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Preschool children's information processing and emotional behavior in social conflict situations

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Preschool Children's Information Processing and Emotional Behavior in Social Conflict Situations

By

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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

Abstract

This study investigated various aspects of the Social Information Processing Model, in particular, young children's emotional behavior regulation and negative emotionality, in Hong Kong. The sample was N=628 from 12 schools. Using Rasch measurement, linear unidimensional scales were constructed for Emotion and Behaviour Regulation (10 items) and for Negative Emotionality (10 items). The well-known Short Temperament Scale was Rasch analyzed too, but a linear scale could not be created – it had initially been designed under the True Score Test theory paradigm. The children were divided into Type A (high on negative emotionality and low on emotion and behavior regulation, N=27 and Type B (low on negative emotionality and high on emotion and behavior regulation, N=31). The children's teachers were given conflict situations and asked to state what strategies the Type A and Type B children would adopt in each conflict situation. The first conflict situation was about the child who was being accidentally pushed by a peer. The second conflict situation was about the child who is being excluded from a game that has enough participants. The third conflict situation was about the child being called "a baby" because he/she was playing with baby toys. The fourth conflict situation was about a peer criticizing and putting marks on a child's picture. The fifth situation was about a peer pushing ahead and taking a toy that a child has been waiting for a long time. The Type A and Type B children were also asked to state what strategies they would adopt in each conflict situation. When the teachers' views were compared to the children's views, it was clear that the teachers did not know their children's thought processes very well. For both Type A and Type B children, Rasch analysis was used to create a calm/angry scale and a sad/happy scale. Conflict situation two (being excluded from a game) is very hard on the calm/angry scale and both Type A and Type B children need to have a very high angry measure to answer this

item positively. Conflict situation two is moderately easy on the sad/happy scale and both Type A and Type B children need only a low sad measure to answer conflict situation two positively. In contrast, conflict situation three (being called a “baby”) is very hard on the sad/happy scale and both Type A and Type B children need to have a very high happy measure to answer this item positively. Conflict situation three is moderately easy on the calm/angry scale and both Type A and Type B children need only a low calm measure to answer conflict situation three positively. The present study gave strong support for the Social Information Processing Model and for the inclusion of emotion and behavior regulation and negative emotionality in the revised model. The study rejected the Short Temperament Scale as it did not produce a linear, unidimensional scale, and it showed that teachers do not know their children, in terms of strategies selection in common social conflict situations, as well as they think that they do. Children are much more conscious of the variety of strategies that can be used in common conflict situations than teachers would normally give them credit. Results indicate that levels of anger aroused in Type A children are associated with differences in the quality of strategies that they are able to generate for solving social problems. Type A and Type B children differ significantly in their choice of best strategy under different emotional conditions for the different conflict situations.

Research Papers Based On This Thesis

Lau, P. L. B. & Waugh, R. F. (2012). A Rasch Measure of Young Children's Temperament in Hong Kong. Paper presented at the *Fifth International Conference on Measurement in Health, Education, Psychology and Marketing*, held at The University of Western Australia, on 23-25 January, 2012.

Lau, P. L. B. & Waugh, R. F.(2011). A Rasch Measure of Emotional and Behavioral Regulation for Preschool Children. Paper presented at the International *Pacific Rim Objective Measurement Symposium (Rasch PROMS Conference)* held in Singapore, National Institute of Education, Nanyang Technological University, 13-15 July, 2011.

Lau, P. L. B. & Waugh, R. F. (under review). A Rasch Measure of Young Children's Temperament (Negative Emotionality) in Hong Kong. *Journal of Applied Measurement*.

DECLARATION

In accordance with the regulations for presenting theses and other work for higher degrees, I hereby certify that this thesis does not to the best of my knowledge and belief:

(i) Incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education;

(ii) Contain any material previously written by another person except where due reference is made in the text; or

(iii) Contain any defamatory material.

Signature

Date 9/3/2013

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Becky P. L. Lau Bailey

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

TPJ	Temporal-parietal junction
MPFC	Medial prefrontal cortex
CBQ	Child Behavior Questionnaire
STS	Short Temperament Scale
TST	True Score Theory
CTT	Classical Test Theory
RUMM 2030	Rasch Unidimensional Measurement Model (version 2030)

CHAPTER ONE
INTRODUCTION

This study investigates emotionality, emotion and behavior regulation, and social information processing with Hong Kong Preschool Children. It examines the relationship between children's emotionality, emotion and behavior regulation, and social information processing in different social conflict situations and attempts to explain the factors involved in children's social problem-solving that occur during peer interactions. The rationale for, and background to, this study are discussed first, and then the aims and research questions are presented. The limitations of the study are explained and the meanings of the main terms used in the study are defined. In the last part of this chapter, the structure of the thesis is outlined, providing a brief overview of each chapter.

Rationale and Background

During the preschool years, social interactions with peers are interesting new and important experiences for many children. Meeting and interacting with new friends in kindergarten provides a context in which children learn how to get along with others. While playing with peers can be enjoyable, it can also involve social conflict situations as part of any peer interaction with other young children. Both developmental psychologists and early child educators have become increasingly aware that children's social conflicts provide an important context for the development of emotion regulation, social skills and reasoning (Chen, 2003; Capage & Watson, 2001; Shantz & Hartup, 1992). Even though children are often involved in social conflicts, some children are still well-like by their peers because they have developed ways of resolving conflicts that allow them to continue playing with their peers. By contrast,

other children are less effective during social conflicts and become rejected or isolated by others. The social problem-solving strategies of children as young as kindergarten age have been found to correlate with peer acceptance (Erwin, 1994; Blair, Denham, Kochanoff & Whipple, 2004). From this and other evidence, how children solve social conflict situations is expected to have an important effect on their social and later life.

Many researchers have been interested in how young children resolve social conflicts (Spivack & Shure, 1974; Rubin & Krasnor, 1986; Crick & Dodge, 1994; Lemerise & Arsenia, 2000; and Eisenberg in liaison with many other researchers from 1996 to 2009). Researchers investigating these social conflicts with young children have generated different models to explain the results (see Fontane & Dodge, 2009; Crick & Dodge, 1994) and researchers have investigated different variables used by young children in resolving their social conflicts. For example, the social information processing approach has generated models to investigate children's behavior in social conflicts (Spivck & Shure, 1974; Crick & Dodge, 1994). A significant line of research in understanding children's social problem solving is from the Social Information Processing Model developed by Crick and Dodge (1994). Designed specifically to explain and to predict the aggressive behavior in children, Crick (1986) proposed a social-cognitive model and reformulated it with Dodge in 1994. The problem that was leading their research was the question, "how can aggressive children be taught to use non-aggressive behavioral patterns in their interactions with peers"? In searching for answers to this question, the researchers borrowed ideas from theories of cognitive, social, and developmental psychology and developed a model with six steps. This model has generated research studies that are related to children's conflict resolution behavior and it is explained in detail in chapter two.

Lemerise and Arsenio (2000) have offered the most elaborate and coherent discussion on integrating the construct emotion in Crick and Dodge's (1994) revised

model. However, not much research has been done to test their ideas. Findings from research in temperament and regulation (Rothbart, 2007; Rothbart & Rueda, 2005; Eisenberg, Fabes, Guthrie & Reiser, 2002) also lend support to the possibility of emotion and regulation as being important components necessary for children's social competence. Research in social competence and strategies generated by young children to solve conflict situations suggest that negative emotion affects control of behavior and social competence in some conflict situations (see Sanson, 2004; Eisenberg & Morris, 2002; Eisenberg, Fabes, Guthrie, & Reiser, 2000). Relevant research studies are reviewed in Chapter Three.

Studies on the Social Information Processing Model, emotionality and regulation are promising clues to understand children's behavior in social conflicts. However, no research study has combined these components and examined them in a systematic manner with Hong Kong preschool children. The present study is an attempt to explore young children's problem solving during social conflict situations as related to their emotionality, their emotion and behavior regulation, and their social information processing, with the application of a Rasch measurement model to make some linear measures of the relevant variables in the Hong Kong situation.

Statement of Purpose

The main aims of this study are :

1. To give a review of the Social Information Processing Model (Crick & Dodge, 1994) and the progress that has been made in the application of the model to explain children's social conflicts;
2. To critically examine the model in view of empirical evidence in the field;
3. To review research in emotionality, emotional and behavior regulation, and

to examine their effects on the Social Information Processing model (Crick & Dodge, 1994);

4. To propose a few areas of the Social Information Processing Model that deserve further investigation;
5. To examine the Short Temperament Scale (Thomas & Chess, 1977) and the Child Behavior Questionnaire (Goldsmith & Rothbart, 1991), and re-construct the relevant temperament measures using the Rasch measurement approach to create linear measures of children's emotionality, emotion and behavior regulation with Hong Kong preschool children;
6. Apply the modified Short Temperament Scale and the revised Child Behavior Questionnaire to measure the emotionality, emotion and behavior regulation of Hong Kong preschool children;
7. To examine the hypotheses related to social information processing in a group of 5 to 6 years old Hong Kong children with differences in emotionality, and emotion and behavior regulation.

Research Questions

There are four main research questions relating to Hong Kong preschool children.

1. Can the Social Information Processing Model be utilized to explain preschool children's behavior during social conflict situations?
2. Can the concept of emotion be integrated in the Social Information Processing Model to explain preschool children's differences of behavior during social conflict situations?
3. What is the relationship between children's emotionality, regulation and social information processing in social conflict situations?

4. Can data collected using the modified Short Temperament Scale and the modified subscales of the Child Behavior Questionnaire, the Emotional and Behavioral Measure, and the Negative Emotionality Measure, be used to create linear unidimensional scales using the Rasch Measurement Model? Can the data for each of the scales be shown to have a good fit to the measurement model and thus be reliable so that valid inferences can be drawn from them?

Hypotheses

Hypothesis 1

Hypothesis 1 is: Type A children would generate fewer strategies in response construction for conflict situations than Type B children, when emotional arousal is high.

Hypothesis 2

Hypothesis 2 is: Type A children would generate more non-constructive strategies than constructive strategies when compare to Type B children in response construction for conflict situations, when emotional arousal is high.

Hypothesis 3

Hypothesis 3 is: Type A children would be more likely to select a more non-constructive strategy in response to decision-making in conflict situations than Type B children, when emotional arousal is high.

Significance of the study

This research makes significant contributions to the understanding of young children's social information processing during different social conflicts. From a practical standpoint, the results of this research are directly relevant to the assessment of emotionality, emotion and behavior regulation, and training of teachers in regard to problem-solving strategies of Hong Kong preschool children. The results will provide educators with a means by which they can systematically assess preschool children's emotion regulation and behavior regulation and negative emotionality and the critical components involved in training children to solve different kinds of social conflicts.

This research makes at least four specific contributions to scholarship within the field of Early Childhood Education. One, this research tests the application of the Social Information Processing Model (Crick & Dodge, 1994) in the Asian culture, specifically with Hong Kong preschool children. Secondly, it applies and expands current knowledge of emotionality, behavior and emotion regulation, in the understanding of young children's social problem-solving within the framework of the Social Information Processing Model (Crick & Dodge, 1994). Thirdly, this study modified existing instruments, re-designed and validated three instruments for evaluating emotionality (Lau & Waugh, 2012), emotion and behavior regulation (Lau & Waugh, 2011) in social conflict situations using the Rasch measurement approach (Andrich, Sheridan & Luo, 2010; Rasch, 2010, 1992). Linear Rasch measures have not previously been created for the variables used in this study, anywhere in the world. Fourthly, with the application of the new measures, preschool children's emotionality, and their emotion and behavior regulation, in various social conflict situations, the researcher was able to order the items by difficulty from low to high more precisely than had

previously been achieved. This allows for assessment of variables with higher accuracy to be used in more complex analysis of the relationships between different variables. The integration of new concepts and new measurements will add new knowledge to our understanding of children's social problem-solving behavior.

Limitations

The present study mainly examined two of the six steps of the Social Information Processing Model, the generation of strategies and decision-making in regard to young children's social problem-solving in different contexts, and it does not test the whole model. More research studies should be done to test the other steps in the Social Information Processing Model in different contexts to provide a comprehensive picture of how children solve their social conflicts.

In the present study, a few measures are created by modifying some existing instruments using the Rasch measurement model in the present study. The modified Emotional and Behavioral Regulation Measure, the Negative Emotionality Measure and the Calm/Angry and Sad/Happy measures are useful tools for others to use or improve. However, further refinement of these measures could include the addition of more easy items and the rewording the non-fitting items, in order to further improve the quality of these measures.

The present study investigated social problem-solving behavior of 5 to 6 years old children in Hong Kong, not children of other age groups and so, strictly, the study does not apply to children of different age or to children in other Asian countries, although it may do so. It would be fruitful to extend the present study into a longitudinal study that allows the examination of the change of influence of emotionality, emotion and

behavior regulation on social information processing of children at different times and different contexts, which are not covered in the present study, and so is a limitation.

Definitions of the Terms Used in this Study

This section provides the definitions for the main terms used in this study. The terms are defined in the context of the present study and applied throughout the study.

Social Information Processing

The six steps of the reformulated Social Information Processing Model include: "(1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4) response access or construction, (5) response decision, and (6) behavioral enactment" (Crick & Dodge, 1994, p.76). The present research only focuses on steps 4 and 5.

Social conflict

The term, social conflict, is defined in the research literature as a condition that exists when one person opposes another (Perry, Perry & kennedy, 1992). Conflicts include states in which a person objects, retaliates or rejects the actions of another (Chen, 2003). The present study uses the term interchangeably with social problems or conflict situations to reflect a focus on both positive and negative behavior that can result and occur during children's social interactions, instead of a one-sided view of interpersonal conflicts that equate conflict with harm, hurt or aggression (Roseth, Pellegrini, Dupuis, Bohn, Hickey, Hilk & Peshkam, 2008).

Emotionality

Many personality theorists conceptualized emotionality in terms of intensity of emotion; emotional intensity here is defined as the normal strength with which individual experiences emotions and the maximum levels of emotional reactivity (Larsen & Diener, 1987). A review of relevant literature on emotionality is presented in Chapter Three.

Emotion Regulation

Emotion regulation in the present study is defined as:

> "the process of initiating, maintaining, modulating, or changing the occurrence, intensity, or duration of internal feeling states and emotion-related physiological processes, often in the service of accomplishing one's goals." (Eisenberg et al., 2000a, p.141)

Behavior regulation

Behavior regulation is defined as

> "the process of initiating, maintaining, inhibiting, modulating, or changing the occurrence, form, and duration of behavioral concomitants of emotion, including observable facial and gestural responses and other behaviors that stem from, or are associated with, internal emotion-related psychological or physiological states and goals." (Eisenberg et al., 2000a, p.141).

Behavior regulation is emotion-related regulation and it may include any actions to deal

with a stressful situation. It is elaborated in detail in chapter three.

Type A children

Type A children in the present study refer to children who are high in negative emotionality and low in emotion and behavior regulation.

Type B children

Type B children in the present study refer to children who are low in negative emotionality and high in emotion and behavior regulation.

Simple Logistic Model of Rasch

The Simple Logistic Model of Rasch is a measurement model designed to create a linear, unidimensional scale when the items are answered in two responses (scored 0/1), for example: wrong/right, no/yes (Rasch, 2010, 1992). The probability of a specified response is represented as a function of person and item parameters. Specifically, in the simple Rasch model, the probability of a correct answer is represented as a logistic function of the difference between the item parameter and the person (Grove, 2004). In designing the items, person measures of the variable are conceptualized as being arranged from low to high according to some specified conditions. The details of the model are provided later in chapter four.

Extended Logistic Model of Rasch

The Extended Logistic Model (Andrich, 1988) is an extension of the Simple Logistic Model. It is designed to create linear, unidimensional measures for items with three or more ordered response categories, for example: never, sometimes, most of the time. Response categories must be ordered and the actual scoring should reflect that order. The Extended Logistic Model of Rasch for Partial Credit Scoring was used for

data analysis of the present study in the Rasch Unidimensional Measurement Model (RUMM2030) computer program (Andrich, 1998b and the RUMM Manual).The mathematical form of the model is provided later in Chapter Four.

Some of the output from the RUMM2030 computer program is briefly explained below.

Person Separation Index

The Person Separation Index is the ratio of the estimated true variance among person measures and the estimated observed variance among person measures (Andrich & van Schoubroeck, 1989).This index is based on the Rasch model generated values, rather than the raw scores, but is similar to the Cronbach Alpha (Cronbach, 1951) and is interpreted in a similar way.

Thresholds

A threshold is defined as the point where the probability of choosing the next category is higher than that for the previous category and the odds are 50:50 of choosing adjacent categories (Wright & Mok, 2000). The thresholds in the Extended Logistic Model of Rasch should be ordered in line with the ordering of the scoring categories, so that the scoring is done logically and consistently.

Residuals

Residuals are the differences between the expected values predicted from the parameters of the Rasch measurement model (Bond & Fox, 2007; RUMM Manual) and the observed values made by the respondents. If the data fit a Rasch Measurement

Model, then there will be good agreement between the predicted and observed residuals.

Targeting

Targeting is to test whether the coverage of all the possible levels of the person measures is provided by the range of the item difficulties. In other words, it means whether the items on the test match the range of the person's proficiency (Bond & Fox, 2007). Measures are considered as well-targeted when the range of item thresholds matches the range of measures on the same linear scale.

Item Characteristic Curves

Item Characteristic Curves investigate to what extent the items differentiate between persons with measures above and below the item location (Andrich, 1988; Bond & Fox, 2001; Waugh, 2006). In the RUMM program, mean measures for groups of respondents are plotted against their expected values predicted from the Rasch analysis and they ought to follow a standard ogive curve, if there is good discrimination.

Response Category Curves

The Response Category Probability Curves are useful for examining the extent to which the response categories are answered logically and consistently. They show the probability of how persons with different measures will choose a different category (Cavanagh & Waugh, 2011).

Differential Item Functioning

Differential item functioning refers to how item might function differently for different types of test-takers, especially for test-takers having the same levels of latent trait but different probabilities of scoring a particular response (Wang, 2008).

Structure of the thesis

This thesis is set out in 14 chapters and a summary of the content of each of these chapters is now given.

Chapter Two is a review of the literature with respect to the Social Information Processing Model (Crick & Dodge, 1986, 1994). It begins with an introduction of the earlier version of the model, then the version of the re-formulated model in 1994. Limitations of the models are identified and discussed.

Chapter Three presents the re-formulated model proposed by Lemerise and Arsenia (2000) with the integration of the construct 'emotion' into the model. Review of recent research on neuropsychology, emotionality, emotional and behavior regulation gives direction to the theoretical framework of the Social Information Processing (SIP) Model. This is followed by a description of the roles of emotionality and behavior regulation in the model and how each steps of the SIP model is affected by these constructs in the social problem solving processes.

Chapter Four explains the concept of the Rasch Measurement Model approach as used in this study. Measurement in general is explained first and that is followed by an

introduction to the Simple Logistic Model of Rasch and the Extended Logistic Model of Rasch, and how Rasch measurement is different from the True Score Theory measurement. The Rasch measurement is then discussed in terms of the importance of measuring emotionality, and emotion and behavior regulation of young children. Finally, the need for using the Rasch model approach to modify existing instruments is proposed.

Chapter Five explains the methodologies used during the study. It describes the definitions of variables and the design of the study. It explains how the three measurement instruments were modified to be consistent with a Rasch Measurement Model, and then two of the instruments were used to measure young children's emotionality and emotion and behavior regulation. Two groups of children, Type A children and Type B children, were identified by these measures and selected to participate in a social cognitive interview. The social conflict situations were also analyzed using the Rasch Measurement Model approach in terms of their level of emotional arousal. This is followed by an explanation of the pilot study of the research procedures. The process of data collection section and method of data analysis follows.

Chapter Six presents the results of the analysis of Emotion and Behavior Regulation data from a sample of N=628 preschool children in Hong Kong using the computer program Rasch Unidimensional Measurement Models (RUMM2030) (Andrich, Sheridan & Luo, 2010). Items were selected from the modified Child Behavior Questionnaire (Goldsmith & Rothbart, 1991) and investigated initially in regard to Emotion and Behavior Regulation. Ten items out of the 12 items originally selected for the Rasch measurement produced data that formed a linear, unidimensional measure. The RUMM (2030) computer program processes item and person fit, item difficulty and person measure tables and graphical output. The analysis begins with the

standardized residual fit and a summary of all the requirements for dimensionality. Next is the Person Separation Index which evaluates how well the measures are separated along the linear scale in relation to the errors. This is followed by the presentation of item fit to the measurement model, item and person residual fit, threshold values, response category, item characteristic curves, targeting graphs and differences by gender.

Chapter Seven presents the results of the analysis of data for Negative Emotionality from a sample of N=628 preschool children using the computer program Rasch Unidimensional Measurement Models (RUMM2030) (Andrich, Sheridan & Luo, 2010). Fifteen items were used for the present study, reduced to 10 as five items produced data not fitting the Rasch Measurement Model. The presentation of results is similar to Chapter Six. The Person Separation Index; item-child test-of-fit residuals; item-trait interaction probability; Response Category Curves and Item Characteristic Curves; targeting graphs and differences by gender are presented and discussed in regard to this instrument.

Chapter Eight presents the Rasch analysis results from the 33 items of the modified Short Temperament Scale (Thomas & Chess, 1977) which was investigated, initially, in regard to children's temperament. The analysis is similar to that conducted for Chapters Six and Seven. The data collected with this questionnaire showed that there was a poor fit to the Rasch measurement model and it was not possible to create a linear, unidimensional scale. Therefore, the data from the Short Temperament Scale were not valid and reliable and they were not used for the latter part of this study.

Chapter Nine presents the results of the analysis of data from the questionnaire, Teacher's Views of their Student's Social Problem Strategies. Teachers were invited to

rate the likelihood that their children would use ten strategies in each of five everyday classroom conflict situations, based on their past observation and experience with the children. An Analysis of Variance was conducted to test the statistical differences of strategies used by Type A and Type B children as reported by their teachers. Results are discussed at the end of the chapter.

