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USING HEAD START CHILDREN'S LANGUAGE DEVELOPMENT TO PREDICT  
SOCIAL INFORMATION PROCESSING ABILITY

by

Kendra Newman

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Human Development and Family Studies

Approved:

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Logan, Utah

2023

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## ABSTRACT

Using Head Start Children's Language Development to Predict Social Information

Processing Ability

by

Kendra Newman, Master of Science

Utah State University, 2023

Major Professor: Lisa Boyce, Ph.D.

Department: Human Development and Family Studies

The current study examines receptive language development, social information processing ability and social skills development in four- to five-year-old children. Data were collected from 51 children attending various 19 Head Start classrooms. Findings showed that as children progressed through their Head Start year, children answered with more aggressive responses when presented with challenging social situations, rather than socially competent or passive responses even though children's social skills significantly increased throughout the Head Start year. The results suggest there was not a significant correlation between receptive language and social information processing ability, or between social information processing ability and children's social skills. Pretest scores showed a positive correlation between children's competent social information processing scores and receptive language; however, this correlation was not maintained at posttest. Future research should continue to examine the development of social

information processing and factors that may influence young children's social information processing ability.

(78 pages)

## PUBLIC ABSTRACT

Using Head Start Children's Language Development to Predict Social Information

Processing Ability

Kendra Newman

As young children grow and develop, gaining social skills and different language abilities is extremely important. As children develop, they also acquire the ability to process social information, which then helps them respond in various social situations. Children should eventually be able to respond to social situations in socially acceptable ways, instead of answering in aggressive or passive ways. This study examined the relations between children's language development, and social information processing ability. This study included 51 children, from 19 Head Start classrooms. Results showed that at the beginning of the Head Start year children with more language, responded in more socially competent ways than children with less language. By the end of the Head Start year, this association was no longer significant. More research is needed to better understand the role of language development in children's social information processing abilities.

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Kendra Newman

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## CHAPTER I

### INTRODUCTION

As children grow and develop, there are many skills and qualities parents, educators, and childcare providers try to teach and instill in their own children and children with whom they work. Adults have expectations and ideas regarding the skills that children need to be successful adults. The people placed in children's lives have a significant role in the skills and qualities children end up developing to use throughout their life course (DellaMattera, 2011). Some of the most important skills children can gain are social skills (Perry et al., 2018; Mok et al., 2014; Laible, McGinley, et al., 2014; Schoon et al., 2010). Social skills include children's ability to effectively talk and play with others, express themselves, communicate, and problem solve with their peers. When children do not have these skills, problems such as externalizing behaviors and poor emotion regulation strategies arise (Lonigan et al., 2017).

While social skills are essential for children to learn during infancy and early childhood, how children process social information is frequently overlooked. Often children are expected to know what to do and how to respond in many social situations by adults. However, before any social interaction can happen, a child must first process the situation to enact a response. Social Information Processing Theory, adapted by Crick and Dodge (1994; 1996), helps to explain how children process information and understand social situations. In this six-step process, children will (1) encode cues, (2) interpret cues, (3) clarify goals for the situation, (4) access responses to potentially enact, (5) decide which response to use, and (6) enact response decision. This process ends with

the child enacting a response to the social situation. Social Information Processing Theory also considers children's development in terms of their cognitive development, social skills, and emotion regulation abilities.

Social information processing (SIP) has been used to help explain behaviors such as aggression, temper tantrums, disruptive hyperactivity, bullying, and autism (Chester & Langdon, 2016; Becker, 2014, Li et al., 2013). SIP has also been used to understand the workplace, employment length, and delinquent behaviors of adolescents and adults (Santone et al., 2020, Liable, Murphy, et al., 2014). While this theory has broad uses and applications, it has rarely been studied with regard to early childhood processing abilities and children's cognitive development (Denham et al., 2013; Ziv, 2013). More research has been undertaken recently with studies of children between three and five years (Denham et al., 2013). Most past research regarding SIP has been conducted with kindergartners and elementary-aged children (see Becker, 2014; Chester & Langdon, 2016; Liable, Murphy et al., 2014; Schultz et al., 2010). Further exploration into the early childhood years may show ways that SIP can foster social skill development. A greater understanding of this process in early childhood may also help improve interventions for children with poor social skills and could impact future curriculum development focused on teaching children social skills (Li et al., 2013).

SIP includes the use of children's cognition as well as social and emotional development. These influence how children are able to process information. Links have been made between SIP, social skills, and emotion regulation. However, cognitive factors have not been researched as fully as emotional and social development (Li et al., 2013). The only known cognitive factor that has been accounted for in SIP has been executive

functioning skills (Volckaert & Noel, 2015; Quistberg & Mueller, 2020). What has not been researched is the role of language development within the context of SIP (Denham et al., 2020; Li et al., 2013). However, it has been well documented in the research that language development is associated with children's social skills and emotion regulation during early childhood development (Alamos & Williford, 2020; Lonigan et al., 2017). Since language is related to social and emotional development, and SIP is related to social and emotional development, language may also be related to children's SIP ability.

Language development is a critical aspect of child development. Language naturally develops as children hear and see others speak. As children develop language, they will develop the means to have social interactions with other children. As children develop more language, they will develop skills to learn communication so they can begin to build relationships and friendships with others (Beauchamp & Anderson, 2010; Cunningham & Rosenbaum, 2015; Doove et al., 2020). Language development is highly correlated with children's social skills (Zubrick et al., 2009; Beauchamp & Anderson, 2010) such that children with more language demonstrate more social skills than children with less language ability.

Children with poor language and social skills are more likely to develop externalizing behaviors (Hawa & Spanoudis, 2014). Studies have shown that children who display externalizing behaviors are less likely to have the language skills and emotion regulation ability necessary to communicate with their peers when situations arise (Mok et al., 2014; Ramscook et al., 2020). Children need to learn about emotions, what could have contributed to the emotions they feel, and specific language to label their emotions in order to regulate them (Cole et al., 2010). Therefore, language is essential to

be able to prevent externalizing behavior and promote emotional regulation. Without having the language to problem solve and express emotions appropriately when conflicts arise, children cannot convey how they feel, why they feel that way, and how to help fix the problem. Children may struggle to gain the skills to manage externalizing behaviors or regulate their emotions by themselves without having appropriate communication skills (Lonigan et al., 2017).

Language development has been shown to correlate with different aspects that make up SIP, including social skills and emotion regulation; however, less is known about the association between language development and SIP. As language development, social skills, and emotion regulation are related, it is expected that language development and SIP will also be related.

The purpose of this study is to examine the association between social information processing and language development among children aged three to five who attend Head Start. In addition, other child factors including age and gender along with maternal education level will be explored to understand how these factors influence language development, social skills, and SIP. The proposed study will examine the following research questions:

RQ1: Do the SIP responses, social skills, and receptive language scores improve between the pretest (beginning of Head Start) and posttest (end of the Head Start year) scores for this sample of English-speaking preschoolers attending Head Start?

RQ2: What are the associations among demographic variables (maternal education level, child gender, and child age), receptive language, social skills, and SIP responses at the beginning and end of the Head Start year?

RQ3: Are children with average or high average receptive language scores more likely to have higher socially competent and lower aggressive scores than children with below average receptive language scores?

RQ4: Does receptive language predict social skills after controlling for social skill scores at pretest and gender, child age, and maternal education?

4a: Do SIP responses add above and beyond language development to children's social skills?



## CHAPTER II:

### LITERATURE REVIEW

This chapter summarizes the relevant research literature on children's language development, Social Information Processing Theory, and social skills. First, the research literature related to Head Start programs, language development, communication, and their relation to social development will be discussed. Next, how children gain social skills and the importance of social skills are addressed. Externalizing behaviors that may result from poor social abilities will then be discussed. Finally, Social Information Processing Theory will be presented as it relates to children's social skills and language development, and specifically how it guides these developmental topics. Hypotheses for this study will follow.

#### **Purpose of Head Start**

Head Start is a government funded program started in the 1960's as a response to the War on Poverty. Early research showed education had an impact on children's futures and could be a good investment for American citizens and their children. Head Start's goal is to provide affordable childcare and education opportunities to families who would not be able to afford early childhood care otherwise. Families who are enrolled in Head Start programs must meet income requirements in order to qualify. The goals of Head Start are to promote whole child development, including language, social, emotional and cognitive development, along with providing parent education to help promote structural changes within families to help end poverty (Lee et al., 2021).

