship between parental provision of physical comfort and child distress. However,

these analyses do not prove causality (i.e., that parental provision of physical comfort caused increased child distress). Our findings are a step in the right direction in determining what causes increased child distress as causality requires directionality (i.e., A cannot cause B unless A precedes B, but A preceding B is not enough to determine that A caused B). Rather than demonstrating a causal relationship, the fact that parental provision of physical comfort preceded increased child distress at induction could also be explained if both variables were caused by a third variable such as child anxious/shy temperament (which could both cause increased parental provision of physical comfort to the child prior to mask placement and increased child distress at mask placement). A number of potential investigations were suggested earlier to further examine the potential causal relationship between provision physical comfort and increased child preoperative anxiety.

Second, selection bias deserves some attention as well. Participation in this investigation was quite good (83%); however, it is important to consider that there may be a reason(s) why some participants did not participate. For example, it could be the case that parents who chose not to participate were ones whose child was typically very anxious and/or parents who were very anxious themselves. Therefore, we may have missed an entire group of very anxious children and/or parents.

Third, the physical set up of the RUH Department of Dentistry may have impacted anxiety ratings and/or behaviour. The OR is down the hall from the waiting room and recovery room is beside the OR. Often one could hear children in distress (i.e., crying or screaming). Hearing other children's distress may have elevated individual children's ratings of anxiety or possibly reduced levels of participation. In order to

examine the impact of this variable it may be necessary for future investigations in this type of setting to inquire if the participants are bothered by hearing other children in distress and if so whether this experience impacted their anxiety ratings or behaviour. Future studies might also artificially control for this factor (i.e., put up sound barriers). While it is important to acknowledge the possible impact of this variable, it should also be recognized that this is simply an aspect of conducting research in the real world.

Fourth, in completing the observer-rated anxiety measure (mYPAS), our first rater was not blind to the study hypotheses. This may have impacted the direction of the findings in that our rater have may rated a child's behaviour as more anxious as a function of knowing that the researchers predict that higher mYPAS scores would be obtained during anaesthetic induction than other purportedly less stress time-points during the day surgery procedure (e.g., waiting in the waiting room). That being said, both modified CAMPIS-R raters were blind to study hypotheses. Further, good inter-rater reliability was observed between first and second raters for both mYPAS and modified CAMPIS-R.

There are a number of interesting directions for future research on this topic. First, an examination of the interaction between parent and child behaviours and their impact on anxiety reduction need to be examined using the newly designed P-CAMPIS. Subsequent research in this vein will allow one to determine if findings using the P-CAMPIS will be similar to those of the present investigation. Second, evaluating the impact of variables inherent in certain settings (i.e., patients being able to hear other patient's distress) on participant distress would better inform us of whether and how these types of "real world" issues impact child anxiety and distress in the pediatric surgery

context. Third, as mentioned previously, further examinations of the associations between parental provision of physical comfort and child distress and between parental provision of reassurance and child distress are required.

Overall there are a number of specific findings. First, the modified CAMPIS-R requires some subsequent modifications (e.g., addition of behaviours that are identified as child coping behaviours, addition of behaviours that are identified as adult coping promoting behaviours since few such behaviors were observed using the existing coding scheme in the present study). While the P-CAMPIS is now available to researchers to examine child and adult behaviours and behaviour interactions during anaesthetic induction, it remains to be determined which measure is most valid in examining such issues in the pediatric surgery context. Second, sequential relationships were observed between the Child Distress composite score and provision of reassurance and physical comfort by parent, using the modified CAMPIS-R. A significant bivariate association was also observed between parental giving control and the Child Distress composite score. Subsequent research is required to examine this latter relationship further as the present investigation was unable to do so due to the absence of this parental behaviour in one of observation intervals during anaesthetic induction.

The knowledge that parents are engaging in behaviours that may increase child anxiety and distress and possibly making the child's anaesthetic induction experience unpleasant (e.g., Bevan et al., 1990) may decrease the likelihood that anaesthesiologists would allow parents to be present during the anaesthetic induction. This decision may be premature, as these findings provide a basis for subsequent research designed to identify or clarify the particular behaviours that parents should engage in while being present

during anaesthetic induction in an effort to promote less child anxiety and distress behaviours or, at the very least, to have information to provide to parents that they should not engage in particular behaviors if they are to be present in the OR with their child.

CHAPTER SIX: Discussion

The surgery experience has shown to be anxiety provoking for child and parent alike. In an attempt to intervene or alleviate such anxiety, the utility of parental presence during what is thought to be the most anxiety provoking aspect of the day surgery experience, mask placement (Kain et al., 1996a), has been explored. Parents often view their presence as helpful; anaesthesiologists, on the other hand, view their presences as less helpful (Kain et al., 2003a). The present series of investigations is unique in a number of ways. First, parent-rated child temperament utilizing the Conners', a measure that has not been previously utilized in this context, was examined. Second, we utilized a reliable and valid measure of parental anxiety, the STAI (Spielberger et al., 1970), to examine the impact of parental anxiety on preoperative anxiety in children. Third, previous investigations have evaluated anxiety during this stressful experience through self-report and observer-rated measures of anxiety. Prompted by assertions made by von Baeyer (2001) and Chambers (2003), this investigation was unique in that a modified version of the behavioural observation tool called the Child Adult Medical Procedures Interaction Scale-Revised (CAMPIS-R; Blount et al., 1997) was utilized to examine parent-child behaviours during anaesthetic induction. The modified CAMPIS-R allowed the examination of the interaction between parent and child behaviours in a more thorough manner as we were able to break up observation periods into smaller increments of time.

The utility of the Child Anxiety Pain Scale-Anxiety scale (CAPS-A; Kuttner & LePage, 1984) as an anxiety measurement tool in the day surgery process was examined in Study 1. The modified Yale Preoperative Anxiety Scale (mYPAS; Kain et al., 1997a)

but not CAPS-A was sensitive to detecting expected increases in child anxiety at two potentially stressful points in the day surgery process relative to baseline. A limited number of significant relationships were observed between the CAPS-A and mYPAS scores. In theory, the CAPS-A is an optimal measure to use in this setting as it is quick and does not require extensive training; however, the results of Study 1 did not provide overwhelming support for its use. Given the time constraints of the busy day surgery department, a valid, quick, self-report measure of anxiety would be ideal. Subsequent research is warranted, employing a larger sample, to examine the utility of CAPS-A more thoroughly, or to identify a more helpful self-report instrument for use in this context. Given these findings, the CAPS-A was not utilized in subsequent studies in this thesis.

Findings from Study 2 demonstrated that anxiety was observed during the most stressful time periods (i.e., separation from parent, anaesthetic induction) and parental presence impacted levels of observer-rated anxiety (as measured by the mYPAS) at one of these stressful periods. Specifically, children in the parental presence group demonstrated significantly lower observer-rated anxiety than children in the parental absence group when leaving the day surgery room for the OR (i.e., when separation from the parent occurred for those assigned to the parental absence group). The predictive utility of parent-rated child temperament was additionally examined. Results suggested that parent-rated anxious/shy temperament (as measured by the Conners') was associated with observer-rated child anxiety at the time point of leaving the day surgery room for the OR and at anaesthetic induction. These latter findings are unique in that this is the first investigation that has utilized the Conners' as a parent-rated measure of relevant child characteristics within this context. This initial finding provides preliminary support for

the clinical use of the Conners' in this context. Subsequent research should examine its utility further. Although parental presence was effective in reducing children's anxiety at departure from the day surgery for the OR, it was no more effective for temperamentally anxious/shy children than for other children. Moreover, this intervention was not effective in reducing children's anxiety at mask induction of anesthetic, regardless of whether they were temperamentally anxious/shy or not. Thus, future work should aim to identify interventions that will address the increased levels of distress experienced by anxious/shy tempered children during the day surgery experience.

In an effort to further examine parental impact on child anxiety, the associations between parental state and trait anxiety and observer-rated child anxiety at the time-points just prior to entering the OR and at anaesthetic induction were explored in Study 3, in the context where parents accompany the child to the OR (i.e., in the context of parental presence). Findings from Study 3 suggested a significant positive association between parental trait anxiety (as measured by STAI) and child anxiety at the time-point just prior to entering the OR. Higher parental trait anxiety was associated with higher observer-rated child anxiety at this potentially stressful period. Further, parental trait anxiety was found to be predictive of higher observer-rated anxiety just prior to entering the OR, in multivariate analyses which controlled for the influence of other relevant variables. Collectively, the results suggest that parental trait anxiety may be a useful concept to employ as a predictor of child anxiety when the child is leaving the day surgery room to enter the OR. The STAI-trait form would be an easily administered measure that could be useful in identifying anxious parents who might benefit from

training in what to do at the time-point when the child is about to leave the day surgery room to enter the OR, to minimize their child's anxiety at this period.

