PARENTAL POST-OPERATIVE MEDICATION ADMINISTRATION: INVESTIGATING PREDICTORS OF ATTITUDE

by

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Abstract

The Theory of Planned Behaviour (TPB) was used as a theoretical framework to elucidate the roles of beliefs and attitudes in the parental management of paediatric post-surgical pain. In essence, the TPB states that beliefs predict attitude, attitude predicts intention and intention predicts behaviour. Over the past 25 years, researchers have used this model to examine the extent to which attitudes (mediated by intention) predict behaviour. The evidence indicates that parents with negative attitudes will tend to undermedicate their children. However, that is not enough. To improve the in-home management of children's post-operative pain, researchers and clinicians need to understand why some parents have negative attitudes towards pain medications.

This thesis set out to determine if various factors, aside from beliefs, could reliably predict a parent's attitude toward administering pain medication to their child. Archival data from 236 parents who had a child undergoing day surgery at British Columbia's Children's Hospital were used. As anticipated by the TPB, it was found that the belief-based measure was a significant predictor of attitude. But contrary to expectations, variables relating to the parents' personal experiences with surgery were stronger predictors of attitude. These findings will aid in bridging the gap between the theory and practice of paediatric pain management.

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Introduction

Overview

In current pediatric practice, the prescription of appropriate doses of analgesic medication to children is the physician's responsibility. But when children come home from pediatric day surgery, the actual administration of the medication is left to the parents. By having children go home directly after surgery, a sharing in culpability for pediatric post-surgical pain is created. Despite an abundance of research supporting the safety of analgesics with children (Dahlstrom et al., 1979; McGrath, 1990; Sirkiä, 1998), recent work has found that children's pain is not being adequately controlled by parents in the home (Gedaly-Duff and Ziebarth, 1994; Finley et al, 1996; Sutters and Miaskowski, 1997). Understanding why parents are undermedicating their children appears to be a necessary step towards alleviating the incidence of post-operative pain. The majority of these studies reported that parental attitudes towards analgesics were important factors determining the pain management strategy chosen by the parents. This study proposed the Theory of Planned Behaviour (Ajzen, 1985) as a theoretical model that would help elucidate the role of attitudes in the parental management of their child's post-operative pain.

Attitudes are defined by Ajzen, as the overall evaluations of the behaviour by the individual engaging (or contemplating whether to engage) in the behaviour . Over the past 25 years, researchers have shown that attitudes toward a specific behaviour exert a significant impact upon the likelihood of performance of that behaviour (Ajzen,1999). Furthermore, Ajzen stated that beliefs about the behaviour in question, will predict the attitude or overall

evaluation of the behaviour. Given the predictive utility of the attitude concept, this thesis set out to establish alternative factors that would predict a global parental attitude toward pain medication administration.

Literature Review

Medication Compliance

Definition. Within the Canadian healthcare system, physicians are entrusted with the prescription of medication. But once the patient leaves the office, adherence to a medication regime, otherwise known as medication compliance, is solely the obligation of the individual patient. One substantial exception to this scenario would occur when the patient is incapable of self-administering medication, as in the case with children and many physically or intellectually impaired adults. In these cases, medication compliance is mainly the responsibility of parents and/or caregivers. Despite modern advances in medication efficacy (potency under ideal behavioural conditions), medication effectiveness (effect of medication under normal conditions of use) is seriously hampered by drug noncompliance (Coambs et al., 1998). The importance of following a prescribed medication regime, is clearly demonstrated with the case of analgesic medications.

Importance of adherence to scheduled analgesic regimes. There are two main types of schedules used when administering a pain medication (Melzack,1990). The first would be the *pro re nata* (PRN) or "as needed" method, whereby patients are given medication when it is determined by caregivers (or patients themselves) that their pain is sufficiently severe as to warrant use of analgesics. The second approach would be a scheduled regime of pain medication, whereby pain is controlled continuously by analgesic dosages delivered on a

time-contingent basis.

One theoretical, empirical, and ethical criticism of the PRN approach to pain relief has been aptly described by M. Angell (1982), when she wrote to colleagues in the *New England Journal of Medicine* that this method must be stopped for humanitarian reasons. She explained that a patient must be in the throes of pain before treatment is administered, but to be in this type of pain is "soul destroying" (p. 99). Ronald Melzack (1990), a distinguished McGill psychologist and pain researcher for some 40 years, endorses the scheduled administrations of analgesics as the "enlightened and preventative" (p. 3) approach to treating pain. According to this method, regularly scheduled doses that have been titrated for each individual patient are administered to prevent the recurrence of pain. Thus pain is controlled continuously and a patient does not wait for their discomfort to first resurface, and then be treated, as is the case with the PRN method.[1] Other benefits of compliance to a scheduled analgesic regime, heralded by Melzack, include reductions in analgesic medications needed thereby reducing mental clouding and other side effects (Melzack, 1990).

The need to adhere to a scheduled analgesic regime is of even greater importance with children. Within the standard PRN regimen of analgesic delivery, the onus is on the patient to either directly or indirectly communicate to caregivers that they are in pain. Even with adults this responsibility is problematic and a reluctance to request analgesia appears to be commonplace (Lavies, 1992). Mather and Mackie (1983) noted upon surveying 170 children recovering from surgery, that children rarely asked for pain medication because they

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[1] Although deeply entrenched within the principles of recommended medical practice, little empirical work has been done proving how much more effective a scheduled regime is during the post-operative period (Pillai & Craig, in preparation)

believed they had to put up with the pain and they did not know that pain relief was available to them. As well, a fear of needles would cause a denial of pain in the worst cases. Furthermore, it was found that children who appeared to be "coping well" and apparently were not in pain (watching TV, reading, quietly lying in bed) would state after direct questioning, that they were actually in pain. Given children's reluctance to admit pain or ask for analgesics, and their frequent inability to articulate their needs (Craig, 1992), parents often must judge pain severity and analgesic needs. Parents most often underestimate their children's pain (Knight, 1994; Chambers et al., 1998), although there has been one instance of overestimate (Chambers et al., 1999)

Inadequacy of Post-operative Pediatric Analgesic Regimes

Undermedication by medical professionals: Past.

In 1968, pediatric experts L. Swafford and D. Allen instructed physicians,

> pediatric patients seldom need relief of pain after general surgery. They seem to tolerate discomfort well. The child will say he does not feel well, or that he is uncomfortable or wants his parents, but often this unhappiness will not relate to pain (p. 133).

These words of advice were based on their intensive care unit experience, where they found that only 26 of 180 of their pediatric intensive care patients had received any analgesia, and no children had suffered any fatalitites. The absence of fatalities is an unsatisfactory basis for the conclusion that children do not need pain management post-operatively.

Eland and Anderson (1977) shocked the medical community with their classic chart review study comparing the analgesic doses administered to adults and children. After

having matched 18 adults to 18 children who had undergone similar surgical procedures (e.g. limb amputation, heart repair and excision of a malignant tumour), they tallied the total amount of analgesic doses dispensed to both the adult and child sample. While each adult received an average of 34.28 doses post-operatively, each child only received an average of 1.33 doses post-operatively.

Subsequent to the Eland and Anderson study, other researchers replicated their results, indicative of the wide-spread discrepancy between adult and pediatric pain control (Mather & Mackie, 1983; Beyer, DeGood, Ashley & Russell, 1983; Gadish, Gonzalez & Hayes, 1988). Schecter, Allen and Hanson (1986) performed a comparable study, but sought to further the validity of these results by conducting the study under a more stringent methodological framework. Length of stay, type of hospital, and type of surgery were controlled in both the adult and child populations. It should be noted that when choosing surgery types to include in their study, the decision was not merely nominal. Similar types of surgery can be performed on adults and children for different reasons. Thus, the four types of surgery (hernias, appendectomies, burns, and fractured femurs) included in their study were selected because they represent nearly similar pathophysiologic problems and invasive procedures in children and adults. Even with the more rigid controls, the bottom line remained constant: children and adults were given significantly different analgesic dosages. Per day, children received about 50% less analgesia (1.08 doses vs. 2.2 doses). It was also found that the longer the patient stayed in hospital, the greater the discrepancy between child and adult opioid administration. Thus, the more severe the illness/surgery, the greater the likelihood a child's pain would be under treated. The authors proposed that nurses and

physicians have incorrect beliefs (such as children become addicted to pain medication or suffer frequent opioid side effects) and that these beliefs could inhibit the prescription and dispensing of adequate pain medication.

More recently, Bauchner, May and Coates (1992) assessed the use of analgesic agents for minor surgical procedures by surveying directors from 38 pediatric intensive care units and 31 neonatal intensive care units. Results indicated that the treatment of children older than newborns was significantly superior to the care for neonatal pain, but that it was still not adequate. While the impact of bone marrow aspirations, central line placements and chest tube insertions was regularly handled with analgesia, other procedures such as lumbar punctures, suprapubic bladder aspirations and intravenous cannulations were routinely not performed more than 50% of the time, in conjunction with pain-relieving medication.

Undermedication by medical professionals: Present From 1968 to roughly 1992, a review of the studies on pediatric post-operative pain showed that these studies entailed mainly documentation and comparison. It appears to have been a period of discovery that children and infants do in fact experience significant pain and that, when compared to adults, children's treatment could be considered sub-optimal at best and abusive at worst. During this time period, articles either reported average doses or described the average levels of pain that children were feeling after surgery, but these two areas of interest were not put together. Pain is a variable experience and the majority of articles were not clear in depicting that it was the children who were in clinically significant pain (and thus the ones who needed analgesics) who were the ones being undermedicated. What use would it be to assert that no analgesics were administered, if it was not first set out that pain was present? Current

research with health professionals is beginning to address this issue.

Tesler, Wilkie, Holzemer and Savedra (1994) provided one of the first studies to put these two pieces of the puzzle together to generate a more definitive statement on the status of pediatric pain control. Like other researchers in the late 1980's and early 1990's, it was found that the actual number of children who received any analgesic post-operatively had vastly improved over prior decades. Yet, within the hospital setting for this study, it was still found that problems existed in both the prescription of pain medication and its administration. Sixteen percent of the children had doses of morphine prescribed that were below the recommended range and only 46 of 104 children actually received any IV morphine on day 1 post-operatively, despite its having been prescribed. It should be further noted, that of these 46 children, 43% of them received a morphine dose below the recommended range, despite the majority of these children describing their pain as "moderately severe". Thus, a problem was elucidated in regards to how the nurses' balanced their interpretation of the written prescription with their judgements of patients' pain.

A Danish study by Rømsing et al. (1996) elaborates this point. One hundred children were asked to rate their pain on the morning after tonsillectomy surgery. Two nurses were also asked to rate how much pain they believed these children were experiencing. Both nurses and children were asked to repeat this procedure two hours later, based on the assumption that the acetaminophen had taken effect. It was found that although the ratings between children and nurses were correlated (r =. 35-.43), nurses grossly overestimated the relief provided by the analgesic. While children's ratings went down by 17%, nurse ratings went down by 55%. If nurses are overestimating the analgesic pain relief that they are

providing to their patients, this could offer one possible explanation why children are not receiving sufficient analgesia from nursing staff. Chambers et al. (1998) demonstrated that the use of correlations for comparing interrater similarity leads to overestimates of judges' correspondence in their ratings. The use of the kappa statistic in this article might better represent the data collected.