Head Start programs have a very large focus on children's language development. Helping children gain communication skills, become exposed to different language, start pre literacy and pre reading skills are all core components of Head Start programs. Head Start also provides ample opportunities for learned social skills as the children have opportunities to play and interact with other children and teachers (Lee et al., 2021). This helps children learn social skills and emotion regulation abilities. Because there is a large focus on learning language, social and emotional skills, Head Start programs focus on many aspects of the current study that should be improved throughout the year.

Head Start interventions have proven to encourage child language development. Play-based interventions focusing on teaching children communication skills have been found to be effective in improving the language development of a child (Craig-Unkefer & Kaiser, 2003). Using scenarios of play with children who had poor language skills included using modeling from an adult, planning how the play would go, and enacting the play to teach the children. This helped the child improve their communication skills, engagement, and play skills (Craig-Unkefer & Kaiser, 2003). It has also been found that using teacher coaching in Head Start improved how teachers talk to children, which improved language development of the child (Hindman & Wasik, 2012).

Head Start is also very well known for implementing home visiting programs. Through home visits parents are able to learn how they can change their home environment and how to play and interact with their children. By teaching parents how to enhance the home environment, parents can increase the conversations and play, which helps improve the quality and quantity of words said to children (Suskind et al., 2013). Similarly, home visiting and playgroups help parents see different ways to talk to their

children to encourage language development (Wong et al., 2020). Focusing intervention on social communication is also effective when focusing on turn-taking, response, and initiation (Stanton-Chapman & Snell, 2011).

Head Start also helps children to develop social skills. Play-based interactions and interventions have been shown to improve social skills among children (Stanton-Chapman et al., 2014). Research has shown that children living in poverty tend to have less developed language, social skills and externalizing and internalizing behaviors (Davis & Qi, 2020, Marti et al., 2016, Qi & Kaiser, 2003). Head Start's goals to help children develop language and social skills make it a good fit for the present study to further explore language and social skills in relation to children's social information processing abilities. As Head Start's overall goals help children gain language and social skills, Head Start was a good fit for data collection for this study.

### **Language Development**

Language begins developing during infancy. As infants develop auditory and oral skills, they hear and try to mimic various sounds and intonations. By the time most children reach one year old, they will begin saying words. As children continue to age and develop, their vocabulary does as well. Language acquisition is crucial for development with children from birth to five years old (Beauchamp & Anderson, 2010; Cunningham & Rosenbaum, 2015).

Language development includes receptive and expressive components. Receptive language is how children understand language, while expressive language is how children express themselves. Children need to understand others, comment on what they are saying, take turns talking, and contribute to the topic. They should be able to act as a

speaker-initiator and a listener-respondent (Stanton-Chapman & Snell, 2011). Children who display early receptive or expressive language problems are more likely to develop behavioral problems later (Hawa & Spanoudis, 2014). Research has shown that children who experience receptive language problems are at greater risk for poor outcomes than children with expressive language concerns. Early receptive language problems are a risk factor for poor adult mental health outcomes (Doove et al., 2020). Caregivers also reported more behavior problems when receptive language was a concern. Helping children understand and interact with their peers is an essential aspect of language development and social skills. Communication is a skill that children must learn.

The need for children to know how to communicate with others and understand what others are saying to them is crucial. Communication enables us to express our needs, wants, emotions, thoughts, and is fundamental to human connection and building relationships (Mok et al., 2014, Brekke Stangeland, 2017). Communication reflects children's ability to interact with others using interpersonal skills (Im et al., 2019). Communication influences learning and development along with social adaptation and participation (Doove et al., 2020). Being able to adapt to different social situations is something everyone has to do. Without having social skills, language and communication skills are very difficult to achieve over the life course (Zubrick et al., 2009; Beauchamp & Anderson, 2010).

Some children have language delays or difficulties expressing themselves, making communication an arduous task. As related to social skills, poor communication has been associated with problem behaviors in childhood, poor mental health and well-being, poor social functioning, inability to maintain employment, difficulty maintaining relationships

(Schoon et al., 2010), difficulties in literacy and learning, poor future parenting skill, and social inequalities (Doove et al., 2020). The need for social skills is vital, and communication is an essential part of gaining those skills. Communication consists of using active listening (receptive) language and responding (expressive) language. Children who begin developing the words to express themselves and develop skills to listen to others while listening are more likely to have successful social interactions compared to their peers.

Communication is also a vital part of emotion regulation. As children begin to understand emotions and social situations, they will start labeling emotions and tell their peers and adults how they feel. They begin to recognize what they are feeling and why. This recognition helps greatly influence their emotion regulatory abilities. Labeling and communicating different emotions increases the child's emotional knowledge and socialization abilities (Alamos & Williford, 2020). With increased emotional knowledge, the child also increases their own emotion regulation abilities.

### **Factors Influencing Language Development**

Low SES and poverty have commonly been associated with poor language skills in children. A well-cited work of research by Hart and Risley in 1995 estimated that a 30-million-word gap could be found between children living in poverty or low-income families compared to high-income families by the time a child is four years old (Wong et al., 2020). Since this study, many scholars have further researched this area. Language gaps have been documented in children as early as 18 months (see Fernald et al., 2013). Other environmental factors besides income, such as parent education levels and maternal

age, have also been significant predictors of language development (Fernald et al., 2013; Rindermann & Baumeister, 2015, Maleki et al., 2019).

Research has shown that children with low SES parents may not spend as much time with the parents, and they do not hear as many rich vocabulary words or have as many social opportunities as children in high SES families (Hoff, 2006). What has been found, however, is that language development is dependent on other factors as well. Low SES parents can still supplement their children with rich conversations and storytelling to help close the word gap. Parents who put their children in high-quality preschools and childcare also expose their children to other language experiences outside of the home while providing them with social opportunities to learn vocabulary to communicate and build relationships with others. While high SES parents may have more money for resources, children of high SES families may also experience differing levels of language complexity and conversations at home. Other factors such as culture, ethnicity, multilingualism, peers, school, and birth order have shown equal or greater importance for children's development, instead of SES being the most significant risk factor (Hoff, 2006).

While Hart and Risley (1995) emphasized the importance of the quantity of words, more recent research has emphasized the quality of the language a child hears (Rowe, 2012; Fernald & Weisleder, 2015). The type of language input a child should receive must also be dependent on the child's age and development (Rowe, 2012). Rowe has found that children under two years benefit from hearing a greater quantity of words; however, as the children age, conversations should become more complex as caregivers expose them to different kinds of talk to encourage development (2012). Adding more

diverse and sophisticated words and including narratives and explanations has been shown to be effective in supporting children's developing vocabulary (Rowe, 2012).

Children with more language development have better school performance, vocabulary usage, and reading abilities. In contrast, those with limited language are more likely to display aggressive behaviors, academic problems, social isolation, or withdrawal from social participation (Walker et al., 2020; Levickis et al., 2018; Conway et al., 2017). Fuhs and Day (2011) also found that language and verbal abilities influence children's executive functioning, a large part of regulatory abilities. Having limited language or an inability to communicate with others is associated with poor social competence (Brekke Stangeland, 2017). Children with language limitations may not feel confident or comfortable trying to engage with peers or do not know what they should say to them. Children with language impairments are also more likely to interact more with adults and are often ignored by their peers (Stanton-Chapman & Snell, 2011)

### **Child Social Skills**

The development of social skills in young children is vital to many aspects of life. As adults, we expect children to learn skills to benefit others, such as being able to share, show empathy, cooperate, help others, regulate themselves and their emotions, and use perspective-taking behaviors (Laible, McGinley, et al., 2014). After learning these skills, children should accomplish these acts and behaviors voluntarily and independently (Im et al., 2019). These are all skills we want people to gain to have a functioning, socially acceptable environment. Children with more prosocial behavior will not only have these skills but will benefit significantly because of them. Children with more competent social skills are more likely to perform better in school, receive higher grades, be happier, make

more friendships, show less internalizing and externalizing behaviors, and are less likely to show teen delinquency (Perry et al., 2018; Mok et al., 2014; Laible, Murphy et al., 2014; Schoon et al., 2010).

Social skills develop in a variety of ways during early childhood. Social skills are “successful initiation[s] of peer relationships” (Denham et al., 2003, p.238), which help children to develop prosocial behavior. When children are first beginning to learn social skills, they need support from adults and peers around them to understand prosocial behavior. Parents, teachers, and peers play a huge role in what children are learning and the kinds of prosocial behaviors they are gaining or not gaining (DellaMattera, 2011). Adults surrounding children, along with other children, influence what the child is learning. Seeing adults and peers in various situations shows children a “socially acceptable” way to react to something and models expected and acceptable behaviors for the children to enact. Children in environments where they see abusive or aggressive behaviors are more likely to act in the same way, whereas children in positive, nurturing environments are more likely to behave more positively (Darwish et al., 2001; Alamos & Williford, 2020). Practicing and gaining exposure to different social situations and people is another way which children learn. Until children are in the moment with a problem, they do not always know how to react.