Chapter Ten presents the results of Rasch analysis for two scales, calm/angry and sad/happy. The data for this chapter comes from two parts: (1) the identification of Type A and Type B children by the teachers (see Chapter Nine); and (2) the children's data from the social cognitive interview by Type A and Type B for five conflict situations. The 27 Type A and 31 Type B children were given five conflict situations and asked to rate their emotional responses from low (score 1) to strong (score 3) for two perspectives – calm/angry and sad/happy. This chapter reports Rasch analyses for the two scales.

Chapter Eleven presents data analysis with respect to children's reports of their strategies used in the five conflict situations. Quantitative and qualitative differences of Type A and Type B children's use of each strategy are presented and compared.

Chapter Twelve presents the comparison of results of further analysis of the data from Type A and Type B children's quality of generation and selection of social-problem strategies in five social conflict situations. The different strategies are grouped into two groups for further analysis. Strategies that attempt to improve the possibility of solving a social conflict in a constructive manner are called constructive strategies. Strategies that will not improve a conflict situation are called non-constructive strategies. The analysis of the quality of strategy generation by Type A and Type B children is reported first and is then followed by the analysis of their strategy selection for each of the five social situations.

Chapter Thirteen presents the results of the analysis of data from the Questionnaire "Teacher's Views of their Student's Social Problem Strategies" and children's report of their proposed social-problem strategies for the five social conflict situations. The analysis presented in this chapter is to find out whether the strategies generated by children are similar to what the teachers predicted that the children would do in the five social conflict situations. A zero-order Pearson product-moment correlation was used to examine the relationship between the children's responses and teachers' predictions for their students. The correlations of teachers' predictions and their children's responses are presented for conflict situations one to five were reported in this chapter.

Chapter Fourteen presents the final discussion of results from the previous chapters. First, the aims and research questions of the thesis are discussed. Second, the key findings of this research are examined, integrated and discussed in relation to the research questions and hypotheses. The remainder of the chapter then addresses limitations and implications of the present research. Finally, future directions in studying young children's emotionality, emotion and behavior regulation and social problem solving are suggested.

The next chapter provides a review of the relevant literature.

CHAPTER TWO

INTRODUCTION TO SOCIAL INFORMATION PROCESSING MODELS

Three decades of empirical research have indicated that children's acceptance by peers is partly determined by their skill in social problem solving (Asher & Renshaw, 1981; Dodge and Price, 1994; Mayeux & Cillessen, 2003; Harper, Lemerise & Caverly, 2010). Social information processing models are popular models used by researchers to explain children's social problem solving behavior. This chapter introduces the older and the reformulated versions of the Social Information Processing Models proposed by Crick and Dodge (1989, 1994). The earlier version of the social information processing is introduced first and then followed by the reformulated version. Critical evaluation of the models in terms of the constructs and relevant empirical research studies are reviewed. Lastly the limitation of the models is discussed in terms of recent research findings.

The Earlier Versions of Social Information Processing Models

Designed specifically to explain and to predict the aggressive behavior in children, Dodge (1986) outlined a social-cognitive model. The problem that was guiding his research was the question, "how can aggressive children be taught to use behavioural patterns that are not aggressive in the interaction with peers"? In searching for an answer to this question, Dodge borrowed ideas from theories of cognitive, social, and developmental psychology. In his model, Dodge proposed five sequential steps necessary for the demonstration of skilled social behavior: (1) encoding of incoming social cues; (2) interpretation of the encoded social cues; (3) evaluation and generation of possible responses to the interpreted social cues; (4) assessment of each response and

decision on the best alternative; and (5) application of the chosen alternative. (see Figure 2.1)

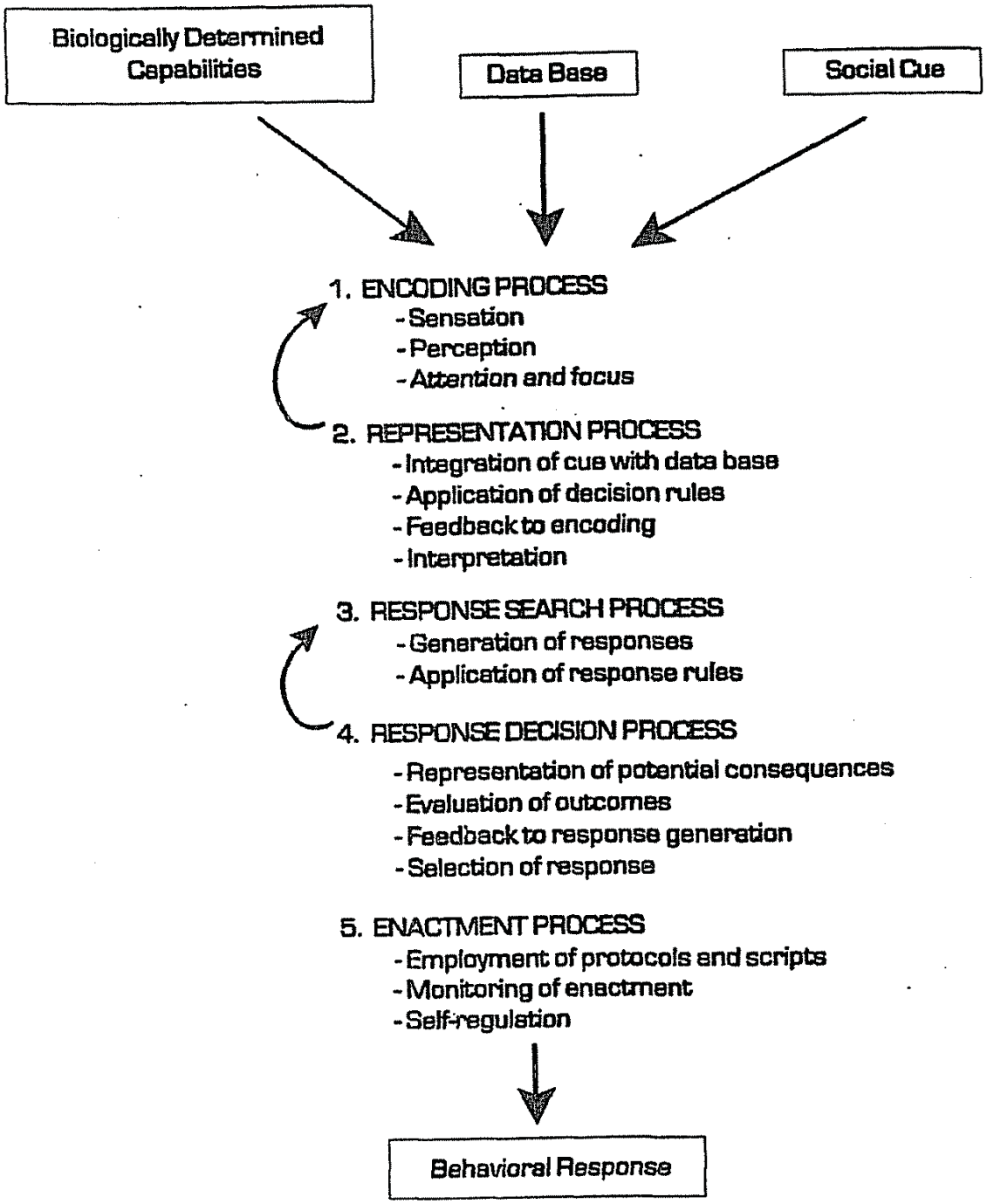

Figure 2.1. A Social Information Processing Model of children's social adjustment. From "A Social Information Processing Model of Social Competence in Children (p.84) by K. A. Crick, 1986, In M. Perlmutter *The Minnesota Symposium on Child Psychology* (v 18). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

During the first two steps of the model, encoding and interpretation of social cues, the researchers hypothesized that only certain situational and internal cues are being selected for processing by children. Selected cues are then encoded and interpreted by children. After interpreting the situation, it is proposed that children choose a goal or desirable result for the situation, or continue with a goal that already existed. Goals are related to "focused arousal states" that lead an individual toward producing certain outcomes. They proposed that children bring preexisting goals to the social situation but they also revise those goals and create new goals by responding to current social stimuli. Next, it is hypothesized that children access past experiences from memory for potential responses to the social situation. When children encounter novel situation, they may or may not construct new behaviours in respond to new social cues. Then, it is hypothesized that children evaluate all the potential responses that are available and choose the best response for enactment. Finally, the selected response is then put into action. The model was criticized by some researchers as sequential, linear and too rigid in nature (Rumelhart, McClelland, and the PDF Research Group, 1986; Crick & Dodge, 1994). Processing is posited as simultaneous parallel paths rather than in a linear direction. In response to the shortcomings of the 1986 social information processing model of social competence in children Dodge and Crick (1994) reviewed and reformulated the social information processing mechanisms.

The Re-formulated Social Information Processing Model

In 1994, Crick & Dodge provided a critical evaluation of the 1986 model and proposed a revision that would reflect more recent conceptual and empirical innovations in the areas of developmental psychology, clinical psychology, cognitive science, and other related fields. Like the previous model, Crick & Dodge (1994) proposed that children enter a social situation with "limited capabilities and a database" full of

memories of past experiences. Cues are inputted for processing to produce behavioral response. The steps of the reformulated model included "(1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4) response access or construction, (5) response decision, and (6) behavioral enactment" (Crick & Dodge, 1994, p.76). In this model, social interaction and mental processing do not stop there, but subsequent events can be seen as "a recycling of the processing steps proposed" (Crick & Dodge, 1994, p.77). The model is depicted in Figure 2.2.

The reformulated model corrected the rigid linear structure of the old model. The recognition of parallel processing is described in the feedback loops and circular structure in the six steps of the reformulated model. Moreover, the relation between social information processing and social adjustment is more interactive in nature. This change has made the model more transactional in operation. Two types of mental processes are proposed: "latent mental structures and on-line processing actions" (Crick & Dodge, 1994, p.78). The researchers proposed that "social experiences lead to the generation of latent mental structures that are stored and carried forward over time in memory in the form of social knowledge" (Crick & Dodge, 1994, p.79). These mental structures that make up the "database" in the processing models affect the on-line processing of social cues of a child and on-line processing directly affect the social behavior that is produced by the child. Thus, both the latent and on-line processing actions are taken into account in the model.

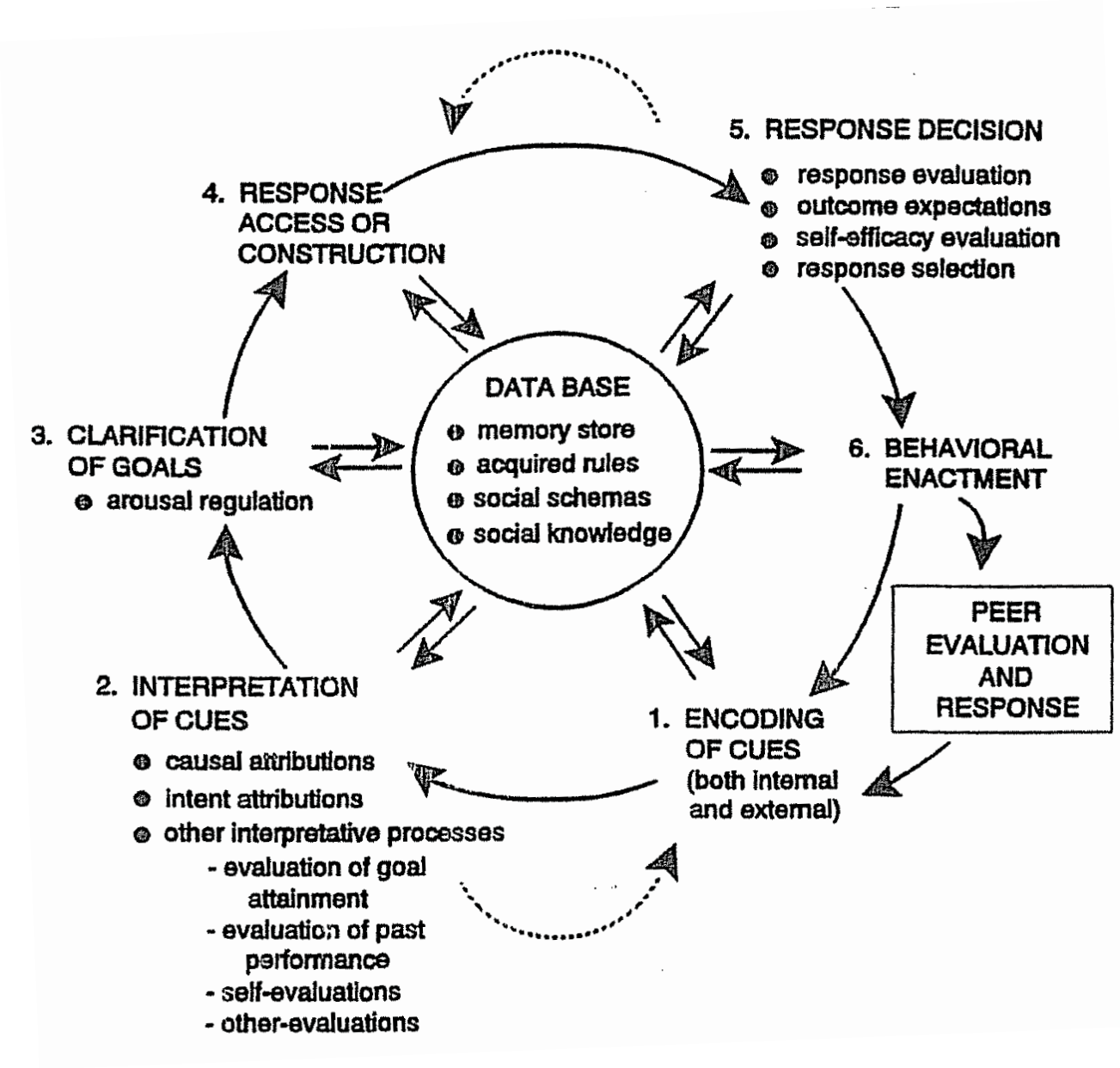

Figure 2.2. A reformulated social information-processing model. From "A review and reformation of social-information-processing mechanisms of children's social adjustment," byN. R. Crick & K.A. Dodge (1994), *Psychological Bulletin*, 115, p.74.

Crick and Dodge (1994) address the developmental issue by identifying two general sources of developmental change in children's processing: "acquisition of cognitive skills" and increases in "capacity or speed of processing". In other words, children's ability to solve social problems depends on their development of cognitive skills and processing speed. The authors also proposed in the reformulated model that

emotions are an integral part of each social information-processing step (Dodge, 1991) but they did not elaborate this concept in detail.

It seems that the reformulated model has taken into consideration many aspects that have been ignored in the old model. Crick and Dodge (1994) reviewed many research studies (e.g. Coie, 1990; Ladd & Crick, 1989; Bem, 1984) and found support for the Proposed model. However, some of the criticisms and limitations of the reformulated model remain unresolved. These limitations are now discussed in the following section.

Limitations of the Social Information Processing Model

The Social Information Processing Models provide a framework for understanding individual differences in social problem solving by examining how children process social information and make decisions in solving the problem. Many research studies have been conducted to test this model (Crick & Dodge, 1994; Fontain, Burks, & Dodge, 2002; Pettit, Polaha & Mize, 2001; Mayeux & Cillessen, 2003) , and mostly they have supported the model. Although the processing model is a theory of normal social behavior, few studies have examined these processes in a general sample. Most of the studies emphasized individual differences in children's processing, mainly in children who have been identified by their peers as socially rejected and behaviorally aggressive. As Crick and Dodge (1994) pointed out, that it is also necessary to study the relation between social information processing and social behavior in the normal populations with the developmental perspective. Lemerise and her colleagues (2006) concluded that nearly three decades of Social Information Processing research has yielded consistent findings between aggressive and nonaggressive children, and or adolescents in encoding, interpretation of cues and other processing steps. Thus, one of the limitations of this model is its main application to special groups. Relatively few studies have been

conducted with normal children, especially preschool children. Since most of the Social Information Processing research studies are conducted with extreme groups, how social information processing patterns relate to social competence in a normal population has not been well established. Testing this approach in a normal population would ensure that knowledge of this model is not limited to a relatively small percentage, or special group, of the child population.

The second limitation of the Social Information Processing model is that there is little research support for this model with the developmental perspective. Crick and Dodge (1994) addressed the developmental issues by identifying two general sources of developmental change in children's processing: acquisition of cognitive skills and increases in capacity or speed of processing. Dodge and Price (1994) pointed out that as children grew older, the processing speed and pattern will undergo changes. In other words, as processing speed and pattern developed across age, it may become more important to individual differences in children's social behavior. Crick and Dodge (1994) suggested that one of the most likely cognitive skills to change with age is the child's database of social knowledge, often referred to more generally as domain-specific knowledge (Bjorklund, 1987). Crick and Dodge proposed that, with age, "the qualitative nature of children's strategies repertoires is likely to change, with a larger proportion of the strategies available for access and becoming more competent and less aversive in nature" (Crick & Dodge, 1994, p.80). However, age differences in social information processing have not been systematically and extensively studied. Most of the research studies are conducted on older children and adolescents. Few research studies have been done on the social information processing with preschool children up to this point of time. Little is known about the Social Information Processing Model's application in early childhood (Runions & Keating, 2007; Schultz,

et. al. 2010). More research studies must be conducted with a developmental perspective to provide support for the model.

The two sources discussed above, the application of the model to normal populations and the investigation of developmental changes in children's processing of the steps of social problem solving, could be the basis for the construction of a developmental social information-processing model. For example, the development of a data base of social knowledge or past experiences, arousal regulation, strategy formulation and implementation, and evaluation, are some good areas in which to explore the developmental aspects in relation to the model. By including the age-related changes in the investigation of different components of the model, the Social Information Processing Model would be more comprehensive in explaining the social behavior of people of different age.

In addition to only having been applied to children with social difficulties, the other limitation of the social information model is how the components of the central data base interact are not clearly explained. Components of the database include the memory store; acquired rules; social schemas and social knowledge. Dodge explored some of the components of the data base such as the relationship among knowledge structures (Burks, Laird & Dodge, 1999), cognitive bias (Dodge & Frame,1982), intention (Dodge, Murphy & Buchsbaum, 1984), decision making processes (Dodge & Newman, 1981), schemas (Dodge & Tomlin, 1987) and children's conflict behaviors. However, the relationship, structure and interactions of the four components of the database from which children base their social information processing and the mechanism through which the data base works are not explained. Whether the components of the database are working in a linear, simultaneous, interactive, reciprocal or hierarchical way is not clear.

Despite the limitations of the model, the reciprocal and cyclical nature of the model has overcome some of the shortcomings of the previous social information processing model. The way the components interact with the data base is depicted as interactive with the first step being encoding of both internal and external cues, and then interpretation, and so on. However, encoding incoming cues may not be always the first step of processing. It is probable that sometimes information may be processed in a top down manner rather than as being depicted in the model. There is goal-directed behavior such as delay of gratification in children for the sake of later outcomes (Mischel, Shoda & Rodriguez, 1989). A child may come to a situation with a goal in mind, then the encoding and interpretation and strategies selected would be affected or controlled by that goal. For example, if a child wants to win in a game, he or she may only selectively process and interpret cues that can help him/her to win the game and ignore the cues that s/he thinks are not helpful in winning the game. Thus, a pre-existing goal could act as a filter in a top down manner at the beginning of processing information, and it is possible that information processing may not always begin with encoding incoming cues, or be in the order that the model has depicted.

Crick and Dodge (1994) gave a low priority to the role of emotion in the 'old' Social Information Processing Model. In the new model, they proposed that emotions are an integral part of each social information-processing step. For example, feelings inside a child may serve as an internal cue that must be encoded in step one. However, how emotions affect the processes of problem solving and the mechanism by which it works is not clearly depicted in the reformulated model. Stein , Liwag and Wade (1996) presented a dynamic theory of emotion episodes in which changes in the status of "valued goals lead to emotional experiences that evoke goal-directed behavior aimed at maintaining or reaching desired outcomes, or avoiding or escaping from undesired

outcome" (p.56). It was argued that emotion has effects on how a child processes information. For example, a very angry child may have a goal to vent his or her anger on someone when he or she is being approached. Crick and Dodge (1994) admitted that relatively little research has been conducted from an integrative perspective on social information processing and emotion. Up to recently, most of the relevant studies of emotion have mainly focused on the relation between social adjustment and emotion without the inclusion of social information processing (Crick & Dodge, 1994) with the exception of a few studies (Lemerise, Gregory & Fredstrom, 2005; Lemeris, Fredstorm, Kelly, Bowersox & Waford, 2006; Castro, Koops, Veerman & Bosch, 2005).

Another limitation of this model is that it does not take sociocultural and contextual factors into account. Knight, Berning, Wilson and Chao (1987) suggested that development of cognitive skills is a necessary but not the only component that determine chronological age differences in social decision making. Sociocultural and situational factors may motivate the child to behave in a certain way toward a particular social decision within that range. These issues are not sufficiently discussed in the new model.

In sum, the reformulated Social Information Processing Model of Crick and Dodge (1994) has some shortcomings: the problem of generalization from research findings that is limited to a relatively small group of the child population; insufficient research has been conducted with a developmental perspective to support the model; and the lack of clarity for the role of emotion in the model. The relatively loose relationship and lack of thorough research on the components of the central data base and, the structure and mechanism that govern and coordinate social information processing require further investigation and clarification. In particular, the effects of socio-cultural and contextual factors are not sufficiently explained in this model. Further research using normal

samples of different age groups that focus on different types of behavior involved in social conflict and on different aspects of the components of the model in different context will increase our knowledge on how children process information in social conflict.

The next chapter discusses the role of emotion in the Social Information Processing Model in the light of recent developments in relevant theories and research findings.