It should also be noted that ratings made by nurses were on a visual analog scale (VAS; 10 centimetre horizontal line with anchors "No Pain" and "Pain as bad as it could be"), while ratings made by the children were made using the Poker Chip Tool (uses four red chips to represent "pieces of hurt"; the more chips the child chooses the more pain the child feels; Hester, Foster & Kristensen, 1990). Thus, problems with congruence of scales may have emerged.

Cummings, Reid, Finley, McGrath, and Ritchie (1996) conducted an epidemiological investigation of pain and its management within a Halifax pediatric hospital. Via direct interviews with 200 patients and/or their parents and a review of their charts, it was found that the level of under managed pain was cause for concern. Pain levels in this study were measured using the Bieri Faces Scale (1990), a series of seven hand-drawn faces increasing in intensity of pain expression. Once again it was found that children were given significantly less medication than was prescribed, regardless of their reported pain level. Even more shocking to the researchers was that over half of the subjects reporting clinically significant levels of pain (defined by researchers as selection of the third face from the left or greater) did not receive any medication. Lastly, it was also disconcerting that 23% of subjects reported that no one helped them with their usual or worst pain. Other studies reiterate the

same point. Boughton, Blower, Chartrand and Dircks (1998), reported that 25% of their pediatric sample (n=86) received no pain intervention despite it having been prescribed. Hamers, Abu-Saad, van den Hout, and Halfens (1998) also performed a literature review of several articles in this area and came to the same conclusion. Children in pain are being under medicated in hospitals. There have been some improvements and there is no doubt that pain management will be exemplary in some settings, but there is no documentation of a widespread improvement in the field.

Undermedication by parents and caregivers: Past and present. Due to modern advances in medical technology and economic necessity, paediatric day surgery is commonplace. It is now often possible to avoid the psychological trauma and physiological complications children sustain with extended hospital stays (Bennett-Branson and Craig, 1993; Bartley & Connew, 1994; Gedaly-Duff & Ziebarth, 1994; Craig, Lilley and Gilbert, 1996) by performing surgeries on an ambulatory basis. By having children go home directly after surgery, a sharing in the responsibility of pediatric post-surgical pain is occurring. In many cases, parents and caregivers are now bearing the new-found responsibility of medicating their children directly after surgical procedures.

Gedaly-Duff and Ziebarth (1994) conducted multiple, intensive interviews with seven mothers whose children had undergone adenoid-tonsillectomy day surgery. Overall, it was found that children's pain lasted up to two weeks post-operatively, with the greatest pain within 12 to 36 hours after discharge from hospital. Pain management questions elicited evidence that some mothers feared that their child would become addicted to the acetaminophen or codeine they were administering. This was especially noticeable because

most of the mothers tried to stretch the time between analgesic doses to reduce the total amount given.

That same year, another study examined problems parents were having when caring for their children after a day-stay tonsillectomy (Bartley & Connew, 1994). Parents of 52 children were interviewed twice (day after surgery; 10-14 days after surgery). Despite every child in the sample receiving a prescription for acetaminophen elixir, 90 % of children experienced substantial post-operative pain, while 12% of these children reported that their pain was not manageable with the medication prescribed to them. It was not clear in this article whether the pain experienced by the remaining 78% of the children was due to inappropriate prescription by the physician or inappropriate administration by the parents.

A larger, more in-depth study was performed by Finley, McGrath, Forward, McNeill and Fitzgerald (1996). It is interesting to take note that in this study, many children were considered too young to self-report their pain (two to five years old), thus parental ratings were used. Despite children being in clinically significant pain (as rated by their parents), the number of doses of medication given appeared to have little relationship to the degree of pain. Most parents administered only one to three doses of acetaminophen in 24 hours, much less than the maximum safe dosage. Once again the fact that many parents believe that they should use "as little medication as possible" surfaced and a call for scheduled medication (not PRN) was made.

Sutters and Miaskowski (1997) found that an average of 3 doses of an analgesic were administered to children post-operatively by their parents and that 56.9% of the parents administered less than half of the safe dose for 24 hours, despite the majority of parents

(74%) rating their child in moderate to severe pain. But it was also found that 93.7% of the prescriptions written for pain relief were below the recommended dose (by body weight) as dictated by the Acute Pain Guidelines (Acute Pain Guideline Panel, 1992) alluding to problems both within the hospital and within the home.

The abundance of research negating myths such as "children do not feel pain", "children become more readily addicted to analgesics" and "narcotics always depress respiration in children" (Eland & Anderson, 1977; Gadish, Gonzalez & Hayes, 1988; McIlvaine, 1989; Lavies, 1992, Sirkiä et al., 1998) is insufficient. Exposés in medical journals are not enough. It appears evident that to change health behaviours, not only is more information necessary but better ways are required to disseminate information about best practices to parents, as well as developing interventions that would ensure delivery of needed medications. One way to more effectively disseminate information, is to better understand the population that would be targeted for dissemination. The following section reviews the literature examining how parents' attitudes impact their medication administration practices.

Reviewing the Attitude-Behaviour Relationship with Parents' Medicating Behaviours

Becker, Drachman and Kirscht (1972) conducted one of the first studies, attempting to use factors (among which was attitudes) to predict mothers' compliance with pediatric medical regimens. One hundred and twenty-five mothers were randomly selected from a population of mothers with children receiving treatment for otitis media (ear infection). Three measures concerning the behaviour of administering medication were used. The first measure elicited beliefs pertaining to their willingness to follow through with the medical advice and intervention and the second measure was the response to the question "I try to do

exactly what the doctor tells me to do, without question". The third measure was based on the response to a question concerning how efficacious mothers felt the medicine was for their child's infection. All three measures were significantly related to the criterion behaviour. But when all other factors were taken into consideration (demographics, beliefs about barriers, general medical beliefs), the first two measures mentioned were among the strongest predictors of the mother's administration of the medication.

A study by Austin (1989), with 29 parents of children with epilepsy, offered evidence that an attitude about a behaviour could be just as effective a predictor of behaviour as intention (whether one intended to perform the behaviour). These parents were asked their beliefs to try to predict their compliance with use of anticonvulsant medication. Using the Theory of Reasoned Action as a framework, it was found that although intention did predict behaviour, attitude actually accounted for unique variance of medicating behaviour, not accounted for by intention. According to the Theory of Planned Behaviour (described below) one would not expect attitude to account for any variance that was unaccounted for by intention.

A study by Forward, Brown and McGrath (1996) directly targeted mothers' attitudes toward pain medication and their behaviours. From a review of the literature, a 20-item scale was developed entitled the Attitudes to Pain Medication Questionnaire (APMQ; more details given in subsequent section on measures selected for this thesis), to measure mothers' attitudes towards using acetaminophen (common brand name: Tylenol) with their children. A factor analysis was performed on the APMQ yielding four stable factors concerning addiction, side effects, tolerance and drug abuse. These factors were used in a subsequent

correlational analysis with actual medicating behaviours. It was found that mothers with more positive attitudes toward medications (on all four factors) were more likely to medicate for everyday pains and would give medication at lower levels of pain. However, due to a methodological oversight regarding the questionnaire, its correlational ability with medicating behaviours could be construed as limited. The questionnaire was framed for mothers within the context of 5-12 year old children. According to Ajzen's theory, the predictive utility of the measure would have been greatly increased had the questionnaire asked parents their opinions about their own children.

Recently, Chambers et al. (1997) found that parental attitudes towards pain medications were predictive of the total number of post-operative analgesic doses given to their child in a day. Attitudes were gathered from parents using a 13-item scale designed to determine parents' evaluations of statements regarding side effects, tolerance, addiction and drug abuse. With the 82 parents in this study, significant correlations between attitude and behaviour were found on the two days directly following surgery.

All these studies clearly display that attitudes are an important factor to consider when trying to understand the context of parental administration of post-operative analgesia. The next section provides a brief introduction to the concept of 'attitude'.

Conceptual Background for the Attitude Concept

Attitude came into the English language vocabulary in the early 1700's. It developed from the Latin "aptus" which meant adaptedness or fitness (Perloff, 1993). Allport (1935, p. 798) stated that "attitude is the most distinctive and indispensable concept in contemporary social psychology".

Definition: The popularity of the attitude concept within the milieu of psychology has waxed and waned. But due to better measurement techniques and stronger proof of predictive utility, the concept has made a strong comeback from the pessimism and decline in interest that characterized the late 1960s and 1970s (Ajzen, and Fishbein, 1977; Chaiken and Stangor, 1987). Despite the resurgence of interest in this area of study, the controversy voiced by Rhine (1958) that "a single meaning of attitude upon which there is close agreement is not available" has not changed much in recent times. As Manstead (1996) concurs, "there is no universally accepted definition of attitude". In light of this definitional variation, researchers have attempted to offer blanket definitions that they feel the majority of social researchers would accept. Manstead (1996) states that the term attitude refers to "a relatively enduring tendency to respond to someone or something in a way that reflects a positive or negative evaluation of that person or thing". Perloff (1993) states that "there is consensus that an attitude is a learned, enduring, and affective evaluation of an object that exerts a directive impact on social behaviour". While Olson and Zanna (1993) state that "we think that most attitude theorists agree that a) evaluation constitutes a central, perhaps predominant aspect of attitudes b) attitudes are represented in memory and c) affective and cognitive and behavioural antecedents of attitudes can be distinguished, as can affective, cognitive and behavioural consequences of attitude" (Olson and Zanna, 1993). It is evident that discrepancies surface regarding what researchers purport the agreed upon components of attitude are. A clear illustration of this point is the incongruence of Perloff's notion that attitude is an "affective evaluation", while Olson and Zanna consider the evaluative component of attitude as distinct from the affective component. Given this thesis is

pragmatically driven, a clear, operational definition of attitude that is reflective of the social psychology literature was desired. Thus the fact that most investigators appear to agree on the basic concept that a person's attitude represents an evaluation of the entity in question (Rhine, 1958; Ajzen and Fishbein, 1977; Wilson and Hodges, 1992; Ajzen and Sexton, 1999), this concept will be used for the term 'attitude' in this thesis.

One final definitional comment must be made to avoid further confusion. As examples that have preceded and that will follow show, some researchers use the terms beliefs and attitudes interchangeably (e.g. the belief measure intended for use in this analysis is called the Attitudes to Pain Medication Questionnaire) . The term 'attitude' refers to a global evaluative statement (e.g. I think health behaviour models are useful for predicting parental post-operative behaviour). The term beliefs is distinct, and refers to the association one makes about the various characteristics, qualities and attributes of an object (e.g. health behaviour models are predictive, are easy to understand, etc).

