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THE RELATIONSHIP AMONG EMOTION UNDERSTANDING, LANGUAGE, AND
SOCIAL BEHAVIOR IN CHILDREN WITH LANGUAGE IMPAIRMENT

by

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A thesis submitted to the faculty of

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BRIGHAM YOUNG UNIVERSITY

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ABSTRACT

THE RELATIONSHIP AMONG EMOTION UNDERSTANDING, LANGUAGE, AND SOCIAL BEHAVIOR IN CHILDREN WITH LANGUAGE IMPAIRMENT

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Master of Science

This study examines the influence of emotion understanding, language, and working memory on reticence and prosocial behavior in children with language impairment (LI). *The Comprehensive Assessment of Spoken Language* (CASL; Carrow-Woolfolk, 1999) and *The Universal Nonverbal Intelligence Test* (UNIT; Bracken & McCallum, 2003) were administered to 39 children with LI and 39 typical age-matched peers. A nonword repetition task and two tasks measuring emotion understanding were also administered. Each of the participant's classroom teachers completed *The Teacher Behavioral Rating Scale* (TBRS; Hart & Robinson, 1996). Structural equation modeling was used to estimate models of the data using a maximum likelihood procedure for each of the groups. Results showed that for children with typical language skills, both dissemblance and language were negatively linked to reticence. For the children with LI,

there was a positive relationship between dissemblance and prosocial behavior and a significant negative relationship between standard language score and prosocial behavior. When the four individual paths were tested one at a time, by constraining the estimates of each of the paths to be equal across groups, only the effect of language on prosocial behavior was significantly different between groups.

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Introduction

It has been well established that children with language impairment (LI) are at high risk for social difficulties. Not only do they have fewer friends than typical peers, but they also may be subject to exclusion and victimization (Conti-Ramsden & Botting, 2004; Fujiki, Brinton, Hart, & Fitzgerald, 1999). Classroom peers regard children with LI as less desirable playmates, and teachers consistently report poor social skills and problem behaviors (Fujiki, Brinton, & Todd, 1996; Gertner, Rice, & Hadley, 1994).

It seems reasonable to assume that these social problems are a result of the child's language deficit. However, it has recently been documented that language disability may not be the only factor responsible for social maladjustment. Factors such as emotion regulation are also predictive of social behavior in children with LI (Fujiki, Spackman, Brinton, & Hall, 2004). In addition, children with LI do not always have social and behavioral problems, and severity of LI does not accurately predict level of social functioning (Fujiki et al., 2004; Hart, Fujiki, Brinton, & Hart, 2004). This study aims to more clearly define the relationships between emotion understanding, language, nonword repetition, and social behavior in children with LI and their typical peers through the use of Structural Equation Modeling (SEM).

Review of Literature

This review will explore various aspects of social behavior in children with and without language difficulties. *Social competence* is first defined and its importance in typical development is highlighted. The social profile of children with LI is then discussed, demonstrating the relationship between LI and social difficulty. The early onset of social problems and their enduring impact is also considered. Specific social outcomes will be addressed, including loneliness, exclusion, and victimization. Peer interaction, friendship, and social tasks are also examined. Special emphasis is given to *withdrawal*, a behavior that has been repeatedly observed in children with LI. The review finishes by exploring the possible causes of social problems in children with LI, including poor language, working memory, and emotion understanding.

Social Competence

Social competence refers to an individual's ability to understand and solve basic problems that are encountered in social relationships (Guralnick & Neville, 1997). To be socially competent an individual must be able to behave in a manner that enhances and improves relationships with others. He or she must also be able to adjust behavior to be appropriate in different social contexts (Odom, McConnell, & McEvoy, 1992).

It is extremely important for children to get along well with peers. In fact, good relationships are necessary for social and academic growth. Successful peer relationships enhance a child's development of communication skills and appropriate prosocial skills (Guralnick & Rice 2000). Successful peer relations also help children manage aggressive behavior and are critical to social acceptance and integration. Conversely, poor peer relationships have negative consequences. Children who have poor peer relationships have a higher likelihood of mental health problems and poor academic achievement.

They also have higher rates of delinquency. Finally, poor peer relationships contribute to a higher likelihood of bad conduct discharge from the military and higher dropout rates from school (Parker & Asher 1987). It is clear that social competence is not a luxury but a necessity in child development.

There is a significant overlap between social competence and communicative competence. Many linguistic behaviors, particularly those falling within the domain of pragmatics, have important social functions. Language is used to express feelings, share information, negotiate misunderstandings, and direct behavior. Ultimately, language is important to the establishment and maintenance of successful social relationships (Fujiki et al., 1996). Thus, poor language skills and social problems are frequently associated.

Social Profile of Children with LI

Longitudinal research has indicated that there is a relationship between LI and poor social competence in children. Problems with socialization appear early and do not typically disappear over time. Numerous studies show that children with LI experience significant loneliness, exclusion, and victimization. They frequently withdraw from social interactions, even though they would like to participate. They struggle with gaining acceptance and friendship. Children with LI also have a hard time demonstrating sociable behaviors and participating appropriately in social tasks. There are numerous studies that have been conducted in this area, however only a few will be reviewed to give the reader a general idea of the research that has been done.

Social problems can appear early in development for children with LI. Paul, Looney, and Dahm (1991) used the Vineland Adaptive Behavior Scales to compare 21 late talkers and 21 typical children aged 2 and then 3 years old. Initially, late talkers had

significantly poorer scores for receptive and expressive language and socialization than typical children. The follow-up testing a year later showed that about half of the late talkers still had deficits in expressive language and socialization.

In addition to beginning early, there is evidence that the social problems of children with LI are persistent. The long-term nature of these deficits is illustrated by the findings of three longitudinal studies conducted in Canada, the United Kingdom, and the United States. In a series of studies conducted in the Ottawa-Carleton area of Canada, Beitchman and his colleagues examined the social profile and development of children with speech and language impairments throughout childhood and adolescence. Beitchman, Hood, Rochon, and Peterson (1989) categorized the children (aged 5 years) into subgroups using a variety of test instruments. The participant groups were labeled as high overall (no impairment in any language measure), auditory comprehension problems, articulation problems, and poor overall language. Seven years later, Beitchman et al. assessed the same children who were now aged 12 years. Again, they were placed into categories of speech impairment, LI, or speech and LI with a battery of formal tests. In comparing data from both studies, the authors found that children who were diagnosed with speech-language problems at 5 years of age were more likely to be diagnosed with psychiatric problems at 12 years old than controls. Speech-language status at 12 years was not a significant variable. In addition, children with speech-language impairment at 5 years old were more likely to have an emotional diagnosis at 12 years old than typical matches.

In an examination of adolescents from the Ottawa group, Johnson et al. (1999) found that those with early speech problems often had subtle speech problems as young

adults. Additionally, children with early language problems still showed problems in academic, cognitive, and language functioning as young adults when compared to typical children in the original comparison group.

Beitchman et al. (2001) found high rates of anxiety and social phobia in teens when they performed a 14-year follow up of participants in the Ottawa study. At age 19 the group with LI had higher rates of anxiety disorder (mostly social phobia), and anti-social personality disorder compared to the control group. Males with LI had higher rates than females with LI on each of these measures as well as a higher overall disorder rate. The rates of overall impairment were 22% in the group speech-impairment only, 40% in the group with LI, and 21% in the control group.

In a second longitudinal study conducted in the United Kingdom, Conti-Ramsden, Crutchley, and Botting (1997) studied a group of 242 children with specific language impairment (SLI). Subjects were recruited from 118 language-based classrooms associated with mainstream schools (a clinical sample). The children were divided into six clusters of (a) problems with syntax-morphology, (b) phonological problems and poor word reading, (c) articulation-phonology problems and expressive difficulties, (d) articulation and phonology problems, expressive difficulties, (e) articulation, phonology, syntax-morphological, expressive and/or receptive difficulties, and (f) semantic and/or pragmatic problems. Conti-Ramsden, Botting, Simkin, and Knox (2001) performed a follow-up at age 11 in which 200 of the original 242 children participated. It was determined that 115 subjects could still be diagnosed with SLI. Most of the children who were no longer considered to be SLI had received lower IQ scores in subsequent testing. Smaller numbers of children had either resolved their problems or could be placed into

other categories of impairment such as autism. These studies highlighted the enduring impact of LI. In later work, Conti-Ramsden and colleagues examined some of the social problems that these students experienced.

Conti-Ramsden and Botting (2004) followed the same group of 242 children discussed above, who were initially tested at age 7. Four years later the children with SLI were found to have significant social problems. They scored poorly on the Rutter behavioral questionnaire, the Strengths and Difficulties questionnaire, and the Peer Competence subscale of the Harter Perceived Competence Scale. Conti-Ramsden and Botting noted that 36% of children with LI were at risk for victimization at school, compared to 12% for a group of typically developing peers.

Tomblin (2007) studied the social functioning of adolescents in the United States who had been diagnosed with LI at age 6. He divided subjects into groups of those who could still be considered to have SLI and those who had a more general LI. Both groups rated themselves significantly lower than peers on a measure of social activity and friendship. Tomblin administered the UCLA Loneliness Scale and found that adolescents with LI reported greater levels of loneliness than typical peers, or even children with SLI.

