ACADEMIC LANGUAGE IN EARLY CHILDHOOD: WHAT WE CAN LEARN FROM DEAF PARENTS’ ACADEMIC ASL USE WITH THEIR YOUNG DEAF CHILDREN ACROSS HOME SETTINGS

by

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Abstract

Children are first socialized in the language of school before even setting foot in a school. This socialization happens at home, with parents acting as a child’s first and most crucial language model. What does this mean for very young deaf children who have varied access to language in their home environment? Parental language competency, motivation, and access to resources available will shape the quality of language access. This research study examined features of parental academic language use in deaf parent and deaf child home interactions. One family was recruited for the study and the researcher visited the family five times over a period of one week. Selected family interactions were videotaped and the parents had a discussion with the researcher based on interview questions about these taped interactions. Analyses focused on parental language complexity (academic language, vocabulary, sentence types, American Sign Language [ASL] to English linking strategies, etc.) in interactions with their deaf children in their home setting. Strong evidence of parental use of extended discourse and academic language with young deaf children was found, particularly at the dinner table. Academic language modelling and higher-level facilitative language techniques by a more knowledgeable other can perhaps be taught within the context of early intervention, preparing deaf children for the world of language learning at school.
Lay Summary

Children experience the language of school before even setting foot in a school. This socialization happens at home, with parents acting as a child’s first and most important language model. What does this mean for very young deaf children who have varied access to language in their home environment? This research study examined features of parental academic language use in deaf parent-deaf child home interactions. One family was observed in natural home settings, selected interactions were videotaped, and the parents were interviewed about the ways that they talk to their deaf children. The videotapes were analyzed for parents’ language complexity (academic language, vocabulary, sentence types, American Sign Language [ASL] to English linking strategies, etc.). The study found strong evidence of parental use of extended discourse and academic language with young deaf children. Early intervention contexts can perhaps teach parents extended discourse and academic language skills.
Preface

This study examines the linguistic features of parental expressive language in deaf children’s primary language and investigates the parent/child language interactions in a home setting (mealtime, storytime, and playtime). This study uses a qualitative approach to investigate one family with two deaf parents, and their deaf children (ages 2 and 4). Findings are represented using descriptive statistics and exemplars. The data were analyzed for counts, themes, and examples of academic language features used during parent/child interactions (semantic, syntactic, and pragmatic). The study is approved by the UBC Behavioural Research Ethics Board (Ethics Certificate Number: H15-02061).
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I am indebted to the research participants for opening their home and bringing light to the countless ways in which language enrichment takes shape in home settings. Through these observations I have learned much about the ways that deaf parents talk to their deaf children, the fascinating shared topics that emerge in conversation, and the amount of rich language deaf children can and should be exposed to. There is great potential with the beginnings of this research, and for that, I am forever grateful. Thank you.

I must give credit where credit is due, starting with the people who, knowing it or not, pointed me in the direction in which I have gone. The early years are everything and I owe a special thank you to my first and most important language teacher, my mum. Thanks also to the teachers, mentors, and peers who got me interested in the ways that people talk. Thank you for sharing your beautiful brains and hearts, encouraging me, and for being exemplary language masters, mentors, and friends. You taught me how to play with language.

Special thanks to my family. Families. Both the family I was born to and the family I have found. More than family, you are friends. And more than friends, you are family.

And, thank you, Aastrid, for the countless hours we spent talking about ASL.

Last, but not least, I owe an enormous thank you to Joanna Cannon, for supporting me through this. For guiding me, pushing me when I needed it, and encouraging me when my brain was spent.
Dedication

For MOTHER-FATHER HEARING and BROTHER DEAF. Mum, Pops, and Jamie.

“The time has come,” the Walrus said,

““To talk of many things:

Of shoes- and ships- and sealing-wax-

Of cabbages- and kings-

And why the sea is boiling hot-

And whether pigs have wings.”

-Lewis Carroll

Through the Looking-Glass and What Alice Found There, 1872
Chapter 1: Introduction

1.1 Autobiographical Signature

I hold a deep-rooted, long-standing interest in early language and literacy acquisition. As a Deaf person, and a professional working with deaf people and their families, my interest has 35-plus years behind it. As the second deaf child to hearing parents, my early family life navigated many of the communication and language avenues available to deaf children at the time. The seeds of language development and linguistic flexibility are planted in the early years and have life-long repercussions. In my work over the past 15 years with families of deaf children, I am asked the same question parents have been asking for decades, if not centuries: how do deaf children learn language? I believe that deaf children can and do successfully acquire and use language.

Parents want the “how,” though: a set of blueprints outlining steps to successful language acquisition. I am most interested in the features and quality of early parent-child language interaction. This is an area where, as a professional, I believe I can make the most impact. I want to find out what types of linguistic interactions best lend opportunities for rich language use at home and within the family unit.