Functions: According to Olson and Zanna (1993) attitudes serve two functions, value expression and object appraisal. Value expressive attitudes communicate important values and/or are held to seek social approval. Object appraisal attitudes stem from the representational nature of attitudes and facilitate the categorization of objects and events. In a more elaborate statement, Perloff (1993) states there are five main functions of attitudes. First, the Knowledge function dictates that attitudes help us interpret the world around us. They help us make sense of ambiguous or unpredictable occurrences. The second function, Utilitarian, denotes that attitudes also help us gain rewards and avoid punishment. Thirdly, the Social-Adjustive function describes how attitudes help us relate to or adapt to social

reference groups. The next function, labelled Ego-Defensive, explains that attitudes can help protect individuals from having to acknowledge unpleasant truths about themselves or about the external world. Finally the fifth function is Value-Expressive and prescribes that attitudes help individuals express their central values. It should be noted that these two conceptualizations of attitude function are not really in opposition. It appears that Perloff's definition merely tenders more specific functions, as opposed to Olson & Zanna's more broad-based functions.

Attitude Structure

The Tripartite Approach: According to this view, attitudes consist of three subcomponents: cognitions, feelings and behaviours. Research has shown that affect, cognition and behaviour can appear as distinctive components. But this model depends on the fact that all attitudes are associated with a behaviour. Perloff (1993) stated that research has shown that under certain conditions, attitudes are not associated with behaviour. This is one of the main reasons why many researchers do not subscribe to this view of attitude structure.

Expectancy-Value Model: The Expectancy-Value theory was originally posited by Fishbein (1963), to explicitly depict the relationship between beliefs and attitudes. This model states that a person's attitude towards a behaviour will be a function of the person's beliefs that performance of the behaviour will lead to a set of consequences and the person's evaluations of those consequences.

$$A_o = \sum_{i=1}^{n} b_i e_i$$

An explanation of the symbols in this formula follows. A_o is the attitude toward some object, *O*. The symbol 'b_i' represents *i*th probability belief about *O*, i.e. the subjective probability that *O* is related to attribute *i*. Next, 'e_i' is the evaluation of attribute *i*- positive evaluations defined by "+" and negative evaluations defined by "-"; and finally 'n' is the number of beliefs. According to this model, attitude is a function of the strength with which one holds these beliefs and his/her evaluations of this belief. In simpler terms, Ajzen and Fishbein (1980) stated that through measurement of belief strength and evaluations with respect to modal salient beliefs, an individuals attitude can be predicted. A practical example of this model could be constructed from the analgesic administration situation. Suppose a parent has an attitude regarding how helpful a pain-relieving medication would be for relieving their child's pain. Assume that they held the following beliefs, analgesics are addictive and analgesics have many side effects. Assume further they believed that the probability of those beliefs occurring with their children (i.e. their child would get addicted, their child would have many side effects) was very high. According to this model the negative beliefs coupled with the high subjective probability would predict that a person would have a strong negative attitude towards pain medication. This model explicitly accounts for how people that have similar beliefs can have different attitudes, as their personal appraisal of how likely that belief is to occur could be varied.

One point should be clarified about this model. According to its formulaic outlay, it could erroneously be presumed that attitudes would increase indefinitely with the addition of new positive beliefs (the $\sum$ sign, would indicate that by increasing the number of beliefs, the attitude would simply get higher or lower). Through their research with this concept,

Fishbein and Ajzen (1975) indicate that as beliefs get less salient, they contribute to less of the total attitude. They see a ceiling effect occurring after a certain number of salient beliefs have been elicited. They state that the number of beliefs required before a ceiling effect occurs depends on the attitude under investigation.

This discussion regarding the definition and structure of attitudes provides the foundation of the central purpose of this thesis, to find alternate predictor of attitudes. But as important as attitudes are to behaviour, they are not the only factor to consider. Researchers have attempted to place the role of attitudes (and beliefs) within the contexts of more comprehensive models. Fishbein and Ajzen (p. 5, 1975) state that "the meaning of a concept such as attitude emerges only within the framework of a general theory". Accordingly, the next section addresses widely-used models available to understand health behaviours.

Health Behaviour Models

Predicting health behaviours, such as the delivery of analgesics to others, is by no means a challenge recently undertaken. Health behaviour models have been postulated to try to discern what factors predict certain health behaviours. An ability to predict whether people will or will not engage in certain health promotion actions would allow the development and implementation of preventive interventions to eliminate unnecessary pain and suffering. The next sections review the literature surrounding health behaviour models, explain the model chosen for this thesis (Theory of Planned Behaviour), and focus on the importance of the attitudinal component of this model as applied to analgesic compliance.

Three main research models have been created and modified to predict health behaviours : trait models, health belief models and the theory of reasoned action/planned behaviour.

Trait models. The first systematic attempts to predict health behaviours were the trait models which attempted to discern the relationships between common, stable characteristics of patients such as level of self-discipline . They were mainly univariate in nature, and were generally not found to be consistent predictors of behaviour (Coambs et al., 1998). They failed to consider the important impact of situational factors which influence whether behavioural dispositions are executed in behaviour (Endler, 1969).

Health Belief Model. According to Rosenstock (1974), the Health Belief Model (HBM) was developed by a number of independent investigators during the 1950's and 1960's as they each confronted practical problems that affected population health. He described these decades as "prevention oriented" as opposed to "treatment oriented", thus the model that finally emerged was created to explain and predict preventive health behaviours. Intrinsic to the Health Belief Model, as described by Rosenstock (1974), was the belief that it is an individual's unique perception of the world, based mainly on "ahistorical dynamics" (current circumstances), that determines what he/she will do. The model, as developed by Becker et al. (1974) has six main components: perceived susceptibility, perceived seriousness, demographic variables (modifier variable), cues to action (modifier variable), benefits of action and barriers to action (see Figure 1, next page). The model argues that, if an individual feels vulnerable to the disease (susceptibility) and is concerned with the severity of the disease (seriousness), he/she would perceive the threat of the disease, which increases the likelihood

they would undertake the recommended preventative health action, if the perceived benefits of that action outweighed the barriers to that particular health action. It is assumed in this model that demographic, sociopsychological and structural variables (i.e. age, personality, knowledge of illness) and the cues to action component (examples of cues to action would be any internal or external trigger that necessitated action, such as media campaigns, the illness of a close friend, perception of a somatic symptom) would moderate the perceived threat, the benefits and the barriers component.

Maiman, Becker, Kirscht, Haefner and Drachman (1977) modified the original model to include a dimension of "general health motivation", in order better equip the model to handle predictions of behaviours outside the domain of preventative health actions. (i.e. chronic illnesses). This dimension is based on an individual's health concerns and practices that are seen as relatively nonspecific and stable across situations. By the late 1970's and early 1980's, numerous studies with various populations had shown the predictive utility of both the whole model and of its parts (Becker, Drachman & Kirscht, 1972; Maiman, Becker, Kirscht, Haefner & Drachman, 1977; Janz & Becker, 1984).

Limitations of the Health Belief Model. Numerous criticisms of this model have been offered. First of all, what is most noticeable when one examines the research that has used this model is that the way it has been operationalized varies widely. How the variables are defined and are combined to predict behaviour tends to vary considerably. Connor and Norman (1994) have stated that the Health Belief Model is more a collection of relevant variables than a systematic theory.

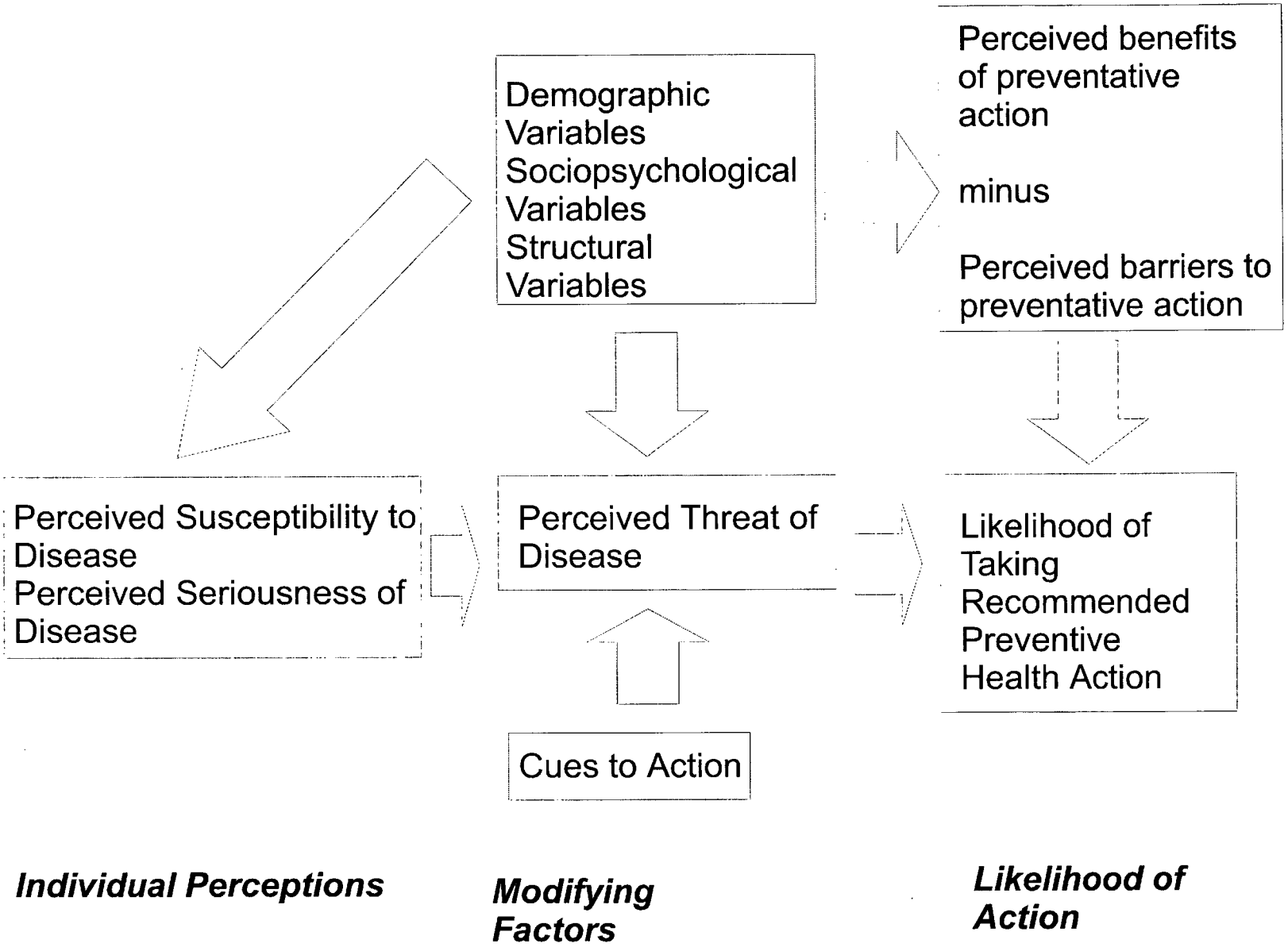

Figure 1: The Health Belief Model (Becker, Drachman and Kirscht, 1974)

A second criticism has been that the HBM does not factor into the model any construct relating to how one has combined all the various beliefs and their respective evaluations of that belief (severity, susceptibility, disease threat, benefits and barriers) in an overall appraisal of whether one would intend to perform the behaviour. Another limitation of the model would be that normative beliefs or one's perception of how others believe we should behave are not included in the model. Following a predictive validity study, Calnan and Rutter (1986) say that the small amount of variance in behaviour accounted for by the HBM was due to the fact that the model only considers a person's 'private' beliefs and does not incorporate the influence of normative beliefs. This sentiment was reiterated by Feigelmen et al. (1993) as the predictive utility of the HBM was limited because it did not properly take into account the effect of socio-demographic, cultural and economic characteristics of the participants. A final criticism of this model concerns the component "cues to action". Janz and Becker (1984) stated that this construct is one of the most understudied HBM variables. This variable is extremely difficult to operationalize for research. For any given health behaviour the specific cue(s) to action and the salience of these cues would vary from person to person. As "cues to action" appear to be a function of individual differences, the ability for a researcher to adequately measure the relationship between "cues to action" and the likelihood of a person undertaking a behaviour seems to be improbable. Therefore, the problems regarding the overall structure of the model and its primary focus on a person's 'private' beliefs necessitated the investigation of a possible alternate model.