CHAPTER EIGHT

DATA ANALYSIS (PART 3)

RASCH MEASURE FOR SHORT TEMPERAMENT SCALE

This chapter presents the Rasch analysis results from the 33 items of the modified Short Temperament Scale (Thomas & Chess, 1977) and investigated initially in regard to children's temperament. For the Short Temperament Scale, the responses range from 1, indicating "almost never," to 6, indicating "almost always". The Short Temperament Scale consisted of 30-items. The teacher of each child was invited to rate his/her behavior. Four temperament dimensions: inflexibility, approach/withdrawal, persistence and rhythmicity were assessed. The scale can be created by ordering the approach, persistence and inflexibility items by difficulty from easy to hard. The analysis is similar to that conducted for Chapters Six and Seven and hence is not reported in the same detail here.

The Questionnaire was originally set up for True Score Theory measurement by Thomas and Chess in 1977 (that is the items were not ordered by difficulty) and, on examination, 16 items were not expected to be appropriate for Rasch Measurement. Also, some of the items were very specific to certain situations; for example, item 9 "My student has his/her own favorite snacks and always wants to eat those," and item 10 "My student will throw a tantrum when he/she cannot eat his/her choice of snacks" are related to children's choice of snack and didn't seem appropriate. This is because some schools provided snacks to children and do not let children bring their own snacks and, as a result, the teacher may not know individual child's favorite snacks in some schools. The remaining 17 items were conceptually ordered by difficulty and the data were then used for Rasch analysis.

Initial Analysis

It was expected that 16 of the original 33 items would produce data inconsistent with Rash measurement and this was confirmed. These items were 1, 5, 8, 9, 10, 11, 12, 15, 17, 18, 20, 23, 27, 28, 30, 31. It was not possible to order these items from easy to hard in a Guttman-like pattern so it was not possible to get agreement about the item difficulties, and they were deleted for the next Rasch analysis.

Final Analysis

Data from the remaining 17 items were Rasch analyzed. These are items 2, 3, 4, 6, 7, 13, 14, 16, 19, 21, 22, 24, 25, 26, 29, 32 and 33, and the data from these items did not form a good linear unidimensional scale either. As a result, while the Short Temperament Scale data was not used to select participants for the rest of the present study, some Rasch results are presented here because other researchers may find it helpful in revising the questionnaire.

Standardized Fit Residuals

Table 8.1: Overall Fit Statistics for Short Temperament Scale (n=628, I=10)

	ITEMS		PERSONS	
	Location	Fit Residual	Location	Fit Residual
Mean	0.00	-0.08	-0.51	-0.29
Standard Dev	0.92	1.65	0.81	1.29

The mean standardized item fit residual is -0.08 (SD =1.65) and the mean standardized children fit residual is -0.29 (SD =1.29) which are acceptable, but suggest that items need to be improved to decrease the residuals for some items.

Item-Trait Interaction (Dimensionality)

The item-trait interaction probability is 0.000 (χ^2=277.19, df = 153) (see Table 8.2). There is a statistically significant interaction between the responses to the items and the location values (the measures) of the children along the Short Temperament Scale. This indicated that there is not good agreement amongst all 628 children to the item difficulties along the scale. The measure is not unidimensional and suggests that improvements need to be made in the wording of many items.

The residual principal components analysis shows the eigenvalue of the first component as 4.36. This supports the view that the scale is NOT unidimensional (see http://www.rasch.org/rmt/rmt191h.htm).

Table 8.2: Item-trait interaction for Short Temperament Scale

Total Item Chi-Square	277.19
Separation Index	0.72
Total Deg of Freedom	153.00
Total Chi-Square Probability	0.000

Person Separation Index

The Person Separation Index is 0.72 indicating acceptable separation of measures in relation to the errors (which is about 0.07 logits), although this index should be improved for any future use of this scale with these children. Based on the Separation Index, the power of the tests-of fit is considered to be satisfactory.

Individual item fit

The fit statistics for all test items for the Short Temperament Scale are listed in Table 8.3, and eight out of 17 items do not fit the measurement model. Deleting the non-fitting items and re-analyzing the data does not produce an improved overall fit.

Table 8.3. Fit of Items to Rasch Measurement Model (Short Temperament Scale)

Item	Location	SE	Residual	df	ChiSq	Probability
21	-0.86	0.07	0.05	577.18	6.34	0.71
2	0.73	0.07	-0.92	585.60	10.14	0.34
25	-0.84	0.07	-0.66	585.60	10.27	0.33
4	0.72	0.07	-0.58	585.60	10.52	0.31
6	1.21	0.08	-0.31	584.66	11.91	0.22
26	-1.11	0.07	-1.31	584.66	12.53	0.19
13	-0.78	0.06	1.63	584.66	13.02	0.16
3	1.02	0.08	-1.75	584.66	17.12	0.05
29	-0.72	0.06	2.41	585.60	17.20	0.05
22	-0.77	0.07	-1.85	574.37	18.71	0.03
7	1.31	0.08	-0.34	585.60	18.87	0.03
16	0.95	0.08	0.84	580.92	19.28	0.02
14	-0.15	0.07	-0.74	584.66	20.08	0.02
32	0.30	0.10	-0.76	246.96	20.86	0.01
19	-0.97	0.07	3.92	584.66	21.89	0.01
33	0.93	0.07	1.39	550.05	21.90	0.01
24	-0.97	0.07	-2.41	585.60	26.53	0.00

Note: The bottom eight items do not fit the measurement model, but deleting them does not improve the overall fit to the model.

Table 8.4: Item Thresholds (Uncentralised) for Short Temperament Scale

Item No.		Mean Location	Threshold 1	Threshold 2
2	(1)	0.73	-0.13	1.59
3	(2)	1.02	-0.42	2.46
4	(3)	0.72	-0.50	1.94
6	(4)	1.21	0.07	2.36
7	(5)	1.31	-0.58	2.04
13	(6)	-0.78	-1.73	0.17
14	(7)	-0.15	-0.53	2.44
16	(8)	0.95	-1.04	0.15
19	(9)	-0.97	-2.10	0.50
21	(10)	-0.86	-2.11	0.39
22	(11)	-0.77	-1.78	0.25
24	(12)	-0.97	-2.34	0.41
25	(13)	-0.84	-2.15	0.46
26	(14)	-1.11	-2.52	0.30
29	(15)	-0.72	-0.70	-0.75
32	(16)	0.30	-0.46	1.07
33	(17)	0.93	0.78	1.08

Response Category Curves

The Response Category Probability Curves show that the response categories are answered logically and consistently for all 17 items and the curve for item 21 is shown as Figure 8.1, indicating that the response categories were used consistently and logically.

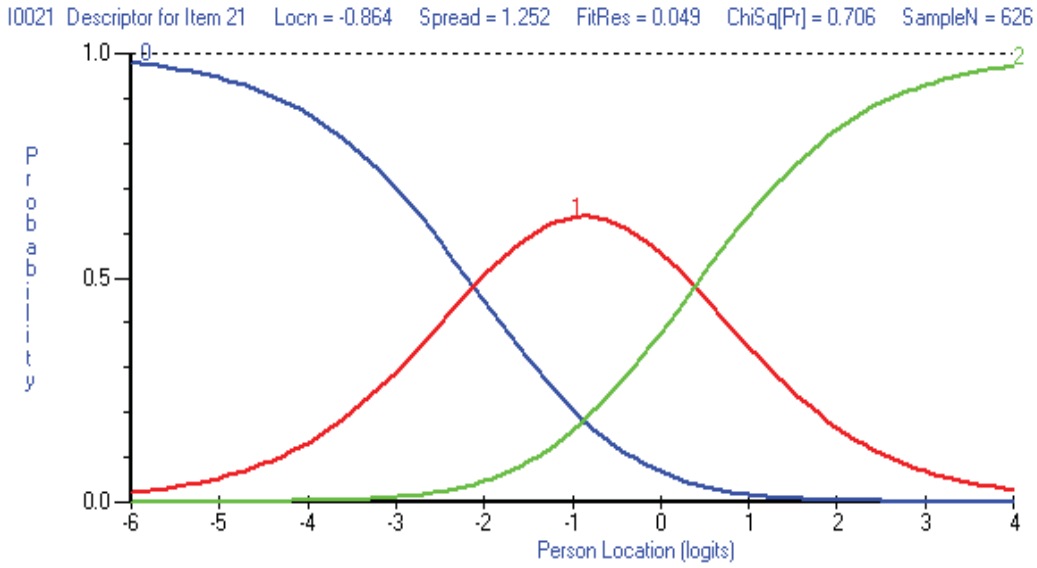

Figure 8.1. Scoring Category Curve for Item 21 (re-numbered item 10 in Table 8.4) of the Short Temperament Scale.

Item Characteristic Curves

The Item Characteristic Curve for a poor-fitting item 24 (Figure 8.2) is typical of the curves for the other non-fitting items (items 33, 19, 32, 14, 16, 7 and 22) and, to some extent the curves for the poor-fitting items 3 and 29. That is, the data for these items are discriminating, but improvements should be made for any future use of the scale.

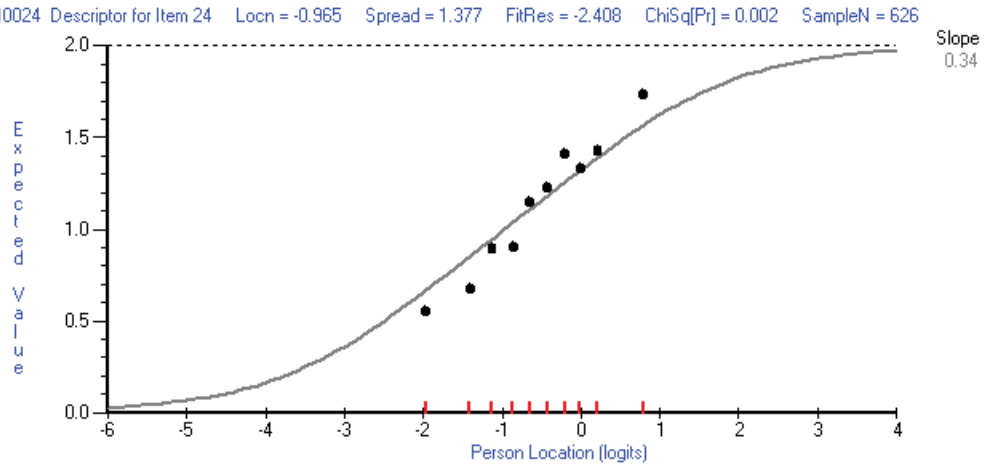

Figure 8.2 Item Characteristic Curve (item 24, re-numbered as item 12 in Table 8.4) for Short Temperament Scale

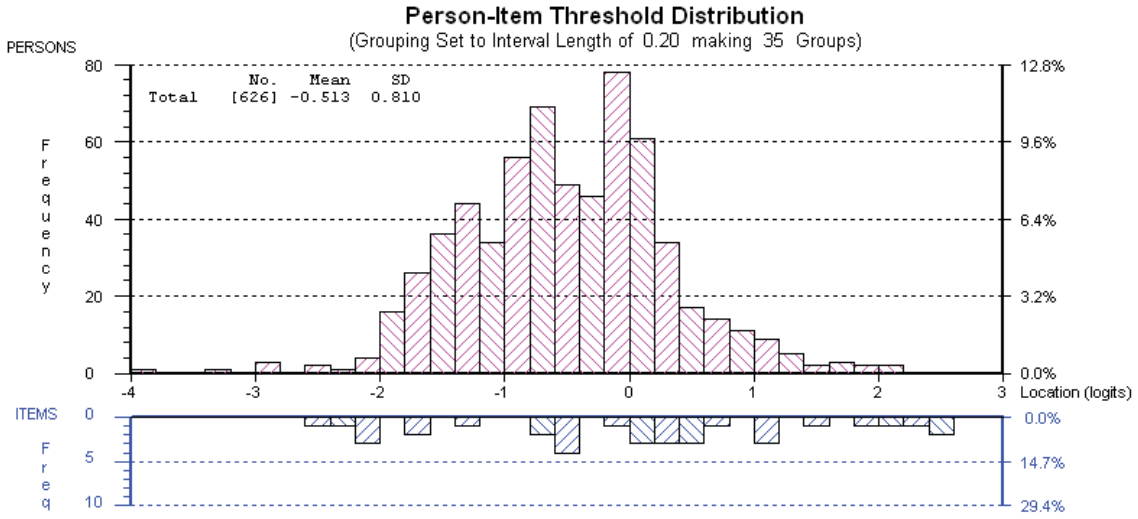

Figure 8.3 Targeting of Measures and Item Thresholds for the Short Temperament Scale.

Note

The measures are ordered from left to right on the upper side of the scale and the item thresholds are ordered from easy to hard on the lower side of the scale.

Targeting

The item difficulties are considered to be reasonably well-targeted because the range of item thresholds (-2.52 to +2.46 logits) matches the range of measures (-3.95 to +2.2 logits) (see Figure 8.3), but a few more items should be added at the easy end for any future use of the scale with these children.

Differences by Gender

Differential Item Functioning by Gender

The Item Characteristic Curve, separated by gender for each item, was investigated for item discrimination against males and females. The RUMM program generates the Item Characteristic Curves to detect differential item functioning and statistically checked through an F-test. Three items, item 3, item 4 and item 13, were found to show gender bias. The remaining 14 items were checked and show no Differential Item Functioning. Item 3 and item 4 are used as examples for discussion. Item 3 (re-numbered as item 2 in Table 8.4) and item 4 (re-numbered as item 3 in Table 8.4) are presented in Figures 8.4, 8.5 respectively.

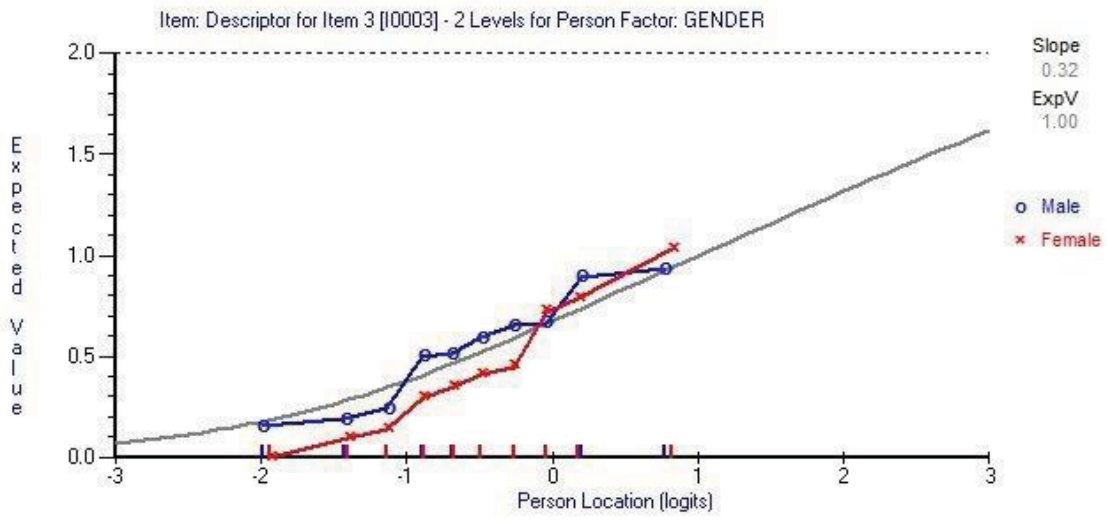

Figure 8.4 Characteristic curve by gender for item 3 (re-numbered as item 2 from Table 8.4).

Notes

1. There is statistically significant Differential Item Functioning by gender/group (main effect) (F=7.65, df=19,1, p=0.006)
2. There is no statistically significant interaction effect for Differential Item Functioning by gender/group
3. Significant level set to p<0.01.

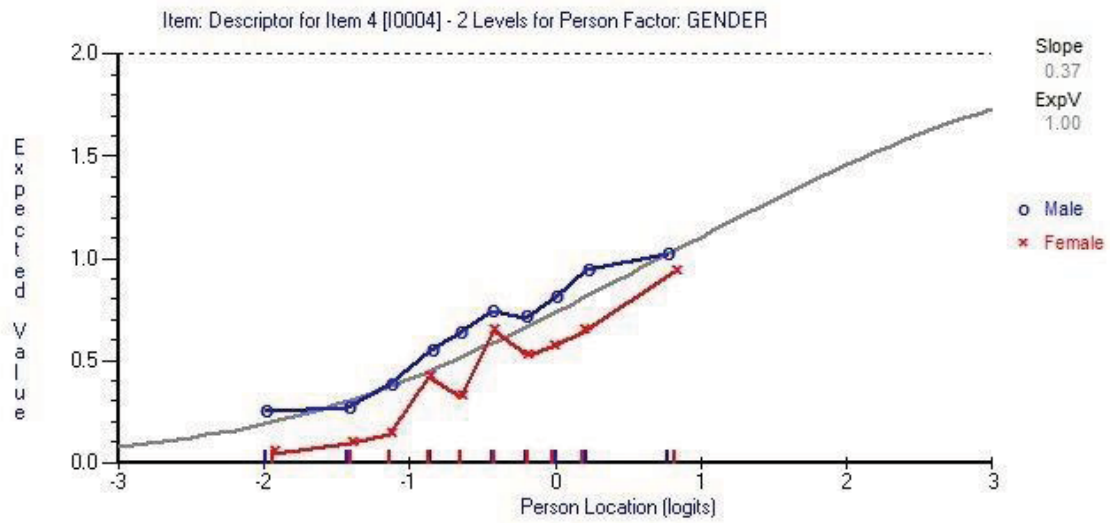

Figure 8.5 Characteristic curve by gender for item 4 (re-numbered as item 3 from Table 8.4).

Notes

1. There is statistically significant Differential Item Functioning by gender/group (main effect) (F=7.65, df=19,1, p<0.001)
2. There is no statistically significant interaction for Differential Item Functioning by gender/group
3. Significant level set to p<0.01.

Figure 8.4 shows that there is statistically Differential Item Functioning by gender for item 3 (re-numbered as item 4 in Table 8.4). Females have lower expected values at most of the points than males and the difference is statistically significant (F=7.65, df=19,1, p<0.001). There is no significant interaction effect for gender by group. Item 3 discriminated against females.

Figure 8.5 shows that there is statistically Differential Item Functioning by gender for item 4 (re-numbered as item 3 in Table 8.4). Females have lower expected values at all the points than males and the difference is statistically significant (F=22.45, df=19,1, p<0.001). There is no significant interaction effect for gender by group. Item 4 functions differently for males and females and females tend to score lower for this item.

Summary of results

This chapter presents some brief results of the Rasch analysis of data for the Short Temperament Scale (33 items). Clearly, the items in this scale were designed for use with True Score Theory measurement and were not conceptually ordered from easy to hard. Consequently, the data collected with this questionnaire showed that there was a poor fit to the Rasch measurement model and it was not possible to create a linear, unidimensional scale. Therefore the data from the Short Temperament Scale were not valid and reliable and they were not used for the latter part of this study. A part of the Rasch analysis for these data is included here only because it may be of help to other researchers who want to improve the Short Temperament Questionnaire.

The Person Separation Index is 0.72 indicating reasonable separation of measures in relation to the errors (about 0.07 logits) but clearly improvements need to be made. The item-trait interaction probability is 0.00 (χ^2=277.19, df = 153) which indicates that there is only limited agreement amongst the children about the different difficulties of the items on the scale. Most of the items do not fit the Rasch measurement model very well and need revising. However, the thresholds were ordered in alignment with the conceptualized scoring categories and this indicates that the response categories are used consistently and logically. Three items out of the 17 items were found to show a statistically significant main effect for Different Item Functioning by gender.

The next chapters (Chapters Nine and Ten) report on the identification of Type A students (high Negative Emotionality, low Emotion and Behaviour Regulation) and the identification of Type B students (low Negative Emotionality , high Emotion and Behaviour Regulation) and their performance on the Social Cognitive Interview. Then the results on the testing of some hypotheses for the differences between Type A and Type B students on various variables are reported.

CHAPTER NINE

DATA ANALYSIS (PART 4)

TEACHER PREDICTIONS OF CHILDREN'S STRATEGIES USED IN CONFLICT SITUATIONS

This chapter presents the results of the analysis of data from the questionnaire, Teacher's Views of their Student's Social Problem Strategies. Based on their past observation and experience with the children, teachers were invited to rate the likelihood that their children would use ten strategies in each of the five everyday classroom conflict situations, Fifty-eight questionnaires were sent out but only fifty-four questionnaires were collected from the teachers: twenty-four questionnaires for Type A children and thirty for Type B children. Type A children are high on negative emotionality and low on emotion and behavior regulation, as identified from the Rasch-created linear measures, described in Chapters Six and Seven. Type B children are low on negative emotionality and high on emotion and behavior regulation, and were identified from the Rasch-created linear measures. The Chi-square test was conducted to test the statistical differences of strategies used by Type A and Type B children, as reported by their teachers. The significance level was set to $p<.05$ prior to the chi-square test.

The first conflict situation was about the child who is being accidentally pushed by a peer. The second conflict situation was about the child who is being excluded from a game that has enough participants. The third conflict situation was about the child being called 'a baby' because he/she is playing with baby toys. The fourth conflict situation was about a peer criticizing and putting marks on a child's picture. The fifth conflict situation was about a peer pushing ahead and taking a toy that a child has been waiting to play with for a long time.

The ten strategies from which the teachers had to choose were similar to the ones in the study by Eisenberg et al. (1997). They are " (1) does nothing, (2) distraction (keeps him- or herself busy so as not to think about the problem), (3) venting (cries to release pent-up feelings or to elicit comfort from others), (4) emotional aggression (uses physical or verbal aggression to release pent-up feelings), (5) emotional intervention (cries to elicit assistance from others to help solve the problem), (6) emotional support or support seeking (talks about his or her problems with friends or a teacher in hope of getting support), (7) instrumental aggression (resolves problems through physical or verbal aggression), (8) cognitive restructuring (tries to think about the situation in a positive way), (9) instrumental coping (takes some constructive action to improve a problem situation), and (10) avoidance (leaves or avoids a problem situation)" (Eisenberg et al. , 1997, p.649). The teachers also rated the likelihood of each strategy being implemented by each child from 0 (not likely), 1 (on some occasions), and 2 (most likely).