Parent-child behaviours, their sequential relations, and associations with observer-rated child anxiety (as measured by the mYPAS) were explored in Study 4. The modified CAMPIS-R was employed to systematically examine parent and child behaviours that were occurring in the OR context just prior to induction. These preliminary findings suggested that the modified CAMPIS-R has utility within this settings, albeit modifications may improve its utility within this setting (e.g., addition of behaviours that are identified as child coping behaviours, addition of behaviours that are identified as adult coping promoting behaviours since few behaviors currently coded in these categories were observed). I wanted to examine the sequential relationships between parental provision of Reassurance, Physical Comfort, and Giving Control with Child Distress demonstrated during anaesthetic induction. Unfortunately, I was not able to examine the sequential relationship between Child Distress and parental Giving Control due to the absence of this behaviour during at least one of the three 30 second observation intervals. Similarly, I was unable to examine the sequential association between purported Child Coping behaviours (i.e., Nonprocedural Talk by child, child Playing) and the one purported Adult Coping Promoting behaviour that was observed (i.e., Nonprocedural Talk by adult) due to the absence of this behaviour during at least one of the three 30-second observation intervals during anaesthetic induction. The lack of variability across Giving Control and Nonprocedural Talk by adult behaviour codes in some cells impacted the ability of AMOS to run these sequential analyses. I was, however, able to examine the relationship between Child Distress and both Reassurance

and Physical Comfort (provided by parent). The analyses showed a sequential relationship between both provision of Reassurance and Physical Comfort with Child Distress. The analyses yielded three good fitting models. Model 2 did not fit the data suggesting that parental provision of reassurance is neither helpful nor harmful during this context. Model 1, on the other hand, demonstrated a sequential association between initial child distress and increased parental provision of reassurance. This finding is consistent with previous painful medical procedure research (e.g., Chambers et al., 2002). Results examining the fit of Model 3 to the data suggested that increased child distress is associated with subsequent decreases in parental provision of physical comfort. Model 4 also showed a relatively good fit with parental provision of physical comfort preceding child distress. The direction of the association suggested that initial parental provision of physical comfort had no impact on child distress in the subseqent interval. However, provision of physical comfort by parents in the second interval just prior to mask placement was positively associated with subsequent child distress at mask placement. Findings suggest that parental physical comfort is neither helpful nor harmful when provided early on in the sequence of events in the OR, but that this parental behavior might actually have harmful effects in increasing child distress if provided relatively close to anesthetic indction. This latter finding also suggests the inclusion of parental provision of physical comfort to the child just prior to mask placement as a distress promoting behavior. There is no prior research that has observed this association.

Ultimately, the objective of this investigation was to facilitate better understanding of the experience of the children during anaesthetic induction and to provide insight and recommendations to improve this experience. These findings do suggest that many

children are anxious during this experience. Parental presence/absence does affect observer-rated child anxiety at least when the child is entering the operating room corridor. Specifically, child anxiety was higher during this period when the child was separated from their parent as opposed to children who were not separated. Parent-rated anxious/shy temperament in the child (as measured by the Conners') was associated with, and parental trait anxiety (as measured by the STAI) was predictive of, observer-rated child anxiety (as measured by the mYPAS) at certain stressful time-points in the day-surgery process. Both of these relations were in the positive direction with temperamentally anxious/shy children showing more anxiety at leaving day surgery for the OR and at induction, and more trait anxious parents having children that showed more anxiety at leaving day surgery for the OR. At anaesthetic induction, child distress was sequentially associated with increased parent provision of reassurance. Further, physical comfort was sequentially related to child distress with increased child distress preceding decreased parental provision of physical comfort and with increased parental provision of physical comfort close to induction preceding increased child distress around the time of induction.

With the above in mind, one might jump to the conclusion that parents should not be allowed to be present during anaesthetic induction. What the findings have initially highlighted is that there appear to be certain types of parental behaviours (e.g., provision of reassurance and physical comfort) that appear to be associated with increased child distress, at least when provided at a certain window close to induction. These findings deserve subsequent investigation. For example, this association could be examined by experimentally manipulating the provision of either parental reassurance (e.g., through

instructions to parents to say reassuring comments "You will be okay.) or physical comfort (e.g., through instructions to parents in the experimental group to hold the child's hand immediately prior to induction). Such investigations would provide us with a better understanding of the causal impact that parental provision of reassurance and physical comfort has on child anxiety at anaesthetic induction. In turn, subsequent findings will allow us to inform parents about what they should do and should not do to help their child if they are to be present during induction. Similarly, future research should further examine the observed significant positive correlation between parental giving of control to the child and child distress at induction to examine causality of this observed correlation.

Although subsequent research is warranted, these findings have initial clinical implications. The findings suggest that child anxiety levels at anaesthetic induction are not impacted by parental presence/absence during anaesthetic induction, although parental presence may ease child anxiety during the transfer to the OR. Given that parental presence does not reduce child anxiety at induction, it appears that the decision as to whether or not parents should be present during induction is best left up to the discretion of the respective anaesthesiologist. However, it may be important to consider that the findings from the present thesis also suggest that some parents are engaging in potentially distress promoting behaviours (i.e., reassuring, providing physical comfort, and giving control to their child) when they are present during induction. At this point, however, we are unable to be sure which parents will engage in such distress promoting behaviours if present during induction. Subsequent research is necessary to further clarify these issues.

The present results also suggest that having parents complete a measure of child temperament, specifically the Conners', may be useful in identifying the children who will likely be anxious at stressful time points on the day of surgery. The Conners' is somewhat lengthy (i.e., 80 items) and therefore pairing down the questionnaire to the specific items that comprise the subscale that was useful in predicting child anxiety behaviors (i.e., the Anxious/Shy subscale) may be more efficient in this context. Having this information prior to the day of surgery would allow medical personnel to be prepared for potential difficulties and to intervene with appropriate interventions if further research can identify which interventions are particularly helpful for such temperamentally anxious/shy children. Parental trait anxiety, as measured by the STAI, predicted child anxiety when children were leaving day surgery for the OR. Having parents complete the STAI as well may provide medical personnel with additional background information that will help with preparation for respective patients and the parents who accompany them to day surgery.

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Appendix A
Letter to Parents and Consent Forms

IWK Letterhead

Letter to Parents

The Department of Anaesthesia at the IWK Health Centre is presently conducting a research study that involves children who are scheduled for day surgery. Many children feel anxious when they are being prepared for surgery. At the IWK, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction (put to sleep prior to surgery) in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, we are conducting a study to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience. This study is being conducted by Dr. Allen Finley, anaesthetist at the IWK Health Centre, Dr. Susan Buffett-Jerrott, clinical psychologist at the IWK Health Centre, Dr. Christine Chambers, clinical psychologist at the IWK Health Centre and Dalhousie University, in conjunction with Dr. Sherry Stewart, clinical psychologist from Dalhousie University, and Kristi Wright, Ph.D. student in Clinical Psychology at Dalhousie University.

This study is being conducted at the IWK Health Centre on the day of your child's surgery. If you choose to participate in this study, the researcher will be videotaping your child's behaviour and interactions with you as well as medical staff prior to and during anaesthetic induction.

Participation in this study is completely voluntary and you and your child have the right to refuse participation at any time and to withdraw your consent at any point. Videotaping will be stopped if either you or your child asks, or if your child is unable or unwilling to continue. Refusal to participate at any point will not affect the quality of your medical care in any way. All individual information is confidential: no one except the researchers will see this information. Also, all information collected from you and your child will be kept in a locked filing cabinet (for a period of 10 years past the age of majority as required by the IWK Research Ethics Board) and will be coded with a participant number. We will send out a written report of the study results (results obtained from the entire group not individual participants) to all parents when the study has been completed. This report will be available by June 2005.

If you are interested in having your child participate, we must receive your written consent and your child's verbal assent, before the study. Please feel free to ask the researcher any questions regarding the study. If you have any other questions regarding this research, please contact me (Kristi D. Wright, M.A.) at 494-3793, Dr. Allen Finley at 470-2708, or Dr. Sherry Stewart at 494-3793. In addition, you may contact the IWK Health Centre Research Services office (470-8765) to ask research-related questions to an individual who is not involved in our study.

Version 06 May 2004.Page1/1

Informed Consent

Study: The Impact of Parental Presence During Anaesthetic Induction on Preoperative Anxiety: Which Children Benefit Most?

Principal Investigator: Kristi D. Wright, M.A.
Clinical Psychology Graduate Student
Department of Psychology
Dalhousie University

Co-investigators:
G. Allen Finley, MD from the Department of Paediatric Anaesthesia at the IWK Health Centre. Sherry Stewart, Ph.D. from the Department of Psychology at Dalhousie University. Susan Buffett-Jerrott, Ph.D. from the IWK Health Centre and an Adjunct Assistant Professor of Psychology at Dalhousie University. Christine Chambers, Ph.D. joint-appointed as an Assistant Professor of Paediatrics and Psychology at the IWK Health Centre and Dalhousie University.

Introduction
We invite you and your child to participate in a research study being conducted in the Department of Anaesthesia at the IWK Health Centre involving children who are scheduled for day surgery. Taking part in this study is voluntary. However, we hope that you consider participating because we believe it may help us gain valuable information about children's anxiety about surgery. If you choose to participate, you may withdraw your child from the study at any time. The study is described below. The description tells you what you and your child will be asked to do, and any risks, inconvenience, or discomfort that you or your child may experience. Participating in the study might not immediately benefit you or your child, but we will learn about children's anxiety about surgery and the impact of parental presence on children's anxiety during anaesthetic induction (when your child is being put to sleep prior to surgery) and this could benefit you and your child in the event of future surgeries. You are encouraged to discuss any questions you have with the people who explain the study to you.