Withdrawal. An observation that has been frequently documented is the tendency of children with LI to be socially withdrawn. In a longitudinal study of 37 children, ages 6 and 7 years old, Redmond and Rice (1998) administered the Child Behavior Checklist (CBCL) and the Teacher's Report Form (TRF) to teachers who rated children over a two-year period. Children with SLI were rated as having more internalizing behavior problems and social difficulties than typical peers. Children with SLI were also rated as demonstrating high rates of withdrawal. Parents did not report these same observations. It

is of note, however, that these scales are not sensitive to subtle socioemotional behavior (Merrell, 2003). Additionally, the CBCL and the TRF did not separate withdrawn behavior into specific subtypes.

A number of social psychologists have observed that the term withdrawal has been used to label a relatively wide range of behaviors. Rubin and Asendorpf (1993) attempted to more specifically define withdrawal by differentiating the act of being alone from peer rejection, neglect, and isolation.

Coplan and Rubin (1998) examined subtypes of withdrawal behavior, labeled as *solitary-passive*, *solitary-active*, and *reticence*. The first subtype, solitary-passive withdrawal, occurs when a child constructively plays or works alone. Teachers are not usually concerned about this type of behavior, since it is generally positive (e.g., reading a book). However, over time peers may view it negatively.

A second subtype, solitary-active withdrawal, invites negative attention and rejection from others (Coplan & Rubin, 1998; Coplan, Rubin, Fox, Calkins, & Stewart, 1994). A child who demonstrates solitary-active withdrawal will often perform similar actions in the midst of other children but not really be involved in the play. The child may also demonstrate repeated sensory motor activity. It is notable, however, that recent work has suggested that it may be more appropriate to divide solitary-active withdrawal into solitary-pretend play (dramatizing) and solitary-functional play (repeated sensorimotor activity). Both types of solitary-active withdrawal have negative social outcomes (Nelson, Hart, & Evans, 2008).

The third type of withdrawal is called reticence (Coplan & Rubin, 1998). A child who is reticent would really like to interact with peers, but is afraid to do so. These

children may watch others play or just wander around aimlessly. Reticient children may also be particularly wary of new situations (Rubin & Asendorpf, 1993).

Children with LI most frequently exhibit the subtype reticence. Fujiki, Brinton, Morgan, and Hart (1999) asked teachers to complete the Teacher Behavior Rating Scale (TBRS; Hart & Robinson, 1996) to 41 children with LI and 41 typical age and gender-matched peers. The different subtypes of both withdrawn and sociable behavior were examined. Classroom teachers rated children with LI as significantly more reticent than typical peers. Younger boys with LI were also rated as demonstrating more solitary-active withdrawal.

Hart et al. (2004) also administered the TBRS to 41 children with LI and 41 typical peers of the same age. Results of the questionnaire showed that teachers rated children with LI as having higher levels of reticence and solitary-passive withdrawal than typical age-matched peers. Results were consistent with Fujiki et al. (1999) in revealing high levels of reticent withdrawal in the children with LI. The higher levels of solitary-passive withdrawal had not been observed previously.

In a detailed study of the relationship among language, emotion regulation, and reticence, Fujiki et al. (2004) also compared reticent behavior in children with LI and their typical age-matched peers. Participants included 86 children, 43 with LI and 43 typically developing. They were selected from two age ranges: 5 to 8 years and 9 to 12 years. The researchers administered the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1998), which is a 24-item checklist targeting “affective lability, intensity, valence, flexibility, and situational appropriateness of emotional expressions” (Shields & Cicchetti, 1998, p. 385). They also administered the TBRS for a measure of reticence,

and the Comprehensive Assessment of Spoken language (CASL; Carrow-Woolfolk, 1999) for a measure of language. A regression analysis revealed that both the CASL and the emotion regulation scores were significant predictors of reticence, accounting for 43% of the variance. In order to determine if the CASL and the ERC differed in their predictive ability based on language and age-groups, group-specific analyses were performed. None of the tests reached greater p -values than .05, indicating that there was no significant difference in predictive power. Thus, it appeared that emotion regulation was just as powerful as language ability in predicting reticent withdrawal in children with LI. Fujiki et al. stressed that reticence does not simply result from poor language ability, but rather may be motivated by both linguistic and emotional factors.

In order to determine if teacher ratings of social behavior would agree with direct observations, Fujiki, Brinton, Isaacson, and Summers (2001) observed 8 children with LI and 8 age-matched peers on the playground. These participants were videotape recorded for 45 minutes during morning and lunch recess. The children's behavior was coded into short segments and then placed into 1 of 37 subcategories. The subcategories were subsequently grouped into six more general categories of peer interaction, adult interaction, withdrawal, aggression, victimization, and other. The authors found significant differences in the peer interaction and withdrawal categories between children with LI and their typical matches. Typical children spent more time interacting with peers than children with LI. In addition, children with LI demonstrated significantly more withdrawn behaviors than typical peers. The children with LI were observed to produce more reticence and solitary-active withdrawal but not more solitary-passive withdrawal. Additionally, they were not more aggressive than peers of the same age. The children

with LI often wandered around the playground and watched other children but did not enter into play themselves. They seemed to have the desire to interact but were too afraid to do so. This study supported previous conclusions drawn from teacher interviews, that children with LI are significantly more withdrawn than their typical peers.

Peer acceptance and friendship. When considering childhood relationships, social psychologists separate *peer acceptance* and *friendship* into different categories (Rubin, Bukowski, & Parker, 1998). Peer acceptance reflects popularity within a group whereas friendship is reciprocal between two friends. Thus, although both acceptance and friendship are important they need to be considered separately. A child may be accepted by a peer group but still be terribly lonely if he or she lacks close reciprocal friendships (Parker & Asher, 1993). In fact, some well accepted children have no close friends in the classroom while some poorly accepted children do (Asher, Parker, & Walker, 1996).

Numerous studies have indicated that children with LI interact less frequently with peers than typical children. In a study previously mentioned, Fujiki et al. (1996) used the Social Skills Rating System-Teacher Form (SSRT; Gresham & Elliott, 1990), the Williams and Asher Loneliness Questionnaire, and an informal picture task to study peer interaction. The SSRT is a norm-referenced behavior scale completed by teachers that measures social skills, problem behaviors, and academic achievement. The Williams and Asher Loneliness Questionnaire consists of 14 questions tapping into children's own feelings of loneliness. For the informal picture task, subjects were shown 10 pictures that depicted common activities such as children eating lunch or playing together. Subjects were then asked if they ever participated in the activity, and if so, with whom. The authors used these measures to examine children with LI and typical age-matched peers

between the ages of 8 and 12 years old. Typical children scored significantly lower than peers with LI on each of the measures, indicating that the group with LI experienced a greater degree of loneliness due to fewer peer contacts during common activities (such as lunch time or recess) than typical classmates.

Guralnick, Connor, and Hammond (1996) compared the peer interactions of preschool aged children with communication disorders to typically developing children of the same chronological age. All participants were previously unacquainted with each other but participated in a number of short-term playgroups. Both the children with communication disorders and typical matches showed similar abilities to sustain play, minimize conflict, join others in play, and respond to the social bids of others. However, the children with communication disorders engaged in fewer positive social interactions, conversed with others less often than typical matches, and were less directive and less successful in social bids. Similar patterns of peer interaction were observed in both mainstream and specialized settings (mainstream settings consisting of children with communication disorders and typical peers, and specialized settings consisting only of children with communication disorders).

At the Language Acquisition Preschool (LAP) of the University of Kansas, a series of studies was performed to examine the social interaction of children with various language abilities. Rice, Sell, and Hadley (1991) observed 26 preschoolers enrolled in the LAP, aged 39 to 67 months. Nine were typically developing, 6 had LI, 3 had speech impairment (SI), and 8 spoke English as a second language (ESL). The authors observed these children in a preschool classroom using the Social Interactive Coding System (SICS), an on-line coding system, to organize conversational interactions. They found

that typical children had a higher percentage of longer responses and preferred to interact with other typical peers. Children with communication handicaps preferred conversing with adults rather than peers. The ESL group was the least likely to initiate any type of interaction.

In a follow-up study, Hadley and Rice (1991) looked at conversational responsiveness in the LAP to determine if responsiveness might influence patterns of social interaction. These authors found that children with communication difficulties (LI and SI) more frequently ignored conversational attempts by other children. In addition, children with LI and SI were ignored by peers and experienced fewer peer interactions. They were more likely to initiate conversation with adults and used shorter or nonverbal responses.

Gertner, Rice, and Hadley (1994) measured the peer popularity of 31 children in the LAP classroom. They compared three groups: (a) children with speech or language impairments (S/LI), (b) normal developing children (ND), and (c) children learning English as a second language (ESL). Each child was presented with pictures of other children in the classroom, and they nominated peers who they would or would not like to play with in the context of dramatic play. This process was repeated in order to obtain three positive nominations from each child. Both positive and negative nominations were combined to classify each child as liked, disliked, low impact, or mixed. Results showed that the typical group received the most positive nominations and were predominately in the liked category. The children with LI were mostly categorized as disliked or low impact.

Fujiki et al. (1999) examined peer acceptance in 8 children with LI from four classrooms. In order to determine acceptance of these children in their own classrooms they administered peer ratings based on methods employed by Asher and Dodge (1986). Children were required to assign each classmate into one of three circles depicting either a happy, neutral, or sad face. Children were instructed that a happy face indicates that you like to play with that child a lot. A neutral face indicates that you kind of like to play with that child, and a sad face indicates that you do not like to play with that child. Ratings were scored on a scale from 1 to 3 and each child was given an overall acceptance score. Three of the children with LI were less well accepted by peers than typical children in the classroom.