The Theory of Planned Behaviour This theory is an extension of the Theory of Reasoned Action posited by Ajzen and Fishbein (1977, 1980). The original theory was based on the supposition that human beings, on the whole, are rational and will make use of information available to them. The ultimate goal was to explain and predict behaviours under volitional control. The Theory of Reasoned Action posits that if one wants to predict behaviour, the only component necessary to measure would be 'intention' or whether an individual actually intended to perform the behaviour (Ajzen & Fishbein, 1980; Kirscht, 1999). But if one wanted to understand why a behaviour was occurring, for the purposes of intervention, it was necessary to understand what predicted intention. According to this theory, intention was made up of two components 'attitudes' and 'subjective norms'. A subjective norm was defined as " the person's perception of the social pressures put on him or her to perform or not perform the behaviour in question" (Ajzen, 1980, p. 6). An attitude was defined as a person's evaluation of the behaviour in question and was described as emerging from the beliefs people hold about the object of the attitude. In terms of behaviours, it was clearly laid out that, in order to elicit a predictive attitude towards a specific behaviour, the attitude would need to match the behaviour in terms of four elements: action, target, context and time (Ajzen & Fishbein, 1977).

This means that the behaviour and the attitude elicited about the behaviour should be parallel in four areas. Explanation will be offered in the form of an example. To attempt to predict the behaviour of a parent administering a pain medication to their post-operative child at home, one would need to ask parents their attitude about administering a pain medication (action), to their child (target), when they are at home (context), after an operation (time).

An example of a study that clearly illustrated the impact of these elements was performed by Schecter, Bernstein, Beck, Hart and Scherzer (1991). They conducted a study that concluded that parental attitudes did not significantly predict children's response to pain. Sixty-five families were interviewed prior to receiving a routine immunization and then the child's pain was measured using a standardized observation scale (Procedure Rating Scale-Revised; Katz, Kellerman & Siegel, 1985). Parents were asked their opinions about children's ability to handle pain and the role they see parents playing in comforting children in pain. No significant correlations were found between parents' attitudes concerning children's pain and the distress responses of their children. According to Ajzen and Fishbein, the lack of relationship between parental attitudes and children's distress was inevitable. Attitudes are only significant predictors of behaviours under the volitional control of the person. A child's pain experience, although subject to mediation by parental attitudes, is not under the direct control of parents. Furthermore, the attitudes elicited regarding the beliefs of children's pain in general and the beliefs about parents' roles in general, do not match the "action", "target", "context" nor "time" of the behaviour.

The Theory of Reasoned Action does appear to show consistent predictive utility in other investigations. Spurred on by reports of low or nonsignificant relations between attitude and behaviour, Ajzen and Fishbein conducted an exhaustive literature review in *Psychological Bulletin* (Ajzen and Fishbein, 1977). They found that poor relationships in the literature were due mainly to low or partial correspondence between the elements (target, action, context and time) of the behaviour examined and the attitude chosen to predict that behaviour. When properly constructed attitudinal measures were used, they found that

attitude was significantly related to behaviour (assuming there is a high correlation between intention and behaviour). They concluded that their model was faring well against scientific scrutiny (Ajzen & Fishbein, 1977).

But the premise of volitional control became problematic for Ajzen. Recognizing the limitations of the model in situations which people have incomplete control, the additional component of 'perceived behavioural control' (PBC) was added to the model to create the Theory of Planned Behaviour (see Figure 2, next page).

Strongly influenced by Bandura's concept of perceived self-efficacy (personal judgements about how well one can execute courses of action required to deal with prospective situations; 1982), Ajzen (1991) stated:

> The importance of actual behavioural control is self evident: The resources and opportunities available to a person must to some extent dictate the likelihood of behavioural achievement. Of greater psychological interest than actual control, however, is perception of behavioural control and its impact on intentions and actions. (p. 183)

The theory of planned behaviour postulates that perceived behavioural control (PBC), together with behavioural intention, could be directly used to either predict the performance of a behaviour or could by itself mediate the factor of intention. Depending on the level of actual control, both perceived behavioural control and intention can directly predict behaviour, but the weighting of their importance in the model will vary. Numerous studies utilizing the new model (Ajzen, 1991; Beale and Manstead, 1991, Armitage and Connor, 1999) found that the predictive value of the new model had increased.

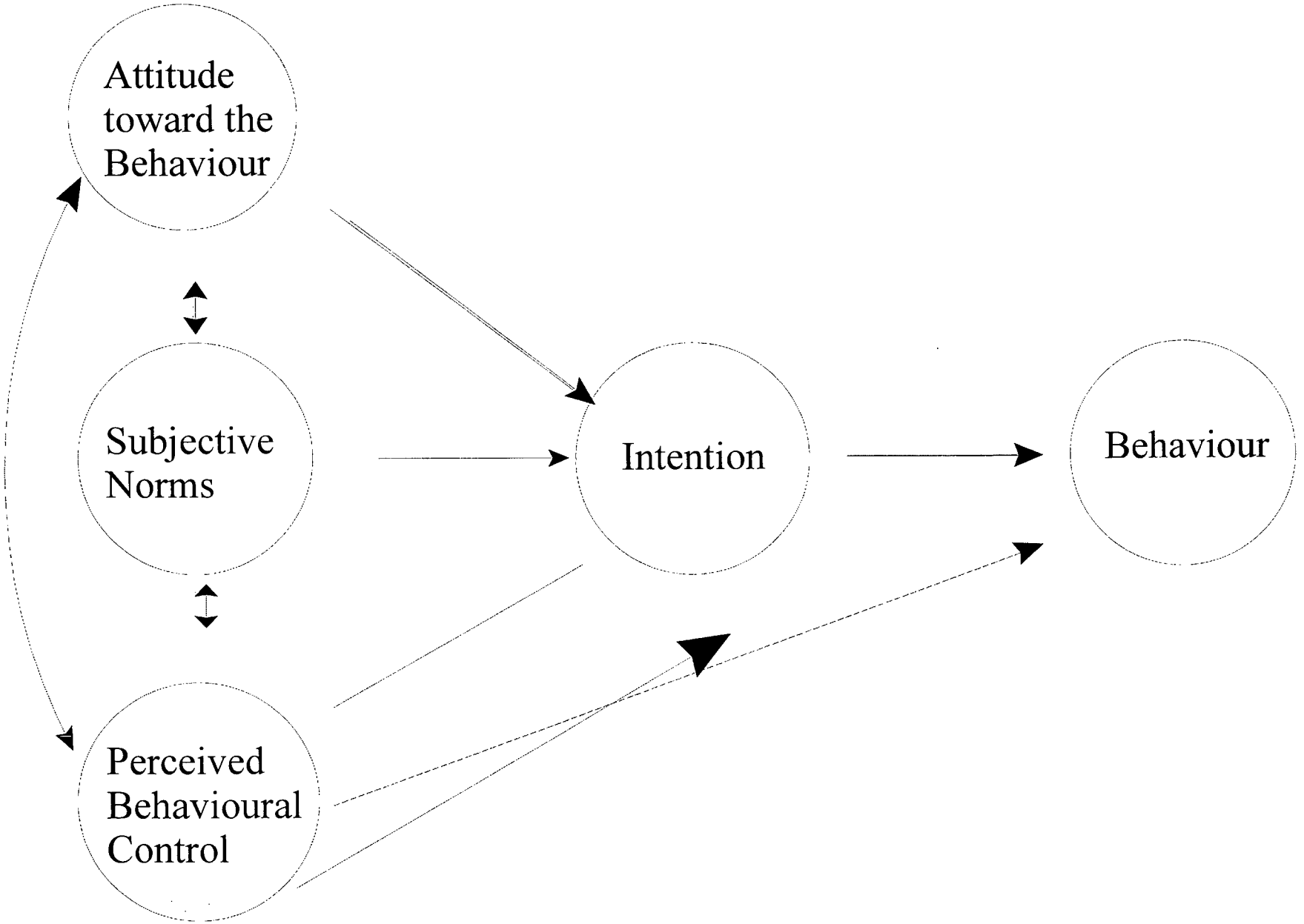

Figure2. The Theory of Planned Behaviour (Ajzen, 1991)

Limitations of the Theory of Planned Behaviour. Ajzen stated that one of the limitations of this model related to the intention component (Ajzen, 1985). Intention to perform a behaviour is a dynamic concept and subject to change depending on circumstances. The greater the time period between obtaining intention and measuring the behaviour, the greater the reduction in the predictive power of the model. Thus, one must exercise caution when sequencing the questionnaire and measuring the specific behaviour.

Furthermore, critics have stated that the TPB does not adequately address affective influences (e.g. fear, depression) upon health behaviour (Manstead, 1996; Conner and Norman, 1994; Conner, Black and Stratton, 1998). They state that the initial reasoning of both the TRA and TPB rest on the fact that the behaviours in question would be under rational control. Affective states may impact whether behaviours are under rational control. These critics theorize that this is because the TPB was not created within the health context, but rather created within the social psychology milieu.

Model Selection for Present Study

As mentioned in the Introduction section, the Theory of Planned Behaviour provided a guiding framework. Both the Health Belief Model and the Theory of Planned Behaviour (Theory of Reasoned Action) have respected followings. Grube, Morgan and McGree (1986) describe the Theory of Reasoned Action as "perhaps the most widely applied model of beliefs and attitudes in contemporary social psychology. It has been used successfully to predict and explain diverse behaviours and behavioural intentions" (p. 81). Rosenstock (1974), upon relating the historical origins of the Health Belief Model, stated that "it is always difficult to trace the historical development of a theory that has been the subject of considerable direct

study and has directly or indirectly spawned a great deal of additional research" (p. 328). As the literature provided support for both health behaviour models, the TPB was chosen for this thesis because it had more clearly defined parameters for the role of attitudes. Moreover, upon closer investigation of the components of the HBM, the majority of the belief components focus on the disease itself, not the actual behaviour. Thus the beliefs that are gathered are not specifically concerned with the behaviour one would want to predict. Intuitively in terms of predictive utility, to measure a belief that is secondary to the specific behaviour of interest would seem less effective. Finally, in response to the aforementioned limitations of the TPB, the timing of the independent and dependent variables was not considered problematic and the outline of the planned analysis (see Overview of Proposed Study) was designed to adequately include affective variables related to post-operative pain and its relief (analgesic and non-analgesic).