Environmental and cultural factors are also very influential in what social behaviors children learn (Maleki et al., 2019). Significant associations have been found between children’s social skills, parental income level, maternal education, and maternal age (Maleki et al., 2019). Berry and O'Connor (2010) found poverty to predict poor social skills. Children who are in abusive or neglecting environments may also have poor social



skills. Maltreated children compared to their non-maltreated peers have difficulty with social skills in initiating interactions with peers and showing a capacity for self-control (Darwish et al., 2001). Maltreated children have also been shown to have more problem behaviors (Darwish et al., 2001). In addition to what they see modeled at home, another reason for more inadequate initiation skills may stem from a lack of experience or knowledge in engaging with others. Children who are maltreated are not always able to have the experience of being with other children if the maltreatment includes any isolation. Maltreated children's social skills may also reflect the expectations of others' responsiveness. Some children experiencing maltreatment do not expect to get a response or may expect a negative reaction for any social interaction they try to make (Darwish et al., 2001).

Children from different cultures and with different abilities also learn social skills, but it may occur in slightly varied ways from other children (Maleki et al., 2019). Children from different cultures may value different social skills to learn, whereas another culture may not. For example, Native American, Asian, Hispanic and Middle Eastern cultures may not make eye contact as it can be considered rude or disrespectful, whereas other cultures value eye contact during conversation. This does not mean children are not learning social skills, they are just learning different skills according to their cultural norms and beliefs. Children with disabilities may also have differences in being able to understand elements of social skills such as communication, understanding, and initiation (Stanton-Chapman & Snell, 2011). Specific skills could be under or over-developed making it harder for the child with disabilities to understand the social cues. Interventions can use the same techniques for any child; however, more time, practice,

and patience may be needed, along with more repetition for children with disabilities to understand the skills being taught. Similarly, children of different cultures or who speak different languages may have lower social abilities resulting from language and cultural barriers that prevent the child from understanding a new environment (Maleki et al., 2019). Gaining insight and continuing research into these components of social development would help further understanding.

Children who develop age-appropriate social skills have a much easier time learning and understanding social behaviors and situations than other children. Children who have learned appropriate social skills can react to different social situations and have an easier time responding to problems and showing regulatory abilities. Most young children have moderate social skills, meaning children are not competent in all situations but have enough social skills to get through a social situation without serious behavioral actions (Denham et al., 2013; Maleki et al., 2019). However, many children will still display moments of challenging and aggressive behaviors (Vahedi et al., 2012). As the number of behavior problems during early childhood has continually increased it emphasizes the importance of learning social skills during the early childhood years. During early childhood, children are experiencing many things for the first time. Imagine feeling anger, jealousy, or disappointment for the first time and not knowing what it is, why it is being felt, and what to do about it. When adults can understand all the changes and new emotions that children experience, it is not surprising that children may act aggressively towards their peers. Learning the skills to act in socially competent ways in every social situation is a nearly impossible task for young children, ergo the reason for children acting out in aggressive ways. By helping to increase children's understanding

and implementing intervention and prevention techniques, children can develop the social skills they need to be successful (Quistberg & Mueller, 2020; Vahedi et al., 2012).

The role of gender in social skill development is inconclusive. While some studies state there are no significant differences between boys and girls in social skills (Maleki et al., 2019), other studies have found significant differences (Lonigan et al., 2017, Stanton-Chapman & Snell, 2011). Maleki (2019) suggests that gender roles may be one reason for differing results. Many cultures deem it unacceptable for girls to act aggressively or assertively, while aggressive and assertive behavior among boys is more acceptable. Further research into gender roles and the socialization of gender roles may help increase understanding of gender differences in social skills.

### **Externalizing Behaviors, Self-Regulation, and Social Skills**

Externalizing behaviors “refers to a grouping of behavior problems that are manifested in children’s outward behavior and reflect the child negatively acting on the external environment,” (Jianghong Liu, 2004, p. 93) and include a variety of behaviors where children lack control. They can include aggressive and disruptive behaviors, such as hyperactivity and temper tantrums (Quistberg & Mueller, 2020). Externalizing behaviors are difficult for parents, teachers, and children to cope with. Preschool teachers report externalizing behavior as the biggest challenge in the classroom (Vahedi et al., 2012). Understanding externalizing behaviors, how to respond to them, and how to help children overcome their behaviors is essential for all educators and parents to know. The roles of parents and early childhood teachers as socializers to help children understand

and use emotional language can determine many future behaviors in children (Alamos & Williford, 2020).

Externalizing behaviors start during early childhood and can last into adolescence or adulthood (Perry et al., 2018, Winsler & Wallace, 2002). Externalizing behaviors in childhood have been linked to poor academic performance, difficulty maintaining employment in adulthood, executive functioning, and social competence (Quistberg & Mueller, 2020; Vahedi et al., 2012). Boys generally exhibit more externalizing behaviors and are diagnosed with these behaviors more often than girls are, and they are more likely to emerge during the transition to school (Lonigan et al., 2017). Some studies also indicate there may be gender differences in how children regulate emotions and develop language skills to help regulation abilities (Lonigan et al., 2017).

Emotion regulation is also a crucial component of children's social skills and prevention of externalizing behaviors. If children cannot regulate their emotions and have difficulty showing self-control, they may use aggression or occasionally passiveness to communicate what they feel in unhealthy or destructive manners (Darwish et al., 2001). Children with poor social-emotional skills are at a greater risk of having other problems, including poor relationships with peers, underachievement in school, externalizing behavior, or physical and mental health problems (Im et al., 2019).

Peer conflicts are challenging social situations, and children can struggle to show regulatory abilities during conflict periods (Darwish et al., 2001). Conflicts are high on emotion, during which children have difficulty being aware of others involved because they are worried about the emotions they are feeling. Conflicts become times where children may act out in more aggressive ways as a result of their own emotions. Conflict

can be seen in situations with other children, but conflict may also be directed towards objects that they struggle to use and manipulate. Darwish et al. (2001) found that during free play, children's aggression was mainly directed at toys or materials the children were using, and was not directed towards other children involved in the play as often.

Externalizing behaviors may be decreased by teaching children social skills, emotion regulation skills and executive functioning skills. Using executive functioning as an intervention to help children gain attention, inhibition, flexibility, and working memory has been shown to reduce children's externalizing behaviors (Volckaert & Noel, 2015). Teaching children engagement techniques like entering play and starting activities while in the classroom could also be beneficial in decreasing levels of externalizing behavior (Alamos & Williford, 2020; Mendelsohn et al., 2018).

Children's social development impacts many areas of development. Links between social skills and externalizing behaviors impact cognitive, physical, and emotional development (Arnold et al., 2012; Sindik et al., 2014; Vitiello & Williford, 2016; Ziv & Sorongon, 2011). Understanding how increasing skills in different developmental areas can also increase the skills in another area is highly important for people working with children. Understanding how social skills affect child development and how children gain social skills is necessary for anyone working with young children to understand. As the literature suggests, without appropriate social development, children are more likely to develop externalizing behaviors and other negative behaviors can follow into adolescence and adulthood. Children who can gain appropriate skills, on the other hand, are more likely to have better communication, create more friendships and have a higher quality of life. Parents and childcare experts can help children in

gaining the social skills they need to succeed (Ramsook et al., 2020, Stanton-Chapman & Snell, 2011).

### **Social Skills and Language Development**

Links between language, social and emotional development have been well established. Ramsook and colleagues found that language abilities and social communication skills were predictors of self-regulatory abilities in preschool and kindergarten children (2020). However, children who cannot communicate their emotions and regulate them are more likely to have externalizing behaviors. Children may not have the skills and knowledge to communicate due to a lack of relevant vocabulary or experience interacting with peers. Children with lower language abilities have also been associated with higher externalizing behavior even after controlling for regulation ability (Lonigan et al., 2017).

Children with language delays have been shown to have difficulties in emotion regulation (Cole, Armstrong & Pemberton, 2010). Children who may have trouble expressing themselves, do not understand language or start speaking later than other children the same age do not have as many emotion regulation skills as children with normative language development. Cohen states that early language and communication impairments are related to later learning and emotional disorders in adolescence (2010). Children with delayed language development are not always able to understand different social experiences. When children cannot understand what is happening in social settings, or lack the communication skills necessary for socialization, they are more likely to show externalizing and internalizing behaviors. They may also have poor regulation as they

may not fully understand theirs and others' emotions or have the language necessary to identify their emotions.