Purpose of Study
Many children feel anxious when they are being prepared for surgery. At the IWK, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, the purpose of the present study is to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience.

Study Design
For this phase of the study, the design is descriptive in nature. We will be utilizing the information obtained from your child to make improvements to the second phase of the study (i.e., determining the number of segments of the day surgery process to videotape).

Screening for Participation
In this phase we plan to include two children scheduled for surgery at the IWK Health Centre. Your child will be eligible to participate if she or he: (1) is between 3 and 6 years old, (2) no decision is made by the anesthesiologist to administer sedative medication prior to surgery, or to perform intravenous induction, and (3) does not have other serious physical, intellectual, or mental health problems that might confuse the results. The researcher will determine whether you and your child meet these conditions and are eligible to participate in this study.

Procedures of the Study
Your child has been scheduled for surgery at the IWK. Once your child has been scheduled for surgery, an information letter describing this research study will be mailed to you. One week after you have received the information letter, you will be contacted by phone and asked if you are willing for your child to participate in the study. If you have chosen to participate, on the day of your child's surgery you will be asked to provide consent for your child's participation. Your child will also be asked whether he or she wants to participate. If both you and your child choose to participate a researcher will be videotaping your child's behaviour and interactions with you as well as medical staff prior to and during anaesthetic induction.

Risks and Discomforts
One possible risk of your child's participation in the research study is that it is possible that additional observation may cause distress for your child who may already feel a great deal of anxiety about the procedure. However, the observers will make every attempt to be as unobtrusive as possible. You will be made aware that you may withdraw your consent (authorization) for your child to participate at any point during the study, and the researchers will discontinue testing if your child should be unwilling or unable to participate.

Potential Benefits
Participating in the study might not immediately benefit you or your child. However, we will learn about children's anxiety about surgery and the impact of parental presence on children's anxiety during anaesthetic induction and this could benefit you and your child in the event of future surgeries. We hope that the results from this study will help to (1) determine whether parental presence during anaesthetic induction is useful in reducing preoperative anxiety in children, (2) help to identify parental behaviours that are helpful/detrimental to alleviating preoperative anxiety in children, and (3) help to identify which children would benefit the most from parental presence. Ultimately, the results of the present research may benefit children who undergo such surgery in the future.

Withdrawal from Participation
Participation in this research study is entirely voluntary. Whether or not you and your child participate in this study, your child's care at the IWK Health Centre will not be affected. Neither your legal rights nor your child's legal rights are waived by participating in this study. The researcher and the hospital still have their legal and professional responsibilities to you and your child. If you chose to participate and later change your mind, you can stop your child's participation at any time. You and your child's participation in the study may be ended if in the opinion of the study staff it is not safe or reasonable for your child to continue.

Compensation
There will be no monetary compensation for this project.

Confidentiality
Neither you nor your child will be identified as a study participant in any reports or publications of this research. After you and your child complete the study, both of your names will be removed from all of the files and replaced with numbers so that no one will be able to identify who gave us the information. In addition, information from this study will be kept in a locked filing cabinet that only the staff directly involved in the research will be able to access for a period of 10 years past the age of majority as required by the IWK Research Ethics Board. The records may be reviewed at any time by the Research Ethics Board at IWK Health Centre to ensure that all procedures are being followed correctly.

Contact Persons
Please feel free to ask the researcher any questions regarding the study. If you have any other questions regarding this research, please contact me (Kristi D. Wright, M.A.) at 494-3793, Dr. Allen Finley at 470-2708, or Dr. Sherry Stewart at 494-3793. In addition, you may contact the IWK Health Centre Research Services office (470-8765) to ask research-related questions to an individual who is not involved in our study.

Communication of Results
We will send out a written report of the results to all parents when the study has been completed (results obtained from the entire group not individual participants). This report will be available by June 2005.

Study Title: The Impact of Parental Presence During Anaesthetic Induction on Preoperative Anxiety: Which Children Benefit Most?

I have read or had read to me the information describing the study on pre-surgery anxiety being conducted by Kristi Wright and Drs. Allen Finley, Sherry Stewart, Susan Buffett-Jerrott, and Christine Chambers and I am willing to have my child participate in the study. If I agree to have my child participate in the study, I also agree to the use of any relevant information from my child's medical file at the IWK Health Centre. I understand that I have the right to withdraw from the research study at any time without affecting my child's care in any way. I have received a copy of the Information Letter and Consent Form for future reference. I freely give consent for my child to participate in this research study.

Name of the Participant (Print) _____

Parent/Guardian's participant signature _____

Date: Time:

STATEMENT BY PERSON PROVIDING INFORMATION ON STUDY:

I have explained the nature and demands of the research study and judge that the participant named above understands the nature and demands of the research study.

Name of the Participant (Print) _____

Signature: Position

Date: Time:

STATEMENT BY THE PERSON OBTAINING CONSENT

I have explained the nature and demands of the research study and judge that the participant named above understands that participation is voluntary and that they may withdraw at any time from participating.

Name of the Participant (Print) _____

Signature: Position

Date: Time:

Name of the Participant (Print) _____

Signature: Position

Date: Time:

IWK Letterhead

Letter to Parents

The Department of Pediatric Anesthesia at the IWK Health Centre is presently conducting a research study that involves children who are scheduled for day surgery. Many children feel anxious when they are being prepared for surgery. At the IWK, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction (put to sleep prior to surgery) in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, we are conducting a study to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience. This study is being conducted by Dr. Allen Finley, anaesthetist at the IWK Health Centre, Dr. Susan Buffett-Jerrott, clinical psychologist at the IWK Health Centre, Dr. Christine Chambers, clinical psychologist at the IWK Health Centre and Dalhousie University, in conjunction with Dr. Sherry Stewart, clinical psychologist from Dalhousie University, and Kristi Wright, Ph.D. student in Clinical Psychology at Dalhousie University.

This study is being conducted at the IWK Health Centre on the day of your child's surgery. If you choose to participate in this study, you will also be asked for permission to use the data from the questionnaire that you will complete with the researcher on the telephone and for any relevant information from your child's hospital file (e.g., number of previous surgeries, if any). On the day of surgery, you will be informed whether you will be present during anaesthetic induction. Your child will be asked to look at some pictures of faces and tell me how anxious he or she feels. The researcher will be videotaping your child's behaviour and interactions with you as well as medical staff prior to and during anaesthetic induction.

The study will be conducted at the IWK Health Centre, and will not take any more time than the normal surgical procedure. Instead, it means that there will be scheduled activities during times that would otherwise be "wait times". There are no right or wrong answers to any of the questions that you and your child will be asked. We simply want to know what you and your child thinks. We feel that children will find the questions interesting. Each child will be given lots of encouragement and attention, and we have found in previous studies that children tend to enjoy this.

The only anticipated potential negative effects of parental presence during anaesthetic induction are that parental presence will not reduce child anxiety. Possible benefits to parental presence may include decreased anxiety before the surgery. As this is a medical procedure, a nurse or doctor will be with the child at all times.

Participation in this study is completely voluntary and you and your child have the right to refuse participation at any time and to withdraw your consent at any point. Testing will be stopped if either you or your child asks, or if your child is unable or unwilling to continue. Refusal to participate at any point will not affect the quality of your medical care in any way. All individual information is confidential: no one except the researchers will see this information. Also, all information collected from you and your child will be kept in a locked filing cabinet (for a period of 10 years past the age of majority as required by the IWK Research Ethics Board) and will be coded with a participant number. We will send out a written report of the study results (results obtained from the entire group not individual participants) to all parents when the study has been completed. This report will be available by June 2005.

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G. Allen Finley, MD from the Department of Paediatric Anaesthesia at the IWK Health Centre. Sherry Stewart, Ph.D. from the Department of Psychology at Dalhousie University. Susan Buffett-Jerrott, Ph.D. from the IWK Health Centre and an Adjunct Assistant Professor of Psychology at Dalhousie University. Christine Chambers, Ph.D. joint-appointed as an Assistant Professor of Paediatrics and Psychology at the IWK Health Centre and Dalhousie University.

Introduction
We invite you and your child to participate in a research study being conducted in the Department of Anaesthesia at the IWK Health Centre involving children who are scheduled for day surgery. Taking part in this study is voluntary. However, we hope that you consider participating because we believe it may help us gain valuable information about children's anxiety about surgery. If you choose to participate, you may withdraw your child from the study at any time. The study is described below. The description tells you what you and your child will be asked to do, and any risks, inconvenience, or discomfort that you or your child may experience. Participating in the study might not immediately benefit you or your child, but we will learn about children's anxiety about surgery and the impact of parental presence on children's anxiety during anaesthetic induction (when your child is being put to sleep prior to surgery) and this could benefit you and your child in the event of future surgeries. You are encouraged to discuss any questions you have with the people who explain the study to you.