Differences in Strategies Used by Type A and Type B Students

The answers to the questionnaires "Teacher's Views of their Student's Social Problem Strategies" were entered into the data file of the SPSS version 18 program. Answers to each strategy were entered either as 0 (not likely), 1, 2 (most likely) into the data file and re-checked for correct entry. Medians and ranges of the ratings for each of the 10 strategies were calculated for Type A and Type B children using the SPSS version 18 program. The 10 strategies rated by teachers for Type A and Type B children were also analyzed by comparing the differences in ratings for the strategies using a chi-square test.

Conflict Situation 1

This is the conflict situation about the child who was being accidentally pushed by a peer. The medians and ranges of the 10 strategies for Type A and Type B children are given in Table 9.1. Teachers' ratings of Type A and Type B children for each strategy were compared using a chi-square test and the results are given in Table 9.2.

Table 9.1 Medians and Ranges of Teachers' Ratings of the 10 Strategies for Type A and Type B Children for Conflict Situation 1

Strategy	Type A			Type B		
	Median	Range	N	Median	Range	N
1	0.00	2.00	24	0.00	2.00	30
2	0.00	2.00	24	0.00	2.00	30
3	0.00	1.00	24	0.00	1.00	30
4	0.00	1.00	24	1.00	2.00	30
5	0.00	1.00	24	0.00	1.00	30
6	2.00	3.00	24	2.00	3.00	30
7	0.00	2.00	24	0.00	2.00	30
8	1.00	2.00	24	1.00	2.00	30
9	1.00	2.00	24	1.00	2.00	30
10	0.00	1.00	24	0.00	1.00	30

Note: Median refers to the median of each strategy used in conflict situation 1. Range refers to the range of teachers' ratings and N is the number of children.

The medians for Type A and Type B children range from 0.00 to 2.00. The medians and ranges for strategy 1, 2, 3, 5, 6, 7, 8, 9 and 10 are the same. In order to test the differences between the ratings of the two groups, a chi-square test was conducted and the results are given in Table 9.2.

Table 9.2 Comparison of Teachers' Ratings of Type A and Type B Children's Strategy Use for Conflict Situation 1

Source	df	Chi-Square	Probability
Strategy1	2	1.06	0.59
Strategy2	2	0.20	0.91
Strategy3	1	0.61	0.43
Strategy4	2	7.82	0.02*
Strategy5	1	2.03	0.16
Strategy6	3	0.92	0.82
Strategy7	2	3.91	0.14
Strategy8	2	0.98	0.61
Strategy9	2	0.73	0.70
Strategy10	1	4.13	0.04*

Note: Number of Type A children is 24 and number of Type B children is 27. Significant value is set to <0.05 and df means degree of freedom.

Statistically significant differences were found among two of the strategies between Type A and Type B children (strategies 4 and 10 at $p<0.05$). No differences in strategy use between Type A and Type B children in conflict situation 1 were found for the other strategies. These results indicated that there were differences between teachers' rating of Type A and Type B children's use of strategy 4, x^2 (2, N=54) = 7.82, $p<0.05$, in social conflicts. Type B children were rated by teachers' as more likely to use

emotional aggression than Type A to release pent-up feelings in social situation 1.

There was a statistically significant difference between the two groups of children for strategy ten, x^2 (1, N=54) = 4.13, $p<0.05$, avoidance strategy. This result indicated that there were differences between Type A and Type B children in using avoidance strategy as rated by teachers, that is, Type A children were more likely to leave or avoid a problem situation, as in conflict situation one.

Conflict Situation 2

This is the conflict situation about the child who is being excluded from a game that already has enough participants. The medians and ranges of teachers' ratings for the 10 strategies for Type A and Type B children are given in Table 9.3. The ratings of Type A and Type B children of each strategy were compared using a chi-square test and the results are given in Table 9.4.

The medians for both Type A and Type B children are from 0.00 to 1.00. Strategy 2, 4, 5, 6, 7 and 8 have the same medians and ranges for both types of children. In order to test the differences between the means of the two groups, a chi-square test was conducted and the results are given in Table 9.4.

Table 9.3. Medians and Ranges of Teachers' Ratings on the 10 Strategies for Type A and Type B Children for Conflict Situation 2

Strategy	Type A			Type B		
	Median	Range	N	Median	Range	N
1	0.00	2.00	24	1.00	2.00	30
2	0.00	2.00	24	0.00	2.00	30
3	0.00	2.00	24	0.00	1.00	30
4	0.00	2.00	24	0.00	2.00	30
5	0.00	2.00	24	0.00	2.00	30
6	1.00	2.00	24	1.00	2.00	30
7	0.00	2.00	24	0.00	2.00	30
8	0.00	2.00	24	0.00	2.00	30
9	0.50	3.00	24	1.00	2.00	30
10	0.00	1.00	24	0.00	2.00	30

Note: Median refers to the median of each strategy used in conflict situation 2. Range refers to the range of teachers' ratings and N is the number of children.

These results indicated that there were no statistically significant differences between Type A and Type B children's use of ten strategies as rated by teachers in conflict situation 2 at the $p<.05$ level. The two groups are similarly likely to use the different strategies in the situation where the child is being excluded from a game that has enough participants.

Table 9.4 Comparison of Teachers' Ratings of Type A and Type B Children's Strategy Use for Conflict Situation 2

Source	df	Chi-square	Probability
Strategy1	2	2.47	0.30
Strategy2	2	1.48	0.48
Strategy3	2	2.73	0.26
Strategy4	2	4.83	0.09
Strategy5	2	2.25	0.33
Strategy6	2	2.03	0.36
Strategy7	2	2.11	0.35
Strategy8	2	0.18	0.91
Strategy9	2	1.48	0.48
Strategy10	2	2.57	0.28

Note: Number of Type A children is 24 and number of Type B children is 27. Significant value is set to <0.05 and df means degree of freedom.

Conflict Situation 3

This is the conflict situation about the child being called 'a baby' because he/she is playing with baby toys. The medians and ranges of teachers' ratings for the 10 strategies for Type A and Type B children are given in Table 9.5. The ratings of Type A and Type B children of each strategy were compared using the Chi-square test and the results are given in Table 9.6.

Table 9.5. Medians and Ranges of Teachers' Ratings on the 10 Strategies for Type A and Type B Children for Conflict Situation 3

Strategy	Type A			Type B		
	Median	Range	N	Median	Range	N
1	0.00	2.00	24	0.00	3.00	30
2	0.00	2.00	24	0.00	2.00	30
3	0.00	1.00	24	0.00	1.00	30
4	0.00	1.00	24	0.50	2.00	30
5	0.00	1.00	24	0.00	1.00	30
6	1.00	2.00	24	1.00	3.00	30
7	0.00	1.00	24	0.00	1.00	30
8	0.00	2.00	24	0.00	2.00	30
9	0.05	2.00	24	0.50	2.00	30
10	0.00	1.00	24	0.00	1.00	30

Note: Median refers to the median of each strategy used in conflict situation 3. Range refers to the range of teachers' ratings and N is the number of children.

The medians for Type A and Type B children range from 0.00 to 1.00. The medians and ranges for strategies 2, 5, 7, 8, 9 and 10 are the same. In order to test for differences between the ratings of the two groups, a chi-square test was conducted and the results are given in Table 9.6.

Table 9.6 Comparison of Teachers' Ratings of Type A and Type B Children's Strategy Use for Conflict Situation 3

Source	df	Chi-Square	Probability
Strategy1	2	1.69	0.64
Strategy2	2	0.69	0.71
Strategy3	1	0.54	0.46
Strategy4	2	8.56	0.01*
Strategy5	1	0.57	0.45
Strategy6	2	4.16	0.13
Strategy7	1	4.82	0.03*
Strategy8	2	2.26	0.32
Strategy9	2	1.56	0.46
Strategy10	1	3.90	0.04*

Note: Number of Type A children is 24 and number of Type B children is 27. Significant value is set to <0.05 and df means degrees of freedom.

No statistically significant difference was found between Type A and Type B children for seven of the ten strategies (strategies 1, 2, 3, 5, 6, 8, 9). There was a statistically significant difference between the two groups of children for strategy 4, x^2 (2, N=54) = 8.56, p<0.05, for strategy7, x^2 (2, N=54) = 4.82, p<0.05, and for strategy 10, x^2 (2, N=54) = 3.90, p<0.05. This result indicated that there were differences between Type A and Type B children in using emotional aggression, instrumental aggression and avoidance strategy as rated by teachers. Type B children are more likely to use the emotional aggression strategy than Type A children in conflict

situation 3. Type B children are more likely to use the instrumental aggression strategy than Type A children in conflict situation 3, and Type B children were more likely to use the avoidance strategy than Type A children. In summary, Type B children were rated to use more emotional and instrumental aggression strategies and use more avoidance strategy than Type A children in conflict situation 3.

Conflict Situation 4

This is the conflict situation about the child being criticized and his/her picture being marked by a peer. The medians and ranges of teachers' ratings for the 10 strategies for Type A and Type B children are given in Table 9.7. The ratings of Type A and Type B children of each strategy were compared using a chi-square test and the results are given in Table 9.8.

The medians for Type A and Type B children range from 0.00 to 1.00. The medians and ranges for strategy 1, 8, 9 and 10 are the same. In order to test the differences between the ratings of the two groups, a chi-square test was conducted and the results are given in Table 9.8.

Table 9.7. Medians and Ranges of Teachers' Ratings on the 10 Strategies for Type A and Type B Children for Conflict Situation 4

Strategy	Type A			Type B		
	Median	Range	N	Median	Range	N
1	0.00	2.00	24	0.00	2.00	30
2	0.00	1.00	24	0.00	2.00	30
3	0.00	2.00	24	0.00	1.00	30
4	0.00	2.00	24	1.00	0.00	30
5	0.00	2.00	24	0.00	1.00	30
6	1.00	3.00	24	1.00	2.00	30
7	0.00	1.00	24	0.00	3.00	30
8	0.00	2.00	24	0.00	2.00	30
9	0.00	2.00	24	0.00	2.00	30
10	0.00	1.00	24	0.00	1.00	30

Note: Median refers to the median of each strategy used in conflict situation 4. Range refers to the range of teachers' ratings and N is the number of children.

No statistically significant differences were found among nine of the ten strategies between the two groups (strategies 1,2,3,4,6,7,8,9,10). A statistically significant difference in strategy use was found between Type A and Type B children in conflict situation 4 for strategy 5, x^2 (2, N=54) = 7.43, $p<0.05$. This result indicated that there were differences between Type A and Type B children's use of emotional intervention in social conflicts. Type A children were rated as more likely to use cries to elicit assistance from others to help solve the problem during social conflict 4.

Table 9.8 Comparison of Teachers' Ratings of Type A and Type B Children's Strategy Use for Conflict Situation 4

Source	df	Chi-square	Probability
Strategy1	2	2.97	0.23
Strategy2	2	2.70	0.26
Strategy3	2	2.81	0.25
Strategy4	2	3.33	0.19
Strategy5	2	7.43	0.02*
Strategy6	2	0.05	0.98
Strategy7	2	3.07	0.22
Strategy8	2	0.18	0.91
Strategy9	2	0.90	0.64
Strategy10	1	0.54	0.46

Note: Number of Type A children is 24 and number of Type B children is 27. Significant value is set to <0.05 and df means degree of freedom.

Conflict Situation 5

This is the conflict situation about a peer pushing ahead and taking a toy for which a child has been waiting for a long time. The medians and ranges of teachers' ratings for the 10 strategies for Type A and Type B children are given in Table 9.9. The ratings of Type A and Type B children of each strategy were compared using a chi-square test and the results are given in Table 9.10.

Table 9.9 Medians and Ranges of Teachers' Ratings on the 10 Strategies for Type A and Type B Children for Conflict Situation 5

Strategy	Type A			Type B		
	Median	Range	N	Median	Range	N
1	0.00	2.00	24	0.00	2.00	30
2	0.00	1.00	24	0.00	2.00	30
3	0.00	2.00	24	0.00	1.00	30
4	0.00	2.00	24	1.00	2.00	30
5	0.00	2.00	24	0.00	2.00	30
6	1.00	3.00	24	1.50	3.00	30
7	0.00	2.00	24	1.00	1.00	30
8	0.00	2.00	24	0.00	2.00	30
9	1.00	2.00	24	0.50	2.00	30
10	0.00	1.00	24	0.00	1.00	30

Note: Median refers to the median of each strategy used in conflict situation 5. Range refers to the range of teachers' ratings and N is the number of children.

The medians for Type A and Type B children range from 0.00 to 3.00. The medians and ranges for strategies 1, 4, 5, 8 and 10 are the same. In order to test for differences between the ratings of the two groups, a chi-square test was conducted and the results are given in Table 9.10.

Table 9.10 Comparison of Teachers' Ratings of Type A and Type B Children's Strategy Use for Conflict Situation 5

Source	df	Chi-square	Probability
Strategy1	2	1.11	0.58
Strategy2	2	1.14	0.57
Strategy3	2	6.27	0.04*
Strategy4	2	8.21	0.02*
Strategy5	2	5.01	0.08
Strategy6	2	1.69	0.43
Strategy7	2	9.15	0.01*
Strategy8	2	3.27	0.19
Strategy9	2	1.26	0.53
Strategy10	1	2.16	0.14

Note: Number of Type A children is 24 and number of Type B children is 27. Significant value is set to <0.05 and df means degrees of freedom.

No statistically significant differences were found between Type A and Type B children for nine of the ten strategies (strategies 1, 2, 5, 6, 8, 9, 10). There was a statistically significant difference between Type A and Type B children for the use strategy 3 as rated by teachers, x^2 (2, N=54) = 6.27, $p<0.05$. This result indicated that there were differences between Type A and Type B children's use of venting in social conflicts as rated by teachers where Type A children were more likely to use venting as

rated by teachers. There was a statistically significant difference between Type A and Type B children for strategy 4, x^2 (2, N=54) = 8.21, p<0.05. This result indicated that there were differences between Type A and Type B children's use emotional aggression. Type B children were more likely to use physical or verbal aggression to release pent-up feelings in conflict situation 5. Statistically significant difference was also found in strategy 7, x^2 (2, N=54) = 9.15, p<0.05. Type B children were more likely to use instrumental aggression in solving social situation 5.

Summary of Results

Five conflict situations were presented and ten strategies were available for Type A and Type B students. Teachers indicated the most likely strategies that their children would use in each conflict situation. Four out of the five conflict situations indicated that there are differences between the two groups of children in terms of some strategies use. The main results are summarized.

For Conflict Situation 1 (child accidentally pushed by a peer)

1. There were significant differences between teachers' rating of Type A and Type B children's use of strategy 4, x^2 (2, N=54) = 7.82, p<0.05, in social conflicts. Type B children were rated by teachers' as more likely to use emotional aggression than Type A to release pent-up feelings in social situation 1.
2. There was a statistically significant difference between the two groups of children for strategy ten, x^2 (1, N=54) = 4.13, p<0.05, avoidance strategy. Type A children were rated as more likely to leave or avoid a problem situation, as in conflict situation one.
3. Type A and Type B children showed no statistically significant different use of strategies 1, 2,3, 5, 6,7,8 and 9 in solving conflict situation 1.

For Conflict Situation 2 (child is excluded from a game that has enough participants)

4. There were no statistically significant differences in any of the ten strategies used by Type A and Type B children to solve this conflict situation.

For Conflict Situation 3 (child is called 'baby' because of playing with baby toys)

5. There was a statistically significant difference between the two groups of children for strategy 4, x^2 (2, N=54) = 8.56, $p<0.05$. Type B children are more likely to use the emotional aggression strategy than Type A children.

6. There was a statistically significant difference between Type A and Type B children for strategy7, x^2 (2, N=54) = 4.82, $p<0.057$. Type B children are more likely to use the instrumental aggression strategy than Type A children in conflict situation 3.

7. There was a statistically significant difference between Type A and Type B children for strategy10, x^2 (2, N=54) = 3.90, $p<0.057$. Type B children were rated as more likely to use avoidance strategy.

8. Type A and Type B children showed no statistically significant different use of strategies 2, 5, 7, 8, 9 and 10 to solve conflict situation 3.

For Conflict Situation 4 (child's picture is criticized and marked by a peer)

9. Type A children are statistically significantly more likely to use cries for help to elicit assistance from others to help solve problems than Type B students as rated by teachers, x^2 (2, N=54) = 7.43, $p<0.05$.

9. Type A and type B children showed no statistically significant different use of strategies 1, 2,3, 4, 6,7,8, 9 and 10 to solve conflict situation 4.

For Conflict Situation 5 (another child pushes ahead after the first child has been waiting for some time for a toy)

10. There was a statistically significant difference between Type A and Type B children

for strategy3, x^2 (2, N=54) = 6.27, p<0.057. Type A children were more likely to use venting to solve social situation 5.

11.Type B children are statistically significantly more likely to use physical or emotional aggression to release pent up feelings than Type A children in conflict situation 5, x^2 (2, N=54) = 9.15, p<0.057

12. Type A and Type B children showed no statistically significant different use of strategies 1, 2, 5, 6, 8, 9 and 10 to solve conflict situation 5.

This next chapter presents the results of the five situations based on the interviews with the children.

CHAPTER TEN

DATA ANALYSIS (PART 5)

RASCH ANALYSIS FOR CALM/ANGRY AND SAD/HAPPY DIMENSIONS BY TYPE A AND TYPE B CHILDREN

The data for this chapter comes from two parts: (1) the identification of type A and type B children by the teachers (see Chapter Six and Seven); and (2) the children's data from the social cognitive interview by Type A and Type B for five conflict situations. The 27 Type A and 31 Type B children were given five conflict situations and asked to rate their emotional responses from low (score 1) to strong (score 3) for two perspectives – calm/angry and sad/happy. Although the numbers (N=27+31=58) were not as high as desirable, a Rasch analysis was made for two scales-calm/angry and sad/happy. This present chapter reports Rasch analyses for the two scales.

The five conflict situations are stated again here for easy reference. The first situation is about the child who is being accidentally pushed by a peer. The second situation is about the child who is being excluded from a game that has enough participants. The third situation is about the child being called "a baby" because he/she is playing with baby toys. The fourth situation is about a peer criticizing and putting marks on a child's picture. The fifth situation is about a peer pushing ahead and taking a toy that a child has been waiting and wanted for a long time. The five conflict situations were presented to the children in random order. Children were asked to respond to the five situations spontaneously or use a puppet to show what they would do and why. After this, the experimenter used the modified questions suggested by Rudolph and Heller (1997) to prompt the child:" How does the main character [child's puppet] feel?" Children answered by pointing to one of the four

basic emotional expressions: calm, angry, sad and happy. The first prompt is to tap the emotional experience of the child for the story. The experimenter then presented an emotional intensity scale to the child and asked him/her to indicate the intensity of the feeling by pointing to a number on the scale (1 to 3), the higher the number meant the stronger they feel of the emotion. For example, a child points to three if (s)he is extremely happy for the sad/happy scale.

Rasch Analysis of Calm/Angry Measure

The measure for Calm/Angry

The children's emotional reactions in each conflict situation were coded according to the calm/angry dimension. The data were then analyzed in the same manner as described in Chapter Six, Seven and Eight using the RUMM 2030 computer program. All the usual Rasch measurement tests were used to create a scale on the calm/angry dimension but they are not reported in detail to avoid repetition. The scale is unidimensional, there is good item and person fits to the Rasch measurement model, the response categories are used consistently and logically and the targeting is acceptable, but can be improved. The two adverse aspects are the low Separation Index (0.33) that occurred because of the low number of persons (N=58) and the low number of items (I=5) and the non-ideal targeting of items against person measures (insufficient easy, medium and hard items).

Item-Trait Interaction (Dimensionality)

The item-trait interaction probability is 0.30 (χ^2=6.83, df = 10) (see Table 10.1). There is no significant interaction between the responses to the items and the location

values (the measures) of the children along the calm/angry scale. This indicated that there is a reasonable agreement between all 58 children to the item difficulties along the scale, and that a unidimensional linear measure has been created. In this context, unidimensional means that there is one parameter for each person (the measure) applicable to all five items and one parameter for each item (the item difficulty) applicable to all 58 persons that can be used to predict each person's response to each item accurately.

The residuals principal components analysis gives the eigenvalue of the first component as 1.60. This is close to the chance level (see http://www.rasch.org/rmt/rmt191h.htm) supporting the view that a unidimensional scale was created.

Person Separation Index

The Person Separation Index is 0.33 indicating low separation of measures in relation to the errors (which are about 1 logit per 1 logit separation of measures). More children and more items (conflict situations) should be included to improve this scale in any future use.

Table 10.1: Item-trait interaction for Calm/Angry Emotion

Total Item Chi-Square	6.83
Separation Index	0.33
Total Degree of Freedom	10.00
Total Chi-Square Probability	0.30

Notes

1. The Index of Child Separation (Andrich & Van-Schoubroeck, 1989) is the proportion of observed variance that is considered true (30%) and is low. This means that the measures are NOT well separated in comparison to the errors.
2. The item-trait interaction test is a chi-square. The results indicate that there is good collective agreement between children of different measures along the scale to the five conflict situations ordered by difficulty. This indicated that the measure is unidimensional.
3. All numbers are given to two decimal points because the errors are only up to two decimal points.