Improving language development can be beneficial in many areas of a child's development. By doing so, this may help children to initiate play and conversations (Stanton-Chapman & Snell, 2011). Improving language also helps decrease externalizing behaviors, improves the child's social competence and knowledge, and improves emotion regulation (Doove et al., 2020; Stanton-Chapman & Snell, 2011, Test et al., 2010). When adults talk with children about their emotions, it helps them understand their own and others' emotions and improves their language development and ability to communicate about emotions. As children continue to understand emotions, they can have more positive relationships with peers and experience greater regulatory abilities and behaviors through the language they have developed (Test et al., 2010).

Language development has also been linked to social acceptance and social competence (Doove et al., 2020). Children with better language development can initiate conversations, respond to peers, and take turns alternating who is speaking (Stanton-Chapman & Snell, 2011). Children with these skills are more likely to be able to create friendships with peers than children who lack these skills. Stanton-Chapman and Snell also state that these children are preferred communication partners and are more likely to be accepted by peers (2011).

Understanding the roles of language and social skills in early childhood are important for parents and educators to understand. A part of gaining social skills that is often overlooked, however, also includes the ability to understand and process social

information. One theory that helps relate how children can process social information and demonstrate social competence is Social Information Processing Theory.

### **Social Information Processing Theory**

Social Information Processing (SIP) Theory, adapted by Crick and Dodge (1994), explains in a six-step sequence how children interpret and process social cues and interactions by using a complex interaction of social and cognitive actions. The first two steps of the model, proposed by Kenneth A. Dodge, are mental processes where the child is focusing on internal and external environments and interpreting the situation as to what they perceive (Schultz et al., 2010). The last four steps of the model involve forming a behavioral response and enacting that response. The steps are as follows: (1) encoding social cues, (2) interpreting cues, (3) clarifying goals, (4) accessing a response, (5) making a response decision, and (6) enacting the behavior (Crick & Dodge, 1994;1996; Schultz et al., 2010). It should also be noted that the original model of Crick and Dodge combined steps 4 and 5 to be response access and decisions. These were later separated into two different steps in the reformulated model; however, some researchers do not differentiate between the two steps (See Crick & Dodge, 1994; Dodge et al., 1986, Crick & Dodge, 1996). Researchers and interventionists primarily use SIP to identify behavioral problems, specifically aggression, and correct those problems by teaching the child effective SIP strategies (Hersh, 2012). By identifying the step in which a child lacks the skills or needs improvement, interventionists can then use techniques to help improve their skills to process social situations.



## **Mechanisms of SIP**

Environmental factors have been shown to play a role in children's SIP. For children growing up with sociodemographic risk factors, or for those who are being maltreated or abused, their experiences may lead them to believe aggression is the way they should act in a situation (Ziv & Sorongon, 2011; Darwish et al., 2001)

Children with aggressive behaviors may not have the ability to process social information. If the child's past social experiences include more harsh and aggressive responses, they may respond to social situations in aggressive ways (Ziv, 2012). Children who are aggressive may be misinterpreting social situations and showing a poor ability to use SIP.

Crick and Dodge (1994) also state that the flow of processing in SIP theory is circular and nonlinear. Of the six steps, any step can occur at any time. Children actively use all process steps at any given time rather than only focusing on one step at a time. While the steps are not necessarily sequential, Crick and Dodge (1994) present the steps in a sequential order that may be common for many children.

## **Steps of SIP**

The first step for SIP is the encoding of cues. In this step, children need to interpret social cues. For children to interpret social cues, they must first attend to the situation. They must be aware of what is going on around them and aware of what is happening with other people in the area (Crick & Dodge, 1994). Children must attend to what is happening to encode the cues from a situation in their brains. Encoding is the first learning opportunity, so children have information to interpret the social interaction. By

paying attention to the interaction, they will have something they can encode, which will give them something to interpret.

After children encode the situation, they must then interpret it, the second step of SIP. Children have a “database” that includes previously stored knowledge, experiences, memories, and schemata. Each child’s database highly influences interpretation processes. Interpretation includes different processes in how children can interpret information. Crick and Dodge (1994, 1996) also address different ways children can interpret cues from others. These interpretations can consist of one or more different processes that influence what the child interprets. Children can interpret cues in a variety of different ways, including filters, personalized representations, analysis of events from the situation, inferences of the situation, goal assessment from previous exchanges, evaluation of outcome expectations, and inferences of meaning for the self and peers (Crick & Dodge, 1994). By engaging in these interpretational processes, children may also revise previous memory stores and schemata in the database at that moment.

After the situation has been interpreted, children can select a goal to get them to the intended outcome. Selecting a goal helps guide the child into enacting a response to the situation. The children’s goal is to get their desired outcome, but they focus on arousal states that function to produce outcomes specific to their goals (Crick & Dodge, 1994). According to Crick and Dodge, as children are clarifying the goal, they are thinking about themselves and the social situations they are in. Because they are thinking about the current situation, they can revise their goals or create new goals based on the stimuli they are receiving (1994). Goal clarification can include internal and external goals for the outcomes the children want to produce.

During response access, the fourth step, children access their memory banks to receive possible responses to the situation. However, if the situation has never been experienced by them before, children may respond differently than how they think they should respond to the situation. Crick and Dodge state that, during this cue, the goal selected by children previously may or may not trigger the children's response (1994).

After children have accessed their database and have constructed different responses, they will decide what they think is the best response for that situation. Other factors may be involved while children evaluate their response, including outcome expectation, self-efficacy, and response evaluation (Crick & Dodge, 1994).

Now that children have gone through the first five steps, they come to the final result of SIP, behavioral enactment. After the behavior has been completed and followed through; then, the children evaluate the peer's response. Children may store the information for future use, whether negative or positive, based on how the peer responded and if the children's goal was accomplished based on their decision. The children can use the information from this social situation in future ones. Whether it was a positive experience or a negative one, children recognize if it ends with their goals and needs being met or not. They can then store the information and use it later.

While children go through these six processing steps, they are processing in real-time (Li et al., 2013). As children are in a social situation, they must process information in the moment using the cognitive and social skills they already have to help them understand the current situation they are in. Children's cognitive and social skills consist of using heuristics and schemata, which include memories, learned rules, and social knowledge. Many social rules and schemata are influenced by past experiences and

knowledge (Ziv, 2013). Social behavior may also change due to maturation (Beauchamp & Anderson, 2010). As children gain more experience and knowledge with continued development, they will understand social rules and expectations more. The cognitive skills they have not yet developed during the early years will develop later to help children make sense of situations and respond accordingly.

### **Role of Emotion**

Crick and Dodge (1994) argue that while emotion does play a role, cognitive factors are more prevalent for SIP theory. Lemerise and Arsenio (2000) argued, however, that emotions play just as important a role in SIP as cognitive factors. They state that the degree of emotionality a child has combined with their regulatory process can affect how they respond to social information processing. Both the cognitive and emotional aspects should be considered together to understand how children process social situations. Children can become highly reactive during times when emotions are heightened, causing children to use aggression. Recognizing and regulating emotions can change the outcomes during social interactions, changing how children process the situation (Denham et al., 2020; Chester & Langdon, 2016). Several studies have documented the importance of emotion regulation during the steps of SIP (see Denham et al., 2020; Li et al., 2013; Wu et al., 2016).

The knowledge children have about emotions can also influence SIP. Emotion knowledge helps children label and identify what it is they are feeling. Understanding the emotions they may be feeling helps children understand how they can react and regulate that emotion (Test et al., 2010). Children with less emotional knowledge and fewer

regulatory skills may show more deficits in SIP, whereas children with higher regulatory abilities and more knowledge of emotions are likely to have higher processing abilities. Children feel varying degrees of emotional intensity and learn to express and regulate their emotions in different ways. Depending on their abilities, this can lead to more or less socially competent or incompetent behaviors (Lemerise & Arsenio, 2000).

### **Using SIP- Application, Intervention, and Future Direction**

SIP theory has primarily been used to better understand and intervene with children displaying aggressive and challenging behaviors, disabilities such as Autism Spectrum Disorder and Attention Deficit Hyper Disorder, children with poor emotion regulation, and children with bullying behaviors (see Stanton-Chapman & Snell, 2011; Chester & Langdon, 2016; Becker, 2014). Interventions implementing specific programs using SIP have positively impacted children's development (Wu et al., 2016). It has been argued that SIP should be used as an intervention and as a primary theoretical base for promoting social competence and preventing aggression in different curricula (Li et al., 2013). Using SIP in interventions has shown to be practical and useful, but including it in curricula could help proactively teach children skills to process situations to improve their social skills. If parents and educators can teach children skills they need before using them, it may help to prevent aggressive behaviors before they even begin, and increase children's ability to process social information and social skills.