The inspiration for this thesis was ignited some years ago. Over the years I have connected with people on the topic of early language and literacy acquisition: people who are Deaf, hearing, parents, professionals, and community members, and spent hundreds, if not thousands of hours talking about this topic, as many of us in the field do, or as many of us who are Deaf (or have deaf children) do. I read book after book, poured through site after site, and read paper after paper on this topic. But even then, my research interests were more wide than deep. This changed a few years ago. The research questions for this thesis were sparked by a talk
I attended in the spring of 2011 where Dr. Raychelle Harris spoke on her research in early language acquisition and extended discourse (Harris, 2011). I experienced an “aha, that’s it” moment. The focus was ignited: I knew what I wanted to ask and the research direction in which I wanted to go.

1.2 A Note on Terminology: d/Deaf and Hard of Hearing

There are varying (and evolving) conventions around writing about people who are d/Deaf and hard of hearing. These conventions stem from medical, audiological, educational, and cultural perspectives of deaf people. The blanket, lowercase forms “deaf” and “deaf and hard of hearing” refer to people who do not hear, or people who have a “hearing loss.” The capitalized “Deaf” refers to those who hold a cultural identity and use sign language (Bauman & Murray, 2014; Easterbrooks & Baker, 2002). Some deaf people are Deaf, and some hard of hearing people are Deaf. This thesis intentionally alternates between capitalization conventions when referring to previous research studies (and the conventions they use), or a distinction between generalities (deaf or DHH) and cultural identity (Deaf).

1.3 Purpose and Rationale

Up to 95% of d/Deaf and hard of hearing (DHH) children are born to hearing parents (Bailes, Erting, Erting, & Thumann-Prezioso, 2009; Mitchell & Karchmer, 2004). For hearing parents, their child will likely be the first deaf person they meet. A communication mismatch often results as a consequence of this reality (Barker et al., 2009). These parents may not come readily equipped with knowledge about language acquisition and deaf children.

Deaf children may acquire language differently due to their varied access to language in their home environment. Children who use spoken English will have limited access to sound depending on their age of identification, hearing level, and other factors. Also, spoken language
is a learned skill; it is not something that is immediately acquired. Parental language competency, motivation, and resources available will shape the quality of language access from primary caregivers.

Deaf people’s academic and literacy challenges can be a result of language deprivation (Bailes et al., 2009) rather than a result of a lag, or a later start. In addition, hearing parents of deaf infants are often unaware of the social, cognitive, and cultural knowledge required to facilitate language acquisition (Bailes et al., 2009). Deaf children disproportionately experience impoverished language in their early years due to the gap between identification and parental skill development of supporting their child’s language acquisition. Researchers refer to the tendency for deaf children to have impoverished language experiences as having serious implications and resulting in very low literacy skills (Marschark & Lukomski, 2002; Paul, 1998; Stobbart & Alant, 2008; Swanwick & Watson, 2005).

Previous research studies have investigated the relationship between parents’ language competency in communication skills and deaf children’s language and literacy development (Bailes et al., 2009; Barker et al., 2009; Calderon, 2000; VanDam, Ambrose, & Moeller, 2012). The research literature, however, does not include investigations of specific features of parents’ academic language competency and communication skills, nor does it look at the extended discourse strategies parents use with their (DHH) children in various home or community contexts.

1.4 Research Questions

Snow, Tabors, and Dickinson (2001) found language-rich home and school environments were high predictors for language and literacy development among hearing children. Language-rich schools with language-impoverished homes came in a close second. Harris’ (2010) research
was inspired by Snow and colleagues’ work and investigated the quality of academic language and extended discourse during language interactions in a bilingual American Sign Language (ASL)/English preschool classroom. Extended discourse refers to cognitively challenging language interactions mirroring academic language, but has limited research with ASL users (Harris, 2010). Because most deaf children are born to hearing parents, Harris (2010) suggested that language-rich (using academic language through extended discourse) preschool classrooms might be able to compensate, and perhaps even close the gap. Examining language interactions is rooted in the top-down approach to literacy development where having a familiar language foundation assists with practicing and mastering the process of reading (Harris, 2010).

Previous research studies (Hart & Risley, 1995, 1999, 2003) examining impoverished language environments in the early years concluded that by age three years, the window quickly closes, and it may even be too late for a language foundation (Harris, 2010). Therefore, Harris (2010) concluded that rich, early language socialization at home, such as childcare, parent mentoring, and coaching in the years from birth to three, set the stage for later academic language development.

This leads to my research interests: What particular features or qualities of parental language interactions might promote deaf children’s language and literacy development? What contexts in the home (i.e., environment/activities) lend the most opportunities for parental academic language? Can we teach parents these skills or provide coaching and mentoring?

I conducted an in-depth examination of parental expressive language in the child’s primary language. I am curious about parents’ use of discourse, and what features and contexts offer the most opportunity for rich language interactions with their deaf child. The following research questions were examined in this research study:
1. What are the parent/child language interactions that occur in a home setting?
   a. What components of language-rich activities (booklike talk; science process talk; and shared reading talk) do parents use during interactions with their children during various settings (mealtime, storytime, or playtime)?