Item Difficulty Order for Calm/ Angry

The easiest item is conflict situation 4 which has a difficulty of -1.08 logits (p=0.69). The second easiest is conflict situation 5 which has a difficulty of -0.36 logits (p=0.15). The third is conflict situation 3 which has a difficulty of -0.24 logits (p=0.61). The fourth is conflict situation 1 which has a difficulty of 0.43 logits (p=0.64). The hardest is conflict situation 2 which has a difficulty of 1.26 logits (p=0.81). All items have p>0.15 for fit to the measurement model.

Table 10.2 Conflict Situation by Difficulty Order for the Calm/ Angry Dimension

item	Conflict Situation	Item Difficulty
4	Peer criticizing and putting marks on a child's picture.	-1.08 logits (easiest)
5	Peer pushing ahead and taking a toy for which the child was waiting.	-0.36 logits
3	Child being called 'baby' for playing with baby toys.	-0.24 logits
1	Child accidently pushed by a peer.	+0.43 logits
2	Child excluded from game that has enough participants.	+1.26 logits (hardest)

Differences by Gender

Mean Measures by Gender

The mean measures by gender are given in Table 10.3. The mean measures are -0.36 logits (N=36, SD=1.21) for males and -0.82 logits (N=22, S.D.=1.30) for females. A one-way ANOVA shows that the measures for males and females are not statistically significantly different (F=1.84, df=1,56, p=0.18).

Table 10.3: Mean Measures (in logits) by Gender for Calm/Angry Dimension (N=58)

	Mean	Standard Deviation	Number
Males	-0.36	1.21	36
Females	-0.82	1.30	22

Figure 10.1 shows the targeting graph by gender. Measures for males and females are spread out in the same general manner over the range of item difficulties, but there are insufficient easy, medium and hard items. The performance of males and females are similar across the five conflict situations.

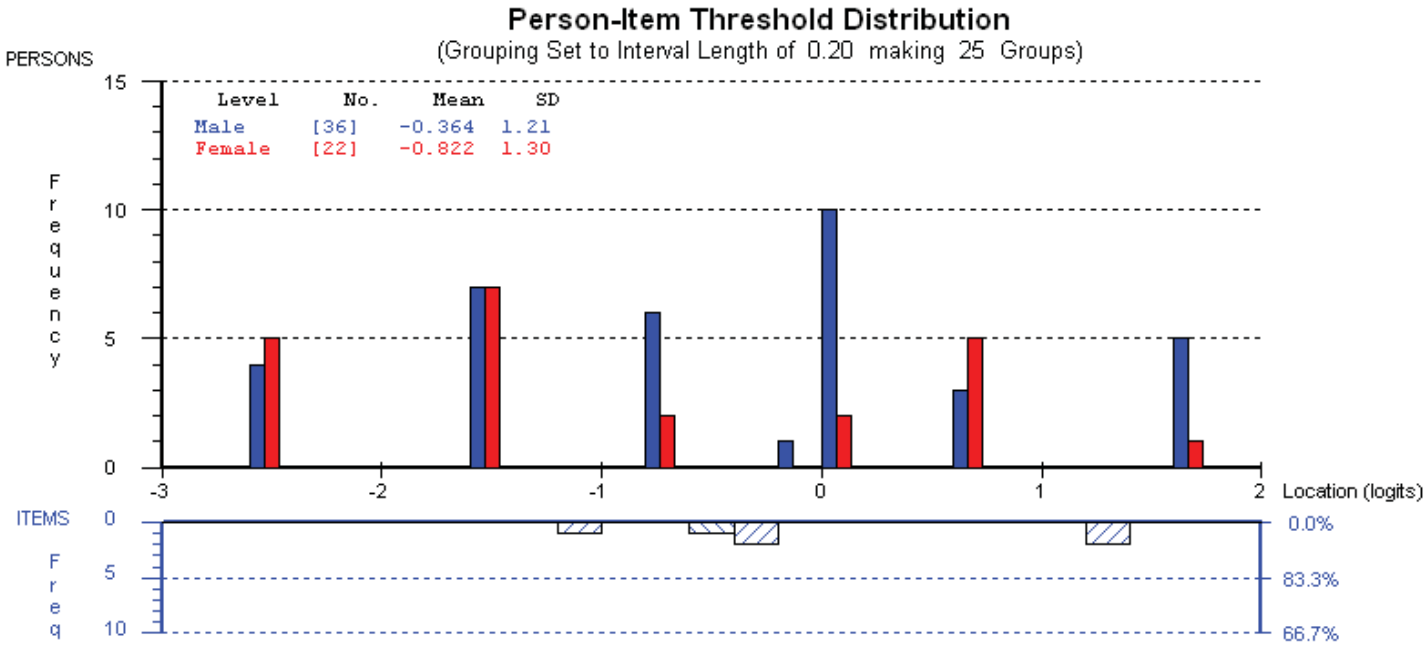

Figure 10.1 Distribution of Measures and Item Thresholds by Gender for the Calm/Angry Scale

Note

The measures are ordered from low (left) to high (right) on the upper side of the scale and the item thresholds are ordered from easy to hard on the lower side of the scale.

Mean Measures by Type

The mean measures by Type A and Type B are given in Table 10.4. A one-way ANOVA showed that Type A and Type B children were not statistically significantly different on the calm/angry dimension (F=0.37, df=1,56, p=0.53). This result, however, has to be interpreted cautiously because of the low Separation Index (PSI=0.30),

although the scale is unidimensional and there is a good fit of items to the measurement model. While the general view in 'Rasch Meaurement Circles' is that one needs at least 10 persons per item (and there are 58 persons for five items satisfying this condition), more items and persons are needed to improve targeting and measurement precision.

Table 10.4: Mean Measures (in logits) by Type for Calm/Angry Dimension (N=58)

	Mean	Standard Deviation	Number
Males	-0.43	1.33	27
Females	-0.63	1.20	31

Figure 10.2 shows the targeting graph by type. Measures for Type A and Type B are spread out in the same manner over the range of item difficulties, but there are insufficient easy, medium and hard items. The performance of both types of children is similar across the five conflict situations.

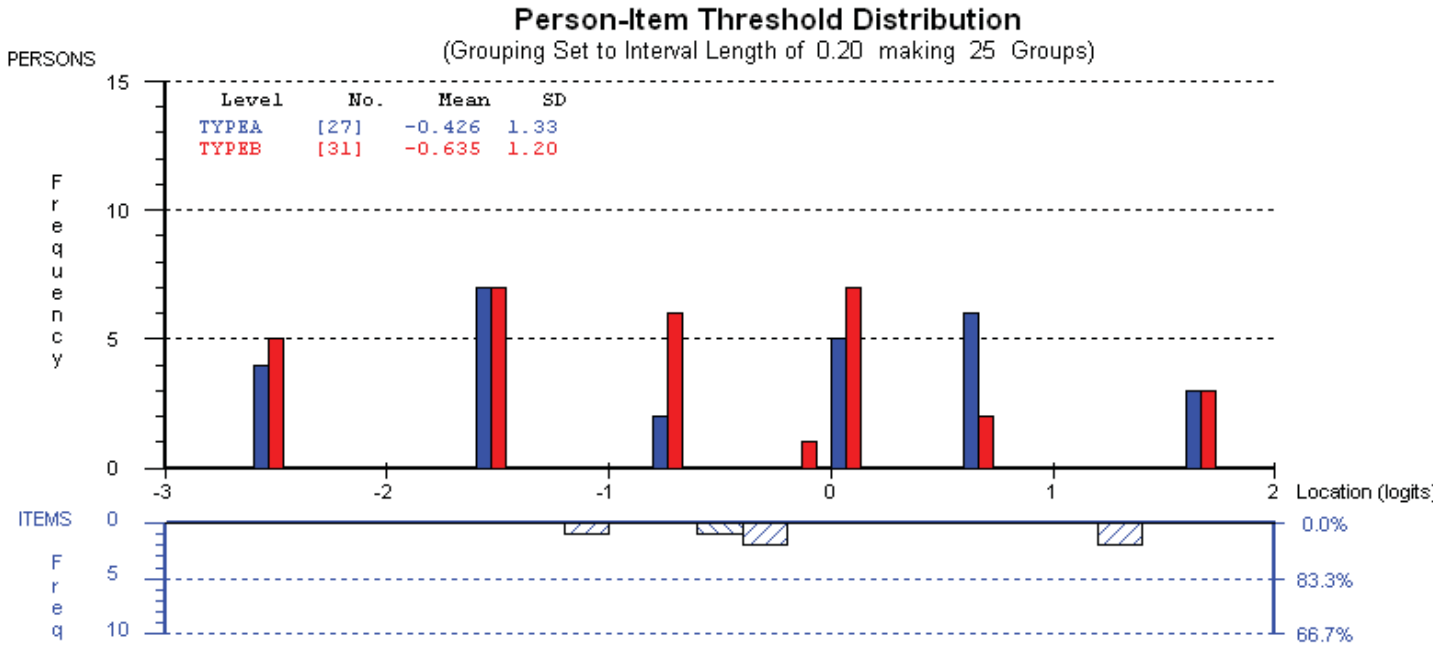

Figure 10.2 Distributions of Measures and Item Thresholds by Type for the Clam/Angry Scale

Note

The measures are ordered from low (left) to high (right) on the upper side of the scale and the item thresholds are ordered from easy to hard on the lower side of the scale.

The next section shows the Rasch analysis results used to create a linear, unidimensional scale for the sad/happy scale.

Rasch Analysis of Sad/Happy Measure

The Measure for Sad/happy

The children's emotional reactions in each conflict situation were coded according to the sad/happy dimension. The data were then analysed in the same manner as described in chapters six, seven and eight using the RUMM 2030 computer program. All the usual Rasch measurement tests were used to create a scale on the sad/happy dimension but they are not reported here in detail to avoid repetition. The scale is

unidimensional, there is good item and person fits to the Rasch measurement model, the response categories are used consistently and logically and the targeting is acceptable. Similar to the calm/angry scale, the two adverse aspects are the low Separation Index that occurred because of the low number of persons (N=58) and the low number of items (I=5) and the less than ideal targeting of items (insufficient easy, medium and hard items). More persons and easy items need to be added in any future use of the scale.

Item-Trait Interaction (Dimensionality)

The item-trait interaction probability is 0.99 (χ^2=2.47, df = 10) (see Table 10.5). There is no significant interaction between the responses to the items and the location values (the measures) of the children along the sad/happy scale. This indicated that there is a good agreement between all 58 children to the item difficulties along the scale, and that a unidimensional linear measure has been created. In this context, unidimensional means that there is one parameter for each person (the measure) applicable to all five items and one parameter for each item (the item difficulty) applicable to all 58 persons that can be used to predict each person's response to each item accurately.

A residual principal componenets analysis gave the eigenvalue of the first component as 1.47. This is close to the chance level (see http://www.rasch.org/rmt/rmt191h.htm) supporting the creation of a unidimensional scale.

Person Separation Index

The Person Separation Index is 0.33 indicating low separation of measures in relation to the errors (which are about 1 logit per 1 logit separation of measures). More

children and more items (conflict situations) should be included to improve this scale in any future use of this scale.

Table 10.5: Item-trait interaction for Sad/happy Emotion

Total Item Chi-Square	2.47
Separation Index	0.33
Total Degree of Freedom	10.00
Total Chi-Square Probability	0.99

Notes

1. The Index of Child Separation (Andrich & Van-Schoubroeck, 1989) is the proportion of observed variance that is considered true (33%) and is low. This means that the measures are NOT well separated in comparison to the errors
2. The item-trait interaction test is a chi-square. The results indicate that there is good collective agreement between children of different measures along the scale to the five conflict situations ordered by difficulty. This indicated that the measure is unidimensional.
3. All numbers are given to two decimal points because the errors are only up to two decimal points.

Item Difficulty Order for Sad/ Happy Dimension

The easiest item is conflict situation 4 which has a difficulty of -0.30 logits (p=0.64). The second easiest is conflict situation 2 which has a difficulty of -0.23 logits (p=0.83). The third is conflict situation 1 which has a difficulty of -0.04 logits (p=0.70). The fourth is conflict situation 5 which has a difficulty of 0.12 logits (p=0.84). The hardest is conflict situation 3 which has a difficulty of 0.44 logits (p=0.94). All items have p>0.63 for fit to the measurement model.

Table 10.6 Conflict Situation by Difficulty Order for the Sad/ Happy Dimension

	Conflict Situation	Item Difficulty
4	Peer criticizing and putting marks on a child's picture.	-0.30 logits (easiest)
2	Child excluded from game that has enough participants.	-0.23 logits
1	Child accidently pushed by a peer.	-0.04 logits
5	Peer pushing ahead and taking a toy for which the child was waiting.	+0.12 logits
3	Child being called 'baby' for playing with baby toys.	+0.44 logits (hardest)

Differences by Gender

Mean Measures by Gender

The mean measures by gender are given in Table 10.7. The mean measures are -1.14 logits (N=36, SD=1.01) for males and -0.88 logits (N=22, S.D.=1.29) for females. A one-way ANOVA shows that the measures for males and females are not statistically significantly different (F=0.76, df=1,56, p=0.39).

Table 10.7: Mean Measures (in logits) by Gender for Sad/happy Dimension (N=58)

	Mean	Standard Deviation	Number
Males	-1.14	1.01	36
Females	-0.88	1.29	22

Figure 10.3 shows the targeting graph by gender. Measures for males and females are generally spread out in the same manner over the range of item difficulties, but there are insufficient easy items. The performance of males and females are generally similar across the five conflict situations.

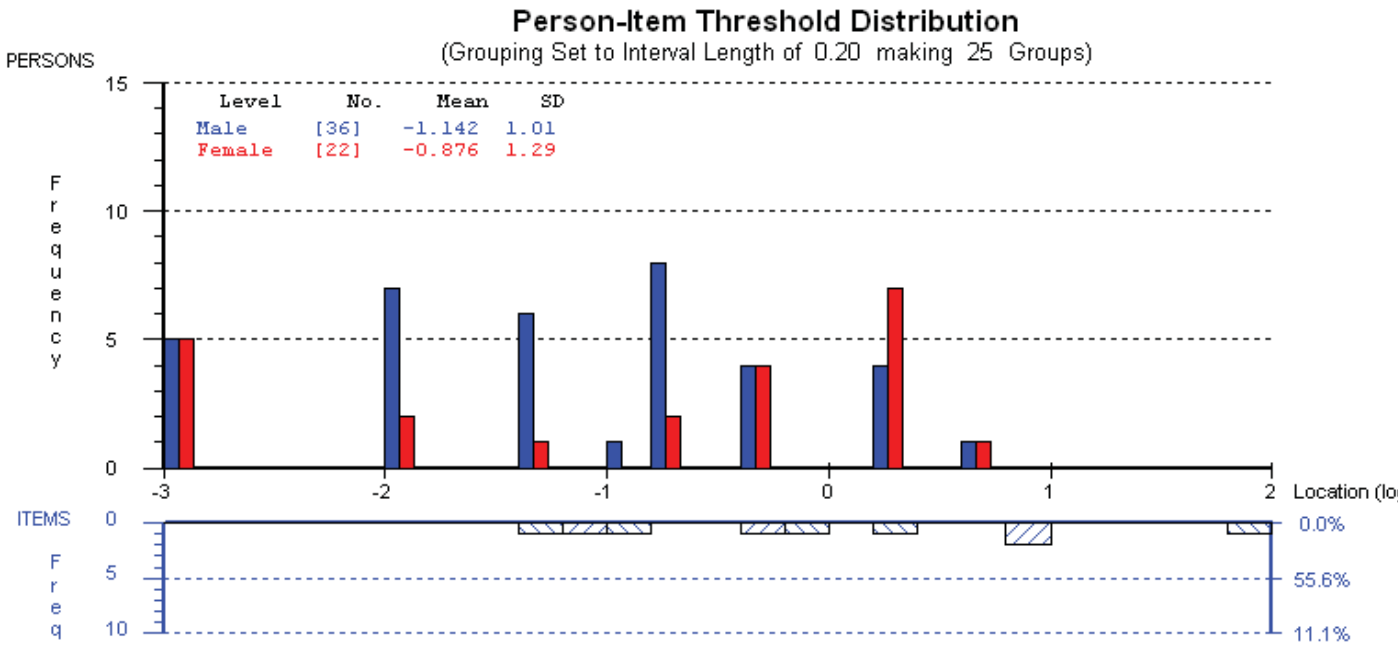

Figure 10.3 Distributions of Measures and Item Thresholds by Gender for the Sad/Happy Scale

Note

The measures are ordered from low to high (left to right) on the upper side of the scale and the item thresholds are ordered from easy to hard on the lower side of the scale.

Mean Measures by Type

The mean measures by Type A and Type B are given in Table 10.8. A one-way ANOVA showed that Type A and Type B children were not statistically significantly different on the sad/happy dimension (F=0.37, df=1,56, p=0.53). This result, however,

has to be interpreted cautiously because of the low Separation Index (PSI=0.30), even though the scale is unidimensional.

Table 10.8: Mean Measures (in logits) by Type for Sad/Happy Dimension (N=58)

	Mean	Standard Deviation	Number
Type A	-1.10	1.24	27
Type B	-0.99	1.03	31

Figure 10.4 shows the targeting graph by Type. Measures for Type A and Type B are spread out in the same manner over the range of item difficulties, but there are insufficient easy items. The performance of both types of children is similar across the five conflict situations.

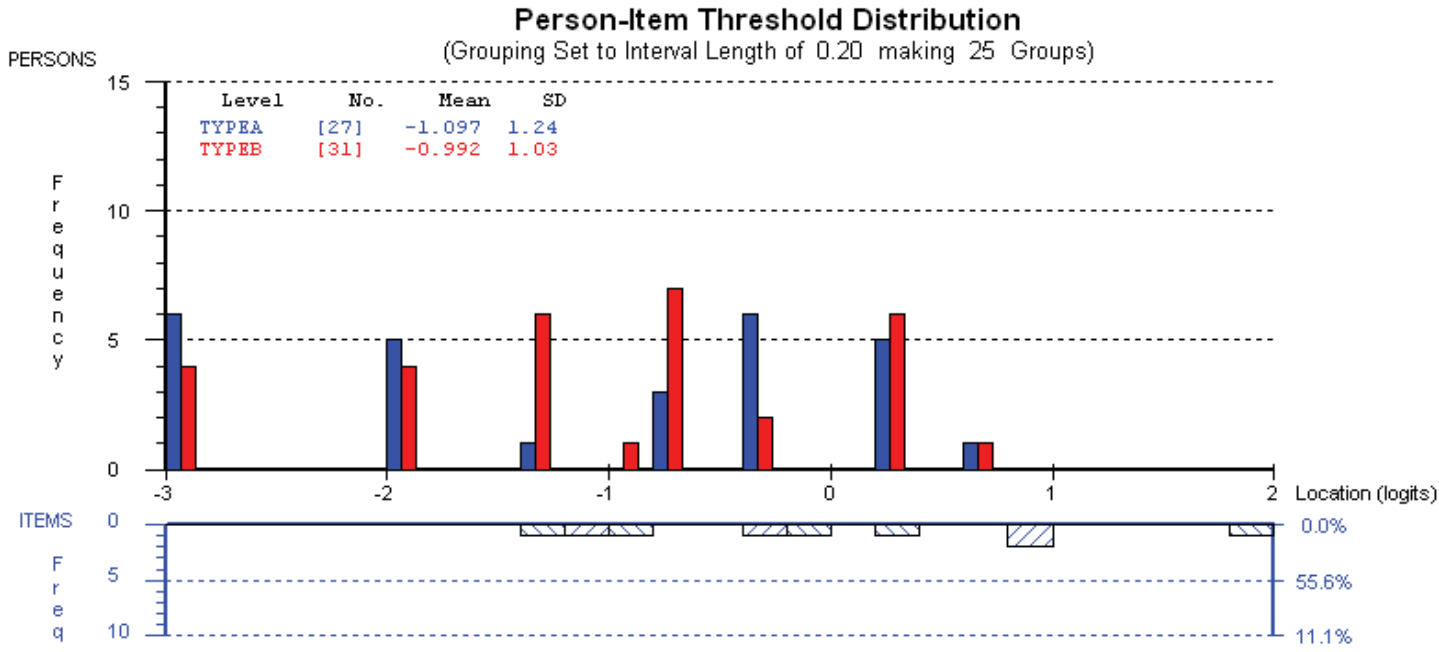

Figure 10.4 Distributions of Measures and Item Thresholds by Type for the Sad/Happy Scale

Note

The measures are ordered from low to high (left to right) on the upper side of the scale and the item thresholds are ordered from easy to hard on the lower side of the scale.

Concluding Statements

The following conclusions can be cautiously drawn from the data analysis in Chapter Ten, bearing in mind that the Person Separation Index is low.

(1) Type A and Type B children are not statistically significantly different on the Calm/Angry dimension (involving the five conflict situations).

(2) Type A and Type B children are not statistically significantly different on the Sad/Happy dimension (involving the five conflict situations).

(3) The conflict situations have different difficulties in regard to the Calm/Angry and Sad/Happy dimensions.

Conflict situation 4 (peer criticizing and putting marks on a child's picture) is easiest on both dimensions for both Type A and Type B children. That is, both Type A and Type B children need only have to have a low Calm/Angry emotional measure (low anger measure) and a low Sad/happy emotional measure (low happy measure) to feel angry and sad in conflict situation 4.

Conflict situation 2 (child excluded from game that has enough participants) is very hard on the Calm/Angry scale and both Type A and Type B children need to have a very high Calm/Angry emotional measure (very high anger measure) to answer this conflict positively in conflict situation 2. In contrast, on the Sad/Happy scale, conflict situation 2 is moderately easy and both Type A and Type B children need only have a low Sad/Happy emotional measure (low happy emotional measure) to answer conflict situation 2 positively.