SIP theory has been used with aggressive behaviors to understand child behavior and improve the negative behaviors (Laible, McGinley, et al., 2014). Understanding how SIP in early childhood relates to externalizing behaviors in adolescence is being studied

more frequently (Laible, McGinley, et al., 2014). SIP helps to inform intervention efforts and reduce aggressive behaviors in children. Children who have inadequate social information processing skills and emotion regulation abilities are more likely to experience peer rejection, negative emotionality, and aggressive antisocial behavior (Wu et al., 2016; Laible, McGinley, et al., 2014). Most SIP research has been with elementary-aged children and adolescents. Only recently has SIP been used in the early childhood years (Denham et al., 2013). A greater understanding of SIP theory and children's social information processing ability in early childhood could help practitioners develop prevention strategies and interventions to address aggressive behaviors and reduce the risks of the outcomes associated with these behaviors.

Recently children's SIP ability has also been associated with early school readiness and school success (Denham et al., 2020; Ziv, 2013). SIP ability is a good predictor of school readiness, as it encompasses both social-emotional skills and cognitive development. Continuing to use SIP ability as a predictor of early school readiness and as a theory to guide intervention efforts to help teach children social skills before they begin school can be effective uses of the theory. Recently more research has been done in this area regarding pre-literacy skills (see Denham et al., 2020), however it is still very new within other early school readiness skills. More research can be done to expand understanding of how SIP ability relates to children's development. Other areas of exploration could include using SIP ability with early math skills, science knowledge, or logic and reasoning to understand if there are links within other developmental areas.

While there have been many studies on social information processing, many focus on aggressive behaviors in children. Studies also very rarely include other variables

which could factor into how children process information. Crick and Dodge (1994) state that there could be variables like developmental considerations such as age, gender, and social adjustment that may also influence children's SIP ability. Further research should explore these variables further and add to the literature on social information processing.

Crick and Dodge also do not fully explain cognitive processes that factor into SIP ability. The importance of children gaining social knowledge and information is evident in their writing; however, they state there is a need to explore other methods (Crick & Dodge, 1994). Other cognitive factors such as executive functioning are related to children's SIP, but understanding cognitive factors such as language could benefit educators and parents. Cognitive factors are also not understood in how they are activated during the SIP process (Li et al., 2013). Creating further understanding of how cognitive processes work and what aspects of cognition play a role in SIP ability can significantly influence how the theory can be applied and used to increase children's SIP ability.

Many scholars have also focused on the role of emotion in SIP. Crick and Dodge did not relate SIP theory to emotions and focused more on cognitive processes. As other scholars have researched more into emotions, it can now be concluded that emotions play a significant role in how children perceive and react during social interactions. In studying emotions, many scholars have focused on negative emotional aspects and the resulting aggressive behaviors. Few studies have explored the role of positive emotions and behaviors though, but the need to explore these roles is still crucial (Li et al., 2013).

Recently more studies examining SIP have been conducted in early childhood (Denham et al., 2013), but much of the past research regarding SIP has been conducted with elementary-aged children and adolescents. Understanding how SIP works in early

childhood may influence how children use SIP as they age. Continuing to understand early childhood SIP and its outcomes can be beneficial for early childhood development.

Most research also has included aggressive behaviors, leaving a gap for children with higher social skills and SIP ability. More research is needed to show how specific areas of SIP are used and how children process information that are successful at using SIP skills. It has been effective to use as an intervention with children who show aggressive behaviors, but little research has shown children who have the needed social skills and SIP abilities to see how it is successful and what outcomes these children may have (Ziv, 2013). Other research has also shown the relationship between aggressive behavior and children growing up with sociodemographic risks (Ziv & Sorongon, 2011). Understanding the relationships between SIP and sociodemographic risks may help extend what is known about aggressive behaviors and SIP and how to intervene in these populations.

Much of the literature surrounding SIP has focused on emotions and regulation, aggression, and social skills. This link between social skills and SIP has been well established (Ziv, 2013). The cognitive processes that influence SIP in contrast have not been fully explored (Denham et al., 2013). However, recent work has shown associations between SIP and executive functioning (Denham et al., 2013). As previous literature has shown relationships between social skills and aggressive behaviors with the child's language development, further examination of SIP and language development may further our understanding and guide intervention efforts.



## Summary

There are still many unknown aspects of language development, SIP, and social skills in how these constructs work together. Language development has established links between social skills and externalizing behaviors, while SIP has been shown to be associated with social skills and externalizing behaviors. A greater understanding of how cognitive development affects children's social processing ability through their language development could add to the research literature and guide intervention efforts. Because of previous associations and relations made in research, it was expected that there would also be an association between children's language development and their SIP ability that is informed by Social Information Processing Theory. Currently, there are no known studies connecting SIP with language development. Understanding the relationship between SIP and language can help guide further research, early childhood curricula, and interventions. Further, exploring the role of environmental factors could add to the research literature and help further understand these factors (Walker et al., 2020).

The following hypotheses are based on the research literature and are proposed for this study:

Hypothesis 1: SIP responses, social skills, and receptive language scores improve between pretest (beginning of Head Start) and posttest (end of the Head Start year) for this sample of English-speaking preschoolers attending Head Start.

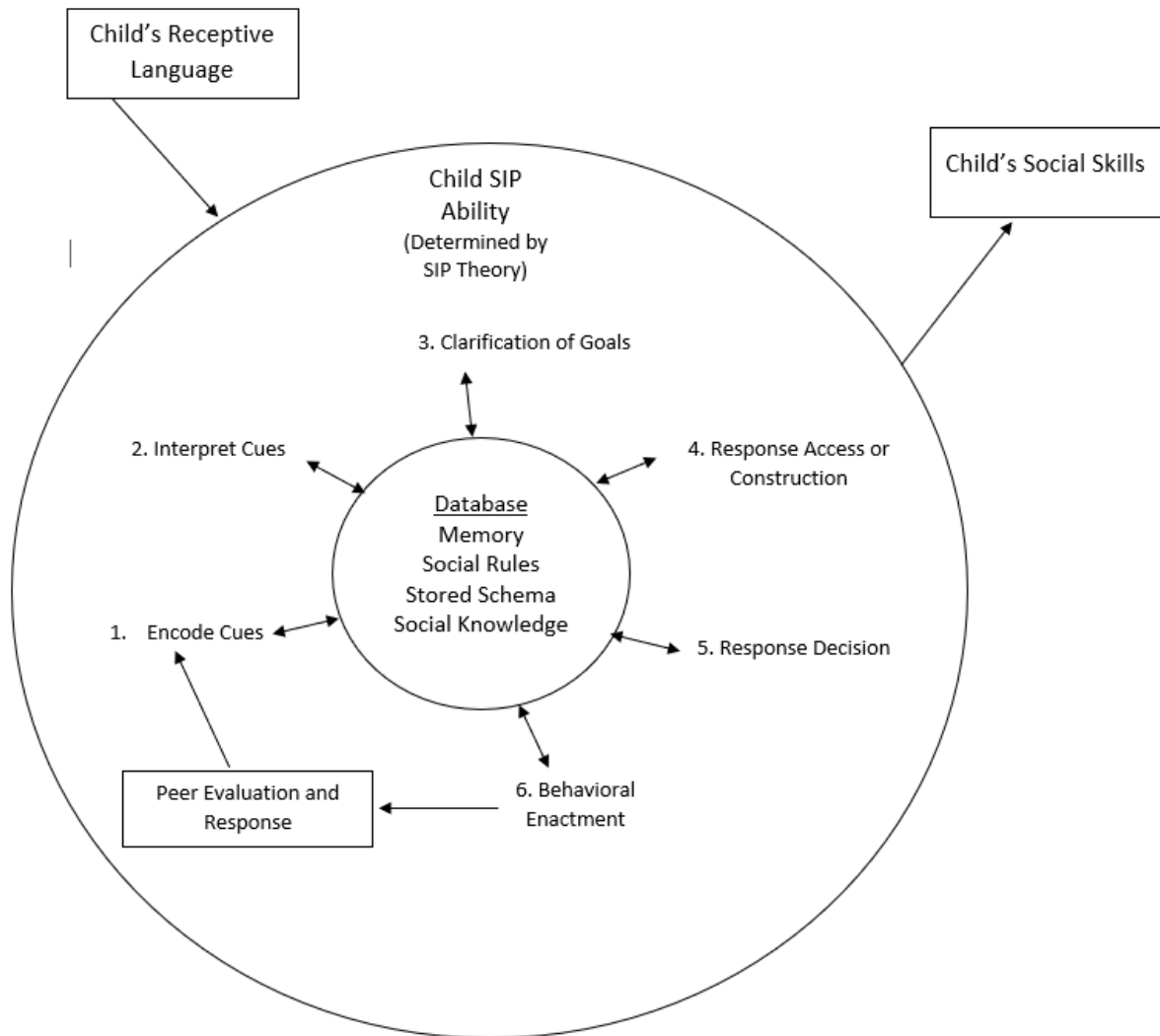
Hypothesis 2: The demographic variables (maternal education level, child gender, and child age), receptive language, social skills, and SIP responses

are concurrently correlated with each other at the beginning and end of the Head Start year.