In addition to peer acceptance, the friendships of children with LI have been examined in several studies. Children with LI have notably fewer friends than typical children. Fujiki et al. (1999) looked at reciprocal friendships in four classrooms using peer ratings. Results showed that of 8 children with LI, 5 reported no reciprocal friendships.

In a recent study, Durkin and Conti-Ramsden (2007) looked at the friendship quality of 120 adolescents with a history of LI. These adolescents indicated that they had poorer quality friendships than their typical peers. Over 90% of adolescents in the typical group reported good quality friendships compared to 60% for the group with LI. It is notable that both prosocial and poor social behavior as well as early language ability played roles in predicting friendship outcomes.

The following section will review sociable behaviors in general as well as various social tasks. Social tasks will include negotiation, cooperation, and the ability to enter, or access, an ongoing interaction.

Sociable behaviors. It is not ideal to examine only the negative behaviors of a child with LI since negative behaviors comprise only a small proportion of that child's overall social profile. In addition, negative behaviors such as withdrawal could potentially be mediated by positive social skills (Fujiki et al., 1999). Thus, a more accurate analysis of a child's behavior would include an examination of *sociability* (helping, sharing, comforting, and cooperating) as well as withdrawal. As with withdrawal, there are subtypes of sociable behavior. These include *prosocial behavior* and *likeability*. Prosocial behavior refers to positive social skills such as helping, sharing, comforting, and cooperating with others during social interactions. Likeability refers to friendly behavior, conformity, rough and tumble cooperative play, and assertive leadership skills. Fujiki et al. found that teachers rated children with LI significantly lower than peers on both subtypes of sociable behavior.

In a study mentioned previously, Hart et al. (2004) also examined the sociable skills of children with LI and their age-matched peers. Consistent with previous research, the children with LI were also rated as demonstrating lower levels of sociable behavior than their typical peers.

The above referenced studies indicate that children with LI exhibit lower levels of prosocial behavior than typical peers. Prosocial behavior refers to skills such as helping, sharing, comforting, and cooperating with others. In addition, children with LI

demonstrate poorer likeability than typical peers, defined as friendly behavior, conformity, rough and tumble cooperative play, and assertive leadership skills.

Performance of basic social tasks. The poor interpersonal skills and lack of friendship that children with LI experience may be linked to their difficulty performing basic social tasks. Some basic social tasks that have been studied are negotiating, cooperating in small groups, and entering ongoing interaction.

Brinton, Fujiki, and McKee (1998) examined the ability of children with LI to participate in a negotiation task with 2 peers of the same age. The task was to come to a consensus in choosing a snack to be shared by the group. The researchers specified three developmental levels of negotiation. Level 0 consisted of strategies involving unreflective and impulsive action such as grabbing, hitting, or affective withdrawal. Level 1 consisted of self-serving actions, and level 2 involved descriptions used to promote or discourage a choice or gathering information for the purpose of persuasion. Level 3 strategies were those that were used to solicit others' opinions or collaborate on a choice, such as asking for the preferences of other children or calling for a group vote. Brinton et al. (1998) found that children with LI produced fewer negotiation strategies, and the strategies that they did suggest were at a lower developmental level. The most actively involved child with LI used strategies at levels 1 and 2, but no subjects with LI produced level 3 negotiation strategies. In contrast, typical peers of the same age employed many level 3 strategies and often came to a group consensus. Children with LI had less impact on the negotiation process as illustrated by the following example. A child with LI suggested the same choice five times throughout the session. The other members of his group never asked for his opinion or acknowledged his comments.

Rather, they negotiated between themselves, came to a decision, and then demanded that the child with LI change his choice. The social functioning of children with LI in negotiation strategies was less developed than would be expected considering age, social experience, and cognitive level.

Brinton, Fujiki, and Higbee (1998), studying the same children, examined the ability to participate in a common school social task, the cooperative work group. Subjects were presented with a periscope made from a shoe box with holes cut out and mirrors inside. They were instructed to work together to build a similar periscope and materials were provided. The researchers recorded both verbal and nonverbal collaborative behavior. Children with LI played minor roles in the work, made minimal verbal and nonverbal contributions, and performed less difficult and less specialized tasks than the typical peers. For example, in one group a typical child instructed his partner with LI to decorate the lid, calling it the most disgusting part. The child with LI was excluded from the group work, verbal and nonverbal, and he produced only 6% of the total utterances.

An important skill in the social development of typical children is the ability to enter, or access, an ongoing interaction (Black & Hazen, 1990). The following studies demonstrate that children with LI have difficulty with this skill. Craig and Washington (1993) tested 5 children with LI and 8 controls. Of the 8 controls, 4 were age-matched, and 4 were language-matched to the children with LI. Twenty-five children were selected to be partners to the 13 participants to form triads. The authors looked at the attempts of children with LI and their typical matches to access ongoing dyadic interactions (both verbal and nonverbal attempts). The results showed that 3 children with LI were

unsuccessful in accessing the ongoing interaction. Two children with LI were able to access but they did not use typical linguistic forms. Every typical child successfully accessed the interactions.

Brinton, Fujiki, Spencer, and Robinson (1997) extended the work of Craig and Washington (1993) by examining the attempts of older children to access ongoing interactions. The purpose of the study was to determine whether access difficulties would resolve for children who have greater social experience. The researchers examined how well the children with LI accessed interactions between typical peers. They also investigated the child's ability to become integrated into group play following successful access. Subjects included 54 children divided into 18 triads, each with one target child and two partners. There were 6 children with LI, 6 chronological age-matched (CA) peers, and 6 language similar (LS) children. Consistent with previous findings, all of the typically developing children accessed the ongoing interactions, whereas 2 of the 6 children with LI never accessed. It is interesting to note that the success or failure of access was not significantly influenced by the bids offered by partners. The authors wished to determine if the children with LI who did access were really part of the group play. In order to do so, they examined three parameters, including (a) how much each member spoke, (b) how much they were spoken to, and (c) how much of the time they were engaged in collaborative activity (verbal or nonverbal). It was determined that the children with LI produced fewer utterances, were more reticent to participate, and were talked to less often by typical peers than either of the partner groups. Children with LI were silent partners in comparison to typical peers. In addition, sequences in which children with LI were excluded from the triad were frequent and lengthy.

In an attempt to replicate and extend previous findings, Liiva and Cleave (2005) examined the ability of 10 children with LI to access an ongoing interaction between two unfamiliar peers. They differentiated between access by initiation (unprompted initiation towards a peer) and access by response (to a question or play invitation). Results showed that 4 of the 10 children with LI were unable to access by initiation. Children with LI who did access by initiation required a longer time period to do so than typical peers required. After successful access, the authors observed subsequent interactions. Again, consistent with previous studies, children with LI participated less in group play, were addressed by peers less often, and exhibited more onlooking and solitary play behavior than typical peers. In addition, Liiva and Cleave found that language ability was negatively related to time required to gain access successfully. Expressive language ability levels were positively related to number of utterances produced by and also addressed to children.

The above referenced studies indicate that children with LI demonstrate significant difficulty performing basic social tasks such as negotiating, cooperating in small groups, and entering ongoing interaction. When compared to typical peers, children with LI consistently produce fewer negotiation strategies and have less of an impact on group decisions. They play minor roles in group work and make minimal verbal contributions to group activity. Children with LI also demonstrate difficulty accessing ongoing interactions and are frequently excluded and ignored. They produce fewer utterances in a group and are more reticent to participate in group activity than typical peers.

Possible Causes of Social Problems

The cause of social problems in children with LI is unclear. Since language plays a basic role in social communication it seems logical that social problems would result from the linguistic difficulties of children with LI. However, it has also been suggested that the communication and social difficulties of children with LI could stem from a more “general and nonspecific cognitive limitation to do with working memory and processing capacity” (Bishop, 1997, p. 211). Bishop has also speculated that deficits in social cognition could be responsible for the social problems that children with LI experience. Thus, a child that has difficulty in pragmatics may in fact have deficits in some social cognitive abilities that are needed for successful interactions. In fact, research has indicated that children with LI have deficits in emotional competence that may contribute to social problems (Ford & Milosky, 2003; Fujiki, Brinton, & Clarke, 2002). These problems could exist in association with LI but may not be the direct result of impaired language. Several explanations for the social problems of children with LI will be reviewed in the following section including language, working memory, social cognition, and emotional competence.

Language. It seems reasonable to assume that social problems are associated with language deficits since language is an essential part of most social interactions. Redmond and Rice’s (1998) Social Adaptation Model (SAM) suggests that a child’s language limitations directly affect social behavior. The SAM suggests that children with LI recognize their linguistic difficulty and adapt by withdrawing or avoiding interactions in which they are likely to struggle. Thus, they have limited practice using their language skills. When an interaction does occur for a child with LI, it is more likely to result in a

negative experience (Bishop, 1997; Rice, 1993). In a study discussed earlier, Gertner et al. (1994) measured the relationship between language ability and peer acceptance in a preschool classroom. The best predictor of popularity was the Peabody Picture Vocabulary Test-Revised, a formal measure of single-word receptive vocabulary. Gertner et al. supported the SAM model in speculating that children with LI recognize that they have language problems so they try to avoid social interactions where language is used.