Purpose of Study
Many children feel anxious when they are being prepared for surgery. At the IWK, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, the purpose of the present study is to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience.

Study Design
This study uses a between-participants design. This means that we will be doing comparisons between children. In other words, we will compare how your child performs on anxiety and behavioural measures to how other children perform on these same measures. The between-children comparisons will involve comparing the group of children whose parent accompanies him/her to the operating room to children whose parent does not accompany him or her to the operating room.

Screening for Participation
In this study we plan to include 60 children scheduled for surgery at the IWK Health Centre. Your child will be eligible to participate if she or he: (1) is between 3 and 6 years old; (2) no decision is made by the anesthesiologist to administer sedative medication prior to surgery, or to perform intravenous induction, and (3) does not have other serious physical, intellectual, or mental health problems that might confuse the results. The researcher will determine whether you and your child meet these conditions and are eligible to participate in this study.

Procedures of the Study
Your child has been scheduled for surgery at the IWK. Once your child has been scheduled for surgery, an information letter describing this research study and three questionnaires will be mailed to you. One week after you (parent) have received the information letter and questionnaires, you will be contacted by phone and asked if you are willing for your child to participate in the study. If you decide to participate two questionnaires will be administered to you over the telephone. The questionnaires will take approximately 25 minutes to complete.
If you have chosen to participate, on the day of your child's surgery you will be asked to provide consent for your child's participation. Your child will also be asked whether he or she wants to participate. If both you and your child choose to participate you will also be asked for permission to use the data from the questionnaire that you completed with the researcher on the telephone and for any relevant information from your child's hospital file. On the day of the surgery your child will be asked to look at some pictures of faces and tell the researchers how anxious he or she feels. The researcher will also rate your child's observed anxiety. You will also be asked to complete a self-report measure designed to assess your anxiety (will take approximately 10 minutes to complete). Immediately prior to leaving the day surgery room half of the 60 children in the study will be assigned to have their parent accompany him or her from the day surgery room to the operating room and be present during anaesthetic induction and half of the 60 children will proceed to the operating room and experience anaesthetic induction without his or her parent. You will be informed whether you will or will not be accompanying your child by the researcher with the OR nurse present (the OR nurse is the nurse who will accompany your child from the day surgery room to the OR). If you and your spouse/partner are present on the day of the surgery you will be allowed to make the decision who will accompany your child (if applicable) to the OR.

Approximately 5 minutes before the notification is made that it is time to proceed to the operating room; your child will be asked again to tell the researcher how anxious he or she feels. The researcher will also rate your child's observed anxiety. Once your child has arrived at the

operating room and prior to anaesthetic induction the your child will be asked again to tell the researcher how anxious he or she feels. The researcher will be videotaping the child's behaviour at two time periods (1) prior to surgery, and (2) during anaesthetic induction. About 1 hour after the surgery, your child will be asked to tell the researcher how anxious he or she feels.

Potential Risks and Discomforts

One potential risk from participating in this research study is that parental presence during anaesthetic induction may increase feelings of anxiety and distress. However, parental presence is currently granted during anaesthetic induction before surgical procedures at the IWK Health Centre when the anaesthetist feels that the child is extremely anxious and it appears that the parent may be helpful in reducing the child's distress during induction. On the other hand, if you are randomized to not accompanying your child, you and/or your child might have increased feelings of anxiety and distress. However, it should be noted that most children proceed to the operating room without a parent without problems. It is also possible that additional testing and observation may cause distress for your child who may already feel a great deal of anxiety about the procedure. However, the observers will make every attempt to be as unobtrusive as possible. You will be made aware that you may withdraw your their consent (authorization) for your child to participate at any point during the research study, and the researchers will discontinue testing if your child should be unwilling or unable to participate.

Potential Benefits

Potential benefits of you being present during your child's anaesthetic induction are that your child's feelings of anxiety and distress may decrease. In turn, potential benefits of you being absent during your child's anaesthetic induction may include less escalation of feelings of anxiety or distress for your child; as your reaction to the anaesthetic induction could increase your child's anxiety. Participating in the research study might not immediately benefit you or your child, but we will learn about children's anxiety about surgery and the impact of parental presence on children's anxiety during anaesthetic induction and this could benefit you and your child in the event of future surgeries. We hope that the results from this research study will help to (1) determine whether parental presence during anaesthetic induction is useful in reducing preoperative anxiety in children, (2) help to identify parental behaviours that are helpful/detrimental to alleviating preoperative anxiety in children, and (3) help to identify which children would benefit the most from parental presence. Ultimately, the results of the present research may benefit children who undergo such surgery in the future.

Withdrawal from Participation

Whether or not you and your child participate in this research study, your child's care at the IWK Health Centre will not be affected. Neither your legal rights nor your child's legal rights are waived by participating in this research study. The researcher and the hospital still have their legal and professional responsibilities to you and your child. If you chose to participate and later change your mind, you can stop your participation at any time. You and your child's participation in the research study may be ended if in the opinion of the research study staff it is not safe or reasonable for your child to continue.

Compensation
There will be no monetary compensation for this project.

Confidentiality
Neither you nor your child will be identified as a study participant in any reports or publications of this research. After you and your child complete the study, both of your names will be removed from all of the files and replaced with numbers so that no one will be able to identify who gave us the information. In addition, information from this study will be kept in a locked filing cabinet that only the staff directly involved in the research will be able to access for a period of 10 years past the age of majority as required by the IWK Research Ethics Board. The records may be reviewed at any time by the Research Ethics Board at IWK Health Centre to ensure that all procedures are being followed correctly.

Contact Persons
Please feel free to ask the researcher any questions regarding the study. If you have any other questions regarding this research, please contact me (Kristi D. Wright, M.A.) at 494-3793, Dr. Allen Finley at 470-2708, or Dr. Sherry Stewart at 494-3793. In addition, you may contact the IWK Health Centre Research Services office (470-8765) to ask research-related questions to an individual who is not involved in our study.

Communication of Results
We will send out a written report of the results to all parents when the study has been completed (results obtained from the entire group not individual participants). This report will be available by June 2005.

Study Title: The Impact of Parental Presence During Anaesthetic Induction on Preoperative Anxiety: Which Children Benefit Most?

I have read or had read to me the information describing the study on pre-surgery anxiety being conducted by Kristi Wright and Drs. Allen Finley, Sherry Stewart, Susan Buffett-Jerrott, and Christine Chambers and I am willing to have my child participate in the study. If I agree to have my child participate in the study, I also agree to the use of any relevant information from my child's medical file at the IWK Health Centre. I understand that I have the right to withdraw from the research study at any time without affecting my child's care in any way. I have received a copy of the Information Letter and Consent Form for future reference. I freely give consent for my child to participate in this research study.

Name of the Participant (Print) _____

Parent/Guardian's participant signature _____

Date: _____ Time: _____

STATEMENT BY PERSON PROVIDING INFORMATION ON STUDY:
I have explained the nature and demands of the research study and judge that the participant named above understands the nature and demands of the research study.

Name of the Participant (Print) _____

Signature: _____ Position _____

Date: _____ Time: _____

STATEMENT BY THE PERSON OBTAINING CONSENT
I have explained the nature and demands of the research study and judge that the participant named above understands that participation is voluntary and that they may withdraw at any time from participating.

Name of the Participant (Print) _____

Signature: _____ Position _____

Date: _____ Time: _____

Name of the Participant (Print) _____

Signature: _____ Position _____

Date: _____ Time: _____

ROYAL UNIVERSITY HOSPITAL LETTERHEAD

Letter to Parents

The Department of Anesthesia at the Royal University Hospital is presently conducting a research study that involves children who are scheduled for day surgery. Many children feel anxious when they are being prepared for surgery. At the Royal University Hospital, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction (put to sleep prior to surgery) in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, we are conducting a study to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience. This study is being conducted by Drs. David C. Campbell and Mateen Raazi, anaesthetists at the Royal University Hospital, Dr. Carl von Baeyer, Professor of Psychology & Associate Member in Pediatrics at University of Saskatchewan, Dr. Sherry H. Stewart, Professor of Psychology at Dalhousie University, Halifax, Nova Scotia and Ms. Kristi D. Wright, Ph.D student in Clinical Psychology at Dalhousie University, Halifax, Nova Scotia.

This study is being conducted at the Royal University Hospital on the day of your child's surgery. If you choose to participate in this study, you will also be asked for permission to use the data from the questionnaires that you will complete with the researcher on the telephone and for any relevant information from your child's hospital file (e.g., number of previous surgeries, if any). On the day of surgery, you will be informed whether you will be present during anaesthetic induction. Your child will be asked to look at some pictures of faces and tell me how anxious he or she feels. The researcher will be videotaping your child's behaviour and interactions with you as well as medical staff prior to and during anaesthetic induction.

The study will be conducted at the Royal University Hospital, and will not take any more time than the normal surgical procedure. Instead, it means that there will be scheduled activities during times that would otherwise be "wait times". There are no right or wrong answers to any of the questions that you and your child will be asked. We simply want to know what you and your child thinks. We feel that children will find the questions interesting. Each child will be given lots of encouragement and attention, and we have found in previous studies that children tend to enjoy this.