Overview of the Proposed Study

Preface. It is important to know if one would be able to predict a behaviour from an attitude. But simply knowing that parents with negative attitudes will tend to undermedicate their children post-operatively is not enough. It does not help guide researchers or clinicians in designing and implementing interventions to help parents better manage their children's pain.

Ajzen states that "attitude is determined by the person's salient beliefs about the behaviour" (Ajzen, 1980). The attitude could be considered the sum total (or some weighted combination) of relevant behavioural beliefs. Even if one knew the total (attitude), one would not know what (distinct beliefs) went into this total. Knowing the specific beliefs that

comprise the attitude would help target strategies that would be effective with parents. "Since people's beliefs represent the information (be it correct or incorrect) they have about their worlds, it follows that their behaviour is ultimately determined by this information" (p. 14, Ajzen, 1985).

Despite Ajzen's assertions of the strong link between a measure of beliefs (a list of beliefs about the behaviour in question) and a measure of attitude (the global evaluation of the behaviour), he has also stated that "the magnitude of this relation has sometimes been disappointing" (Ajzen, 1991, p. 192). Intrinsically, one would think that if appropriate beliefs were gathered about a behaviour, the overall attitude to that behaviour would display a close to perfect correlation to the measure of beliefs, yet this has not been the case (Godin & Shephard, 1987; Insko, Blake, Cialdini & Muliak, 1970; Armitage & Conner, 1999).

Possible Alternate Determinants of Attitude. The purpose of this thesis was to determine if other factors could help account for more of the variance in attitudes than behavioural beliefs (See Figure 3 for overview, next page). Thus, the current study sets out to predict a global attitudinal evaluation of administering pain medication to one's own child, from not only a measure of related beliefs, but also from past medical (child and parent) experience variables, demographic variables, a parental empathy variable, a parental pain relief goals variable and a variable designed to measure use of alternative pain-relieving practices. It is hypothesized that the variance of the parental attitude measure will be significantly better accounted for by including the aforementioned variables, in addition to the belief based measure.

It should be noted that data for this thesis were part of a larger study (Lilley, 1997). The novel contribution of this thesis was the use of the Theory of Planned Behaviour to

predict attitudes. The attitudinal measure selected and the alternate determinants of the attitudinal measure chosen to be explored reflect not only the theoretical underpinnings of this thesis, but also the archival nature of the data set. Since the following data analysis was created after the data collection had begun, the measures in the analysis were limited to those selected for the original study. Fortuitously, one of the original analyses planned for this data set was to predict medicating behaviour from parental attitudes. Thus, the framework from which the original variables were selected was deemed compatible with the motivations and theoretical framework of the present study. Once the original source from which the variables for this study was deemed appropriate, the actual variables to be included needed to be selected. These variables were selected based on a review of the relevant literature.

Dependent Variable- The global attitudinal measure: "How helpful do you think pain medicine will be for making your child's pain feel better?" (p. 52, Palermo & Lambert, 1997). This specific question was asked of the parent, while the child was in surgery (See Appendix A). Parents were asked to rate the perceived helpfulness of pain medicine on a pain scale presented as a 10 centimetre vertical, visual analog scale (resembling a ladder). Digits were aligned to each rung with the anchors being labelled, 0 (not helpful at all) and 10 (really helpful). This was considered an appropriate global attitudinal measure of administering pain medication to one's own child and was included as the criterion variable.This measure evaluates the parents' perception of how helpful the pain medication would be for relieving their child's pain. Thus, for a parent to answer this question (while their child is in surgery; see Methods section), the parent is in essence evaluating the global validity and utility of administering a pain medication to their child.

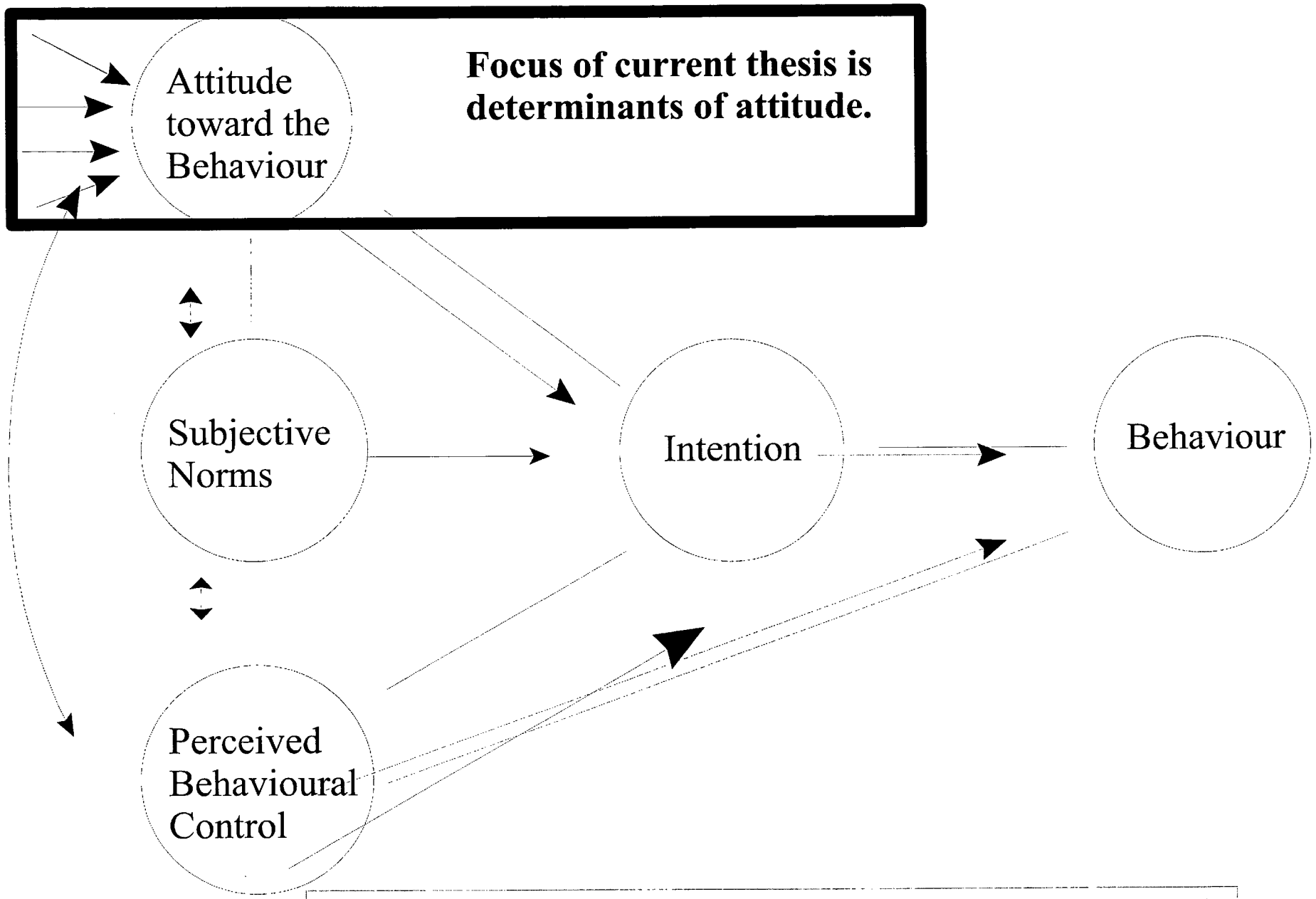

Figure 3. The Theory of Planned Behaviour (Ajzen, 1991) with graphic presentation of the thesis focus

The target (their child), action (implicit pain medication administration), and time (implicit notion of postoperatively) were congruous with the target, action and time of the behaviour of analgesic administration. This is in line with Ajzen and Fishbein (1977) who state that of the four aspects, the most crucial components to match would be target and action. Furthermore, Fishbein and Ajzen (1975) state that the definition of attitude requires a measurement procedure whereby a person assigns some concept to a position on an evaluative dimension. As this measure ranges from " Really helpful" to "Not helpful at all" this criterion is satisfied.

Using the "helpfulness" notion of pain medication in this analysis would be congruent with other definitions of a predictive attitudinal construct in the literature (Charron-Prochownik et al., 1993, Calnan & Rutter, 1988, Maiman et al., 1977 and others). An example within the context of parent-child medical behaviours was a study by Peterson, Farmer and Kashani (1990). They successfully used the parent's subjective perception of how "efficacious" certain injury prevention behaviours were to predict whether or not parents taught those injury prevention behaviours to their children. Also, as previously reviewed, Becker et al. (1972) successfully used a measure of mothers' attitudes regarding how efficacious a medication was for curing their child's ear infection to predict mother's compliance with a pediatric ear infection medication regime.

Independent Variable One: Attitudes to Pain Medication (Forward, Brown & McGrath, 1996). This constitutes the belief based measure for the attitude measure of this study (See Appendix B). Fishbein and Ajzen (1977) stated that ideally the measure created to understand what specific beliefs comprise the attitude in question would be generated from belief statements that were collected from the relevant population. In this case, Forward,

Brown and McGrath (1996) created a questionnaire based on areas of concern identified in the literature on parental attitudes towards the use of analgesics. These items were then reviewed by six pediatric pain researchers for clarity and content. As the literature the scale was based on represented the product of researchers interviewing parents, this process was considered appropriate for the purpose at hand. The final scale consists of 20 statements (four subscales, with five items each), in which the parents respond to a 7-point Likert scale that ranges from "Strongly Agree" to "Strongly Disagree". All four subscales (side effects, tolerance, addiction and drug abuse) have moderate internal consistency.

This measure is considered appropriate for the analysis at hand because it is theorized that beliefs about pain medication side effects, tolerance addiction and drug abuse would be salient beliefs that parents would draw upon when determining whether or not they believed their pain medication would be helpful in alleviating their child's pain. Furthermore, as this measure was filled out by parents within the context of their own child's operation, the subjective probability of whether the parent beliefs could occur, implicitly underlies the entire questionnaire. By containing the theoretical concepts of evaluative beliefs and subjective probability (Fishbein, 1963), the measure has the necessary components for predicting an attitude from a list of beliefs. Although this measure does not separately measure the belief evaluation and subjective probability as originally outlined in the expectancy-value theory, the implicit combination of these two aspects within this measure is considered to accomplish this ends.[2]

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[2] For example, a parent reads item 8 on the APMQ "My pain medicine has many side effects". To answer this item anywhere on the Strongly Agree to Strongly Disagree scale requires that the parent process a belief about the pain medication they are going to use with their child. By endorsing Strongly Agree, it means that the parent has a negative belief about their pain medication and they believe this belief has a high probability. Conversely, if they endorse Strongly Disagree, it means that the parent has a positive belief about their pain medication and does not believe "many side effects" are very probable.