A series of longitudinal studies performed by Tomblin and colleagues at the university of Iowa also highlighted the role of language in behavior disorders for children with LI. A group of 1328 children were selected to participate in the research and were followed from kindergarten to fourth grade. Tomblin, Zhang, Buckwalter, and Catts (2000) followed a cohort of these children to determine whether children with LI were at a greater risk for reading and behavior problems than their typical peers. Tomblin et al. used a sample of 581 second graders, 164 with LI, who had been administered a variety of tests to measure language, reading, and behavior. They found that reading disability was directly associated with behavior disorder. However, for children with LI, behavior disorder was conditioned or influenced by the child's reading status.

Although language clearly plays a role in social competence, other research has demonstrated that language disability is not solely responsible for poor social adjustment. In fact, social and behavior problems do not co-occur in all children with LI (Fujiki, et al., 1999; Fujiki et al., 2004). Also, the severity of LI is not always predictive of a child's level of social functioning (Fujiki et al., 2004; Hart et al., 2004). In the second part of the Hart et al. study mentioned previously, subjects were placed into groups according to severity of LI. Results showed that for the most part there was no significant difference

between severity groups when looking at withdrawn behaviors. The exception was that girls with more severe receptive problems demonstrated higher levels of solitary-passive withdrawal. However, in comparing sociable behaviors with severity of LI, there was a significant difference. Children with less severe receptive LI had higher levels of sociability than those children with more severe receptive LI. So, a child's level of sociable behavior was associated with the severity of that child's LI. However, level of reticence was not associated with severity of LI.

Working memory. Research has indicated that children with LI often have problems with working memory tasks. There is a huge body of research that has been conducted in this area. For the purposes of this study, only a small portion of this research will be discussed. It is evident that children with LI tend to be less accurate than typically developing age-matched peers in completing tasks involving nonword or sentence repetition and nonverbal memory (Bishop, 1997; Botting & Conti-Ramsden, 2001; Dollaghan & Campbell, 1998; Edwards & Lahey, 1998; Kirchner & Klatsky, 1985; Montgomery, 2000). Illustrative of this work, Dollaghan and Campbell asked children with LI and their typical peers, ranging in age from 6 to 10 years old, to repeat phonetic strings of nonwords that were 1, 2, 3, and 4 syllables long and controlled for word likeness and articulatory difficulty. The children with LI were significantly less accurate in the nonword repetition task than their typical peers.

In a second example of work involving nonword repetition, Botting and Conti-Ramsden (2001) reported a longitudinal study of 200 children aged 7 years and then 11 years old. Tasks of block design and picture completion were used to measure working memory and performance IQ. The authors concluded that their nonword repetition task

was able to predict test performance for numerous language domains and that working memory was a strong factor involved in LI for elementary school age children.

With respect to social competence, Bishop (1997) suggested a limited processing model in which poor social adjustment might result from deficits in working memory and processing capacity. Or in other words, children with LI may not be able to process all the necessary information for success in social situations. The child with LI might also have difficulty integrating meaning from multiple utterances or interpreting contextual cues.

Donlan and Masters (2000) analyzed the relationship between working memory and social development in 32 children with communication disorders. For a measure of working memory the children were required to point to familiar words in a specific order (the order in which they were read to the child). For a measure of sociability, caregivers, teachers, and speech-language pathologists rated children according to characteristics such as having a best friend, eye contact in conversation, pointing out objects of interest, and using imaginative ideas. The researchers found that level of social skills could be predicted by working memory but not by language comprehension for children with communication disorders.

It is clear that children with LI often have difficulties with working memory. However, the link between working memory and social problems has not been widely explored. Further research is needed in this area.

As noted previously, there is a marked variability in the social functioning of children with LI. Consequently, additional variables that might control or intensify the

influence of LI on social outcomes must be considered. One variable that may potentially play a role is emotion regulation.

Emotion regulation. There has been a large body of research demonstrating that *emotion regulation* influences social functioning in typical and disordered populations. In addition, there are noteworthy links between emotion regulation and language development. Children with LI may have a poorer ability to regulate their emotions and a combination of LI and poor regulation skills could cause significant social problems (Fujiki, Brinton, & Clark, 2002). However, as Fujiki et al. note, there are many factors that can influence emotion regulation such as cognitive functioning, temperament, and socialization practices. So perhaps a child who has poor language skills may still be able to regulate emotion adequately, depending on these other factors. The authors point out that external support from caregivers is crucial to a child's development of emotion regulation and language plays an important role in these interactions. When caregivers discuss emotions with children it allows the child to recognize and understand his or her own emotions and link those emotions to particular events. In fact, the sophistication of maternal talk about emotion is related to a child's success at dealing with his or her own emotions (Denham, Cook, & Zoller, 1992). Sharing emotional experiences with others is a significant factor in the development of emotional competence and most often verbal language is the medium through which these experiences are shared. Children must eventually be able to independently regulate their own emotions internally in order to self regulate, think about verbal responses, and inhibit inappropriate behavior. Language plays an important role in these internal cognitive processes (Saarni, 1997).

It is clear that language is an important factor in emotion regulation skills. However, emotion regulation may also influence language development. If children cannot regulate emotion they may be excluded from participating in certain experiences that would enrich their language skills, such as engaging in sustained verbal interactions or learning appropriate pragmatic skills by tuning in to the needs of a listener (Fujiki et al., 2002). Since there is a relationship between emotion regulation and language ability it seems reasonable to assume that children with LI would be at a disadvantage for learning appropriate emotion regulation skills. Fujiki et al. determined that children with LI do indeed have poorer emotion regulation skills than typical children. Their subjects included 41 children with LI and 41 typically developing children. Teachers of the children completed the ERC. Analyses indicated that the children with LI were consistently rated lower than typical children on the ERC regardless of age. Older boys with LI seemed to have the most difficulty according to ratings on the ERC, and so the authors concluded that maturity and experience did not appear to have resolved difficulties with emotion regulation. Children with LI had particular difficulty with the emotion regulation subscale of the ERC. Although it might be expected that language ability would predict the ability to discuss one's emotions this was not the case. The score from the emotion regulation subscale of the ERC was not highly correlated with language ability as measured by the Clinical Evaluation of Language Fundamentals-Revised (CELF-R; Semel, Wiig, & Secord, 1987). This indicated that there were additional factors involved. Finally, there was a significant difference between typical older boys and older boys with LI on emotional affect items such as appearing sad or listless and displaying flat affect. This significant difference indicated that teacher's perceptions were

influenced by something other than language behavior. Indeed, correlational analysis showed that ERC scores were not highly related to performance on the CELF-R.

In a study previously mentioned, Fujiki et al. (2004) analyzed the severity of LI, social behaviors, and emotion regulation. Their analysis showed that language and emotion regulation scores were both significant predictors of reticence. Together, they accounted for 43% of the variance in social scores. It was determined that there was no significant difference between the two predictive factors when performing group specific analyses. Fujiki et al. concluded that emotion regulation played as important a role in reticence as language.

Emotion understanding. As well as being able to effectively regulate emotions, a child must learn to understand the emotional reactions of other people. Ford and Milosky (2003) suggested that the ability to infer the mental state or feelings of others may be a critical factor in the relationship between language comprehension difficulties and social difficulties of children with LI. The authors posed three questions: (a) Do children with LI have difficulty identifying facial expressions? (b) Can they integrate facial expression knowledge with other verbally and/or visually presented information in order to make a social inference? and (c) Are inferencing difficulties modality-specific? In order to address these questions, the authors examined the ability of 12 kindergarten children with LI and 12 typical peers of the same age to infer certain causes of emotion in context by completing a series of emotion understanding tasks. The children with LI had significantly more difficulty integrating their knowledge of emotion within the context of a story in order to infer the character's emotional reaction compared to typical peers. Children with LI made significantly more valence errors (selecting mad when happy was

the answer). It is interesting to note that inferencing ability was related to performance on a standardized test of language comprehension (CELF-P receptive). The authors concluded that inferencing errors may contribute to the social difficulties experienced by children with LI.

Spackman, Fujiki, and Brinton (2006) replicated Ford and Milosky's (2003) study by presenting common emotion eliciting scenarios to elementary school age children with LI and typical peers. The children were presented with short stories in which Chris, the main character, was placed in situations that would typically elicit anger, fear, happiness, or sadness. The children were asked to indicate what emotion Chris was feeling. Following some of the scenarios, children were asked to talk about the emotions that they associated with that story. They were also asked why the character would experience that emotion and to describe how that emotion would feel. Both groups identified happiness the most accurately, followed by sadness, fear, and anger. Older children were more accurate than younger children in identifying the correct response. Also, typically developing children were more accurate in their responses than children with LI. In addition, children with LI gave less sophisticated descriptions of emotion. They also gave more responses that were inappropriate (off topic or tangential), a restatement of a story event, or a repetition of the emotion in question. For example, when a child with LI was asked how it feels inside to be mad, he gave an off-topic comment about the thunder. Another child with LI restated a story event about a fish dying when asked how it feels inside to be sad. Spackman et al. questioned whether emotion understanding is poor in children with LI due to relatively little experience talking about emotions with caregivers and lack of opportunities to learn about the nature of emotions. They suggested that

perhaps children with LI need more intense and frequent input to learn about emotions and to gain competence in understanding and regulating their own personal feelings.