Hypothesis 3: Children with average or high average receptive language scores are more likely to have higher socially competent and lower aggressive scores than children with below average receptive language scores.

Hypothesis 4: Receptive language predicts social skills at the end of the Head Start year after controlling for social skill scores at pretest and gender, child age, and maternal education.

4a: SIP responses add above and beyond language development to children's social skills.

**Figure 1***Conceptual Model*

## CHAPTER III

### METHODOLOGY

#### **Participants**

Data were collected from a larger study focused on self-regulation and communication. Participants were recruited from 19 Head Start classrooms where parental consent was given for their children to participate. Consent forms were obtained for 230 children. Only those children whose home language was English were included in this study resulting in a sample of 135 children. After excluding cases with missing data for the study measures, 51 total children were included in the study, 60.8% being female. Families met low-income criteria as they were eligible for Head Start. Maternal education and home language were collected from Head Start at the child's enrollment. Maternal education was at a high school graduate or GED level on average, and ranged between ninth grade or less and a master's degree. For this study, both pretest and posttest scores were used.

#### **Procedures**

After parents gave informed consent, pretest data collection occurred in the fall at the beginning of the Head Start year. Demographic data including age, gender, home language, and maternal education were collected from Head Start enrollment forms. Teachers reported social skills using the Social Skills Rating System for Teachers (SSRS; Gresham & Elliot, 1990). Assessors were trained to conduct assessments over a two-day training. The supervisor reviewed the final practice assessment conducted by each

assessor and observed assessments and checked protocol for accuracy. During the Head Start day, assessments were conducted in a quiet area outside of the classrooms. Assessors also spent time with children before assessments took place to build rapport with the children.

## **Measures**

### **Social Skills**

Teachers completed the Social Skills Rating System for Teachers (SSRS; Gresham & Elliot, 1990), providing a comprehensive assessment of typical social skills displayed in the classroom. Teachers were given a questionnaire with standardized instructions to complete for each child. The checklist contains 40 social and behavioral skills items rated on a 3-point scale (0=never, 1=sometimes, and 2=very often). The SSRS uses a social skills scale and a problem behavior scale. The social skills scale contains three subscales: cooperation, assertion, and self-control. For this study, only the social skills scale was used as the study explored the positive social skills of the child, rather than the problematic behaviors and included all three social skill subscales. Furthermore, the psychometric properties of the SSRS-T indicated adequate reliability and validity. Internal consistency using Cronbach's alpha was ( $\alpha=0.9$ ) for the social skills scale.

### **Language**

Children completed receptive language development assessments using the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 2006). Children were shown four pictures of various items in this task while the assessor read a word or a description

that matched one picture. Children then identified which picture matched. Scores were calculated based on the number of pictures they correctly identified. The PPVT demonstrates excellent internal consistency ( $\alpha = .95-.97$ ) and high test-retest reliability ( $r's = .91-.94$ ).

## **SIP**

SIP was measured using the Challenging Situation Task (CST; Denham & Bouril, 1994), which assesses children ages three to seven in social problem-solving skills. In this task, children are shown a picture of peer interaction: a peer knocking down a sandcastle, a peer taking a ball away, being hit by a peer, and a child wanting to join a group of peers. The assessor then asked if the child were in that situation what they would do, and the child responded (example responses: The child would hit the peer, get a teacher, do nothing, feel sad, etc.). Responses were coded as passive avoidant (0), aggressive (1), or socially competent (2). An aggregate scale score across the four scenarios was created, reflecting the number of each behavior response (Denham et al., 2020). Scores for only the socially competent responses were then used in calculating the child's SIP ability. Reliability for this sample was .71 at pretest and .64 at posttest.

## **Analyses**

Analyses were conducted using SPSS statistical computing software. For the first research question, paired-samples *t*-tests were used to determine if there was a significant difference between pretest and posttest scores of children's social skills, and language development and the Wilcoxon signed-rank test was used to determine the differences in SIP responses. Next, to address research question two, correlation analyses were

conducted to examine concurrent associations among the demographic variables, SIP, social skills, and language development at the beginning of the Head Start year (pretest) and the end of the Head Start year (posttest).

For the third research question, chi-square goodness of fit tests were used to determine whether children with average receptive language scores or above responded to the challenging situation task with more socially competent responses than children with below average language scores. A hierarchical regression analysis was used to answer research question four. The first step of the regression model in the hierarchical regression included social skills at posttest as the dependent variable with receptive language scores at pretest, maternal education, child's age, and child gender entered as control variables. Children's SIP ability was entered in the second step of the hierarchical regression to determine if children's SIP ability predicts children's social skills above and beyond the independent variables entered on the first step (i.e., language development, maternal age, child age, and child gender).

## CHAPTER IV

## RESULTS

**RQ1: Do the SIP responses, social skills, and receptive language scores improve between the pretest and posttest scores for this sample of English-speaking preschoolers attending Head Start?**

Pretest and posttest scores for children's receptive vocabulary and social skills, were examined using paired samples *t*-tests to determine if there was improvement in children's scores from the beginning to the end of the Head Start year. As shown in Table 1, in contrast to expectations, language development standard scores showed no significant difference between the pretest and posttest scores,  $t(50) = -.020, p = .984$ . However, ratings of children's social skills significantly increased between pretest and posttest  $t(50) = -3.164, p = .003$ .

**Table 1**

*Means, Standard Deviations and Range for Measures*

Variables	<i>M</i>	<i>SD</i>	Range
Child Age Pretest	48.45	4.51	37-54
Child Age Posttest	54.08	4.34	43-59
Receptive Vocab Pretest	84.94	17.28	44-110
Receptive Vocab Posttest	84.98	15.49	40-120
Social Skills Pretest	97.33	16.61	54-131
Social Skills Posttest	103.78	13.48	80-131

Note.  $N = 51$



A Wilcoxon signed-rank test was used to determine if competent scores for children's SIP responses improved over the year. The results from a Wilcoxon signed-rank test indicate that there was not an improvement from pretest to posttest for the number of competent responses to the challenging situation task. Surprisingly, there was a statistically significant drop in the number of competent responses ( $Z = -4.830$ ,  $p < .001$ ). Specifically, 36 children's competent scores were lower at posttest than pretest, 5 children's scores increased from pretest to posttest and 10 children's scores remained the same.

The decrease in competent SIP responses at posttest was surprising. SIP response pretest scores showed the majority of the children had either passive or socially competent responses, with very few aggressive responses. Posttest scores showed that the majority of children had aggressive responses with fewer socially competent and passive responses (Table 2).

**Table 2***Percentage of Child Behavior Type for SIP Responses*

	Pretest Scores	Posttest Scores
<b>Knock Down Sandcastle Task</b>		
Passive	51.2 %	33.3 %
Aggressive	0 %	58.3 %
Socially Competent	48.8 %	8.3 %
<b>Join Group Task</b>		
Passive	25.7 %	12.2 %
Aggressive	0 %	85.7 %
Socially Competent	74.3 %	2.1 %
<b>Take Away Ball Task</b>		
Passive	42.9 %	38.8 %
Aggressive	11.9 %	44.9 %
Socially Competent	45.2 %	16.3 %
<b>Being Hit Task</b>		
Passive	35.4 %	3.9 %
Aggressive	20.8 %	76.5 %
Socially Competent	43.8 %	19.6 %

**RQ2: What are the associations among demographic variables (maternal education level, child gender, and child age), receptive language, social skills, and SIP responses at the beginning and end of the Head Start year?**

Correlations were calculated among the pretest scores and again among the posttest scores, and included child's age (at pretest or posttest), child's gender, and maternal education. Additional correlations were calculated between pretest and posttest scores for child receptive language, social skills, and competent and aggressive SIP responses.