Independent Variables Two and Three: Past Surgery Pain Experience of Parent and Helpfulness of Pain Medicine For the Parental Pain [caused from that surgery] (Palermo & Lambert, 1997). If parents had undergone surgery, they were asked "How much pain did you have from your surgery?" (Appendix C) and "How helpful did you find pain medicine following your surgery?" (Appendix D). Each question was followed by a 10 centimetre vertical, visual analog scale and ascending numbers between 0 and 10 were aligned to each rung. For the 'pain' question, the anchors were "No Pain" and "The worst pain possible". For the 'helpful' question, the anchors were "Not helpful at all" and "Really Helpful". Surgery history of the parent and the subsequent pain relief provided by pain medication were expected to be predictors of attitude. If personal experience had proven to the parent that pain medication was helpful, then it would follow that this would influence whether or not they would believe the pain medication would be helpful for their child. This would be in line with past research (Pate et. al., 1996) which found that an adult's past childhood medical experiences of fear, pain and coping, significantly predicted adult levels of fear, pain and coping in similar situations.

Independent Variable [Group] Four : Demographic Variables. Research has indicated that certain demographic characteristics, such as parental age, socioeconomic status (as measured by the Hollingshead Index; a ratio constructed from occupational ranking and education level; Hollingshead and Redlich, 1958) have some relationship with attitudinal factors (Pellino, 1997, Courneya et. al, 1999). They are not explicitly mentioned in the TPB but rather assumed to influence attitudes, subjective norms and perceived behavioural control (Ajzen and Fishbein, 1977). Exploration of this relationship was therefore included in this analysis.

Independent Variable Five: Interpersonal Reactivity Index (Davis, 1983). This is a 14-item list of statements, designed to elicit a total score indicating how empathetic a person is (Appendix E). The measure used in this study comprised of two subscale scores, Perspective Taking and Empathetic Concern. Each statement in the index is followed by a horizontal scale ranging from 0 (does not describe me well) to 4 (describes me very well). Four questions are reverse worded, as an internal reliability check. When asking a parent whether or not a child's pain will be relieved by pain medication, the answer may be influenced by the degree of empathy they possess. Despite the paucity of research regarding the relationship between empathy and attitudes to pain medication, this variable was investigated on intuitive grounds. It should be noted that the original Interpersonal Reactivity Index included four subscales, but the other two (Fantasy Scale and Personal Distress) were not included because they were not deemed relevant. All four subscales have satisfactory internal and test-retest reliability.

Independent Variable (Group) Six: Past Medical Experiences of the Child and their reactions (slight modification of Dahlquist, 1986) Parents were asked how often (never, one or two times, three or four times, or more than four times) their child had experienced a throat culture, medical appointment, dental appointment, blood work, hospitalization and surgery (Appendix F). Then, they were asked to rate their child's reaction to each of those medical procedures on a scale from 1 (negative) to 7 (positive). Just as it has been posited that the past medical experiences of the parent would be relevant to this study, it was considered important to factor in the past medical experiences of the child and the child's positive or negative reactions (Frank et al., 1995). If a child had positive or negative medical

experiences (including inadequate/adequate pain relief), this could help account for the variance of the attitudinal criterion variable.

Independent Variable Seven: Pain Relief Goals for their Child (Cohen, 1980) Parents were posed the question, "Which of these choices best describes your goal for your child's pain relief?" (Appendix G). Four alternatives were provided: complete pain relief, relief of as much pain as possible, relief of just enough pain to allow the child to function, relief of just enough pain to allow the child to tolerate his or her pain. If a parent did not consider "complete" or "as much as possible" pain relief a goal for their child, it was theorized that pain medication administered to the child would not be considered as "helpful" to the parent, because their child would not require as much help.

Independent Variable Eight: Psychosocial Comfort Measures Used. This 23-item measure was created by Lilley (1997) after a review of the literature that dealt with alternatives to pain medication (Appendix H). Parents were asked to rate the frequency (five-point scale ranging from 'Never' to 'More than once an hour') they had performed pain-relieving behaviours aside from medicating. Sample items included massage, cuddling and breathing exercises. It was conjectured that the more alternatives a parent uses and the more frequently they use them, the less helpful they would think a pain medication would be for their child, as they have found non-pharmacological ways to deal with their child's pain

Methods

As previously mentioned, data for this thesis were archival and therefore information about the methodology of this study focuses solely on procedures relevant to the data collected for this specific analysis.

Participants. Participants were children undergoing day surgeries and their parents (n=236). They were recruited at the British Columbia Children's Hospital (BCCH) prior to undergoing the following surgical procedures: genitourinary corrections, orthopaedic interventions, inguinal hernia repair, plastic surgery and painful dermatological laser treatments. These procedures were chosen because they have been shown to cause a significant amount of post-operative pain (Mather and Mackie, 1983; Schecter, Allen and Hanson, 1986; Finley et al., 1996).

Children's ages ranged from 2 years 0 months to 13 years 0 months (M = 6 years 2 months; S.D. = 3.11 years). The sample of children was comprised of 161 boys and 75 girls. Exclusionary criteria were: developmental difficulties, chronic illnesses involving the central nervous system, and the use of chronic analgesics or central nervous system medications.

Parents' ages ranged from 23 years to 56 years, with a mean age of 36 years (S.D. = 5.67). For parents to participate in the study, they had to be not only the person who brought the child into the hospital but also be the person providing the postoperative care for the 3-day study period. Most parents that volunteered to participate were mothers (n=207), but 27 fathers and 2 others (1 guardian;1 grandparent) filled out the questionnaires in the hospital, while their child was in the operating room.

Procedure. Data for the original study were collected in three phases (day of surgery, the immediate postoperative period, and one week following surgery). Most variables involved in this analysis were collected during the first phase (day of surgery), thus description of procedures in other phases only entails relevant details.

Enrollment was undertaken during the 60 minutes that families routinely check in, prior to surgery. During this time, parents were approached by a member of the hospital staff

and given a sheet outlining the study protocol. If parents were interested in participating, they were instructed to inform the unit clerk that they were willing to be contacted by a research assistant in the hospital. Any questions or concerns regarding the specifics of the study and all informed consent procedures were handled by the research assistant. Due to the stressful nature of the period prior to a child's surgery, any parents who were hesitant to participate were discouraged from enrolling in the study.

After the child had been separated from the parent to undergo the surgical procedure, parents were asked to complete five measures: demographic forms; child's history of medical experiences (Dahlquist, 1996); parent report of anxiety and expectations (Palermo & Lambert, 1997); Interpersonal Reactivity Index (Davis, 1983); and the Parental report of goals for pain relief (Cohen, 1980).

After measures related to the other two phases were explained, parents were given a package that included a copy of the Attitudes to Pain Medication scale (Forward et al., 1996), a checklist of psychosocial management strategies (Lilley, 1997), and a return envelope with the appropriate postage. The Attitudes to Pain Medication scale and the psychosocial management checklist were both sealed in an envelope and inscribed with the instructions not to open until after the telephone interview (Phase 3).

Once the phone interview was completed (a week post-surgery), parents were asked to open the sealed envelope and fill in the questionnaires contained within. These questionnaires were purposely delayed until after the medication record and diaries were complete (Phase 2), to avoid any effect on their natural pain administering behaviour that could result from filling out forms about medications and alternate pain-relieving strategies.

Data Analysis.

All analyses were conducted with SPSS 8.0 Frequencies and Linear Regression functions. The initial step in this analysis entailed routine data screening of the relevant variables for obvious errors in data entry by examining the frequency distribution, mean values and range of scores. Two possible independent variables were deleted from the analysis (number of adults in family, number of medical appointments of child undergoing surgery) as they had very little variance and therefore limited predictive power. The vast majority of families who participated in this experiment had two parents and the bulk of children undergoing surgery had a medical appointment "more than 4 times".

Data Screening

Missing Values: Missing values were replaced with mean values. Three percent of the scores of the Interpersonal Reactivity Index and seven percent of the Attitudes to Pain Medication Questionnaire were replaced. Due to the contingent nature of certain variables, two sets of variables had a large number of cases with missing values. These variables are called 'conditional missing data' (Cohen & Cohen, 1983). Specifically, in the first set of variables, parents were asked if their child had undergone a certain medical experience and then were asked to rate the quality of that experience (See Appendix F). If their child had not undergone one of the listed medical experiences, they were unable to rate the quality of the experience, thus resulting in a missing value for the associated 'quality' variable. The ability for a parent to rate the 'quality'of their child's medical experience is conditional on whether or not the child had undergone that medical experience. The same type of missing values resulted when parents were asked about how much pain and pain relief they experienced after a surgical procedure. If they had not had surgery, they could not rate the pain from their

surgery, nor how helpful pain medication was for their post-surgical pain (See Appendix D). Usually when a variable has a high proportion of missing values, one would have to discard these variable. But according to procedures set forth by Cohen & Cohen (1983), conditional missing data can replaced with mean values (Refer to Table 1 for details). Thus the variables that had 'conditional missing data' had their missing values replaced with mean values for that variable (quality of medical experience variables, parents' rating of surgical pain, and pain medication helpfulness). If any of these variables were to be included in the final regression model, the question that initially resulted in missing values ("How many times your child has experienced each of the following medical procedures?"and "Have you ever had surgery?") also had to be included in the final regression model. This is done to preserve the missing data dichotomy in the final regression equation.

Univariate Examination:

Categorical Variables: Categorical variables (child gender; whether or not a parent had undergone surgery) were examined using an independent samples t-test. The categorical variable served as the 'grouping factor' for the dependent variable. Both variables resulted in non-significant t-values, using a criterion of alpha = .05.

Continuous Variables: All variables in the analysis were screened for univariate outliers, using a decision rule of scores greater that 3.29 standard deviations (Tabachnick & Fidell, 1996). Outliers were identified for further analysis at the multiple regression stage. Z-tests for skewness and kurtosis using an alpha of .01 were conducted (Tabachnick & Fidell, 1996). For the independent variables, problems with skew and kurtosis and possible remedial transformations were noted. The dependent variable, "Helpfulness of pain medication for your child", was found to have a significantly negative skew, thus a

Table 1
Number of Missing Variables Replaced

Variable Name	Number Replaced
qu_throat (child's reaction to throat culture)	123
qu_dental (child's reaction to dental appointment)	58
qu_hosp (child's reaction to hospitalization)	100
qu_surg (child's reaction to surgery)	102
qu_blood (child's reaction to bloodwork)	68
psurgpai (how much pain a parent had after surgery)	55
psurgmed (how helpful pain medication was for parent's post-surgical pain)	63

reflected, square root transformation was applied (Tabachnick & Fidell, 1996). Future interpretation involved a reversal of the Beta weight sign to account for the reflection transformation.