The only anticipated potential negative effects of parental presence during anaesthetic induction are that parental presence will not reduce child anxiety. Possible benefits to parental presence may include decreased anxiety before the surgery. As this is a medical procedure, a nurse or doctor will be with the child at all times.

Participation in this study is completely voluntary and you and your child have the right to refuse participation at any time and to withdraw your consent at any point. Testing will be stopped if either you or your child asks, or if your child is unable or unwilling to continue. Refusal to participate at any point will not affect the quality of your medical care in any way. All individual information is confidential: no one except the researchers will see this information. Also, all information collected from you and your child will be kept in a locked filing cabinet (for a period of at least 5 years after the completion of the study as required by the Royal University Hospital Research Ethics Board) and will be coded with a participant number. We will send out a written report of the study results (results obtained from the entire group not individual participants) to all parents when the study has been completed. This report will be available by Fall 2005.

If you are interested in having your child participate, we must receive your written consent and your child's verbal assent, before the study. Please feel free to ask the researcher any questions regarding the study. If you have any other questions regarding this research, please contact Dr. Mateen Raazi at 655-1192, Dr. David C. Campbell at 655-1183, Dr. Carl von Bayer at 966-6676, Dr. Sherry H. Stewart at 902-494-3793, or Ms. Kristi D. Wright, M.A. at 306-924-4464 (Regina contact number). In addition, you may contact the Royal University Hospital Research Office of Research Services (966-2084) to ask research-related questions to an individual who is not involved in our study.

ROYAL UNIVERSITY HOSPITAL LETTERHEAD

Consent Form

You are invited to participate in a study entitled **"The Impact of Parental Presence During Anaesthetic Induction on Preoperative Anxiety: Which Children Benefit Most?"** Please read this form carefully, and feel free to ask questions you might have.

Investigators:

Mateen Raazi, MD (Principal Investigator)
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Royal University Hospital
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Sherry Stewart, Ph.D., R. Psych., Professor
Department of Psychology
Dalhousie University
Phone: (902) 494-3793

Kristi D. Wright, M.A., Ph.D. Candidate
Psychology Department
Dalhousie University
Phone: (902) 494-3793 (Lab) (prior to July 15th)
Phone: (306) 337-2473 (following July 15th)

Introduction

We invite you and your child to participate in a research study being conducted in the Department of Anesthesia at the Royal University Hospital involving children who are scheduled for day surgery. Taking part in this study is voluntary. However, we hope that you consider participating because we believe it may help us gain valuable information about children's anxiety about surgery. If you choose to participate, you may withdraw your child from the study at any time. The study is described below. The description tells you what you and your child will be asked to do, and any risks, inconvenience, or discomfort that you or your child may experience. Participating in the study might not immediately benefit you or your child, but we will learn about children's anxiety about surgery and the impact of parental presence on

children's anxiety during anaesthetic induction (when your child is being put to sleep prior to surgery) and this could benefit you and your child in the event of future surgeries. You are encouraged to discuss any questions you have with the people who explain the study to you.

Purpose of Study
Many children feel anxious when they are being prepared for surgery. At the Royal University Hospital, and at a number of other children's hospitals, some parents are allowed to be present during anaesthetic induction in an attempt to reduce their child's anxiety. However, we do not yet know if a child's anxiety is actually reduced by parental presence. We are also unsure if parental presence makes children less anxious about the possibility of future surgery. Therefore, the purpose of the present study is to determine if parental presence during anaesthetic induction will reduce a child's anxiety for their surgery experience.

Potential Benefits
Potential benefits of you being present during your child's anaesthetic induction are that your child's feelings of anxiety and distress may decrease. In turn, potential benefits of you being absent during your child's anaesthetic induction may include less escalation of feelings of anxiety or distress for your child; as your reaction to the anaesthetic induction could increase your child's anxiety. Participating in the research study might not immediately benefit you or your child, but we will learn about children's anxiety about surgery and the impact of parental presence on children's anxiety during anaesthetic induction and this could benefit you and your child in the event of future surgeries. We hope that the results from this research study will help to (1) determine whether parental presence during anaesthetic induction is useful in reducing preoperative anxiety in children, (2) help to identify parental behaviours that are helpful/detrimental to alleviating preoperative anxiety in children, and (3) help to identify which children would benefit the most from parental presence. Ultimately, the results of the present research may benefit children who undergo such surgery in the future. The potential benefits outlined above cannot be guaranteed.

Study Design
This study uses a between-participants design. This means that we will be doing comparisons between children. In other words, we will compare how your child performs on anxiety and behavioural measures to how other children perform on these same measures. The between-children comparisons will involve comparing the group of children whose parent accompanies him/her to the operating room to children whose parent does not accompany him or her to the operating room.

Screening for Participation
In this study we plan to include 84 children scheduled for surgery at the Royal University Hospital. Your child will be eligible to participate if she or he: (1) is between 3 and 6 years old; (2) no decision is made by the anesthesiologist to administer sedative medication prior to surgery, or to perform intravenous induction, and (3) does not have other serious physical, intellectual, or mental health problems that might confuse the results. The researcher will determine whether you and your child meet these conditions and are eligible to participate in this study.

Procedures of the Study

Once your child has been scheduled for surgery, an information letter describing this research study and three questionnaires will be mailed to you. One week after you (parent) have received the information letter and questionnaires, you will be contacted by phone and asked if you are willing for your child to participate in the study. If you decide to participate three questionnaires will be administered to you over the telephone. The questionnaires will take approximately 25 minutes to complete.

If you have chosen to participate, on the day of your child's surgery you will be asked to provide consent for your child's participation. Your child will also be asked whether he or she wants to participate. If both you and your child choose to participate you will also be asked for permission to use the data from the questionnaire that you completed with the researcher on the telephone and for any relevant information from your child's hospital file. On the day of the surgery your child will be asked to look at some pictures of faces and tell the researchers how anxious he or she feels. The researcher will also rate your child's observed anxiety. You will also be asked to complete a self-report measure designed to assess your anxiety (will take approximately 10 minutes to complete). Immediately prior to leaving the day surgery room half of the 84 children in the study will be assigned to have their parent accompany him or her from the day surgery room to the operating room and be present during anaesthetic induction and half of the 84 children will proceed to the operating room and experience anaesthetic induction without his or her parent. You will be informed whether you will or will not be accompanying your child by the researcher with the OR nurse present (the OR nurse is the nurse who will accompany your child from the day surgery room to the OR). If you and your spouse/partner are present on the day of the surgery you will be allowed to make the decision who will accompany your child (if applicable) to the OR.

Approximately 5 minutes before the notification is made that it is time to proceed to the operating room; your child will be asked again to tell the researcher how anxious he or she feels. The researcher will also rate your child's observed anxiety. Once your child has arrived at the operating room and prior to anaesthetic induction the your child will be asked again to tell the researcher how anxious he or she feels. The researcher will be videotaping the child's behaviour at two time periods (1) prior to surgery, and (2) during anaesthetic induction. About 1 hour after the surgery, your child will be asked to tell the researcher how anxious he or she feels.

Potential Risks and Discomforts

One potential risk from participating in this research study is that parental presence during anaesthetic induction may increase feelings of anxiety and distress. However, parental presence is currently granted during anaesthetic induction before surgical procedures at the Royal University Hospital when the anaesthetist feels that the child is extremely anxious and it appears that the parent may be helpful in reducing the child's distress during induction. On the other hand, if you are randomized to not accompanying your child, you and/or your child might have increased feelings of anxiety and distress. However, it should be noted that most children proceed to the operating room without a parent without problems. It is also possible that additional testing and observation may cause distress for your child who may already feel a great deal of anxiety about the procedure. However, the observers will make every attempt to be as unobtrusive as possible. You will be made aware that you may withdraw your their consent (authorization) for your child to participate at any point during the research study, and the

researchers will discontinue testing if your child should be unwilling or unable to participate.

Withdrawal from Participation
Whether or not you and your child participate in this research study, your child's care at the Royal University Hospital will not be affected. Neither your legal rights nor your child's legal rights are waived by participating in this research study. The researcher and the hospital still have their legal and professional responsibilities to you and your child. If you chose to participate and later change your mind, you can stop your participation at any time. You and your child's participation in the research study may be ended if in the opinion of the research study staff it is not safe or reasonable for your child to continue.

Confidentiality
Neither you nor your child will be identified as a study participant in any reports or publications of this research. After you and your child complete the study, both of your names will be removed from all of the files and replaced with numbers so that no one will be able to identify who gave us the information. In addition, information from this study will be kept in a locked filing cabinet that only the staff directly involved in the research will be able to access for a period of at least 5 years after the completion of the study as required by the Royal University Hospital Research Ethics Board. The records may be reviewed at any time by the Research Ethics Board at Royal University Hospital to ensure that all procedures are being followed correctly.

Use of Study Data
The data obtained from this research project will be combined with data obtained from research taking place at the IWK Health Centre in Halifax, Nova Scotia. The combined data comprises one dissertation project for Kristi D. Wright, M.A., one of the researchers involved in the present study. The combined data will also be submitted for publication in an appropriate scientific journal. It is important to note that only aggregate data will be reported, not individual, in both dissertation and any scientific journal.