Another basic aspect of emotion understanding is the ability to recognize specific emotion cues, such as prosody. There have been numerous studies conducted in this area, and the following is just one example. Fujiki, Spackman, Brinton, and Illig (2007) examined the ability of 19 children with LI and 19 age-matched peers to identify emotion conveyed by prosody in a narrative passage. Participants listened to seven-sentence long narratives that were read by actors with the intention of conveying one of four emotions (happiness, anger, sadness, and fear). The participants were then asked to identify the emotion of the narrative. The authors found that the children with LI performed significantly more poorly in the task of identifying emotion from prosody than typical peers. It was also found that happiness was the easiest emotion to identify and fear was the most difficult. This study offers more evidence that children with LI have significant deficits in emotion understanding.

The ability to dissemble or hide an emotional reaction in order to conform to appropriate social conduct is a more sophisticated aspect of emotional competence. Sometimes it is not appropriate for a child to display the emotion that he or she is actually feeling. For instance, when a disappointing gift is received from a grandparent there is a socially appropriate expectation to express thanks. In such a situation children must be able to hide, or dissemble their true emotions. Brinton, Spackman, Fujiki, and Ricks (2007) evaluated the dissemblance skills of 10 children with LI and 19 children with typical language skills ranging in age from 7 to 10 years. They presented 10 hypothetical situations in which the main character, Chris, experiences an emotion that should be

dissembled in order to display appropriate social behavior. The subjects were asked four questions following each scenario. The first was a comprehension question that measured their understanding of the scenario. Second, they were asked to identify the emotion Chris felt. Next, they were asked what Chris should say (a dissemblance question). Finally, they were asked what Chris' parents would want him or her to do. Children in both the typical group and the group with LI did not differ significantly in their understanding of the story. In addition, the groups did not differ significantly in their ability to identify the emotion Chris felt or what Chris' parents would want him or her to do. However, the children with LI indicated that the emotion should be dissembled significantly less often than peers in the typical group. These findings suggested that the children with LI did not understand the impact that failing to dissemble an emotion might have on a relationship as well as typically developing children.

Summary

It has been established that children with LI struggle more than typical peers in several areas of social competence. In addition, they are more withdrawn and exhibit less sociable behaviors than typical peers. Researchers have speculated a great deal about the causes or contributing factors to these social problems in children with LI. For example, Redmond and Rice (1998) proposed a social adaptation model. Bishop (1997) suggested a limited processing model of working memory. Beitchman et al. (1996) focused on the association between LI and the psychiatric outcomes of poor social relationships. Finally, a series of studies have examined emotion understanding in children with LI (Ford & Milosky, 2003; Fujiki et al., 2002). The relationships between language, emotion understanding, and social behavior of children with LI have been reviewed in detail.

However, there are still questions as to how various aspects of development are related to one another. The purpose of this study was to more clearly define the relationships between emotion understanding, language, and social behavior in children with LI.

Method

Participants

Participants included 78 children; 39 children with LI and 39 typically developing peers, matched for age and gender. Participants were selected from the 2nd to 5th grades. The group with LI ranged from 7:1 to 10:10 ($M = 9:3$, $SD = 13$). The typical group ranged from 7:1 to 11:0 ($M = 9:0$, $SD = 12$). Before beginning the study, an application was approved by the IRB, Brigham Young University for the protection of human subjects. To qualify as LI, children were required to have a nonverbal intelligence score above 75 on a standardized intelligence test and performance of at least one standard deviation below the mean on a standardized language test. Subjects with LI were also required to be in a mainstream classroom placement and enrolled in speech and language services or resource services for LI. Finally, the subjects with LI could have no formal diagnosis of emotional, neurologic, or behavioral deficits.

Permission was obtained to contact speech-language pathologists in the Jordan, Alpine, and Nebo School Districts. The speech-language pathologists were asked to identify children in their caseloads that met the above specified criteria. After children who met the criteria were identified, parental consent was obtained. If parents gave permission for their child to participate, they signed an informed consent form.

Once children with LI were identified, potential matches with typical skills were also identified. Teachers were asked to submit the names of typical children in their classroom who were of the same gender and chronological age (within 6 months) of the child with LI. The typical children were not to be enrolled in services for academic, behavioral, or communication problems according to school records. Informed consent forms were sent to the parents or guardians of potential typical matches. Only one typical

match for each child with LI actually participated. This was the first typical child whose permission form was received by the researchers.

Procedures

Children were tested at their own school in a quiet room. The classroom teachers notified researchers of times that were appropriate to test the children. Before participating in the testing, each child signed an informed consent form. Children participated in two sessions lasting between 45 and 60 minutes each.

Children completed tasks that assessed their skills in understanding emotion. Also, each child completed a test of nonverbal intelligence, a standardized language test, a measure of working memory (nonword repetition), and a measure of their perception of appropriate social strategies. After each session, the children were allowed to pick a prize.

Teachers were asked to complete a questionnaire about social skills for each child in their classroom that was a participant. The administration of the emotional understanding and the social strategies tasks were videotape recorded to insure reliability and consistency of the task administration. Tasks and instruments that were used are described below.

Measures

Emotion understanding task 1: Identification of emotion expressed on faces. The identification of emotion expressed on faces was assessed using methods from Spackman, Fujiki, Brinton, Nelson, and Allen (2005) in order to examine emotional understanding while minimizing reliance on language. Children were shown 24 standardized photographs selected from Matsumoto and Ekman's (1988) standardized

photographs of facial expressions. Children labeled the emotion being expressed using previously taught symbols. The emotions assessed were happy, mad, scared, sad, surprised, and disgusted.

Emotion understanding task 2: Structured dissemblance. The ability of children with LI to appropriately dissemble emotion in a structured task was measured based on methods from Brinton et al. (2007). Children were presented with 10 simple scenarios. Each scenario consisted of a main character Chris who is exposed to various situations that would typically elicit a particular emotion such as happiness, sadness, fear, anger, or disgust. For example, “Chris receives a sweater from his grandmother that Chris thinks is very ugly. He does not want to wear it. His grandmother washes the sweater and it shrinks. Now it is too small for Chris to wear.” After listening to the situation subjects were asked what the character should say. For example, in the above situation Chris would feel happy, but it would not be appropriate for him to express this happiness to his grandmother. There were two scenarios to represent each emotion, and the task took approximately 10 minutes to administer.

Teacher Behavior Rating Scale (TBRS; Hart & Robinson, 1996) was administered to teachers for a measure of each child’s social functioning. The TBRS is a 74-item questionnaire that contains a scale measuring subtypes of aggressive, anxious, withdrawn, and sociable behavior. For example, there are several items that are indicative of reticence such as staring at other children without interacting with them and fear in approaching other children. A longer version of the TBRS has been administered in various studies examining the behavior of children with LI and their typically developing peers (Brinton et al., 2000; Fujiki et al., 1999; Hart et al., 2004). In addition it

has been used to measure the behavior of preschool and elementary age children in different cultures (Hart et al., 2000). The psychometric properties of the TBRS have been extensively examined and documented (Fujiki et al., 1999). A copy of the TBRS is available from Dr. Craig Hart, Brigham Young University.

The Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999). The CASL is a standardized norm-referenced language test for individuals between the ages of 3 and 21 years. It includes subtests in four areas of language: lexical/semantic, syntactic, supralinguistic, and pragmatic. The CASL provides subtest scores as well as an overall core composite score. For individuals between 7 and 21 years old the core composite score is derived from a combination of scores from five subtests. The CASL was used to establish that all participants with LI in the study scored at least one standard deviation below the mean on a standardized language test, and that typical peers scored within normal range.

The Universal Nonverbal Intelligence Test (UNIT; Bracken & McCallum, 2003). In order to establish that all participants in the study including the children with LI had typical nonverbal intelligence scores, the UNIT was administered to each child. The UNIT is a formal, standardized, nonverbal test of intelligence for children aged 5 to 17 years. The UNIT does not require participants to provide oral responses, read, write, or listen to verbal instructions. Therefore there is no disadvantage for children with LI because the test is designed to measure solely cognitive and not linguistic ability. The test uses only manipulatives, gestures, and paper and pencil for an assessment that is not biased by language, ethnicity, race, or hearing status. There were four subtests

administered including symbolic memory, cube design, spatial memory, and analogic reasoning. This version of the UNIT required approximately 30 minutes to administer.

Nonword repetition task. To evaluate the language processing skills of each participant, a nonword repetition task was administered. This task is a culturally-nonbiased way to separate children with LI from typical peers. The stimulus for this study was based on Edwards and Lahey's (1998) study in which they created 3- and 4-syllable nonwords for children between the ages of 4 to 9 years old. Participants were asked to repeat 4- and 5-syllable nonwords (10 nonwords total) that had strong-weak-strong-weak-(strong) patterns. The nonwords were produced by a female speaker in a sound booth, with a microphone placed 6 inches from her mouth. They were digitally audiotape recorded, converted into MP3 files, and then copied onto a CD for administration. This task took less than 2 minutes to administer.

Data Analysis

The data were analyzed using SEM. The purpose was to examine the extent that certain factors such as emotion understanding, working memory, and language ability might predict outcome variables such as reticent withdrawal and sociable behavior.

Results

Participants were divided into two groups according to their language status (LI and typical). Means and standard deviations for the variables of interest for both groups are presented in Table 1. SEM was used to determine if the variables studied were significant predictors of prosocial and reticent behavior in the two groups. The potential predictor variables included language (represented by the overall standard score from the CASL), a basic emotion recognition task (recognizing facial expressions of emotions), an emotion understanding task (dissemblance of emotion), and a measure of working memory (nonword repetition). The initial SEM that was developed included nonverbal intelligence as a covariate (see Figure 1). Preliminary analysis indicated that this variable did not have a direct effect on any of the path relationships. Thus, nonverbal intelligence was omitted from subsequent models.