Conflict situation 3 (being called a 'baby' for playing with baby toys) is very hard on the Sad/Happy scale and both Type A and Type B children need to have a very high Sad/Happy emotional measure (very high happy measure) to feel happy in conflict situation 3. In contrast, on the Calm/Angry scale, conflict 3 is moderately easy and both

Type A and Type B children need only have a relatively low Calm/Angry emotional measure (moderately low anger emotional measure) to feel angry in conflict situation 3. (4) The Calm/Angry and Sad/Happy measures for the Type A and Type B children could be improved by increasing the number of children and the number of conflict situations (items), particularly, but not only, at the easy end of the scale.

The next chapter shows the analysis results of Type A and Type B children's strategies used in the five conflict situations.

CHAPTER ELEVEN

DATA ANALYSIS (PART 6)

CHILDREN'S REPORTS OF

THEIR STRATEGIES USED IN CONFLICT SITUATIONS

This chapter presents the results of the analysis of data from Type A and Type B children's report of social-problem strategies used in five social conflict situations in an interview. The interview consisted of five situations about everyday conflicts. The situations and strategies were exactly the same as those in the teachers' report of strategies used by children. The types of strategies are similar to the ones in the study of Eisenberg et al. (1997). They are " (1) does nothing, (2) distraction (keeps him- or herself busy as not to think about the problem), (3) venting (cries to release pent-up feelings or to elicit comfort from others), (4) emotional aggression (uses physical or verbal aggression to release pent-up feelings), (5) emotional intervention (cries to elicit assistance from others to help solve the problem), (6) emotional support or support seeking (talks about his or her problems with friends or a teacher in hope of getting support), (7) instrumental aggression (resolves problems through physical or verbal aggression), (8) cognitive restructuring (tries to think about the situation in a positive way), (9) instrumental coping (takes some constructive action to improve a problem situation), and (10) avoidance (leaves or avoids a problem situation)" (Eisenberg et al. , 1997, p.649).

The first situation is about the child who is being accidentally pushed by a peer. The second situation is about the child who is being excluded from a game that has enough participants. The third situation is about the child being called 'a baby' because he/she is playing with baby toys. The fourth situation is about a peer criticizing and putting marks on a child's picture. The fifth situation is about a peer

pushing ahead and taking a toy that a child has been waiting for a long time. Differences in strategies used by Type A and Type B children are compared in this chapter. The number of strategies generated by Type A and Type B children for each social situation are presented first, then followed by results related to the types of strategy generated. The best strategy selected by Type A and Type B children is presented last.

Differences in Strategies Used by Type A and Type B Children

This section reports the number of different strategies generated by Type A and Type B children for social situations one to five. The differences between the Type A and Type B children's strategies use in the five social situations are discussed in terms of the number of the generated strategies for the situation and the quality of the generated strategies.

Total number of Strategies Generated by Type A and Type B Children

An independent t- test was conducted to test the difference in total number of strategies generated by Type A and Type B children. There was no statistically significant difference in the total number of strategies generated for Type A children ($M = 10.77$, $SD = 3.06$) and Type B children ($M = 9.29$, S.D.=2.63); $t(44) = 1.76$, $p > 0.05$. These results suggest that the two groups of children are similar in terms of total number of strategies generated across the five social situations.

Number of Different Strategies Generated in the Five Conflict Situations

The means of the number of different strategies generated by Type A and Type B children for the five conflict situations are presented in Table 11.1. The means of number of strategies generated by Type A children ranged from 1.83 to 2.33 and that of Type B children ranged from 1.48 to 2.14. Type A children generated more strategies than Type B children in all conflict situations except conflict situations 3 and 5.

Table 11.1. Means of Type A and Type B children's number of strategies generated for the five conflict situation.

	Type A			Type B		
	M	SD	N	M	SD	N
Situation 1	2.13	0.85	24	1.48	0.80	27
Situation 2	2.29	0.86	24	1.96	0.79	28
Situation 3	1.83	0.96	24	2.00	1.05	28
Situation 4	2.33	1.00	24	2.00	0.98	28
Situation 5	2.04	0.96	24	2.14	0.89	27

Note: M refers to the mean strategies generated by children in different conflict situations. SD refers to the standard deviation and N is the number of children.

In order to test if there were significant differences between the two groups, a t-test was conducted to compare the means of strategies generated by Type A and

Type B children for each conflict situation. The results are given in Table 11.2.

Table 11.2. Comparison of the means of Type A and Type B children's number of strategies generated for the five conflict situations.

Situation	N	M	SD	t	df	Sig.
Situation 1						
Type A	24	2.13	0.85	2.78	49	0.00**
Type B	27	1.48	0.80			
Situation 2						
Type A	24	2.29	0.86	1.43	50	0.16
Type B	28	1.96	0.79			
Situation 3						
Type A	24	1.83	0.96	-0.59	50	0.56
Type B	28	2.00	1.05			
Situation 4						
Type A	24	2.33	1.00	1.21	50	0.23
Type B	28	2.00	0.98			
Situation 5						
Type A	24	2.04	0.96	-0.03	48	0.98
Type B	28	2.14	0.89			

Note: M refers to the mean of strategies generated by children in different conflict situation. SD refers to the standard deviation and N is the number of children. t is the t-test value and df refers to the degree of freedom. Sig. refers to the significance value which is set to <0.01.

There is a statistically significant difference between Type A and Type B children's number of strategies generated to solve conflict situation one to five. For conflict situation one, the child who is being accidentally pushed by a peer, there was

a statistically significant difference in the number of strategies generated for Type A children (M = 2.13, SD = 0.85) and Type B children (M = 1.48, S.D.=0.8); t(49) = 2.78, $p < 0.01$. These results suggest that Type A children generated more strategies than Type B children in conflict situation one.

The second conflict situation is about the child who is being excluded from a game that has enough participants. There was no statistically significant difference in the number of strategies generated for Type A children (M = 2.29, SD = 0.86) and Type B children (M = 1.96, S.D.=0.79); t(50) = 1.43, $p > 0.01$. These results suggest that Type A children and Type B children generated similar number of strategies for conflict situation two.

Conflict situation three is about the child being called 'a baby' because he/she is playing with baby toys. No statistically significant difference was found in the number of of strategies generated for Type A children (M = 1.83, SD = 0.96) and Type B children (M = 2.00, S.D.=1.05); t(50) = -0.59, $p > 0.01$. These results suggest that there is no difference in terms of the number of strategies generated between Type A and Type B children in conflict situation three.

The fourth conflict situation is about a peer criticizing and putting marks on a child's picture. There was no statistically significant difference in the number of strategies generated for Type A children (M = 2.33, SD = 1.00) and Type B children (M = 2.00, S.D.= 0.98); t(50) = 1.21, $p >0.01$. These results suggest that both groups of children generated similar number of strategies in conflict situation four.

The fifth conflict situation is about a peer pushing ahead and taking a toy that a child has been waiting for a long time. No statistically significant difference in

the number of strategies generated was found between Type A children (M = 2.04, SD = 0.96) and Type B children (M = 2.14, S.D.= 0.89); t(48) = 0.03, p >0.01. These results suggest that both groups of children generated similar number of strategies in conflict situation five.

In sum, Type A children generated more strategies than Type B children for conflict situations one and both groups of children were very similar in generating strategies in other social conflict situations.

Qualitative Differences in Strategies Proposed by Type A and Type B Children in different conflict situations

The previous section reports the number of strategies generated by Type A and Type B children for social situations one to five. This section will examine the qualitative differences between the Type A and Type B children's strategies generated in the five social situations. The differences in terms of types of strategies generated by Type A and Type B children will be compared.

Types of Strategies Generated in the Five Conflict Situations

The strategies that children generated for conflict situation one are classified from one to ten. They are " (1) does nothing, (2) distraction (keeps him- or herself busy as not to think about the problem), (3) venting (cries to release pent-up feelings or to elicit comfort from others), (4) emotional aggression (uses physical or verbal aggression to release pent-up feelings), (5) emotional intervention (cries to elicit assistance from others to help solve the problem), (6) emotional support or support seeking (talks about his or her problems with friends or a teacher in hope of getting

support), (7) instrumental aggression (resolves problems through physical or verbal aggression), (8) cognitive restructuring (tries to think about the situation in a positive way), (9) instrumental coping (takes some constructive action to improve a problem situation), and (10) avoidance (leaves or avoids a problem situation)" (Eisenberg et al. , 1997, p.649). ANOVA is selected to compare the results of the types of strategy and the significant level is set to $p<0.01$. The following Table 11.3 represents the results of comparing Type A and Type B children's types of strategies generated for conflict situation one.

Table 11.3 Comparison of Type A and Type B children's strategy generated for conflict situation one (ANOVA Results)

Source	SS	df	MS	F	Sig.
Strategy 1	0.00	1	0.00	0.03	0.86
	14.28	56	0.26		
Strategy 2	0.50	1	0.50	4.58	0.04
	6.07	56	0.11		
Strategy 3	0.05	1	0.05	0.79	0.38
	3.68	56	0.07		
Strategy 4	0.08	1	0.08	2.39	0.13
	3.67	56	0.03		
Strategy 5	0.06	1	0.06	1.80	0.19
	1.87	56	0.03		
Strategy 6	0.02	1	0.02	0.12	0.74
	11.49	56	0.21		
Strategy 7	1.00	1	1.00	3.86	0.05
	14.60	56	0.26		
Strategy 8	0.04	1	0.04	0.30	0.59
	6.86	56	0.12		
Strategy 9	0.61	1	0.61	1.56	0.22
	21.87	56	0.39		
Strategy 10	0.71	1	0.71	6.00	0.02
	6.67	56	0.12		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and sig. to its significance value which is set to <0.01.

For conflict situation one, where the child is being accidentally pushed by a peer, there is no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. There is no statistically significant difference between Type A and Type B children's mean for each strategy generated to solve conflict situation one. These results suggest that Type A children and Type B children are similar in their use of strategy in solving conflict situation one.

The second conflict situation is about the child who is being excluded from a game that has enough participants. Table 11.4 represents the results of comparing Type A and Type B children's types of strategies generated for conflict situation two. There is no statistically significant difference between Type A and Type B children's mean of each strategy generated to solve conflict situation two. Results indicated that there is no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. These results suggest that Type A children and Type B children are not different in the use of strategy in solving conflict situation two.

Conflict situation three is about the child being called 'a baby' because he/she is playing with baby toys. Table 11.5 represents the results of comparing Type A and Type B children's types of strategies generated for conflict situation three. There is no statistically significant difference between Type A and Type B children's mean for each strategy generated to solve conflict situation three. There was no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. These results suggest that Type A children and Type B children are similar in the use of strategy one solving conflict situation three.

Table 11.4 Comparison of Type A and Type B children's strategy generated for conflict situation two (ANOVA Results)

Source	SS	df	MS	F	Sig.
Strategy 1	0.05	1	0.05	0.34	0.56
	7.56	56	0.14		
Strategy 2	0.50	1	0.50	4.56	0.04
	6.07	56	0.11		
Strategy 3	0.00	1	0.00	0.01	0.92
	1.93	56	0.03		
Strategy 4	0.06	1	.060	1.80	0.19
	1.87	56	.033		
Strategy 5	0.02	1	.020	1.15	0.29
	0.96	56	.017		
Strategy 6	0.23	1	0.23	1.36	0.25
	9.38	56	0.17		
Strategy 7	0.05	1	0.05	0.79	0.38
	3.67	56	0.07		
Strategy 8	0.38	1	0.38	1.19	0.28
	17.90	56	0.32		
Strategy 9	0.15	1	0.15	0.17	0.68
	48.83	56	0.87		
Strategy 10	0.10	1	.098	0.73	0.40
	7.51	56	.134		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and sig. to its significance value which is set to <0.01.

Table 11.5 Comparison of Type A and Type B children's strategy generated for conflict situation three (ANOVA Results)

Source	SS	DF	MS	F	Sig.
Strategy 1	0.25	1	0.25	1.58	0.21
	8.67	56	0.16		
Strategy 2	0.02	1	0.02	1.15	0.29
	0.96	56	0.02		
Strategy 3	0.05	1	0.05	0.79	0.38
	3.67	56	0.07		
Strategy 4	0.11	1	0.11	0.76	0.39
	8.05	56	0.14		
Strategy 5*	0.00	1	0.00		
	0.00	56	0.00		
Strategy 6	0.08	1	0.08	0.20	0.66
	22.01	56	0.39		
Strategy 7	0.78	1	0.78	2.80	0.10
	15.50	56	0.28		
Strategy 8	0.10	1	0.10	0.58	0.45
	9.50	56	0.17		
Strategy 9	0.29	1	0.29	0.66	0.42
	24.20	56	0.43		
Strategy 10	0.02	1	.02	0.08	0.78
	12.60	56	.23		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and sig. to its significance value which is set to <0.01. *No one selected strategy five.

There is no statistically significant difference between Type A and Type B children's mean for each strategy generated to solve conflict situation three. There was no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. These results suggest that Type A children and Type B children are similar in the use of strategy one solving conflict situation three.

The fourth situation is with regard to a peer criticizing and putting marks on a child's picture. Table 11.6 represents the results of comparing Type A and Type B children's types of strategies generated for conflict situation four. There is no statistically significant difference between Type A and Type B children's mean of each strategy generated to solve conflict situation four. There was no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. These results indicated that Type A children and Type B children are not different in the use of strategies to solve conflict situation four.

Table 11.6 Comparison of Type A and Type B children's strategy generated for conflict situation four (ANOVA Results)Source

	SS	DF	MS	F	Sig.
Strategy 1	0.06	1	0.06	1.80	.19
	1.87	56	0.03		
Strategy 2	0.08	1	0.08	2.39	0.13
	1.85	56	0.03		
Strategy 3	0.06	1	0.06	1.80	0.19
	1.87	56	0.03		
Strategy 4	0.00	1	0.00	0.02	0.89
	3.72	56	0.07		
Strategy 5	0.08	1	0.08	2.39	0.13
	1.85	56	0.03		
Strategy 6	0.10	1	0.10	0.24	0.62
	21.97	56	0.39		
Strategy 7	0.28	1	0.28	0.94	0.34
	16.84	56	0.30		
Strategy 8	0.00	1	0.00	0.01	0.92
	1.93	56	0.03		
Strategy 9	0.22	1	0.22	0.42	0.52
	29.18	56	0.52		
Strategy 10	0.11	1	0.11	1.02	0.32
	6.05	56	0.11		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and sig. to its significance value which is set to <0.01.

The fifth situation is about a peer pushing ahead and taking a toy that a child has been waiting for a long time. Table 11.7 represents the results of comparing Type A and Type B children's types of strategies generated for conflict situation five. There is no statistically significant difference between Type A and Type B children's mean of each strategy to solve conflict situation five. There was no statistically significant difference in the use of strategies from one to ten for Type A children and Type B children at the $p<0.01$ level. These results suggest that Type A children and Type B children are similar in the use of strategy in solving conflict situation five.

In sum, there is no significant difference between Type A and Type B children's mean of each strategy to solve conflict situation one to five. These results indicate that Type A and Type B children generated similar strategies for each conflict situation. The following section compare the selection of best strategy between Type A and Type B children for conflict situations one to five.

Table 11.7 Comparison of Type A and Type B children's strategy generated for conflict situation five (ANOVA Results)

Source	SS	DF	MS	F	Sig.
Strategy 1	0.03	1	0.03	0.50	0.48
	2.82	56	0.05		
Strategy 2	.02	1	0.02	1.15	0.29
	.96	56	0.02		
Strategy 3	0.02	1	0.02	0.87	0.36
	0.97	56	0.02		
Strategy 4	.05	1	.051	.79	.38
	3.67	56	.066		
Strategy 5*	.00	1	0.00	.00	.00
	.00	56	0.00		
Strategy 6	.78	1	.783	1.72	.20
	25.44	56	.454		
Strategy 7	.19	1	0.19	1.05	.31
	10.09	56	0.18		
Strategy 8	.031	1	0.03	.39	.54
	4.54	56	0.08		
Strategy 9	.13	1	0.13	0.20	.66
	36.10	56	0.65		
Strategy 10	.01	1	0.01	.06	.81
	11.51	56	0.21		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and sig. to its significance value which is set to <0.01.* No one selected strategy 5.

The Best Strategy Selected by Type A and Type B children for Conflict situation One to Five

During the social cognitive interview, children were asked to select one strategy from all the strategies that they generated as the best strategy to solve each conflict situations. This section reports the best strategy selected by Type A and Type B children for conflict situation one to five.

The following Table 11.8 presents the frequency of each strategy selected as best strategy by Type A and Type B children for conflict situation one.

Table 11.8. Strategy selected as best strategy by Type A and Type B children for social situation one

Strategy	Type A	Type B
1	0	3
6	3	4
7	1	0
8	5	2
9	13	18
10	1	0
11	0	1

From Table 11.8, strategy nine, instrumental coping (takes some constructive action to improve a problem situation), is selected most frequently as the best strategy by both Type A and Type B children for conflict situation one. Thirteen Type A children

selected strategy nine as the best strategy and eighteen Type B children selected the same strategy.

The following Table 11.9 presents the frequency of each strategy selected as best strategy by Type A and Type B children for conflict situation two.

Table 11.9. Strategy selected as best strategy by Type A and Type B children for social situation two

Strategy	Type A	Type B
1	2	2
2	2	0
3	1	0
4	0	1
6	2	1
7	0	2
8	2	2
9	11	16
10	3	2
11	0	1

From Table 11.9, strategy nine, instrumental coping (takes some constructive action to improve a problem situation), is again selected most frequently as the best strategy by both Type A and Type B children for conflict situation two. Eleven Type A children selected strategy nine as best strategy and sixteen Type B children selected the same strategy.

The following Table 11.10 presents the frequency of each strategy selected as the best strategy by Type A and Type B children for conflict situation three.

Table 11.10. Strategy selected as best strategy by Type A and Type B children for social situation three

Strategy	Type A	Type B
1	2	3
2	1	0
3	0	1
4	1	1
6	2	2
7	3	1
8	2	4
9	8	11
10	3	2
11	0	0

From Table 11.10, strategy nine, instrumental coping (takes some constructive action to improve a problem situation), is again selected most frequently as the best strategy by both Type A and Type B children for conflict situation three. Eight Type A children selected strategy nine and eleven Type B children selected the same strategy as the best strategy.

The following Table 11.11 presents the frequency of each strategy selected as best strategy by Type A and Type B children for conflict situation four.

Table 11.11. Strategy selected as best strategy by Type A and Type B children for social situation four

Strategy	Type A	Type B
1	0	2
3	0	1
4	0	2
6	7	8
7	6	1
8	1	0
9	5	7
10	4	4

From Table 11.8, strategy six, emotional support or support seeking, where children talk about their problems with friends or a teacher in hope of getting support, is selected most frequently as the best strategy by both Type A and Type B children for conflict situation four. Seven Type A children selected strategy seven and eight Type B children selected the same strategy as the best strategy.

The following Table 11.12 presents the frequency of each strategy selected as best strategy by Type A and Type B children for conflict situation five.

From Table 11.8, strategy six, emotional support or support seeking (talks about his or her problems with friends or a teacher in hope of getting support), is selected most frequently as the best strategy by both Type A and Type B children for conflict situation

five. Eight Type A children selected strategy six as best strategy and eleven Type B children selected the same strategy. Seven Type A children selected strategy nine and eight Type B children selected the same strategy as the best strategy.

Table 11.12. Strategy selected as best strategy by Type A and Type B children for social situation five:

Strategy	Type A	Type B
2	1	0
4	0	1
6	8	11
7	4	2
8	1	1
9	7	8
10	0	3

In sum, Type A and Type B children selected certain strategy most often as their choice of best strategy for conflict situations. Strategy nine was chosen more often as the best strategy for conflict situation one, two and three whereas strategy six was selected more often as the best strategy for conflict situation four and five. Chapter ten discussed conflict situation one, two and three as being the relatively difficult items and four and five being the relatively easy items for the Calm/ Angry Dimension, difficulty level may affect children's use of strategy. From the results, children tend to select strategy nine, instrumental coping, i.e. take some constructive action to improve

a problem situation, when the conflict situations made it difficult to feel angry. However, children tend to use strategy six, emotional support or support seeking, i.e. talks about their problems with friends or a teacher in hope of getting support, when the conflict situations make them easy to feel angry. In other words, children choose to take action to improve a social problem by themselves when they feel calm but they tend to find someone to help when the social situation easily makes them feel angry.

Conclusions

The following conclusions are drawn from the data.

i. Type A children generated statistically significantly more strategies than Type B children in conflict situations one.
ii. Type A and Type B children generated similar number of strategies for conflict situations two, three, four and five.
iii. Type A children and Type B children are similar in their use of strategies in solving all five conflict situations.
iv. Both Type A and Type B children tend to take action to improve a social problem by themselves when they feel calm but they tend to find someone to help when the social situation easily makes them feel angry.

In other words, there is a quantitative difference in terms of the number of strategies generated for conflict situations one between Type A and Type B children. However, there is no qualitative difference found between the two groups in terms of the types of strategy generated for social situation one to five. There is no significant difference between Type A and Type B children‘s mean of each strategy to solve conflict situation one to five. These results indicate that Type A and Type B children

generate similar strategies for each conflict situation. Moreover, Strategy nine was chosen more often as the best strategy for conflict situation one, two and three whereas strategy six was selected as the best strategy for conflict situation four and five.

CHAPTER TWELVE

DATA ANALYSIS (PART 7)

QUALITY OF STRATEGIES, GENERATION AND SELECTION BY CHILDREN IN CONFLICT SITUATIONS

From the analysis in Chapter Eleven, there is no significant difference between Type A and Type B children's mean choice of any strategy to solve conflict situations one to five. These results indicate that Type A and Type B children generate similar kinds of strategies for all the conflict situations. In order to examine the data in more detail, strategies were investigated according to their characteristics. Some strategies such as emotional aggression (number four) and instrumental aggression (number seven) are similar in nature, they both are aggressive strategies, and so some strategies are combined in this chapter for further analysis. If one examines the functional aspect of each strategy to improve a problem situation, then two groups of strategies, constructive and non-constructive strategies, could be differentiated for further investigation of the quality of strategy generation and strategy selection by children to solve the conflicts. The results of analyzing the constructive and non-constructive strategies give an alternative perspective of the data in answering the proposed hypotheses for this study.