Contact Persons
Please feel free to ask the researcher any questions regarding the study. If you have any other questions regarding this research, please contact Dr. Mateen Raazi at 655-1192, Dr. David C. Campbell at 655-1183, Dr. Carl von Bayer at 966-6676, Dr. Sherry H. Stewart at (902) 494-3793, or Ms. Kristi D. Wright, M.A. at (306) 924-4464 (Regina contact number). This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Sciences Research Ethics Board on August 25, 2004. In addition, you may contact the Royal University Hospital Research Office of Research Services (966-2084) to ask research-related questions to an individual who is not involved in our study. Out of town participants may call collect.

Communication of Results

We will send out a written report of the results to all parents when the study has been completed (results obtained from the entire group not individual participants). This report will be available by Fall 2005.

Consent to Participate

I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent for my child to participate in the study described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.

_____
Name of Participant

_____ _____
Parent/Guardian's Signature Date

_____ _____
Signature of Researcher Date

Appendix B
Measures

Conners' Parent Rating Scale - Revised (L)

by C. Keith Conners, Ph.D.

Child's Name: _____ **Gender:** M F (Circle One)

Birthdate: ___/___/___ (Month / Day / Year) **Age:** _____ **School Grade:** _____

Parent's Name: _____ **Today's Date:** ___/___/___ (Month / Day / Year)

Instructions: Below are a number of common problems that children have. Please rate each item according to your child's behavior in the last month. For each item, ask yourself "How much of a problem has this been in the last month?", and circle the best answer for each one. If none, not at all, seldom, or very infrequently, you would circle 0. If very much true, or it occurs very often or frequently, you would circle 3. You would circle 1 or 2 for ratings in between. Please respond to all the items.

	NOT TRUE AT ALL (Never, Seldom)	JUST A LITTLE TRUE (Occasionally)	PRETTY MUCH TRUE (Often, Quite a bit)	VERY MUCH TRUE (Very Often, Very Frequent)
1. Angry and resentful	0	1	2	3
2. Difficulty doing or completing homework	0	1	2	3
3. Is always "on the go" or acts as if driven by a motor	0	1	2	3
4. Timid, easily frightened	0	1	2	3
5. Everything must be just so	0	1	2	3
6. Has no friends	0	1	2	3
7. Stomach aches	0	1	2	3
8. Fights	0	1	2	3
9. Avoids, expresses reluctance about, or has difficulties engaging in tasks that require sustained mental effort (such as schoolwork or homework)	0	1	2	3
10. Has difficulty sustaining attention in tasks or play activities	0	1	2	3
11. Argues with adults	0	1	2	3
12. Fails to complete assignments	0	1	2	3
13. Hard to control in malls or while grocery shopping	0	1	2	3
14. Afraid of people	0	1	2	3
15. Keeps checking things over again and again	0	1	2	3
16. Loses friends quickly	0	1	2	3
17. Aches and pains	0	1	2	3
18. Restless or overactive	0	1	2	3
19. Has trouble concentrating in class	0	1	2	3
20. Does not seem to listen to what is being said to him/her	0	1	2	3
21. Loses temper	0	1	2	3
22. Needs close supervision to get through assignments	0	1	2	3
23. Runs about or climbs excessively in situations where it is inappropriate	0	1	2	3
24. Afraid of new situations	0	1	2	3
25. Fussy about cleanliness	0	1	2	3
26. Does not know how to make friends	0	1	2	3
27. Gets aches and pains or stomachaches before school	0	1	2	3
28. Excitable, impulsive	0	1	2	3
29. Does not follow through on instructions and fails to finish schoolwork, chores or duties in the workplace (not due to oppositional behavior or failure to understand instructions)	0	1	2	3
30. Has difficulty organizing tasks and activities	0	1	2	3
31. Irritable	0	1	2	3
32. Restless in the "squirmy sense"	0	1	2	3
33. Afraid of being alone	0	1	2	3
34. Things must be done the same way every time	0	1	2	3
35. Does not get invited over to friends' houses	0	1	2	3
36. Headaches	0	1	2	3
37. Fails to finish things he/she starts	0	1	2	3

Items continued on back page...

Conners' Parent Rating Scale - Revised (L)

by C. Keith Conners, Ph.D.

	NOT TRUE AT ALL (Never, Seldom)	JUST A LITTLE TRUE (Occasionally)	PRETTY MUCH TRUE (Often, Quite a Bit)	VERY MUCH TRUE (Very Often, Very Frequent)
38. Inattentive, easily distracted	0	1	2	3
39. Talks excessively	0	1	2	3
40. Actively defies or refuses to comply with adults' requests	0	1	2	3
41. Fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities	0	1	2	3
42. Has difficulty waiting in lines or awaiting turn in games or group situations	0	1	2	3
43. Has a lot of fears	0	1	2	3
44. Has rituals that he/she must go through	0	1	2	3
45. Distractibility or attention span a problem	0	1	2	3
46. Complains about being sick even when nothing is wrong	0	1	2	3
47. Temper outbursts	0	1	2	3
48. Gets distracted when given instructions to do something	0	1	2	3
49. Interrupts or intrudes on others (e.g., butts into others' conversations or games)	0	1	2	3
50. Forgetful in daily activities	0	1	2	3
51. Cannot grasp arithmetic	0	1	2	3
52. Will run around between mouthfuls at meals	0	1	2	3
53. Afraid of the dark, animals, or bugs	0	1	2	3
54. Sets very high goals for self	0	1	2	3
55. Fidgets with hands or feet or squirms in seat	0	1	2	3
56. Short attention span	0	1	2	3
57. Touchy or easily annoyed by others	0	1	2	3
58. Has sloppy handwriting	0	1	2	3
59. Has difficulty playing or engaging in leisure activities quietly	0	1	2	3
60. Shy, withdrawn	0	1	2	3
61. Blames others for his/her mistakes or misbehavior	0	1	2	3
62. Fidgeting	0	1	2	3
63. Messy or disorganized at home or school	0	1	2	3
64. Gets upset if someone rearranges his/her things	0	1	2	3
65. Clings to parents or other adults	0	1	2	3
66. Disturbs other children	0	1	2	3
67. Deliberately does things that annoy other people	0	1	2	3
68. Demands must be met immediately — easily frustrated	0	1	2	3
69. Only attends if it is something he/she is very interested in	0	1	2	3
70. Spiteful or vindictive				
71. Loses things necessary for tasks or activities (e.g., school assignments, pencils, books, tools or toys)	0	1	2	3
72. Feels inferior to others	0	1	2	3
73. Seems tired or slowed down all the time	0	1	2	3
74. Spelling is poor	0	1	2	3
75. Cries often and easily	0	1	2	3
76. Leaves seat in classroom or in other situations in which remaining seated is expected	0	1	2	3
77. Mood changes quickly and drastically	0	1	2	3
78. Easily frustrated in efforts	0	1	2	3
79. Easily distracted by extraneous stimuli	0	1	2	3
80. Blurts out answers to questions before the questions have been completed	0	1	2	3

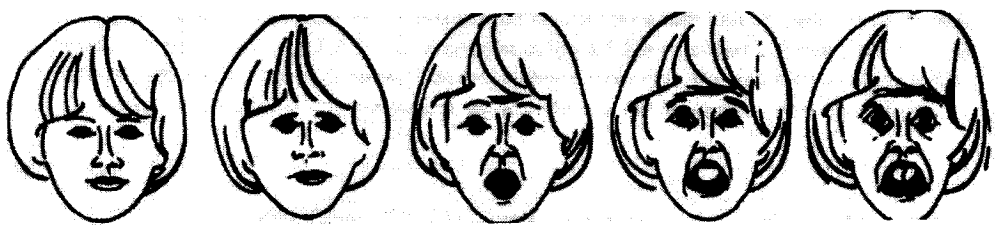
EASI Temperament Survey

Please rate each item on a scale of 1 to 5 (1=a little, 5=a lot)

	1	2	3	4	5
1. Child gets upset easily	O	O	O	O	O
2. Child tends to cry easily	O	O	O	O	O
3. Child is easily frightened	O	O	O	O	O
4. Child is easygoing or happy-go-lucky	O	O	O	O	O
5. Child has a quick temper	O	O	O	O	O
6. Child is always on the go	O	O	O	O	O
7. Child likes to be off and running as soon as he wakes up in the morning	O	O	O	O	O
8. Child cannot sit still long	O	O	O	O	O
9. Child prefers quiet games such as block play or coloring to more active games	O	O	O	O	O
10. Child fidgets at meals and similar occasions	O	O	O	O	O
11. Child likes to be with others	O	O	O	O	O
12. Child makes friends easily	O	O	O	O	O
13. Child tends to be shy	O	O	O	O	O
14. Child tends to be independent	O	O	O	O	O
15. Child prefers to play by himself rather than with others	O	O	O	O	O
16. Child tends to be impulsive	O	O	O	O	O
17. Learning self-control is difficult for the child	O	O	O	O	O
18. Child gets bored easily	O	O	O	O	O
19. Child learns to resist temptation easily	O	O	O	O	O
20. Child goes from toy to toy quickly	O	O	O	O	O