Separate models were constructed for the typical children and the group with LI. A comparison of these two models indicated differing results. For the children with LI, prosocial behavior was predicted by dissemblance, $Z = 2.12$, $p = .03$. Additionally, the standard language score also predicted prosocial behavior, $Z = -2.41$, $p = .02$. None of the other relationships was significant. Regression coefficients, Z values, and significance levels for all variables are presented in Table 2. In contrast, for children with typical language skills, reticence was related to dissemblance, $Z = -2.83$, $p = .00$. The standard language score also predicted reticence, $Z = -1.97$, $p = .05$. None of the other relationships was significant. Regression coefficients, Z values, and significance levels for all variables are presented in Table 3.

Table 1

Means and Standard Deviations for the Typical Group and Group with LI

Group	Variable	<i>M</i>	<i>SD</i>
LI	Language Standard	76.19	7.34
	Nonverbal IQ	94.90	9.52
	Nonword repetition	60.42	8.81
	Facial recognition	17.89	2.95
	Dissemblance	2.06	2.28
	Prosocial	5.53	2.91
	Reticence	3.97	2.55
Typical	Language Standard	102.17	9.23
	Nonverbal IQ	105.30	10.71
	Nonword repetition	72.34	5.46
	Facial recognition	19.56	2.38
	Dissemblance	4.39	2.56
	Prosocial	7.93	2.51
	Reticence	1.10	1.14

Note. Language Standard is the composite score from the CASL. Nonverbal IQ is the standard score from the UNIT. Nonword repetition score is the mean total of nonword syllables correctly repeated. Facial recognition is the mean number of emotions correctly identified on the facial recognition task. Dissemblance is the mean number of scenarios on which children indicated an emotion should be dissembled. Prosocial and reticence scores are the mean total score for each of these behavioral subtypes on the TBRs.

Table 2

Unstandardized and Regression Coefficients, Z and p Values for the Group with LI

Variable Relationships	Unstandardized	Standardized	Z	p
Prosocial <- Facial recognition	.14	.14	.84	.40
Prosocial <- Dissemblance	.42	.33	2.12	.03
Prosocial <- Working Memory	.03	.10	.65	.51
Prosocial <- Language Standard	-.15	-.39	-2.41	.02
Reticence <- Facial recognition	.14	.17	.92	.36
Reticence <- Dissemblance	-.01	-.01	-.05	.96
Reticence <- Working Memory	-.07	-.25	-1.50	.13
Reticence <- Language Standard	-.04	-.11	-.63	.53

Table 3

Unstandardized and Regression Coefficients, Z and p Values for the Typical Group

Variable Relationships	Unstandardized	Standardized	Z	p
Prosocial <- Facial recognition	-.08	-.07	-.47	.64
Prosocial <- Dissemblance	.20	.20	1.28	.20
Prosocial <- Working Memory	.04	.08	.51	.61
Prosocial <- Language Standard	.04	-.14	.89	.37
Reticence <- Facial recognition	.08	.17	1.23	.22
Reticence <- Dissemblance	-.18	-.40	-2.8	.00
Reticence <- Working Memory	-.03	-.14	-.97	.33
Reticence <- Language Standard	-.03	-.28	-1.97	.05

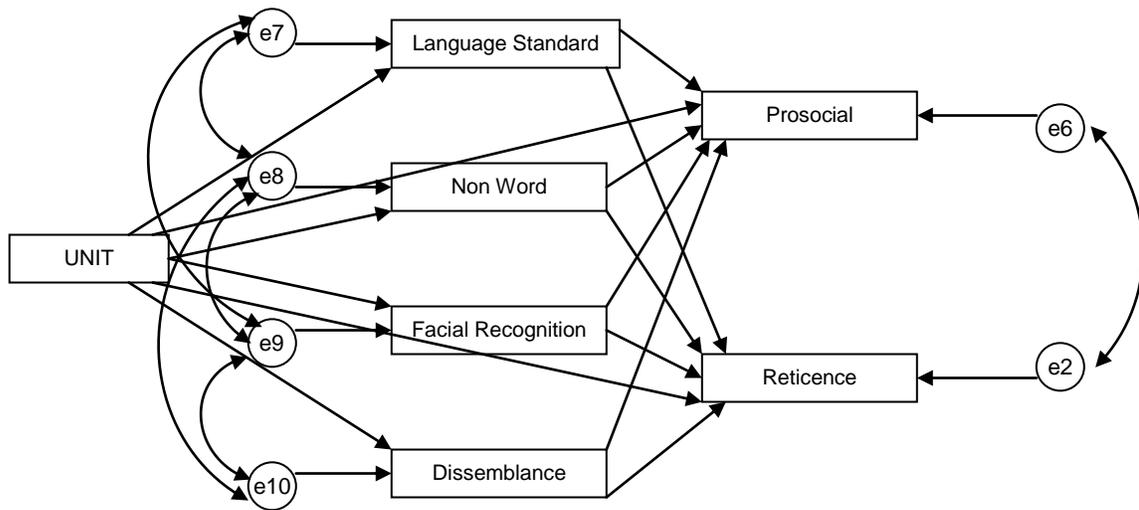


Figure 1.

Illustrates a hypothesized SEM of predictive factors for prosocial and reticent behavior.

Nonverbal intelligence is included as a covariate.

Based on this analysis a reduced model with two predictor variables (language and dissemblance) and two outcome variables (prosocial and reticent behavior) was constructed for each group (see Figure 2). For children with LI, the resulting SEM indicated that dissemblance predicted prosocial behavior, $Z = 2.03, p = .04$. Similarly, language predicted prosocial behavior, $Z = -2.22, p = .03$. None of the other relationships was significant. The correlation between dissemblance and language was relatively low ($r = .17$) indicating that both variables were uniquely correlated with prosocial behavior. For children in the typical group dissemblance was predictive of reticence, $Z = -2.52, p = .01$. The language standard score was predictive of reticence, $Z = -1.95, p = .05$. The correlation between dissemblance and language was relatively low ($r = .20$) indicating that both variables were uniquely correlated with reticent behavior.

Individual paths were tested one at a time by constraining the estimates of each of the paths to be equal across groups. It was found that the effect of language on prosocial behavior was significantly different between groups, $X^2(1, N = 78) = 5.29, p = .02$. None of the other three paths in the reduced models was significantly different between the two groups.

A final model was constructed in which the effect of language on prosocial behavior could differ between groups but the other paths were constrained to be equal across groups. No significant differences were observed, $X^2(3, N = 78) = 1.51, p = .68$, indicating that this model fit the data well.

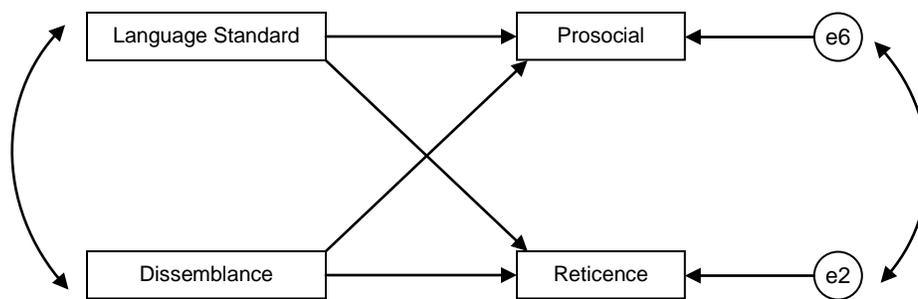


Figure 2.

SEM illustrating a reduced model with two predictor and two outcome variables.

Discussion

The relationships between language, emotion understanding, and social behavior of children with LI have not been clearly defined. The purpose of this study was to determine how language, emotion understanding, and working memory influence reticent withdrawal and prosocial behavior in children with LI. Participants of the study included a group of children with LI and a group of typical peers. Children completed a test of nonverbal intelligence, a standardized language test, a measure of working memory, and tasks that assess various levels of understanding emotion. SEM was used to estimate models of the data using a maximum likelihood procedure for each of the groups.

For children with typical language skills, both dissemblance and language were negatively linked to reticence. So, as both dissemblance and standard language scores decreased, the level of reticence increased. None of the other relationships was significant. For the children with LI, there was a positive relationship between dissemblance and prosocial behavior, with dissemblance scores increasing as prosocial scores also increased. Additionally, there was a significant negative relationship between standard language score and prosocial behavior, with standard language scores decreasing as prosocial ratings increased. None of the other relationships was significant. In the reduced model that contained two predictor variables (language and dissemblance) and two outcome variables (prosocial and reticent behavior) the effects remained the same. It was determined that for the typical group both predictor variables (dissemblance and language standard score) were uniquely correlated with reticent behavior. For the group with LI, the same two predictor variables were uniquely correlated with prosocial behavior. When the four individual paths were tested one at a time, by constraining the estimates of each of the paths to be equal across groups, only the effect of language on

prosocial behavior was significantly different between groups. None of the other three paths in the reduced models was significantly different between groups. So, a final model was constructed in which only the effect of language on prosocial behavior could differ between groups and this model fit the data well.