This chapter presents the comparison of results of further analysis of the data from Type A and Type B children's quality of generation and selection of social-problem strategies in five social conflict situations. The strategies are grouped into constructive and non-constructive strategies for further analysis. The original types of strategies are similar to the ones in the study of Eisenberg et al. (1997). They are: "(1) does nothing; (2) distraction (keeps himself or herself busy so as not to think about the problem); (3) venting feelings (cries to release pent-up feelings or to elicit comfort from others); (4)

emotional aggression (uses physical or verbal aggression to release pent-up feelings); (5) emotional intervention (cries to elicit assistance from others to help solve the problem); (6) emotional support or support seeking (talks about his or her problems with friends or a teacher in hope of getting support); (7) instrumental aggression (resolves problems through physical or verbal aggression); (8) cognitive restructuring (tries to think about the situation in a positive way); (9) instrumental coping (takes some constructive action to improve a problem situation); and (10) avoidance (leaves or avoids a problem situation)" (Eisenberg et al. , 1997, p.649). Strategies five, six, eight and nine are classified as constructive strategies, as each one of them attempts to improve the possibility of solving a social conflict in a constructive manner. Strategies one, two, three, four, seven and ten are grouped as non-constructive strategies, as none of them will improve a conflict situation. The analysis of the quality of strategy generation by Type A and Type B children is reported first and is then followed by the analysis of their strategy selection for each of the five social situations.

Differences in Quantity and Quality of Strategy Generation by Type A and Type B Children

This section reports the quantity and quality of strategy generation by Type A and Type B children for social situations one to five. The mean of all constructive and non-constructive strategies of Type A and Type B children across the five social situation are reported. The differences between the Type A and Type B children's strategies generation in the five social situations are discussed in terms of the constructiveness in improving or solving the social conflicts.

Table 12.1. The means of total constructive and non-constructive strategies of Type A and Type B children

	Type A			Type B		
Strategy	M	SD	N	M	SD	N
Constructive	6.95(	3.12	22	6.29	2.11	24
Non-constructive	3.82	1.92	22	3.00	1.93	24

Note: M refers to the mean constructive strategies generated by children in different conflict situations. SD is the standard deviation; N is the number of children.

Both types of children generated more constructive strategies than non-constructive strategies. A related t-test was conducted to test the difference of constructive and non-constructive strategies for Type A and Type B children. Type A children generated more constructive strategies than non-constructive strategies, $t(21) = 3.52$, $p<0.01$. It is the same for Type B children, $t(23) = 5.23$, $p<0.01$. Both groups generated more constructive strategies than non-constructive strategies across social situations.

Number of Constructive and Non-constructive Strategy Generated in the Five Conflict Situations

The number of constructive and non-constructive strategies generated by Type A and Type B children for the five conflict situations are presented in Tables 12.1 and 12.2.

Table 12.2. Means of Type A and Type B children's number of constructive strategies generated for the five conflict situations

	Type A			Type B		
	M	SD	N	M	SD	N
Situation 1	1.63	1.00	27	1.03	0.71	31
Situation 2	1.67	1.41	27	1.13	0.85	31
Situation 3	0.70	0.73	27	0.97	0.98	31
Situation 4	1.26	1.10	27	1.07	0.73	31
Situation 5	1.07	1.04	27	1.29	1.22	31

Note: M refers to the mean constructive strategies generated by children in different conflict situations. SD is the standard deviation; N is the number of children.

Table 12.3. Means of Type A and Type B children's number of non-constructive strategies generated for the five conflict situations

	Type A			Type B		
	M	SD	N	M	SD	N
Situation 1	0.30	0.67	27	0.30	0.46	31
Situation 2	0.56	0.70	27	0.52	0.52	31
Situation 3	0.93	0.87	27	0.71	0.78	31
Situation 4	0.81	0.83	27	0.52	0.68	31
Situation 5	0.63	0.84	27	0.65	0.91	31

Note: M refers to the mean non-constructive strategies generated by children in different conflict situations. SD is the standard deviation; N is the number of children.

The mean of the number of the constructive strategies generated by Type A children ranged from 0.70 to 1.67 and those of Type B children ranged from 0.97 to 1.29. The mean of the number of non-constructive strategies generated by Type A children ranged from 0.30 to 0.93 and those of Type B children ranged from 0.30 to 0.71. Table 12.3 presents the related t-test results of Type A children's differences in constructive and non-constructive strategies. Table 12.4 presents the related t-test results of Type B children's differences in constructive and non-constructive strategies. For Type A children, t-values are significant at the $p<0.01$ level for situation 1 and 2. Type A children generated more constructive strategies than non-constructive strategies in conflict situations 1 and 2. For Type B children, t-values are significant at the $p<0.01$ level for situation 1, 2 and 4. Type B children generated more constructive strategies than non-constructive strategies in these three situations. In other words, Type B children generated more constructive strategies in three out of the five situations.

Table 12.4. Comparison of Type A children's difference of constructive and non-constructive strategies generated for the five conflict situations (related t-test results)

Source	M	SD	df	t	Sig.
Situation 1					
Constructive Strategies	1.63	1.00	26	-5.00	0.00**
Non-constructive Strategies	0.30	0.67			
Situation 2					
Constructive Strategies	1.67	1.41	26	-2.96	0.00**
Non-constructive Strategies	0.56	0.70			
Situation 3					
Constructive Strategies	0.70	0.72	26	0.90	0.38
Non-constructive Strategies	0.93	0.87			
Situation 4					
Constructive Strategies	1.26	1.10	26	-1.49	0.15
Non-constructive Strategies	0.82	0.83			
Situation 5					
Constructive Strategies	1.07	1.04	26	-1.56	0.13
Non-constructive Strategies	0.63	0.84			

Note: M refers to mean. SD refers to standard deviation. df refers to the degrees of freedom. t is the t-test and Sig. is its probability whose critical value was preset at p=0.01**.

Table 12.5 Comparison of Type B children's difference of constructive and non-constructive strategies generated for the five conflict situations (related t-test results)

Source	M	SD	df	t	Sig.
Situation 1					
Constructive Strategies	1.03	0.71	30	-4.28	0.00**
Non-constructive Strategies	0.30	0.46			
Situation 2					
Constructive Strategies	1.13	1.41	30	-3.14	0.00**
Non-constructive Strategies	0.51	0.51	30		
Situation 3					
Constructive Strategies	0.97	0.98	30	-1.11	0.28
Non-constructive Strategies	0.71	0.78	30		
Situation 4					
Constructive Strategies	1.06	0.73	30	-2.80	0.00**
Non-constructive Strategies	0.52	0.68	30		
Situation 5					
Constructive Strategies	1.29	1.22	30	-1.93	0.06
Non-constructive Strategies	0.65	0.91	30		

Note: M refers to mean. SD refers to standard deviation. df refers to the degrees of freedom. t is the t-test and Sig. is its probability whose critical value was preset at p=0.01**.

In order to test if there are significant differences between the means of constructive and non-constructive strategy of Type A and Type B children, the ANOVA test was conducted to compare the means of constructive and non-constructive strategy generated within and between Type A and Type B children for each conflict situation. The results are given in Table 12.5 and 12.6.

For conflict situation one, where the child is being accidentally pushed by a peer, there is a statistically significant difference in the use of the constructive strategies for Type A children and Type B children at the $p<0.01$ level. Type A children generated more constructive strategies than Type B children in conflict situation one. There is no statistically significant difference between Type A and Type B children's generation of constructive strategies in other conflict situations. In other words, Type A and Type B children are very similar in generating constructive strategies for most of the social conflicts except in social situation one.

Table 12.6. Comparison of Type A and Type B children's means of constructive strategies generated for the five conflict situations (ANOVA Results)

Source	SS	df	MS	F	Sig.
Situation 1	5.15	1	5.15	6.99	0.01*
	41.26	56	0.74		
Situation 2	4.17	1	4.17	3.18	0.08
	73.48	56	1.31		
Situation 3	1.00	1	1.00	1.32	0.26
	42.60	56	0.76		
Situation 4	0.55	1	0.55	0.65	0.42
	47.1	56	0.84		
Situation 5	0.68	1	0.68	0.52	0.47
	72.24	56	1.29		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and Sig. to its probability whose critical value was preset at p=0.01.

Table 12.7. Comparison of Type A and Type B children's non-constructive strategies generated for the five conflict situations (ANOVA Results)

Source	SS	df	MS	F	Sig.
Situation 1	0.00	56	0.00	0.00	0.97
	18.01		0.32		
Situation 2	0.02	1	4.17	0.06	0.81
	20.40	56	1.31		
Situation 3	0.68	1	0.68	0.99	0.32
	38.91	56	0.68		
Situation 4	1.29	1	1.29	2.27	0.14
	31.10	56	0.57		
Situation 5	0.00	1	0.00	0.00	0.95
	43.39	56	0.78		

Note: SS refers to the sums-of-squares. df refers to the degrees of freedom. MS refers to mean square. F is the F-test and Sig. to its probability whose critical value was preset at p=0.01.

There is no statistically significant difference between Type A and Type B children in generating non-constructive strategies in the five conflict situations. Both groups of children generated similar number of non-constructive strategies for social situation one to five.

In sum, there is no significant difference between Type A and Type B children's means of constructive and non-constructive strategies generated to solve conflict situations one to five. These results indicate that Type A and Type B children generated similar number of strategies for each conflict situation except for conflict situation one

where Type A children generated more constructive strategies than Type B children. The following section reports the comparison of selection of best strategies between Type A and Type B children for conflict situations one to five.

The Best Strategy Selected by Type A and Type B children for Conflict Situations One to Five

During the social cognitive interview, children were asked to select one strategy among all the proposed strategies as the best strategy to solve each conflict situation. This section reports analysis of difference in the best strategy classified under constructive or non-constructive strategies, as selected by Type A and Type B children for conflict situation one to five. Table 12.7 presents the frequency of constructive and non-constructive strategies, selected as best, by Type A and Type B children for conflict situations one to five.

Table 12.8. Frequency of constructive and non-constructive strategies selected as best strategy by Type A and Type B children for social situation one to five

	Strategy	Type A	Type B
Situation 1	Constructive	20	18
	Non-constructive	3	9
Situation 2	Constructive	15	20
	Non-constructive	8	7
Situation 3	Constructive	7	20
	Non-constructive	13	9
Situation 4	Constructive	9	16
	Non-constructive	13	8
Situation 5	Constructive	14	12
	Non-constructive	5	17

From Table 12.7, a constructive strategy is selected most frequently as the best strategy by both Type A and Type B children for conflict situation one. Although Type B children tend to select more non-constructive strategies than Type A children, the difference is not significant as indicated in a Chi-Square test, $\chi^2(2, N=50)=0.46$, $p>0.49$.

In situation two, constructive strategies are selected most frequently, as the best, by both Type A and Type B children. Type A children select slightly more non-constructive strategies than Type B children. A Chi-Square test was performed to examine the difference between Type A and Type B children and their types of strategies selected as the best strategy. The difference between these strategy choices was not statistically significant, $\chi^2(2, N=50)=2.8$, $p>0.09$. Type A and Type B are likely to select a similar strategy as the best strategy for conflict situation two.

In conflict situation three, Type A children select more non-constructive strategies and less constructive strategies as the best strategy when compared to Type B children. The difference between these strategy choices was statistically significant at the $p<0.05$ level, $\chi^2(2, N=49)=5.52$, $p<0.02$. Type A children's selection of strategy as best strategy was different from Type B children. Type A children tend to choose more non-constructive and less constructive strategies, as the best strategy to solve conflict situation three when compared to Type B children.

In conflict situation four, Type A children again select more non-constructive strategies and less constructive strategies as the best strategy when compared to Type B children. The difference between these strategy choices was statistically significant at the $p<0.05$ level, $\chi^2(2, N=48)=4.09$, $p<0.04$. Type A children's selection of strategy as best strategy is different from Type B children. Type A children tend to choose

more non-constructive and less constructive strategies, as the best strategy to solve conflict situation four when compared to Type B children.

In conflict situation five, Type A children selected less non-constructive strategies and slightly more constructive strategies as the best strategy when compared to Type B children. The difference between these strategy choices was statistically significant at the $p<0.05$ level, $\chi^2(2, N=48)=4.83$, $p<0.03$. Type A children's selection of strategy as best strategy is different from Type B children. Type A children tended to choose more constructive and less non-constructive strategies as the best strategy to solve conflict when compared to Type B children in conflict situation five. Type B children tended to choose more non-constructive strategies than constructive strategies in the same situation.

Relating the results to the difficulty levels of the five social conflicts along the Sad/Happy Scale and the Calm/Angry Scale, some patterns on the generation of strategies and strategy selection of Type A and Type B children were identified. When the social situations are difficult on the Calm/Angry Scale (difficult to get angry), as in the case of the two most difficult situations, one and two, there are no differences between the Type A and Type B children in the quality of strategies selected as the best strategy to solve a social conflict. Both groups of children select more constructive strategies as the best solution for the conflict. In other words, when the emotional arousal of anger is low, both Type A and Type B children are able to select appropriate strategies for solving a problem. However, when the social situations are relatively easy on the Calm/Angry Scale which means high emotional arousal of anger, as in the case of situations three and four, Type A children select more non-constructive strategies and less constructive strategies as the best strategy for solving the social conflict.

That means that when the situations were easy to feel angry, Type A children tend to choose more non-constructive strategies as the best strategy for solving a problem. This indicates that Type A children's selection of best strategy for solving a social situation is more likely to be affected by how easy they will feel angry in the situation. They are able to select constructive strategies when it is difficult to feel angry but they will select non-constructive strategies when the situation makes it easy to feel angry. However, Type B children's selection is only affected by how easy they will feel sad. Type B children are found to select more non-constructive strategies and less constructive strategies as best strategy than Type A children, when the social situation is relatively difficult, as in the case of situation five, on the Sad/Happy Scale. In other words, Type B children select more non-constructive strategies for a situation when it is relatively difficult to feel happy.

Conclusions

The following conclusions are drawn from the data.

(1) Both groups of Type A and Type B children generated more constructive strategies in total than non-constructive strategies across social situations.

(2) Type A children generated more constructive strategies in situations 1 and 2. Type B children generated more constructive strategies in situation 1, 2 and 4. Both groups of children generated more constructive strategies in situations 1 and 2 when it is hard to feel angry according to the Calm/Angry dimension. Type B children generated more constructive strategies than non-constructive strategies in more social situations.

(3) There is significant difference between Type A and Type B children's choice of constructive and non-constructive strategies to solve conflict situation one. There is no significant difference between Type A and Type B children's choice of constructive and non-constructive strategies to solve conflict situation from two to five. These results indicate that Type A and Type B children generated similar strategies for each conflict situation, except for conflict situation one where Type A children generate more constructive strategies than Type B children.

(4)Type A and Type B children are able to select an appropriate strategy as the best strategy for solving social problems in social situation 1 and 2. However, Type A children would choose a more non-constructive strategy as the best strategy in social situation 3 and 4. Type B children would choose a more non-constructive strategy as the best strategy in social situation 5.

(5)Type A and Type B differ qualitatively in their choice of strategy as the best strategy for different social conflicts that have different emotional arousal. Type A children select more non-constructive strategies, when the situations make it easy to feel angry, whereas Type B children tended to choose more non-constructive strategies when the situations are difficult to feel happy.

The next chapter will compare the responses from teachers and children in terms of the strategies used in conflict situations.

CHAPTER THIRTEEN

DATA ANALYSIS (PART 8)

CORRELATIONS BETWEEN TEACHERS' AND CHILDREN'S REPORTS OF STRATEGIES USED IN CONFLICT SITUATIONS

This chapter presents the results of the analysis of data from the Questionnaire "Teacher's Views of their Student's Social Problem Strategies" and children's report of their proposed social-problem strategies for the five social conflict situations. Teachers were invited to indicate the strategies that they thought that their students would use in five social situations from their past observation and experience with the children. The responses were grouped into constructive and non-constructive strategies. The same situations and strategies were also presented to children in an interview. Children would generate as many strategies as possible for each social situation. Their proposed responses were also grouped into constructive and non-constructive strategies. The analysis presented in this chapter is to find out whether the strategies generated by the children are similar to what the teachers predicted that the children would do in the five social conflict situations. A zero-order Pearson product-moment correlation was used to examine the relationship between the children's responses and teachers' predictions for their students. The correlations of teachers' predictions and their children's responses are presented for conflict situations one to five in the present chapter. A summary of the results is presented at the end of the chapter.

Correlations of Teachers' and Children's Responses to Five Conflict Situations

Predictions of Strategies from Teachers and Type A Children

The results of the zero-order Pearson product-moment correlations of teachers'

predictions and Type A children's responses are presented in Table 13.1 for constructive strategies.

Table 13.1. Correlations of teachers and Type A children's report of constructive strategies for the five social situations (N=58 pairs)

	Teachers' reports				
Children's reports	Situation 1	Situation 2	Situation 3	Situation 4	Situation 5
Situation 1	-0.10				
Situation 2		-0.41**			
Situation 3			-0.16		
Situation 4				-0.50**	
Situation 5					-0.65**

*p<0.05
** p<0.01

Conflict situation one is about the child who was being accidentally pushed by a peer. There is no statistically significant correlation from zero between the predictions of constructive strategies from teachers and generated constructive strategies from Type A children (r= - 0.10, N=58, p>.05). There is a negative relationship – the lesser the number of strategies predicted by teachers, the higher the number of constructive strategies reported by Type A children for solving conflict situation one, and vice versa. This means that teachers' predictions 'explain' only 1% (- 0.1 times -0.1) of the variance in Type A children's reports of the use of constructive strategies for solving conflict situation one. On this basis, teachers' predictions are of no practical use in predicting Type A children's strategies for conflict situation one.

Conflict situation two is about the child who is being excluded from a game that has enough participants. There is a statistically significant negative correlation from zero between the predictions of constructive strategies by teachers and reports

from Type A children (r= - 0.41, N=58, p<0.05). This is a negative relationship – the lesser the number of strategies predicted by teachers, the higher the number of constructive strategies reported by Type A children for solving conflict situation two, and vice versa. Still, the amount of common variance is only 16% (-0.4 times -0.4) and would only be of limited practical use, but it does show that teachers do not know their children as well as they think that they do. It means that the generation of constructive strategies to solve this conflict by Type A children is contrary, in many individual cases, to the expectations of their teachers.

Conflict situation three is about a child being called 'a baby' because he/she is playing with baby toys. There is no statistically significant correlation from zero between the report of constructive strategies from teachers and Type A children (r= - 0.16, N=58, p>0.05). Again, this is a negative relationship and the amount of common variance is only 2.6%, meaning that it is not of any practical use. Then again, it shows that teachers do not know their children as well as they think that they do.

Conflict situation four is about a peer criticizing and putting marks on a child's picture. There is a statistically significant negative correlation from zero between the report of constructive strategies from teachers and Type A children (r=-0.50, N=58, p<0.01). There is a negative relationship between teachers' report of Type A children's use of constructive strategies and Type A children's report of constructive strategies proposed for solving conflict situation four. It means that the use of constructive strategies by Type A children is contrary to the expectation of their teacher. The amount of common variance is 25% and low, but it is getting towards the stage where it might be considered to have some use as a predictor of children's use of constructive strategies for situation four.

Conflict situation five is about a peer pushing ahead and taking a toy that a child has been waiting for a long time. There is a statistically significant negative correlation from zero between the predictions of constructive strategies from teachers and Type A children's report of constructive strategies they use in conflict situation five ($r = -0.65$, $N=58$, $p<0.001$). This is a moderately strong negative relationship between teachers' predictions of Type A children's use of constructive strategies and Type A children's report of constructive strategies proposed for solving conflict situation five. The higher the number of strategies predicted by the teacher, the lower the number of strategies used by the students, and vice versa. The common variance is 42% and again it supports the view that teachers do not know their children as well as they think that they do. It means that what teachers expect Type A children will do in terms of using constructive strategies in conflict situation five is contrary to the constructive strategies that children are able to generate in solving the problem.

The results of the zero-order Pearson product-moment correlations of teachers predictions and Type A children's report of non-constructive strategies are presented in Table 13.2.

Table 13.2. Correlations of teachers and Type A children's report of non-constructive strategies for the five social conflict situations (N=58 pairs)

	Teachers' reports				
Children's reports	Situation 1	Situation 2	Situation 3	Situation 4	Situation 5
Situation 1	0.07				
Situation 2		-0.02			
Situation 3			0.05		
Situation 4				-0.07	
Situation 5					0.18

Note: None of the correlations are statistically significantly different from zero ($p>.05$)

There are no statistically significant correlations from zero between the predictions of constructive strategies from teachers and reports of non-constructive strategies used by Type A children in any of the social conflict situations. In each case, there is no practical relationship between teachers' reports of Type A children's use of non-constructive strategies and Type A children's report of non-constructive strategies proposed for solving the five conflict situations. The common variance between teachers' predictions of the number of strategies used and the children's reports of the number of strategies used was not more than 3% and is not of any practical use. The correlations show, once again, that teachers do not know their children as well as they think they do.

Reports of strategies from teachers and Type B children

The results of the Pearson product-moment correlations of teachers' predictions of the number of strategies and Type B children's responses about the number of constructive strategies used to solve the five conflict situations are presented in Table 13.3.