Buss, Plomin, & Willerman (1973)

Child Anxiety Faces Scale (Kuttner & Lepage, 1984)



Yale Preoperative Anxiety Scale (Kain et al., 1997a)

	Baseline	10 minute post drug/5 minutes to leaving day surgery	Separation	Anaesthetic Induction	Post-surgery
A. Activity					
B. Vocalizations					
C. Emotional Expressivity					
D. State of Arousal					
E. Use of Parent					
F. Overall Child Anxiety Level					

A. Activity

0. Cannot code (child not visible)
1. Looking around, curious, playing with toys, reading (or other age appropriate behavior); moves around holding area/treatment room to get toys or go to parent; may move toward OR equipment
2. Not exploring or playing, might look down, may fidget with hands or suck thumb (blanket); may sit close while waiting, or play has a definite manic quality
3. Moving from toy to parent in unfocused manner, nonactivity derived movements; frenetic/frenzied movement or play; squirming, moving on table, may push mask away or clinging to parent
4. Actively trying to get away, pushes with feet and arms, may move whole body; in waiting room, running around unfocused, not looking at toys or will not separate from parent, desperate clinging
9. Uncertain

B. Vocalizations

0. Cannot code (child not visible or cannot hear audio)
1. Reading (nonvocalizing appropriate to activity), asking questions, making comments, babbling, laughing, readily answers questions but may be generally quiet; child too young to talk in social situations or too engrossed in play to respond
2. Responding to adults but whispers, "baby talk", only head nodding
3. Quiet, no sounds or responses to adults
4. Whimpering, moaning, groaning, silently crying
5. Crying or may be screaming "no"
6. Crying, screaming loudly, sustained (audible through mask)
9. Uncertain

C. Emotional Expressivity

0. Cannot code (cannot see face or child not visible)
1. Manifestly happy, smiling, or concentrating on play
2. Neutral, no visible expression on face
3. Worried (sad) to frightened, sad, worried, or tearful eyes
4. Distressed, crying, extreme upset, may have wide eyes
9. Uncertain

D. State of Apparent Arousal

0. Cannot code (child not visible)
1. Alert, looks around occasionally, notices watches what anesthesiologist does with him or her (could be relaxed)
2. Withdrawn child sitting still and quiet, may be sucking on thumb or face turned into adult
3. Vigilant looking quickly all around, may startle to sounds, eyes wide, body tense
4. Panicked whimpering, may be crying or pushing others away, turns away
9. Uncertain

E. Use of Parents

0. Cannot code (child not visible)
1. Busy playing, sitting idle, or engaged in age appropriate behavior and doesn't need parent; may interact with parent if parent initiates the interaction
2. Reaches out to parent (approaches parent and speaks to otherwise silent parent), seeks and accepts comfort, may lean against parent
3. Looks to parent quietly, apparently watches actions, doesn't seek contact or comfort, accepts it if offered or clings to parent
4. Keeps parent at a distance or may actively withdraw from parent, may push parent away or desperately clinging to parent and will not let parent go
9. Uncertain

SELF-EVALUATION QUESTIONNAIRE

Developed by Charles D. Spielberger
in collaboration with
R. L. Gorsuch, R. Lushene, P. R. Vagg, and G. A. Jacobs

STAI Form Y.1

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment.* There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	Not at all	Somewhat	Moderately so	Very Much so
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

STAI- Form Y-2

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then choose the response that indicates how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

Please select your responses from the choices below:
1 = Almost Never
2 = Sometimes
3 = Often
4 = Almost Always

1. I feel pleasant	1	2	3	4
2. I feel nervous and restless	1	2	3	4
3. I feel satisfied with myself	1	2	3	4
4. I wish I could be as happy as others seem to be	1	2	3	4
5. I feel like a failure	1	2	3	4
6. I feel rested	1	2	3	4
7. I am "calm, cool, and collected"	1	2	3	4
8. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
9. I worry too much over something that really doesn't matter	1	2	3	4
10. I am happy	1	2	3	4
11. I have disturbing thoughts	1	2	3	4
12. I lack self-confidence	1	2	3	4
13. I feel secure	1	2	3	4
14. I make decisions easily	1	2	3	4
15. I feel inadequate	1	2	3	4
16. I am content	1	2	3	4
17. Some unimportant thought runs through my mind and bothers me	1	2	3	4
18. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
19. I am a steady person	1	2	3	4
20. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

modified CAMPIS-R

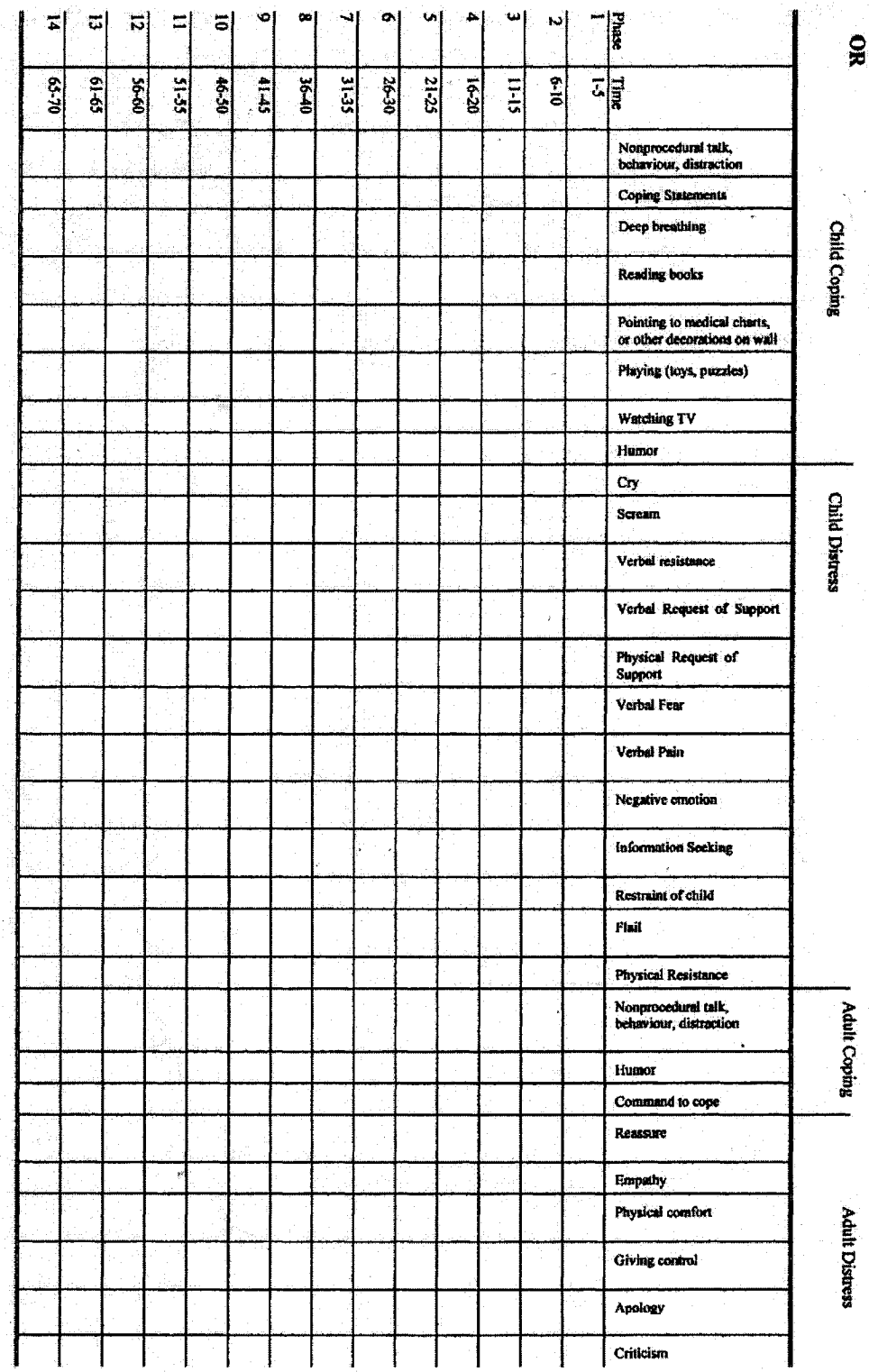
Part # _____ Coder _____ Date on tape _____

Scoring: for presence of behaviour

Baseline

		Child Coping								Child Distress											Adult Coping			Adult Distress					
Phase	Time	Nonprocedural talk, behaviour, distraction	Coping Statements	Deep breathing	Reading books	Pointing to medical charts, or other decorations on wall	Playing (toys, puzzles)	Watching TV	Humor	Cry	Scream	Verbal resistance	Verbal Request of Support	Physical Request of Support	Verbal Fear	Verbal Pain	Negative emotion	Information Seeking	Restraint of child	Flail	Physical Resistance	Nonprocedural talk, behaviour, distraction	Humor	Command to cope	Reassure	Empathy	Physical comfort	Giving control	Apology	Criticism
1	1-5																												
2	6-10																												
3	11-15																												
4	16-20																												
5	21-25																												
6	26-30																												
7	31-35																												
8	36-40																												
9	41-45																												
10	46-50																												
11	51-55																												