Univariate regression analyses were then run between the dependent variable (DV) and each possible independent variable. Transformations were attempted, if it had been noted as a possibility in the initial examination of the variable. Univariate models pre- and post-transformation were compared. If the residual scatterplots showed improvement in homogeneity of variance and/or normality or the Beta weights became stronger, the transformation was applied. For this analysis no transformations of the independent variables were applied. Those variables with significant Beta weights were kept as possible predictors for the final multiple regression model (See Table 2). The following variables remained for initial entry into the regression model:

1) how many times a child had blood work done; 2) whether or not a parent had surgery; 3) how much pain the parent had experienced from a past surgery; 4) how helpful parents found medication for their post-surgical pain; 5) parents' goals for pain relief ; 6) the Attitude to Pain Medication subscale regarding beliefs about tolerance and 7) the Attitude to Pain Medication subscale regarding beliefs about stoicism. It should be noted that although the categorical variable regarding whether a parent had surgery did not have a significant relationship with the DV, it needed to be included to preserve the missing data dichotomy for the continuous variables relating to surgical pain and helpfulness of pain medication. In addition, although the helpfulness of pain medication variable and the parental goals' variable had been flagged due to problems with skew, transformations were not applied due to the decision algorithim for transformations previously outlined.

Table 2
Results of the Univariate Regression Analyses:
Possible Predictors of the Final Multiple Regression Model*

Variable Name	B	SE B	β
no_blood (number of times child had bloodwork performed)	-9.699 E-02	.031	-.20'
p_surg* (dichotomous variable indicating whether or not parent had undergone surgery)	—	—	---
psurgpai (how much pain parent experienced after their surgery)	-4.833 E-02	.016	-.197'
psurgmed (how helpful pain medication was forparents' post-operative pain)	-.141	.015	-.530°
pgoals (parents' goals for their child's pain relief)	-.190	.055	-.222°
atttol (tolerance subscale of Attitudes to Pain Medication Questionnaire)	-1.896 E-02	.008	-.150*
attstoic (stoic subscale of Attitudes to Pain Medication Questionnaire)	-2.681 E-02	.009	-.188'

* NOTE: when interpreting the negative beta-weights, one must keep in mind the reflected transformation of the dependent variable.
**non-significant ANOVA; included due to conditional missing values for 'psurgpai' and "psurgmed"
* $p < .05$
' $p < .01$
° $p < .001$

Multiple Regression Models

Initial Multiple Regression Block: As per the hypothesis, a hierarchical regression model predicting parents' attitude was run with the two belief-based variables in the first block. This initial model with only the two subscales of the belief based measure produced a significant regression model ($F_{2,233}$= 4.667, p =.01) that had an R = .196 (adj. R = .03).

Second Multiple Regression Block: The second block was run with all seven significant independent predictors. The results of this analysis led to the deletion of three variables, due to the fact that in the context of the other predictors, they no longer had a significant relationship with the dependent variable (bloodwork variable and the two belief-based variables). Notably, both the belief-based variables were dropped out of the final model. Although the parents' past surgery variable did not have a significant relationship with the dependent variable, it was retained into the model, as per Cohen & Cohen's 1983 guidelines regarding the conditional missing values for 'psurgpai' and 'psurgmed'.

Final Multiple Regression Model: The final model regressed the remaining four variables onto the dependent variable. This model was highly significant with an $F_{4,231}$ = 27.813, p <.000. The multiple correlation coefficient was .570 and the adjusted R square =.313. The strongest predictors in order from highest to lowest were: how helpful parents' found pain medication for their surgery, their overall goals for pain relief, how much pain they had from surgery and their past surgery status (see Table 3). Variance Inflation Factors (VIF) were examined to determine how much the variances of the estimated regression coefficients were inflated due to multicollinearity between the independent variables. The largest VIF was 1.038 and did not exceed a value of 10 (Neter, Wasserman & Kutner, 1990), thus multicollinearity was not considered a problem.

Table 3
Beta weights for the Final Multiple Regression Model

Variable name	B	SE B	β
Block 1			
atttol	-8.486 E-03	.010	-.067
attstoic	-2.156 E-02	.011	-.151*
Block 2			
atttol	-1.457 E-02	.008	-.115
attstoic	3.530 E-03	.010	-.115
noblood	-5.142 E-02	.027	-.106
p_surg	-2.026 E-03	.075	-.001
psurgpai	-3.263 E-02	.013	-.133*
psurgmed	-.127	.015	-.475°
pgoals	-.132	.049	-.154°

Note: R^2 = .039 for Block 1; ΔR^2 = .296 for Block 2 ($p < .000$)

*Negative beta-weights are a result of the reflected transformation of the dependent variable.
* p< .05
° p< .001

Residual Analysis: Residual plots of this model were examined for normality and homogeneity of variance. No problems were evident. Possible outliers were examined through Cook's Distance and Mahalanobis distance. Cook's distance was used as an overall measure of the combined impact of each case on all of the estimated regression coefficients (Neter, Wasserman, and Kutner, 1990). An F value of .875 (degrees of freedom: 5, 231) was used. No residual exceeded this value. Furthermore, Mahalanobis distance was used to evaluate the leverage of the residual of any unusual combinations of values (Tabachnick & Fidell, 1996). A Chi-Square (df = 5) of 20.52 was used and only one problematic case was found. It was the result of a parent who had surgery, rated their pain a '10' (on a 10 point scale), stated that pain medication was not helpful for their pain ('0' on a 10 point scale) and rated that their pain relief goal for their child was "complete" pain relief ('3' on a 3 point scale). The decision to keep this outlier was made for three reasons. First, the case was considered part of the model's target population. Although the combination of values on the independent variables were unusual they were nonetheless feasible. Secondly, running the model without the outlier did not result in any visible differences to the residual scatterplot. Finally, there was no difference in the amount of variance accounted for by the model, when the outlier was deleted and the analysis was re-run.

Discussion

A strong predictive regression model was obtained through this analysis. It was found that a parent's attitude regarding how helpful a pain medication would be for alleviating their child's pain could be predicted by their overall goals for pain relief and their past surgical experience. Relationships were found to be in the direction initially predicted. Parents who

stated goals for high levels of post-surgical pain relief for their child felt that pain medication would be helpful for their child. Furthermore, the higher the pain levels were for the parent's own surgical experience, and the more helpful pain medication was for that pain, the more helpful they believed pain medication would be for their child's pain. It seems logical that a parent who experienced significant post-surgical pain and significant post-surgical pain relief would believe that pain medication would be helpful for their child. These parents have had the first hand experience about how painful surgery is and how beneficial analgesic medications are.

Contrary to expectations, the belief variables were not strong enough to be included in the final model. As predicted by the Theory of Planned Behaviour, two of the subscales of the belief based measure were significantly related to the dependent variable, the tolerance subscale and the stoicism subscale. Positive beliefs were related to positive attitudes. However when other significant predictors were added to the model, these variables were dropped due to lack of significance.

A possible interpretation of these findings is that the Theory of Planned Behaviour needs to be modified to directly include a person's past experience with the behaviour. The TPB delineates that a global evaluation (attitude) is purely a product of beliefs and personal appraisals of the likelihood that those beliefs will occur. The question this analysis has raised is whether or not a person's attitude is merely a function of their beliefs. If pain medication was helpful for the parents' own pain, it is conceivable that this past experience would result in the attribution of positive characteristics (beliefs) to pain medication for their children, which in turn would result in a positive overall evaluation of the helpfulness of pain medication for their children (attitude). One could then argue that beliefs are formulated from

a person's past experience. This analysis has shown beliefs are a significant predictor of attitude, but that a person's past experience is an even better predictor of attitude. Given the strong relationship between a parent's personal experience with post-operative pain medication and their attitudes towards post-operative pain medication with their child, perhaps the Theory of Planned Behaviour needs to be adapted to directly incorporate a measure of past experience, in addition to a measure of beliefs. Moreover, it is possible that salient beliefs about a behaviour are only important predictors of attitude if a person has had no past experience with the behaviour that one wants to predict. When a person has direct experience with the behaviour, beliefs are not as predictive because they are only an indirect measure of direct experience.

Clinical Implications and Future Directions

Avenues for further research in the area of relieving children's post-surgical pain should explore the implications of this research. Given the importance of a parent's past surgical experience, it appears important to target interventions at the population of parents who have had negative experiences with post-surgical pain relief. For example, it would be informative to investigate the impact of having a nurse or doctor speaking to parents before they take their child home from day surgery. A medical professional could briefly ask parents about their past surgical experience, and address any issues that may surface related to pain relief. If a parent reported to the medical professional that they did not receive adequate pain relief during their surgery, the professional could ask the parent about the type, dose, route and schedule of the pain medication and troubleshoot about why the parents' pain was not relieved. This type of discussion could help parents understand why their pain may not have been relieved adequately, modify their attitude about pain medications in general and improve

the likelihood that they will properly medicate their post-operative child. Another alternative that could achieve the same ends, would be to create an 'easy-to-read' brochure or pamphlet that communicated similar information to parents.

Finally, it is important the Theory of Planned Behaviour be applied in its entirety to this context. Given its predictive utility with other health behaviours, researchers should attempt to apply it's concepts from beliefs to behaviour, to the pediatric post-operative setting.

Limitations of the Study

Alternate explanations for the results derived in this study could relate to problems with the belief-based measure. The belief statements in the measure were not obtained directly from a focus group of parents with children undergoing surgery, as recommended by Fishbein & Ajzen (1977). This methodology is recommended in order to gather as many relevant beliefs as possible about the target behaviour from the target population. Perhaps important key parental beliefs about pain medication were overlooked in the measure because the statements were obtained from a literature review, instead of the parents themselves. Second, the actual belief and the likelihood of that belief occurring were not measured separately, as laid out by Fishbein & Ajzen (1980). Although it was assumed at the beginning that the Attitudes to Pain Medication questionnaire sufficiently addressed these areas, it could be that the predictive utility would have been increased had the belief and the likelihood of that belief occurring been measured separately. Before the predictive utility of beliefs is abandoned, further research should be conducted with a measure of beliefs that is based directly on a sample of parents and measures 'beliefs' and 'likelihood' separately.

Concluding Notes

Within the framework of the Theory of Planned Behaviour, attitudes are integral concepts because of their crucial role in predicting behaviour. But as previously mentioned, predicting health behaviour is not sufficient. Knowing why someone holds a particular attitude, aids in better understanding why the behaviour occurred or did not occur. This thesis has determined that the best predictor of a parent's attitude towards medicating their child post-operatively, is the parent's own post-surgical experience. This suggests that if a parent has had a unsatisfactory experience with pain medication after their own surgery, they will not likely perceive pain medication as helpful for their child and would therefore be likely to undermedicate their child post-operatively. In terms of theory building, these findings uncover the possibility that the TPB may need to be modified to include measures of direct experience. Clinically, these results could be used in targeted interventions will help researchers, clinicians and parents lessen the impact of pediatric post-surgical pain.

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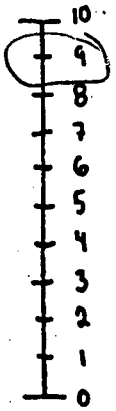
APPENDIX A

Family Management of Pain

Participant Number _____

4) How helpful do you think pain medicine will be for making your child's pain feel better?