Table 13.3. Correlations of teachers' and Type B children's reports of constructive strategies for the five social conflict situations (N=58 pairs)

			Teachers' reports		
Children's reports	Situation 1	Situation 2	Situation 3	Situation 4	Situation 5
Situation 1	0.14				
Situation 2		0.14			
Situation 3			0.02		
Situation 4				-0.24	
Situation 5					0.20

Note: None of the correlations are statistically significantly different from zero (p>.05)

There are no statistically significant correlations from zero between the predictions of constructive strategies from teachers and reports of non-constructive strategies used by Type B children in any of the five social conflict situations. The small correlations mean that no practically useful relationships were found between teachers' reports of Type B children's use of constructive strategies and Type B children's report of constructive strategies proposed for solving all the five conflict situations. The common variance between teachers' predictions of the number of strategies used and the children's reports of the number of strategies used were not more than 6% and so they cannot be considered as any practical use. The correlations show that teachers do not know very well what strategies Type B children would generate in terms of proposing constructive strategies to solve any of the five conflict situations.

The results of the Pearson product-moment correlations of teachers' predictions of the number of strategies and Type B children's responses about the number of non-constructive strategies used to solve the five conflict situations are presented in Table 13.4.

Table 13.4. Correlations of teachers' and Type B children's reports of non-constructive strategies for the five social situations (N=58 pairs)

			Teachers' reports		
Children's reports	Situation 1	Situation 2	Situation 3	Situation 4	Situation 5
Situation 1	-0.08				
Situation 2		-0.05			
Situation 3			0.12		
Situation 4				-0.16	
Situation 5					-0.03

Note: None of the correlations are statistically significantly different from zero ($p>.05$)

The predictions of constructive strategies from teachers and reports of non-constructive strategies used by Type B children in any of the five social conflict situations do not show any statistically significant correlation that is different from zero. It means that there is no practical relationship between teachers' expectations of Type B children's use of non-constructive strategies and Type B children's reports of non-constructive strategies proposed for solving the five conflict situations. The common variance between teachers' predictions of the number of strategies used and the children's reports of the number of strategies used was not more than 3% and is not of any practical use. The correlations show, once again, that teachers do not know their children as well as they think they do.

Summary of Findings

The following findings were found on the predictions by teachers of the strategies used by the children in their care and the children's own reports of strategies proposed for solving five social conflict situations.

For Type A Children Generating Constructive Strategies

1. For conflict situation one, where a child is being accidently pushed by a peer, there is a low negative correlation between the prediction of constructive strategies from teachers and reports of strategies used by the children themselves ($r = -0.10$, $N=58$, $p>0.05$), but this correlation is not significantly different from zero and so, it is of no practical use.
2. For conflict situation two, where a child is being excluded from a game that has enough participants, there is a moderately high negative correlation between the prediction of constructive strategies from teachers and reports of strategies used by the children themselves ($r = -0.41$, $N=58$, $p>0.05$). This correlation is statistically significantly different from zero and potentially useful, as it involves about 16% common variance.
3. For conflict situation three where a child is being called a 'baby' because he/she is playing with baby toys, there is a low negative correlation between the prediction of constructive strategies from teachers and reports of strategies used by the children themselves ($r = -0.16$, $N=58$, $p<0.05$), but this correlation is not significantly different from zero and so, it is of no practical use.
4. For conflict situation four, about a peer criticizing and putting marks on a child's picture , there is a moderately high negative correlation between the prediction of constructive strategies from teachers and reports of strategies used by the children themselves ($r = -0.50$, $N=58$, $p<0.01$). This correlation is statistically significantly different from zero and potentially useful, as it involves about 25% common variance.

5. For conflict situation five about a child peer pushing ahead and taking a toy that a child has been waiting for a long time, there is a moderately high negative correlation between the prediction of constructive strategies from teachers and reports of strategies used by the children themselves ($r = -0.65$, $N=58$, $p<0.01$). This correlation is statistically significantly different from zero and potentially useful, as it involves about 42% common variance.

For Type A Children Generating Non-Constructive Strategies

6. For all five conflict situations, there are low correlations between the predictions of non-constructive strategies from teachers and reports of strategies used by the children themselves that are not statistically significantly different from zero.

The findings indicate that teachers, very often, do not know what strategies children would generate in their minds to solve the social problems in class. For Type A children, teachers expectations are even contrary to the constructive strategies that children are able to generate in solving three out of the five social problems. In other words, teachers frequently are overestimating or underestimating Type A children's ability to use constructive strategies as solutions for the problems.

For Type B Children Generating Constructive Strategies

7. For all five conflict situations, there are low correlations between the predictions of constructive strategies from teachers and reports of strategies used by the children themselves that are not statistically significantly different from zero. The amount of common variance is low and not more than 6%.

For Type B Children Generating Non-Constructive Strategies

8. For all five conflict situations, there are low correlations between the predictions of non-constructive strategies from teachers and reports of strategies used by the children themselves that are not statistically significantly different from zero. The amount of common variance is low and not more than 3%.

The next chapter provides a discussion of the findings of this study in relation to answering the research questions, to providing evidence for and against the main models relating to the study, to interpreting some of the results, and to the relation of the findings to some aspects of the literature review.

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Appendices

Appendix A: covering letters of explanation and consent forms to participants.

Informed Consent Document

I have been provided with a copy of the Participant Information Letter for the research study. I have read and understood the information provided and have been given the opportunity to ask questions about the research project. I am aware that if I have any additional questions I can contact the research team.

I am aware that participation in the research project will involve distributing and collecting consent letters from parents and teachers and allowing the project to take place in my school. I understand that the information provided about the participating children will be kept confidential. I understand that I am free to withdraw my school from the study at any time, without explanation or penalty. I understand that withdrawal from the research project will lead to withdrawal of data already collected.

I freely agree to allow my school (name)_____ to participate in this project.

Signature of principal

_____

Date:_____

Dear teachers,

I am conducting a research project on children's Inflexibility (Contrary behaviour), Persistence with Activities and Games, Acceptance of Strangers, Acceptance of Repeated Activities. This study is about children's temperament and their social problem solving strategies.

The study is expected to provide information about young children that can be used to understand children's temperament and their behaviour in solving social conflicts.

You are asked to complete the attached three questionnaires. Each questionnaire takes about ten to fifteen minutes to complete. Participation is voluntary and you can withdraw at any time without permission or prejudice.

Your student's name is required in the questionnaire. The research results will be published without the names of you or your students.

You can obtain a copy of the results or ask any questions about the study by contacting Professor Russell F. Waugh, the Principal Supervisor, at Edith Cowan University, Bradford Street, Mount Lawley 6050 in Western Australia (+618 9370 6941) or myself at Rm. 43, 2/F, 10 Lo ping Rd,

Hong Kong Institute of Education, N. T. Hong Kong (29487569)

Thank you for your cooperation and participation. It is appreciated and it will help us to help parents and young children.

Your consent to complete the questionnaire is given on the conditions mentioned above. Please complete the questionnaires and return to me personally or through your child's school.

Lau Po Lin Becky

PhD Student

Address : Rm 43, 2/F, 10 Lo ping Rd,
Hong Kong Institute of Education,
N. T. Hong Kong

Telephone: 29487569

I agreed to participate in this project.

Signature of teacher

_____

Date:_____

Dear Parents,

I am conducting a research project on children's Emotions, Inflexibility (Contrary behaviour), Persistence with Activities and Games, Acceptance of Strangers, Acceptance of Repeated Activities and Self-control. This study is about children's temperament and their social problem solving strategies.

The study is expected to provide information about young children that can be used to understand children's temperament and their behaviour in solving social conflicts.

Your child will be asked to participate in an interview that takes about ten minutes to complete. Five stories will be told to your child. He/she will give verbal responses or act out the responses to the stories. Participation is voluntary and you can withdraw at any time without permission or prejudice.

You can obtain a copy of the results or ask any questions about the study by contacting Professor Russell F. Waugh, the Principal Supervisor, at Edith Cowan University, Bradford Street, Mount Lawley 6050 in Western Australia (+618 9370 6941) or myself at Rm. 43, 2/F, 10 Lo ping Rd,

Hong Kong Institute of Education, N. T. Hong Kong (29487569)

Thank you for your cooperation and participation. It is appreciated and it will us to help parents and young children.

Your consent is given on the conditions mentioned above. Please complete the consent form and return to me personally or through your child's school.

Lau Po Lin Becky

PhD Student

Address : Rm 43, 2/F, 10 Lo ping Rd,

Hong Kong Institute of Education,

N. T. Hong Kong

Telephone: 29487569

I allow my child (name)_____ to participate in this project.

Parent's signature

_____

Date:_____

Lau Po Lin Becky
B2, Rm. 43, 2/F, 10 Lo ping Rd,
Hong Kong Institute of Education,
N. T. Hong Kong

Participant Information Letter

Dear principal,

I am conducting a research project in Hong Kong on children's Inflexibility (Reaction to Changes), Persistence with Activities and Games, Acceptance of Strangers, Acceptance of Repeated Activities as part of the PhD study. This study is about children's temperament and their social problem solving strategies. The Human Research Ethics Committee of Edith Cowan University has granted approval for this study.

The study is expected to provide information about young children that can be used to understand children's temperament and their behaviour in solving social conflicts.

I am writing to request your approval to conduct the project in your school. You are requested to distribute and collect consent letters from parents and teachers in your school. Participating children will be asked individually to participate in a verbal game and an interview that takes about fifteen to twenty minutes to complete. Each Participating child will name the emotions involved in four pictures showing four facial expressions and five situations in the verbal game. For the interview, five stories will be told to the participating child. He/She will give verbal responses or act out responses to the stories. The teacher will be asked to complete the attached three questionnaires. Each questionnaire takes about ten to fifteen minutes to complete. Participation is voluntary and you can withdraw at any time without permission or prejudice.

Your student's name is required in the questionnaire but research results will be published without the names of you or your students. You can obtain a copy of the results or ask any questions about the study by contacting the Principal Supervisor:

Professor Russell F. Waugh,
Edith Cowan University,
Bradford Street, Mount Lawley 6050 in Western Australia
Australia
Phone:+618 9370 6941
Email: r.waugh@ecu.edu.au
or
Becky Lau at B2, Rm. 43, 2/F, 10 Lo ping Rd,
Hong Kong Institute of Education, N. T. Hong Kong
Phone: 29487569
Email: blau@ied.edu.hk

If you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:

Research Ethics Officer

Edith Cowan University
270 Joondalup Drive
JOONDALUP WA 6027
Austraila
Phone: (08) 6304 2170
Email: research.ethics@ecu.edu.au

Thank you for your cooperation and participation. It is appreciated and it will help us to help parents and young children.

Your consent is given on the conditions mentioned above. Please return the informed consent document to me through mail.

Lau Po Lin Becky
PhD Student
Address : B2, Rm 43, 2/F, 10 Lo ping Rd,
Hong Kong Institute of Education,
N. T. Hong Kong
Telephone: 29487569
Email: blau@ied.edu.hk

Appendix B: Ethical approval letter

Dear Becky,

Project Number: 5129 PO

Project Name: Emotionality, Emotion and Behavioural Regulation and Social Problem Solving of Young Children in Hong Kong

Student Number: 10134414 The ECU Human Research Ethics Committee (HREC) has reviewed your application and has granted ethics approval for your research project. In granting approval, the HREC has determined that the research project meets the requirements of the ***National Statement on Ethical Conduct in Human Research***.The approval period is from 29 April 2010 to 30 September 2011. The Research Assessments Team has been informed and they will issue formal notification of approval. Please note that the submission and approval of your research proposal is a separate process to obtaining ethics approval and that no recruitment of participants and/or data collection can commence until formal notification of both ethics approval and approval of your research proposal has been received.

Please note the following conditions of approval:

The HREC has a requirement that all approved projects are subject to monitoring conditions. This includes completion of an annual report (for projects longer than one year) and completion of a final report at the completion of the project. An outline of the monitoring conditions and the ethics report form are available from the ethics website:

http://www.ecu.edu.au/GPPS/ethics/human_ethics_resources.html

You will also be notified when a report is due.Please feel free to contact me if you require any further information.

Regards

Kim Gifkins

Research Ethics Officer

Edith Cowan University

270 Joondalup Drive

JOONDALUP WA 6027

Phone: (08) 6304 2170

Fax: (08) 6304 2661

Email: research.ethics@ecu.edu.au

Appendix D: Children Measures for Emotion and Behaviour Regulation

ID	Location	SE
359	-4.08	1.26
233	-4.08	1.26
382	-4.08	1.26
590	-4.08	1.26
274	-4.08	1.26
379	-4.08	1.26
275	-4.08	1.26
377	-4.08	1.26
218	-4.08	1.26
113	-4.08	1.26
468	-4.08	1.26
111	-4.08	1.26
230	-4.08	1.26
595	-4.08	1.26
180	-4.08	1.26
378	-4.08	1.26
483	-4.08	1.26
288	-4.08	1.26
347	-4.08	1.26
506	-4.08	1.26

Appendix D (Continued)

ID	Location	SE
506	-4.078	1.26
518	-4.078	1.26
209	-4.078	1.26
529	-4.078	1.26
530	-4.078	1.26
531	-4.078	1.26
532	-4.078	1.26
219	-4.078	1.26
94	-4.078	1.26
177	-4.078	1.26
420	-4.078	1.26
405	-4.078	1.26
407	-4.078	1.26
410	-4.078	1.26
411	-4.078	1.26
402	-4.078	1.26
244	-4.078	1.26
416	-4.078	1.26
260	-4.078	1.26
422	-4.078	1.26
424	-4.078	1.26
428	-4.078	1.26
162	-4.078	1.26
152	-4.078	1.26
602	-4.078	1.26
432	-3.996	1.27
75	-3.860	1.32
67	-3.860	1.32
433	-3.239	1.38

ID	Location	SE
383	-3.222	0.91
187	-3.222	0.91
350	-3.222	0.91
503	-3.222	0.91
190	-3.222	0.91
414	-3.222	0.91
413	-3.222	0.91
507	-3.222	0.91
495	-3.222	0.91
161	-3.222	0.91
489	-3.222	0.91
385	-3.222	0.91
525	-3.222	0.91
142	-3.222	0.91
408	-3.222	0.91
387	-3.222	0.91
308	-3.222	0.91
165	-3.222	0.91
388	-3.222	0.91
535	-3.222	0.91
335	-3.222	0.91
423	-3.222	0.91
132	-3.222	0.91
334	-3.222	0.91
434	-3.222	0.91
429	-3.222	0.91
376	-3.222	0.91
374	-3.222	0.91
373	-3.222	0.91
115	-3.222	0.91
380	-3.222	0.91
492	-3.222	0.91
176	-3.222	0.91

ID	Location	SE
73	-2.981	0.95
71	-2.981	0.95
70	-2.981	0.95
69	-2.981	0.95
68	-2.981	0.95
57	-2.981	0.95
56	-2.981	0.95
52	-2.981	0.95
44	-2.981	0.95
43	-2.981	0.95
77	-2.981	0.95
54	-2.981	0.95
45	-2.981	0.95
90	-2.981	0.95
86	-2.981	0.95
175	-2.600	0.74
436	-2.600	0.74
527	-2.600	0.74
398	-2.600	0.74
395	-2.600	0.74
628	-2.600	0.74
528	-2.600	0.74
266	-2.600	0.74
430	-2.600	0.74
320	-2.600	0.74
597	-2.600	0.74
322	-2.600	0.74
469	-2.600	0.74
138	-2.600	0.74
225	-2.600	0.74
36	-2.600	0.74
276	-2.600	0.74
173	-2.600	0.74
418	-2.600	0.74
627	-2.600	0.74
626	-2.600	0.74
248	-2.600	0.74
409	-2.600	0.74
623	-2.600	0.74

ID	Location	SE
5	-2.600	0.74
6	-2.600	0.74
27	-2.600	0.74
417	-2.600	0.74
227	-2.600	0.74
538	-2.600	0.74
421	-2.600	0.74
237	-2.600	0.74
426	-2.600	0.74
24	-2.600	0.74
591	-2.600	0.74
25	-2.600	0.74
243	-2.600	0.74
217	-2.600	0.74
509	-2.600	0.74
476	-2.600	0.74
339	-2.600	0.74
474	-2.600	0.74
488	-2.600	0.74
338	-2.600	0.74
491	-2.600	0.74
472	-2.600	0.74
285	-2.600	0.74
471	-2.600	0.74
286	-2.600	0.74
199	-2.600	0.74
514	-2.600	0.74
494	-2.600	0.74
282	-2.600	0.74
229	-2.600	0.74
279	-2.600	0.74
116	-2.600	0.74
498	-2.600	0.74
499	-2.600	0.74

Appendix E: Children Measures for Negative Emotionality

ID	Location	SE
416	-2.719	0.76
360	-2.719	0.76
45	-2.719	0.76
420	-2.719	0.76
618	-2.719	0.76
596	-2.719	0.76
193	-2.719	0.76
27	-2.719	0.76
601	-2.719	0.76
479	-2.719	0.76
510	-2.719	0.76
481	-2.719	0.76
188	-2.719	0.76
485	-2.719	0.76
332	-2.719	0.76
175	-2.719	0.76
219	-2.719	0.76
64	-2.719	0.76
184	-2.719	0.76
492	-2.719	0.76
504	-2.719	0.76
172	-2.719	0.76
592	-2.719	0.76
23	-2.719	0.76
549	-2.719	0.76
218	-2.719	0.76
51	-2.719	0.76
84	-2.719	0.76

ID	Location	SE
179	-3.360	0.93
200	-3.360	0.93
522	-3.360	0.93
243	-3.360	0.93
529	-3.360	0.93
178	-3.360	0.93
437	-3.145	0.94
389	-3.145	0.94
401	-3.145	0.94
425	-3.145	0.94
432	-3.145	0.94
406	-3.145	0.94
402	-3.145	0.94
392	-3.145	0.94
397	-3.145	0.94
396	-3.145	0.94
394	-3.145	0.94
612	-2.719	0.76
223	-2.719	0.76
408	-2.719	0.76
407	-2.719	0.76
313	-2.719	0.76
112	-2.719	0.76
181	-2.719	0.76
207	-2.719	0.76
208	-2.719	0.76
57	-2.719	0.76
411	-2.719	0.76
230	-2.719	0.76
413	-2.719	0.76
111	-2.719	0.76
309	-2.719	0.76
383	-2.719	0.76
44	-2.719	0.76
227	-2.719	0.76
536	-2.719	0.76

ID	Location	SE
438	-3.360	0.93
400	-3.360	0.93
277	-3.360	0.93
280	-3.360	0.93
276	-3.360	0.93
419	-3.360	0.93
202	-3.360	0.93
110	-3.360	0.93
382	-3.360	0.93
86	-3.360	0.93
373	-3.360	0.93
349	-3.360	0.93
440	-3.360	0.93
116	-3.360	0.93
442	-3.360	0.93
361	-3.360	0.93
359	-3.360	0.93
100	-3.360	0.93
294	-3.360	0.93
335	-3.360	0.93
379	-3.360	0.93
540	-3.360	0.93
512	-3.360	0.93
626	-3.360	0.93
247	-3.360	0.93
518	-3.360	0.93
26	-3.360	0.93
176	-3.360	0.93
534	-3.360	0.93
523	-3.360	0.93
308	-3.360	0.93
514	-3.360	0.93
30	-3.360	0.93
31	-3.360	0.93
627	-3.360	0.93
628	-3.360	0.93

ID	Location	SE
475	-4.226	1.28
236	-4.226	1.28
32	-4.226	1.28
28	-4.226	1.28
25	-4.226	1.28
24	-4.226	1.28
239	-4.226	1.28
590	-4.226	1.28
249	-4.226	1.28
597	-4.226	1.28
232	-4.226	1.28
197	-4.226	1.28
435	-4.023	1.28
434	-4.023	1.28
429	-4.023	1.28
426	-4.023	1.28
405	-4.023	1.28
395	-4.023	1.28
423	-4.023	1.28
478	-3.360	0.93
85	-3.360	0.93
142	-3.360	0.93
298	-3.360	0.93
71	-3.360	0.93
182	-3.360	0.93
60	-3.360	0.93
470	-3.360	0.93
591	-3.360	0.93
477	-3.360	0.93
233	-3.360	0.93
480	-3.360	0.93
600	-3.360	0.93
237	-3.360	0.93
186	-3.360	0.93
185	-3.360	0.93
595	-3.360	0.93
493	-3.360	0.93
495	-3.360	0.93
189	-3.360	0.93

ID	Location	SE
279	-4.226	1.28
398	-4.226	1.28
388	-4.226	1.28
387	-4.226	1.28
380	-4.226	1.28
278	-4.226	1.28
377	-4.226	1.28
275	-4.226	1.28
364	-4.226	1.28
347	-4.226	1.28
162	-4.226	1.28
322	-4.226	1.28
177	-4.226	1.28
180	-4.226	1.28
378	-4.226	1.28
73	-4.226	1.28
489	-4.226	1.28
487	-4.226	1.28
486	-4.226	1.28
484	-4.226	1.28
483	-4.226	1.28
476	-4.226	1.28
108	-4.226	1.28
468	-4.226	1.28
469	-4.226	1.28
75	-4.226	1.28
91	-4.226	1.28
94	-4.226	1.28
196	-4.226	1.28
273	-4.226	1.28
274	-4.226	1.28

ID	Location	SE
501	-4.226	1.28
491	-4.226	1.28
519	-4.226	1.28
516	-4.226	1.28
515	-4.226	1.28
513	-4.226	1.28
509	-4.226	1.28
521	-4.226	1.28
505	-4.226	1.28
525	-4.226	1.28
500	-4.226	1.28
199	-4.226	1.28
498	-4.226	1.28
497	-4.226	1.28
496	-4.226	1.28
251	-4.226	1.28
506	-4.226	1.28
533	-4.226	1.28
255	-4.226	1.28
258	-4.226	1.28
66	-4.226	1.28
67	-4.226	1.28
539	-4.226	1.28
538	-4.226	1.28
520	-4.226	1.28
535	-4.226	1.28
490	-4.226	1.28
532	-4.226	1.28
531	-4.226	1.28
530	-4.226	1.28
528	-4.226	1.28
527	-4.226	1.28
526	-4.226	1.28
537	-4.226	1.28
287	-4.226	1.28
494	-4.226	1.28