For the pretest scores (Table 3), children's language development was significantly associated with maternal education and children's competent SIP responses. This positive correlation between language development and children's competent SIP was expected and aligns with the study hypothesis. Moreover, at the end of the Head Start year, language development continued to be positively significantly correlated with maternal education.

**Table 3***Bivariate Correlations at Pretest*

Variables	1	2	3	4	5	6	7
1. Child Gender	-						
2. Child Age at Pretest	.234	-					
3. Maternal Education	.047	.245	-				
4. Receptive Vocab Pretest	.185	.266	.453**	-			
5. Child Social Skills	-.037	.199	-.052	-.051	-		
6. Competent SIP Response Pretest	.195	.082	.198	.348*	-.081	-	
7. Aggressive SIP Response Pretest	-.159	-.220	-.076	.107	-.212	-.194	-

Note.  $N = 51$

\*  $p < .05$ , \*\*  $p < .001$  (two-tailed)

Table 4 illustrates that competent and aggressive SIP responses were also negatively associated at posttest indicating that children with more competent choices had fewer aggressive choices than children with fewer competent choices.

**Table 4**

*Bivariate Correlations at Posttest*

Variables	1	2	3	4	5	6	7
1. Child Gender	-						
2. Child Age at Posttest	.238	-					
3. Maternal Education	.047	.259	-				
4. Receptive Vocab Posttest	.151	.197	.401**	-			
5. Child Social Skills	-.242	.158	-.039	-.040	-		
6. Competent SIP Response Posttest	.101	-.124	.001	.068	-.173	-	
7. Aggressive SIP Response Posttest	-.055	.064	.267	-.012	.255	-.701**	-

Note.  $N = 51$

\*  $p < .05$ , \*\*  $p < .001$  (two-tailed)

Additional correlations (Table 5) were examined between the pretest and posttest scores for each outcome variable (social skills, receptive vocabulary, competent SIP responses, and aggressive SIP responses). Positive correlations were found between receptive vocabulary pretest and posttest scores, as well as social skills pretest and posttest scores. This suggests that for both receptive vocabulary and social skills, children with higher scores at pretest, also had higher scores at posttest.

**Table 5**

*Bivariate Correlations Between Pretest and Posttest Scores*

	PPVT Posttest	SSRS Posttest	Competent SIP Posttest	Aggressive SIP Posttest
PPVT Pretest	.650 **	-.174	.074	.086
SSRS Pretest	-.046	.549**	-.156	.176
Competent SIP Pretest	.263	-.070	-.075	.118
Aggressive SIP Pretest	-.116	-.200	.011	.045

Note.  $N = 51$

\*  $p < .05$ , \*\*  $p < .001$  (two-tailed)

**RQ3: Are children with average or high average receptive language scores more likely to have higher socially competent and lower aggressive scores than children with below average receptive language scores at posttest?**

Chi-square goodness of fit tests were calculated to determine if children's SIP responses differed between children who scored below average or average and above in receptive language. Analyses were conducted for both children's socially competent responses and their aggressive responses. One of the assumptions with the chi-square goodness of fit test is that each of the variables are expected to contain at least five cases per subcategory. Therefore, categories with fewer than five cases were combined resulting in two subcategories for socially competent responses and four subcategories for aggressive responses. For socially competent responses the subcategories consisted of children having no socially competent responses of the four different CST questions (0 socially competent responses) or having answered at least one or more socially competent responses at posttest (1 or more socially competent responses). For aggressive SIP responses, children with zero or one aggressive response were put into the subcategory "0 or 1 aggressive responses" while other children fell into either "2 aggressive responses", "3 aggressive responses" or "4 aggressive responses".

Children's receptive vocabulary standardized scores were categorized as either below average, scores under less than 85, or average and above, scores of 85 or greater. Table 6 shows that the number of children's competent and aggressive SIP responses did not differ by language ability (below average or average and above).

**Table 6**

*Chi-Squared Goodness-of-Fit Analysis of Children's Receptive Language Score in Relation to Number of Competent and Aggressive Posttest Responses*

	<u>Language Scores</u>		Chi-Square Tests for Goodness of Fit
	Below Average	Average or Above Average	
	n= 25	n=26	
Competent SIP Responses			$\chi^2 (1) = .692$
0 Responses	19 (76%)	17 (65.4%)	$p = .406$
1+	6 (24)	9 (34.6)	$N=51$
Aggressive SIP Responses			
0-1 Responses	4 (16)	7 (26.9)	$\chi^2 (3) = 1.558$
2	8 (32)	5 (19.2)	$p = .669$
3	6 (24)	6 (23.1)	$N = 51$
4	7 (28)	8 (30.8)	

*Note.*  $N=51$ . Numbers in parentheses are proportions.



**RQ4: Does receptive language predict social skills after controlling for social skill scores at pretest and child gender, child age, and maternal education?**

**4a: Do SIP responses add above and beyond language development to children's social skills?**

A multiple hierarchical regression was used to first determine whether receptive language predicted children's social skills, and then to see if SIP responses accounted for additional variance above and beyond children's social skills. The first step of the regression model contained the control variables of age, gender, maternal education, and social skills pretest, along with the children's receptive vocabulary posttest scores. The second step then added either competent or aggressive SIP responses.

As shown in Table 7, competent SIP responses were not a significant predictor in the multiple hierarchical regression. The variables included in Model 1 explained 36.5% of the variance for children's posttest social skills, with competent SIP responses adding only an additional 0.3%. The control variable of children's gender (male) and social skills pretest scores were significant predictors of children's posttest social skills in Model 1, but only children's posttest social skills remained significant in Model 2.

**Table 7**

*Summary of Multiple Hierarchical Regression for Social Skills with Competent SIP Responses*

	<u>Model 1</u>			<u>Model 2</u>		
	<i>B</i>	<i>SE</i>	beta	<i>B</i>	<i>SE</i>	beta
(Intercept)	47.461	21.864	-	49.308	22.459	-
Child Gender	-6.937	3.383	-.254*	-6.759	3.438	-.247
Child Age	.409	.404	.132	.384	.411	.124
Maternal Education	-.250	.845	-.039	-.252	.853	-.040
SSRS Pretest	.417	.099	.513**	.411	.101	.507**
PPVT Posttest	.010	.114	.012	.014	.116	.016
Competent Posttest				-.905	2.058	-.054
$R^2$	.365			.368		
Adjusted $R^2$	.294			.281		
$F$ Change	5.168			.193		

Note.  $N = 51$

\*  $p < .05$ , \*\*  $p < .001$

The same variables were included in a second hierarchical regression model with aggressive SIP responses entered on the second step. Aggressive SIP accounted for 2.7% of the variance above and beyond the 36.5% from Model 1. This increase was not statistically significant. Similarly to the competent SIP regression, only social skills pretest scores were significant predictors of children's posttest social skills (Table 8).

**Table 8**

*Summary of Hierarchical Regression for Social Skills with Aggressive SIP Responses*

	<u>Model 1</u>			<u>Model 2</u>		
	<i>B</i>	<i>SE</i>	beta	<i>B</i>	<i>SE</i>	beta
(Intercept)	47.461	21.864	-	47.009	21.642	-
Child Gender	-6.937	3.383	-.254*	-6.752	3.351	-.247
Child Age	.409	.404	.132	.422	.400	.136
Maternal Education	-.250	.845	-.039	-.624	.878	-.098
SSRS Pretest	.417	.099	.513**	.390	.100	.480**
PPVT Posttest	.010	.114	.012	.029	.114	.034
Aggressive Posttest				1.960	1.408	.175
$R^2$	.365			.392		
Adjusted $R^2$	.294			.309		
<i>F</i> Change	5.168			1.939		

Note.  $N = 51$

\*  $p < .05$ , \*\*  $p < .001$

## CHAPTER V

### DISCUSSION

Research has shown the importance of language development and social skills for children during the early childhood years (Rose et al., 2022; Hoff, 2006; Levickis et al., 2018; Ramsook et al., 2020). Social Information Processing Theory, adapted by Crick and Dodge (1996) helps to explain the development of children's social skills through children's interpretation of social stimuli in different social situations. There are still many unknowns about SIP and how it relates to children during early childhood. The current study aimed to increase our understanding of SIP during early childhood by examining the role of language development in relation to SIP and children's social skills.