The results from the typical group were generally consistent with expectations, but there were some surprises. Children with lower linguistic and emotion understanding skills would be expected to be more reticent than peers with stronger abilities. Thus, the relationship between these variables could be predicted. However, it was puzzling that emotion understanding, at least as measured by dissemblance, and language, as measured by the CASL, did not predict prosocial skills. One would expect sociability to be tied into language and emotion understanding. One explanation for this mismatch could be that there is a certain level or threshold of language ability required for prosocial skills. After a child reaches that threshold, his or her prosocial skills might no longer be closely linked to language or emotion understanding. A comparison with arm strength can be used to illustrate this idea. When a person has achieved a certain level of arm strength, he or she may be able to lift a 1-pound weight. However, for typical individuals, the ability to lift that weight is not correlated with arm strength because almost every typical individual has arm strength far beyond the minimal level needed to perform the task.

Results for the group with LI are difficult to interpret because of the unexpected negative association between language and prosocial scores. This association is contradictory to expectations based on previous work. For example, Hart et al., (2004) found that children with less severe receptive LI had higher levels of sociability than those children with more severe receptive LI. So, a child's level of sociable behavior was

associated with the severity of that child's LI. Level of reticence was not associated with severity of LI. The negative relationship that was found between language and prosocial behavior in this study is puzzling.

In considering this finding, it is first recognized that it may be accurate. Even though the negative effect of language ability on prosocial behavior does not seem to make sense, these variables may be negatively correlated for reasons not currently understood. It may be the case that these findings are accurate for the children sampled, or that the findings are tied to the measures used. These explanations are elaborated upon as follows.

It is possible that the observed findings are related to the measures used. Language was assessed using a single test. Although the CASL was standardized on a large randomized sample, it is possible that using a different measure of language would produce differing results. It is also the case that prosocial ability is just one type of sociable behavior. If the SEM had included a different type of sociable behavior, such as likeability, the results may have been different. It may also be the case that if prosocial behavior were measured in a different way the results may have varied. In the current study prosocial behavior was measured on the basis of teacher ratings of five items. These included; offers to help a child having difficulty with a task, offers to share materials with peers, helps other children who are feeling sick, shows sympathy to someone who makes a mistake, and comforts a child who is crying or upset. Since there were only five items, the data collected may not have provided an accurate or comprehensive representation of true prosocial behavior.

Another potential explanation is that the data that were collected may have produced a result that was unique to the current group of subjects being tested. It is also possible that it was related to the current administration, and was influenced by factors specific to this testing. In this regard it will be important for future researchers to examine these questions to determine if this finding is unique to this study or is more generalizable.

It was also found that dissemblance and CASL scores were not significantly related to reticence in the group with LI. This finding replicates past research (Fujiki et al., 1999; Hart et al., 2004). Perhaps the lack of a relationship can be explained by the fact that reticent behavior can be due to numerous and variable factors. Fujiki et al. (2004) stressed that reticence does not simply result from poor language ability, but rather represents a more fearful and anxious behavior involving language and emotional factors. It is likely that factors other than language were influential here. For example, a child may simply have an inherent anxious or fearful personality. Regardless of language skill, that child may be naturally shy and hesitant to engage socially with other children. It is also possible that reticence might be related to environmental factors, such as parenting styles, level of emotional support, and a variety of other factors not examined in the current study.

This study raises a number of issues for future study. It was noted previously that the negative relationship between prosocial behavior and language in the group with LI might have been the result of the specific measures used. It is recognized that this issue is also relevant to the study as a whole. It is clear that the current results depend heavily on the specific tasks used to measure language and emotion understanding. It is important

to note that the CASL is a global, standardized measure of language. As such it combines measures of a variety of language skills. It may be that the overall combination of skills masks the influence of individual language abilities. It is likely that if the study had focused on a specific type of language behavior (rather than the composite) the results would have been different.

It is also important to note that this study used dissemblance for a measure of emotion understanding. Dissemblance can be classified as a midlevel task of a person's theory of mind. There are other numerous measures that could have been used, and another measure may have produced differing results. In addition, it might be beneficial to gather a more comprehensive picture of prosocial behavior. Such tests would more closely parallel the CASL, since it is comprised of several subtests measuring different aspects of language competence.

Finally, it should also be pointed out that the sample size might have influenced the findings. Hoyle (1995) recommends a sample size of at least 100 to 200 subjects for SEM. This study contained only 78 subjects. It would be beneficial to collect data from a larger sample of children, in order to have more confidence in causal relationships. To summarize, this study found a negative correlation between language ability and prosocial behavior for the group with LI. This relationship was significantly different between groups. In the future, these variables must continue to be explored. It must be determined whether these results are specific to this population studied or if they are more generalizable. As mentioned, it would be interesting to combine some different tests of emotion competence as well as include other measures of prosocial behavior in the

analysis. If identical procedures are followed, more subjects could be added to the current data to increase the sample size and the SEM repeated.

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Appendix A. Informed Consent

(For parents of children with LI)

Introduction

This research study is being conducted by Dr. Martin Fujiki, Brigham Young University, to study the ability of children with language impairment to correctly interpret the emotions of other people. Your child was selected because he/she is currently receiving language intervention.

Procedures

I will ask your child to complete the following tasks: (1) listen to a short paragraph read with various emotional tones of voice and judge what emotion is being conveyed, (2) listen to a short story and tell how the main character feels and what he/she should do, (3) look at pictures of facial expressions and tell what emotion is conveyed, and (4) make judgments about how emotion should be expressed in social situations. These tasks will be videotaped. Your child will also be asked to complete a test of nonverbal intelligence, a standardized language test, and a short memory test. Your child's teacher will complete a questionnaire focusing on social skills. This work will take about 2 to 2.5 hours (divided into shorter segments) of your child's time and 10 minutes of your child's teacher's time. All testing will take place in your child's school.

Risks/Discomforts

Your child will miss some class time. I will work closely with your child's teacher to make sure that research activities do not conflict with normal educational activities.

Benefits

There are no direct benefits to participants. It is hoped, however, that the research will help educators work with the social problems experienced by most children with language problems.

Confidentiality

Be assured that your child's participation will be confidential. All materials will be stored in a locked cabinet at BYU. Names will be removed from research materials and neither your name nor your child's name will ever be used in connection with any presentation of this research. All videotapes will be erased.

Compensation

At the end of each segment of work, your child will be offered a small toy, treat, or school supply to keep.

Participation

Participation is voluntary. If you give permission to include your child in the study, he/she will also be asked if he/she would like to participate. Even if you give consent, your child may withdraw at any time without penalty. Also, you may withdraw him/her at any time.

Questions about the Research

If you have any questions concerning the study, please contact me. My phone number and email address are (801) 422-5994, martin_fujiki@byu.edu.

Questions about your Rights as a Research Participant

If you would like to discuss this study with a person not involved in the research, you may contact Dr. Renea Beckstrand, Brigham Young University, 120 B RB, (801) 422-3873 (renea_beckstrand@byu.edu)

I have read, understand, and received a copy of the above consent and of my own free will allow my child to participate in the study.

Signature _____ Date _____

Consent to Take Part in Research (for parents of typical children)

Introduction

This research is being conducted by Dr. Martin Fujiki, Brigham Young University, to study the ability of children with language impairment to correctly interpret the emotions of other people. Your child was selected because I need children without language problems to serve as a comparison group.

Procedures

I will ask your child to complete the following tasks: (1) listen to a short paragraph read with various emotional tones of voice and judge what emotion is being conveyed, (2) listen to a short story and tell how the main character feels and what he/she should do, (3) look at pictures of facial expressions and tell what emotion is conveyed, and (4) make judgments about how emotion should be expressed in social situations. These tasks will be videotaped. Your child will also be asked to complete a test of nonverbal intelligence, a standardized language test, and a short memory test. Your child's teacher will complete a questionnaire focusing on social skills. This work will take about 2 to 2.5 hours (divided into shorter segments) of your child's time and 10 minutes of your child's teacher's time. All testing will take place in your child's school.

Risks/Discomforts

Your child will miss some class time. I will work closely with your child's teacher to make sure that research activities do not conflict with normal educational activities.

Benefits

There are no direct benefits to participants. It is hoped, however, that the research will help educators work with the social problems experienced by most children with language problems.

Confidentiality

Be assured that your child's participation will be confidential. All materials will be stored in a locked cabinet at BYU. Names will be removed from research materials and neither your name or your child's name will ever be used in connection with any presentation of this research. All videotapes will be erased.

Compensation

At the end of each segment of work, your child will be offered a small toy, treat, or school supply to keep.

Participation

Participation is voluntary. If you give permission to include your child in the study, he/she will also be asked if he/she would like to participate. Even if you give consent, your child may withdraw at any time without penalty. Also, you may withdraw him/her at any time.

Questions about the Research

If you have any questions concerning the study, please contact me. My phone number and email address are (801) 422-5994, martin_fujiki@byu.edu.

Questions about your Rights as a Research Participant

If you would like to discuss this study with a person not involved in the research, you may contact Dr. Renea Beckstrand, Brigham Young University, 120 B RB, (801) 422-3873 (renea_beckstrand@byu.edu).

I have read, understand, and received a copy of the above consent and of my own free will allow my child to participate in the study.

Signature _____ Date _____

Consent to Take Part in Research (for teachers)

Introduction

This research study is being conducted by Dr. Martin Fujiki, Brigham Young University, to study the ability of children with language impairment to correctly interpret the emotions of other people. You are being asked to participate because you are the classroom teacher of a child with language impairment.