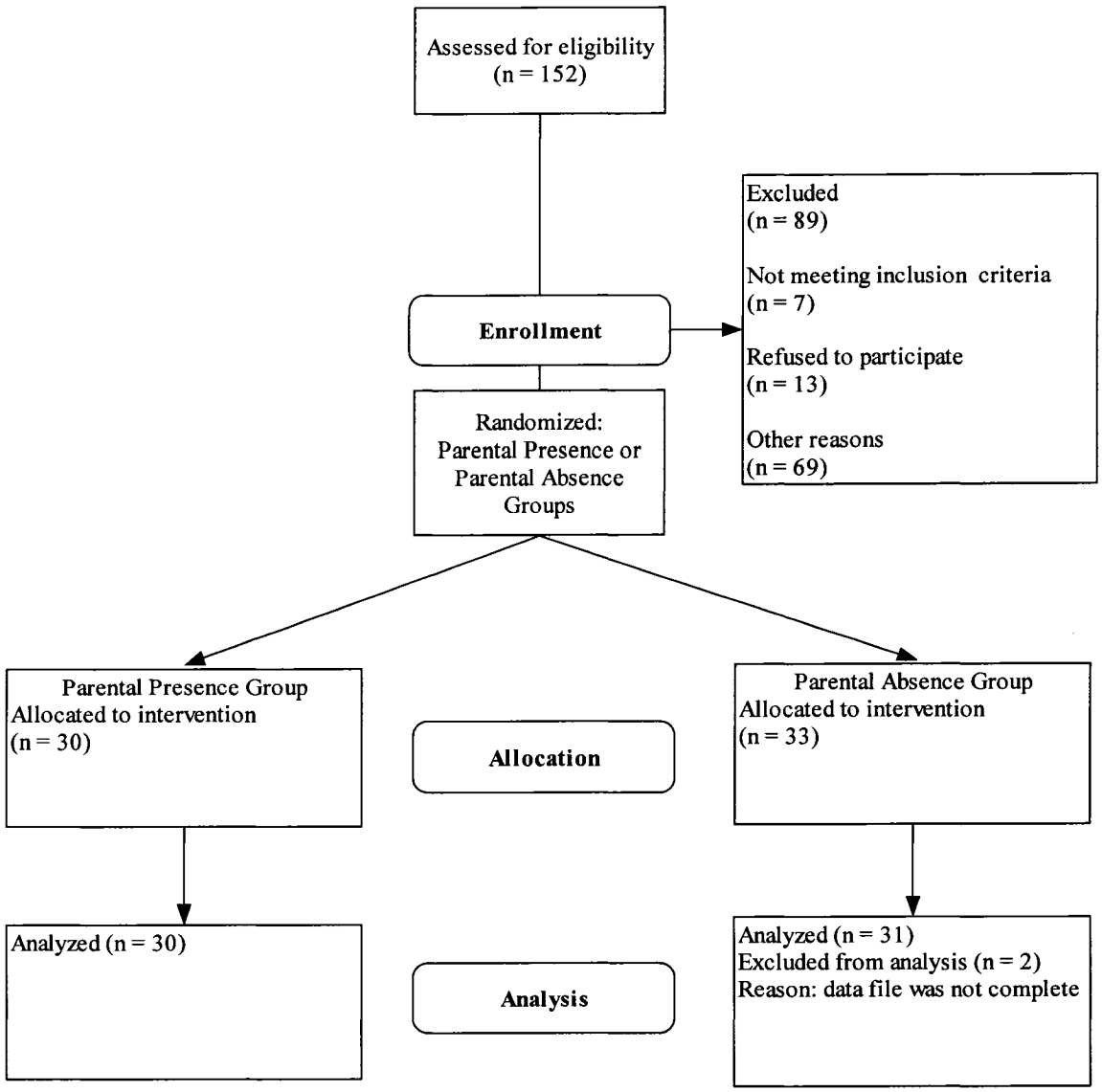
12	56-60																													
13	61-65																													
14	65-70																													
15	71-75																													
16	76-80																													
17	81-85																													
18	86-90																													


OR
Phase
Time
1-5
6-10
11-15
16-20
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61-65
65-70
Nonprocedural talk, behaviour, distraction
Coping Statements
Deep breathing
Reading books
Pointing to medical charts, or other decorations on wall
Playing (toys, puzzles)
Watching TV
Humor
Cry
Scream
Verbal resistance
Verbal Request of Support
Physical Request of Support
Verbal Fear
Verbal Pain
Negative emotion
Information Seeking
Restraint of child
Flail
Physical Resistance
Nonprocedural talk, behaviour, distraction
Humor
Command to cope
Reassure
Empathy
Physical comfort
Giving control
Apology
Critlcism
Child Coping
Child Distress
Adult Coping
Adult Distress

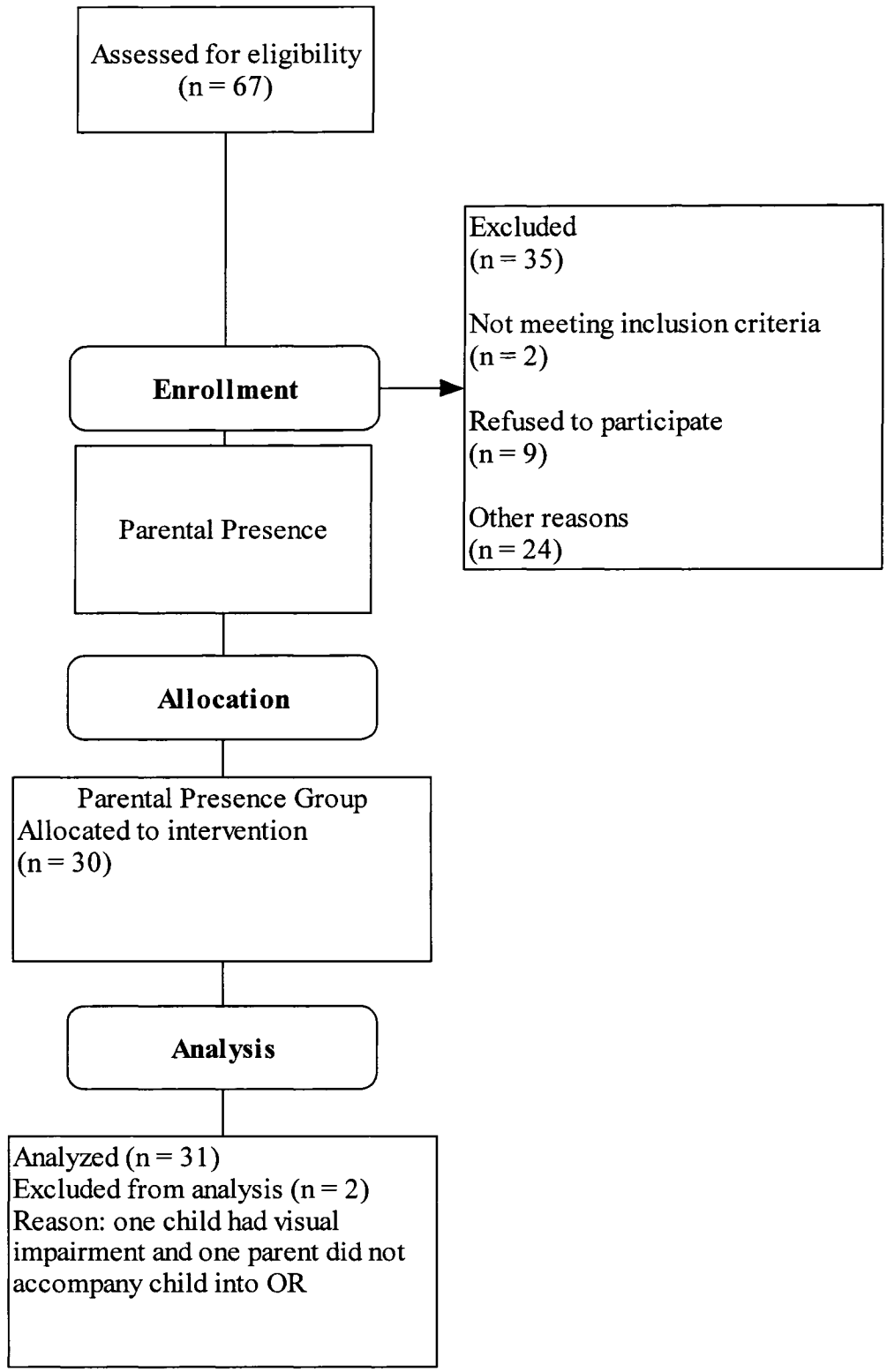
15	71-75				
16	76-80				
17	81-85				
18	86-90				

Appendix C
Flow-chart for Study Procedures

Studies 1 and 2 Flowchart



Studies 3 and 4 Flowchart



Appendix D
Ethics Approval Letters