#### **Language Development**

While the number of words that children understood likely increased from the beginning to end of their Head Start year, their standardized scores did not improve reflecting a lack of progress in comparison to the normative sample. This was very curious as many aspects of language development are crucial to the overall mission of Head Start. Past research has shown children enrolled in Head Start programs improved their receptive vocabulary standard scores throughout the year (Craig-Unkefer & Kaiser, 2003; Stanton-Chapman & Snell, 2011; Abbott-Shim et al., 2003). While some past research has demonstrated significant positive developmental outcomes for children attending Head Start, other studies have called into question the effectiveness of Head Start (Abbott-Shim et al., 2003, Lee et al., 2021). Previous research indicates that teachers' use of scenarios of play with children who had poor language skills that

included modeling, planning how the play would go, and enacting the play with the children helped them to improve their communication skills, engagement, and play skills (Craig-Unkefer & Kaiser, 2003). Unfortunately, teachers' language modeling and support of children's play were not included in this study.

The positive correlations between language and maternal education found in the present study fit with previous literature (Martí et al., 2016), and continue to align with past findings that children with more language abilities also have mothers with higher education levels.

Correlations between competent SIP responses and receptive vocabulary at pretest also aligned with the study hypotheses, and indicated children with higher vocabulary skills also were more likely to have socially competent responses in hypothetical conflict situations. This significant association was not maintained at posttest. Classroom quality may explain the lack of association at posttest. Other literature states that quality of the program and teacher interactions have been correlated with children's social, language, and academic skills (Mashburn et al., 2008). Further exploration into SIP and language development is needed further to understand this relationship.

## **SIP**

Another surprising find in the current study was that children's SIP responses became more aggressive, rather than becoming more socially competent throughout the year. This finding is particularly interesting, as we would expect children to respond with more socially competent answers after learning more social skills. Teacher report of child social skills did improve through the year, which leads to the question of why the children's responses became more aggressive at the end of the year. One possible

explanation for the gain in aggressive responses could be due to learned social behaviors. As children begin to engage with other children and teachers, they can learn skills from those interactions. While they do learn positive social skills and behaviors, they can also learn negative ones. They may still understand prosocial behavior and can act on it in the classroom and in real social situations, however, using the CST with a hypothetical response instead of an actual action, could result in children responding with aggressive solutions. A study done by Capage and Watson (2010) investigated the influence of theory of mind on children's social-cognitive skills and social competence. Capage and Watson stated that aggression is not the only determinant of peer relationships, and suggested some aggressive children are considered more popular (2010). Other studies have found that some children are liked better by peers because their behaviors match behaviors that are valued in their peer group (Coie, 1990).

Capage and Watson stated "in addition to aggression and the tendency to generate aggressive solutions to social problems, one or more additional characteristics must mediate poor social competence. One possibility is that other aspects of social-information processing play an important additional role in determining social behaviors" (2010, p. 614). The concept of a child's false belief, from the theory of mind, guided Capage and Watson to believe that false beliefs could account for children's aggressive responses. A false belief, refers to internal representations that are different from reality and other people, that must also rely on other sources such as the current environment, current behaviors, as well as past and future environments and behaviors (Capage & Watson, 2010). False beliefs could be an explanation as to why children with higher social skills could respond with more aggressive SIP responses. Before children can

respond to challenging situations and generate solutions, they must first have the cognitive ability to perceive and understand the situation. Children can learn various social skills, both positive and negative, however, depending on how they perceive different situations and understanding, they can still respond in hypothetical situations in opposite ways from what they would in a real situation. This reiterates the importance of cognition in regards to social information processing and shows again that more research is needed in regards to how children process social information and why cognitive functions are important. Another limitation included in this study was besides children's language skills, other cognitive factors were not accounted for. Future research should further explore this area and how cognition and SIP are interrelated.

Further research into the CST and the administering of it is also important. Children may not have completely understood the task, or could have thought the response they gave was funny. Lack of cognitive abilities and understanding of the task for the children could have led to misinterpreting it or to not understanding that a serious response was needed. Further research into the effectiveness of the CST is also important. Research into testing whether it is measuring what it is supposed to be measuring, its accuracy and effectiveness are all important to continue to explore. It is also important to consider the child's environment from the day they were tested. There may have been an altercation with another child right before the testing that could have also led to children giving the type of response they did. Lack of sleep, or the child being hungry and so on can also affect the testing of the child. While these do factor in, for this particular sample, most of the children became more aggressive in their responses, which is not due to having an off-testing day. One thing other studies did while using the CST task to

measure SIP was also including the child's emotion of how that situation would make them feel. Those studies found that the emotions of the child were also good predictors of the child's ability to respond to tasks in passive, aggressive or socially competent ways (Denham et al., 2013). Perhaps including this aspect into this study would also help with understanding the effectiveness of the CST task.

The increase of the children's aggressive SIP responses was not expected with this study, and shows how there are still many unknowns within early childhood SIP. There has been little research done into SIP theory during the early childhood years, and it is still unknown how these processes all work together and occur for young children to be able to process social information. A hypothesis could be that children first have more passive responses, then can answer with more aggressive responses, and then lastly gain skills to be able to respond with socially competent answers. The end goal for all children is to be able to respond in socially competent ways, however much is still unknown about how they are able to get there. It was very interesting that in this study the children began the school year with mainly passive and socially competent responses, but by the end of the school year most of the children responded with aggressive responses.

One potential explanation for the increase in aggressive responses could have also occurred because of the lack of receptive language development. Because children did not gain as much language as was expected, this could be an explanation for why children responded with more aggressive responses. Children may not have known how to communicate socially competent responses, or maybe gained the language to communicate aggressive responses instead. A longitudinal study done in Germany tested children at 3 years old and again at 13 years old for language and aggressive behavior.



The study found that children who had less language ability at 3 years old also showed more aggressive behavior when they were both 3 and 13 years old (Rose et al., 2022). Literature shows that children who gain language skills also show gains in their social skills (Vahedi et al., 2012). Children who did not gain as much language ability, could then gain more socially unacceptable behaviors. Further research into aggressive SIP, language development and social skills may also help guide future research and knowledge regarding SIP.

Competent and aggressive SIP responses were also negatively correlated at posttest but not pretest. A better understanding of how children gain SIP skills, different SIP responses and if children develop them in an order could guide future curriculum, teaching, and intervention programs for young children.

### **Social Skills**

Social skills were also interesting in this study. While children demonstrated significant improvement in their social skills over the year, there were no other statistically significant correlations between social skills and other variables, which was also not expected. No statistically significant correlations were found with social skills and other variables, even though social skills did improve. This is surprising because research findings from other literature indicate positive associations among children's social skills, language development, SIP abilities, gender, age, and maternal education (Beauchamp & Anderson, 2010; Martí et al., 2016, Brekke Stangeland, 2017, Li et al., 2013). Power to detect these associations in the current study may have been limited due to relatively small sample.

### **Limitations and Implications for Future Research**

This study included many different factors which contributed to the limitations in this research. One limitation was the sample size used, and only using complete cases. The sample size ended up being fairly small. After excluding children who spoke Spanish as their first language, and all other children who did not complete the posttest assessment, the sample size ended up being 51 children. A larger sample of children is needed to better understand how all the variables work together. This study did not have as much power because of the small sample size being used with many different variables being tested.

Another limitation was that this study excluded dual language learners. Including children who are dual language learners with diverse home languages could guide future directions for research in SIP theory.

This study also did not include children's abilities to regulate or express emotions, or to use emotion language. Past research has shown the importance of emotions in a child's SIP abilities, and further research can help extend understanding, especially the use of children's emotion language (Lemerise & Arsenio, 2000; Li, et al., 2013; Denham, 2013).

Another limitation to this study was that only receptive language vocabulary was used, and receptive vocabulary in this study did not significantly increase. Without improved receptive language, it is still unclear what the relationship is between language and child SIP and it should continue to be researched to increase understanding. Many other studies regarding language include both aspects of expressive and receptive language (Hawa & Spanoudis, 2014; Brekke Stangeland, 2017; Mok et al., 2014;

Stanton-Chapman & Snell, 2011). Including aspects of other kinds of language development like communication abilities, non-verbal communication, or expressive language can also be beneficial and could further show the role of language development in SIP as well as show if any aspects of language development are more important to children's developing SIP abilities.

It would also be beneficial to include children from different populations in future SIP research, not only children enrolled in Head Start. Including multiple preschools or childcare centers with differing teaching philosophies and SES backgrounds would also help direct future research and could make findings more applicable to the general public, instead of only applicable to those families enrolled in Head Start.

Although this study did not find what was expected, multiple variables were still able to be explored, and additional findings were examined to help expand our knowledge and understanding of SIP within the early childhood years. Findings from this study can continue to help guide future research and directions to better understand language development, SIP theory and social skills.

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