Procedures

A child with language impairment and a typically developing child in your class are being asked to take perform a series of tasks that measure the ability to read the emotional reactions of other people. They will also be asked to take a test of nonverbal intelligence, a standardized language test, and a short memory test. We are asking you to complete a questionnaire focusing on social skills. You may return the completed questionnaire in stamped, self-addressed envelope that will be provided.

Risks/Discomforts

This questionnaire is 74 questions long and will take about 10 minutes, per child, for you to complete.

Benefits

This research will help educators work with the social problems experienced by most children with language problems.

Confidentiality

Be assured that participation will be confidential. All materials will be stored in a locked cabinet at BYU. Names will be removed from research materials and neither your name nor your students' names will ever be used in connection with any presentation of this research..

Compensation

We will compensate you \$5 per completed questionnaire as a thank you for your participation.

Participation

Participation is voluntary. You may withdraw at any time.

Questions about the Research

If you have any questions concerning the study, please contact me. My phone number and email address are (801) 422-5994, martin_fujiki@byu.edu.

Questions about your Rights as a Research Participant

If you would like to discuss this study with a person not involved in the research, you may contact Dr. Renea Beckstrand, Brigham Young University, 120 B RB, (801) 422-3873 (renea_beckstrand@byu.edu).

I have read, understand, and received a copy of the above consent and of my own free agree to participate in the study.

Signature _____ Date _____

Child's Assent

Introduction

My name is Martin Fujiki. I work at Brigham Young University. I study the way that children learn to tell what other people are feeling. I am working with children in Mrs./Ms/Mr. _____'s class. I would like your help.

What Will Happen (Procedures)

I will ask you to do several things. I will ask you to listen to a story and tell me how a person in the story feels. I will ask you to listen to another story and tell me how a person in the story feels and what he/she should do. I will ask you to look at some pictures of people and tell me how the people feel. I will ask you to tell me what a person should say when certain things happen. I will ask you some questions about things you like. I will videotape you doing some of these things. I will also ask you to take some tests. You will need to point to pictures, answer questions, follow directions, repeat some words, and solve some puzzles on these tests. Your teacher will answer some questions about how you work with others at school. You will do all the work at school. You will work with us two or three times. It will take an hour or less each time.

Possible Problems (Risks)

You will miss some class time. I will work with Mrs./Ms/Mr. _____ to make sure than you do not miss things in class that are really important or really fun.

Good things that will happen (Benefits)

You will get to pick a small toy or prize every time you work with us.

Who will know about this work (Confidentiality)

You, your parents, and your teacher will know that you are working with us. No one else at your school will know. We will not put your name on any of our papers. We will not put your parents' names or your teacher's names on any of our papers. We will keep all of our papers and work locked up in a cabinet at BYU.

What you will get (Compensation)

Every time you work with us, you will get to pick out a small toy or prize.

Working with us (Participation)

You do not have to work with us if you don't want to. You may quit this work any time you want to. You will still get your prize.

Questions

If you have any questions, please ask me. You can also ask your parents or your teacher. If you want to ask someone else questions about this work, you may call Dr. Renea Beckstead. Dr. Beckstead is a professor at BYU. Her number is (801) 422-3873.

I want to take part in this study.

Signature _____

Date _____

Appendix B. Research Tasks

The following is a detailed description of each of the research tasks to be administered.

1. Training the child to use the emotion cards (children will indicate an emotion by pointing to cards to eliminate the need to verbally name the emotion. In all of the tasks, a spoken answer is considered acceptable.)

Materials: emotion cards representing happy, sad, mad, afraid, surprise, and disgust.

Examiner: "Here are some cards. These cards show some feelings. Each card shows a different feeling. Look at these cards." (Examiner lays out cards one at a time as she reads the corresponding description. Cards are put out in random order for each child.)

"Look at this card. This means happy. Look at the sun. It means happy.
 Look at this card. It means mad. See the lightning? It means mad.
 Look at this card. It means scared. See the ghost? It means scared.
 Look at this card. It means sad. See the tear? It means sad.
 Look at this card. It means surprised. See the exclamation point. It means surprised.
 Look at this card. It means disgusted. See the yucky worms. It means disgusted.
 Look at this card. It means, I don't know, or I'm not sure. See the question mark? It means I don't know.

The examiner puts out all the cards in a line (random order) before the child.
 "Show me happy. Show me mad. Show me scared. Show me sad. Show me surprised. Show me disgusted. Show me I don't know."

If the child cannot point to each label correctly, repeat training.

2. Recognition of emotion in facial expressions in pictures.

Materials: Matsumoto and Ekman picture book of facial expressions of emotion.

Ex: "I am going to show you some faces. I want you to tell me how each person feels by pointing to our cards. Remember that: this card means happy. This card means mad. This card means scared. This card means sad. This card means disgusted. This card means surprised. This card means "I don't know."

How does this person feel? Point to the card that shows how the person feels. (repeat before each item—can discontinue the directions before each item if it is clear that the child understands the task.)

The 24 Matsumoto and Ekman pictures are presented. After five of the questions the examiner says, I wonder why he feels that way. Can you make up a story to tell me why he feels that way?
 "Tell me about a time when you felt that way."

3. Structured dissemblance task.

Equipment: book containing pictures that go with each story

Examiner: "I am going to tell you a story. Then I'm going to ask you some questions. Listen carefully. This is Chris. Chris likes to eat at McDonalds. He does not like salad. He loves chicken nuggets.

Question 1. What does Chris like to eat?

Question 2. What does Chris not like to eat?

If child answers incorrectly:

Examiner: "Listen carefully." (Repeat story and questions.)

Here is another story.

This is Chris and this is Kelly. Chris gets two big suckers. Chris decides to share. She/he gives one sucker to her/his friend Kelly.

Question 1. What did Chris have?

Question 2. What did Chris do with the suckers?

If child answers incorrectly:

Examiner: "Listen carefully." (Repeat story and questions.)

If child answers correctly:

Examiner: Good. Now I am going to tell you some more stories about Chris. I want you to point to how Chris feels. For some questions will use our cards (use same cards as used in the recognition of emotion in music by pointing to labels task). For other questions you can just tell me the answer.

(take the surprise and disgust cards out)

1. (FEAR) This is Chris. This is Chris's class. The whole class is going to the swimming pool. The teacher tells all the kids to jump off the high dive. The other kids are excited to jump off the high dive. But Chris thinks the diving board is very high in the air. He/She thinks he/she will get hurt.

- What does Chris think will happen if he/she jumps off the high dive?
- How does Chris feel?
- What should Chris say to his/her class? (What should Chris say about his feelings?)
- What would Chris's parents want him/her to do?

The following scenarios are presented with the same framework.

2 (SAD). This is Chris. This is Chris's favorite aunt. Chris's favorite aunt comes to visit him/her. Chris's aunt brings him/her a present for his/her birthday. Chris really wants a new scooter. Chris opens the present. It is a shirt. Chris does not want a shirt.

3 (ANGER). This is Chris. This is Chris's best friend, Taylor. Chris likes to play with Taylor every day. Chris and Taylor are playing with water balloons. Taylor throws a water balloon right at Chris's face. It hurts a lot.

4. (HAPPY). This is Chris and his/her Mom. Chris's mom loves to go to the museum. Chris does not want to go to the museum. He/she thinks that the museum is boring. Mom wants to take Chris to the museum. Mom and Chris get in the car to go. The car won't start. They cannot go to the museum.

5. (DISGUST) This is Chris. This is Chris's favorite uncle, Bob. Chris gets to eat dinner at Uncle Bob's house. Uncle Bob makes chocolate cake. He gives Chris a big piece of cake. Chris takes a bite of the cake. The cake tastes really nasty.

6. (HAPPY) This is Chris. This is Chris's Grandma. Grandma knitted a sweater for Chris for his/her birthday. Grandma worked very hard on the sweater. But Chris thinks the sweater is very ugly and he/she does not want to wear it at all. Then Grandma washes the new sweater. It shrinks in the dryer (make gesture for shrinking). It is too small for Chris to wear.

7. (DISGUST) This is Chris. This is Chris's mom. Chris's mom always cooks something good for dinner. One day, Chris's mom is sick. She has to stay in bed. The next-door neighbor, Mrs. Smith, brings dinner for Chris's family. Mrs. Smith brings tuna casserole. Chris thinks the tuna casserole is very yucky.

8. (FEAR). This is Chris and his class. The class is going to Lagoon. There are lots of rides there. The teacher is taking Chris's whole class on the big roller coaster. The other kids love roller coasters. Chris thinks that he/she might fall out of the roller coaster.

9 (SAD). This is Chris. This is Chris's Grandma. Chris wants to be a dinosaur for Halloween. He/She wants his costume to be really scary. Grandma has been working for weeks on Chris's Halloween costume. Grandma finishes the costume and shows it to Chris. It is a Barney costume.

10 (ANGER). This is Chris. This is Chris's good friend, Lee. Chris and Lee are finding seats in music class. Chris starts to sit down. Lee pulls Chris's chair out from under him/her. Chris falls on the floor and it hurts a lot.

Non-word Repetition Task Directions

Listen. You will hear some made up words. I want you to say exactly what you hear. Let's try a practice word. Are you ready?

/tæs/

/pIm/

(If child repeats the first word correctly, say, "that was good," and go on to second word. If child does not repeat correctly, repeat instructions and present the word again).

Now, you will hear some longer made up words through these headphones. After each made up word you will hear a beep. After the beep, I want you to say the word you heard. Say exactly what you hear. Ready?

(begin task)

10 non-words are presented