Really helpful

Not helpful at all

APPENDIX B

Family management of pain

Participant number 2121

Attitudes to Pain Medication

We would like you to respond to a series of statements about the pain medicines you were instructed to give to your child. Please answer the following questions ***with respect to the specific pain medicine (e.g. acetaminophen, acetaminophen with codeine) your doctor or nurse recommended.*** There are no right or wrong answers to these questions, we are interested in how you feel.

Please circle the response choice which best suits how you feel about the statement. So, for children who are recovering from having day surgery...

1. Children should be given ***your pain medicine*** as little as possible because of side effects.

Strongly Agree | Agree | Slightly Agree | Uncertain | **Slightly Disagree** | Disagree | Strongly Disagree

2. Putting up with pain without ***your pain medicine*** will make a child feel helpless.

Strongly Agree | Agree | Slightly Agree | **Uncertain** | Slightly Disagree | Disagree | Strongly Disagree

3. Children who take ***your pain medicine*** for pain may learn to use drugs to solve other problems.

Strongly Agree | Agree | Slightly Agree | Uncertain | **Slightly Disagree** | Disagree | Strongly Disagree

4. ***Your pain medicine*** works the same no matter how often it is used.

Strongly Agree | Agree | Slightly Agree | Uncertain | Slightly Disagree | **Disagree** | Strongly Disagree

5. ***Your pain medicine*** works best when it is given as little as possible.

Strongly Agree | Agree | Slightly Agree | **Uncertain** | Slightly Disagree | Disagree | Strongly Disagree

6. Children should learn that taking ***your pain medicine*** is a good way to relieve pain.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | **Slightly Disagree** | Disagree | Strongly Disagree

7. Giving children ***your pain medicine*** is like giving in to pain.

Strongly Agree | Agree | Slightly Agree | Uncertain | Slightly Disagree | **Disagree** | Strongly Disagree

8. ***Your pain medicine*** has many side effects.

Strongly Agree | Agree | Slightly Agree | Uncertain | Slightly Disagree | **Disagree** | Strongly Disagree

9. Children will become addicted to ***your pain medicine*** if they take it for pain

Strongly Agree | Agree | Slightly Agree | Uncertain | Slightly Disagree | **Disagree** | Strongly Disagree

10. There is little need to worry about side effects from ***your pain medicine***.

Strongly Agree | **Agree** | Slightly Agree | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

11. It is unlikely that a child will become addicted to ***your pain medicine*** if used for pain.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

12. ***Your pain medicine*** is addictive.

Strongly Agree | Agree | Slightly Agree | **Uncertain** | Slightly Disagree | Disagree | Strongly Disagree

13. ***Your pain medicine*** works best if saved for when the pain is quite bad.

Strongly Agree | Agree | Slightly Agree | **Uncertain** | Slightly Disagree | Disagree | Strongly Disagree

14. Children will be strong if they learn to handle pain without ***your pain medicine***.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

15. Using ***your pain medicine*** for children's pain leads to later drug abuse.

Strongly Agree | Agree | Slightly Agree | Uncertain | Slightly Disagree | **Disagree** | Strongly Disagree

16. There is little risk of addiction when ***your pain medicine*** is given for pain.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

17. Children learn how to use ***your pain medicine*** responsibly when it is given for pain.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

18. Side effects are something to worry about when giving children ***your pain medicine***.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

19. The less often children take ***your pain medicine*** for pain, the better the medicine will work.

Strongly Agree | **Agree** | Slightly Agree | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

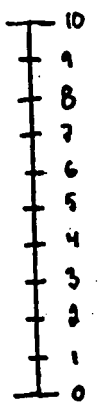
20. Giving children ***your pain medicine*** for pain teaches proper use of drugs.

Strongly Agree | Agree | **Slightly Agree** | Uncertain | Slightly Disagree | Disagree | Strongly Disagree

APPENDIX C

5) Have you ever had surgery? ☑ Yes ☐ No

5a. If so, how much pain did you have from your surgery?



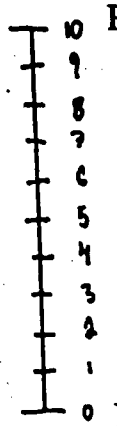
The worst possible pain

too young to remember I was 5

No pain

APPENDIX D

5b. How helpful did you find pain medicine following your own surgery?



Really helpful

See above

Not helpful at all

APPENDIX E

Family Management of Pain

Participant Number F-212

Interpersonal Reactivity Index

1. I often have tender, concerned feelings for people less fortunate than me.

0	1	2	(3)	4
does not describe me very well				describes me very well

2. I sometimes find it difficult to see things from the "other guy's" point of view.

0	1	(2)	3	4
does not describe me very well				describes me very well

3. Sometimes I don't feel very sorry for other people when they are having problems.

0	1	2	(3)	4
does not describe me very well				describes me very well

4. I try to look at everybody's side of the disagreement before I make a decision.

0	1	2	(3)	4
does not describe me very well				describes me very well

5. When I see someone being taken advantage of, I feel kind of protective towards them.

0	1	2	(3)	4
does not describe me very well				describes me very well

6. I sometimes try to understand my friends better by imaging how things look from their perspective.

0	1	2	(3)	4
does not describe me very well				describes me very well

7. Other people's misfortunes do not usually disturb me a great deal.

0	(1)	2	3	4
does not describe me very well				describes me very well

Family Management of Pain Participant Number _____

Interpersonal Reactivity Index

8. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.

0	1	2	3	4
does not describe me very well				describes me very well

9. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

0	1	2	3	4
does not describe me very well				describes me very well

10. I am often quite touched by things that I see happen.

0	1	2	3	4
does not describe me very well				describes me very well

11. I believe that there are two sides to every question and try to look at them both.

0	1	2	3	4
does not describe me very well				describes me very well

12. I would describe myself as a pretty soft-hearted person.

0	1	2	3	4
does not describe me very well				describes me very well

13. When I'm upset at someone, I usually try to "put myself in their shoes" for a while.

0	1	2	3	4
does not describe me very well				describes me very well

14. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

0	1	2	3	4
does not describe me very well				describes me very well

APPENDIX F

Family Management of Pain

Participant Number 212

Past Medical Experiences

Please indicate how many times your child has experienced each of the following medical procedures:

0 = never
1 = one or two times
2 = three or four times
3 = more than four times

Throat Cultures	(0)	1	2	3
Medical Appointments	0	1	2	(3)
Dental Appointments	0	1	2	(3)
Bloodwork (i.e., finger poke and/or venipuncture)	0	1	2	(3)
Hospitalizations	0	1	2	(3) – 5 times
Surgery	0	1	2	(3) – 9 times

Please rate your child's reactions to each of these medical experiences:

Throat Cultures

1 2 3 4 5 6 7
negative no reaction positive

Medical Appointments

1 2 3 (4) 5 6 7
negative no reaction positive

Dental Appointments

1 2 (3) 4 5 6 7
negative no reaction positive

Bloodwork (i.e., finger poke and/or venipuncture)

1 2 (3) 4 5 6 7
negative no reaction positive

Hospitalizations

1 2 (3) 4 5 6 7
negative no reaction positive

Surgery

1 (2) 3 4 5 6 7
negative no reaction positive

APPENDIX G

3. Which of these choices best describes your goal for your child's pain relief?

☐ complete pain relief
☑ relief of as much pain as possible
☑ relief of just enough pain to allow the child to function
☑ relief of just enough pain to allow the child to tolerate his or her pain

APPENDIX H

Family Management of Pain Participant Number 2121

Psychosocial Comfort Measures

These questions are about things that you may or may not have done to help your child feel less pain after his or her surgery. Please circle the answer that describes how frequently you used each of these strategies.

1) How frequently did you use heat or cold packs?

Never | About once a day | Several times a day | About once an hour | More than once an hour

2) How frequently did you help your child to use deep breathing or rhythmic breathing strategies?

Never | About once a day | Several times a day | About once an hour | More than once an hour

3) How frequently did you help your child to use relaxation strategies?

Never | About once a day | Several times a day | About once an hour | More than once an hour

4) How frequently did you use stroking, rubbing or massage?

Never | About once a day | Several times a day | About once an hour | More than once an hour

5) How frequently did you rock your child?

Never | About once a day | Several times a day | About once an hour | More than once an hour

6) How frequently did you hold and/or cuddle your child?

Never | About once a day | Several times a day | About once an hour | More than once an hour

7) How frequently did you encourage your child to talk about a special place or activity?

Never | About once a day | Several times a day | About once an hour | More than once an hour

Family Management of Pain Participant Number _____

8) How frequently did you encourage your child to think about other pleasant things?

Never	About once a day	Several times a day	About once an hour	More than once an hour

9) How frequently did you help your child to use his or her imagination in other ways?

Never	About once a day	Several times a day	About once an hour	More than once an hour

10) How frequently did you help your child to find a comfortable position?

Never	About once a day	Several times a day	About once an hour	More than once an hour

11) How frequently did you talk softly or soothingly to your child?

Never	About once a day	Several times a day	About once an hour	More than once an hour

12) How frequently did you sing to your child?

Never	About once a day	Several times a day	About once an hour	More than once an hour

13) How frequently did you explain how the body works and/or why the child has pain?

Never	About once a day	Several times a day	About once an hour	More than once an hour

14) How frequently did you offer your child a pacifier?

Never	About once a day	Several times a day	About once an hour	More than once an hour

15) How frequently did you encourage your child to play with friends?

Never	About once a day	Several times a day	About once an hour	More than once an hour

Family Management of Pain

Participant Number _____

16) How frequently did you encourage your child to play with toys?

Never | About once a day | Several times a day | About once an hour | More than once an hour

17) How frequently did you read books with your child or encourage your child to read?

Never | About once a day | Several times a day | About once an hour | More than once an hour

18) How frequently did you encourage your child to listen to music?

Never | About once a day | Several times a day | About once an hour | More than once an hour

19) How frequently did you encourage your child to watch TV?

Never | About once a day | Several times a day | About once an hour | More than once an hour

20) How frequently did you encourage your child to play video games?

Never | About once a day | Several times a day | About once an hour | More than once an hour

21) How frequently did you tell stories to your child?

Never | About once a day | Several times a day | About once an hour | More than once an hour

22) How frequently did you play games with your child?

Never | About once a day | Several times a day | About once an hour | More than once an hour

Family Management of Pain Participant Number _____

23) Alternative/Complementary Treatment Techniques
We are also interested in what some people call alternative medicine or complementary medicine, which means any treatment that is different from what is used in traditional Western medicine. These can be family remedies or treatments from other cultures.
Did you use any of these methods to help your child feel better?

Please describe each of the methods that you used on these lines.

1) _____

How frequently did you use this method?

Never | About once a day | Several times a day | About once an hour | More than once an hour

2) _____

How frequently did you use this method?

Never | About once a day | Several times a day | About once an hour | More than once an hour

3) _____

How frequently did you use this method?

Never | About once a day | Several times a day | About once an hour | More than once an hour

4) _____

How frequently did you use this method?

Never | About once a day | Several times a day | About once an hour | More than once an hour