2. What are the academic language features used during parent/child interactions (semantic, syntactic, and pragmatic)?
   a. What semantic features of academic language (e.g., content words, function words, and word or word parts that teach word structure) do parents use in these interactions?
   b. What syntactic language features (e.g., ASL Sentence Patterns, simple vs. complex sentences, etc.) do parents use in these interactions?
   c. What pragmatic approaches to language (e.g., parallel talk, open-ended questions, expansion, expatiation, recasting) do parents use in these interactions?

1.5 Theoretical Framework

There is no one story or point of view. A social constructivist research epistemology offers great potential in unpacking features of family/child language use, lived experiences, and realities. With a social-interactive framework, social interactions are highlighted as the crux igniting the maturation of innate cognitive language capacities (Paul, 2009). This approach can be enriched by considering or including Chomsky’s position that human languages take root in what he coins “universal grammar” with innate language mechanisms in analysis of linguistic
features in early language acquisition (Chomsky, 1975). Embracing both points of view unpacks, or reveals, various dimensions of early language acquisition.

1.5.1 Early Language Environments

Family/child language interaction sets the stage for conversational feedback and the synthesis of existing words with new words, phrases, and ideas. Conversation does not occur without people, and incidental learning does not occur without conversation (Easterbrooks & Baker, 2002). Without incidental learning, world knowledge stores and critical thinking skills cannot develop to the fullest potential (Easterbrooks & Baker, 2002). Interlocutors use an optimal range of scaffolding to facilitate young children’s incidental learning and cognitive development. Vygotsky (1978) coined the term “zone of proximal development” (ZPD) to describe the point at which children’s development is mediated by “problem solving under adult guidance or in collaboration with more capable peers” (p. 86). Incidental teaching offers a platform for a more capable peer or a more knowledgeable other (MKO) to model and scaffold new concepts or the opportunity for a child to try out communication conventions (Easterbrooks & Baker, 2002; Vygotsky, 1978; Warren & Kaiser, 1986). Early language environments should be filled with language opportunities, stories, and explanations, all the while producing high amounts of lexicon (Snow et al., 2001). A significant factor in the quality of parent-child language interaction is the child’s language exposure, or what Easterbrooks and Baker (2002) coin language “input.” An additional layer to this interaction is the question of what the child actually processes or understands: “uptake” (Easterbrooks & Baker, 2002). Language is social and cannot adequately develop without communication partners. Social-interactive functions of language are viewed as the most important aspect of language acquisition and are argued to
develop through social activities and interactions, such as those found during conversations and routines at bath time and during story-reading (Paul, 2009).

Early language learning sets the stage for, and is interrelated with, learning through language and later, learning about language (Halliday, 1993). This developmental continuum is ignited by the innate motivation to make meaning by way of experiences and is thereby a meaning-making or semiotic process (Halliday, 1993). Halliday’s (1993) framework of a language-based theory of learning highlights the importance of looking at the language continuum in children’s unconscious use in their natural environments, that is, observed rather than elicited. Here, also, a continuum of child language development is organized using a hierarchy of 21 features ranging from the fundamental (e.g., signs or acts of meaning) to the developing (e.g., lexicogrammar, generalization) and complex (e.g., dialectic processes; Halliday, 1993). Language exposure shapes a child’s early language journey whereby connections can be made between previously acquired concepts or lexicon and new words and meanings (Paul, 2009). Syntactic conventions are typically internalized by age 4 or 5 years, and mastered by age 9 or 10 (Crystal, 1997, 2006; Gerken, Jusczyk, & Mandel, 1994; O’Grady, 2005; Paul, 2009; Pence & Justice, 2008). The ultimate goal of early language acquisition is to see a child unlock the rules of language, use language to learn, and ultimately create language. This point is described as the “threshold of understanding” where a child becomes a self-sufficient language-learner, consumer, and producer because, realistically, she cannot be taught everything there is to know about language (Paul, 2009). This threshold of understanding then becomes a platform for facilitating the kind of language seen in school: academic language, or decontextualized language with registers on the end of the spectrum, opposite that of surface-level conversational language. Academic language is language typically found in school and
requires mastery in order to successfully navigate subjects in school and the world outside of school. How does a child reach this threshold?

Schleppegrell’s (2004) functional linguistics framework posits language and context as having a dialectical relationship. Children’s early experience with language influences what they are able to bring to and learn at school (Schleppegrell, 2004). Learning to use academic language is “especially difficult for those who have little opportunity for exposure to and use of such language outside of school” (p. 6). Early access to academic language in the home is varied, as are the activities in which rich opportunities for language are offered. For instance, making connections to personal experiences during story reading, the kinds of questions used to elicit responses, and asking for explanations. Questioning is an integral strategy to extend language and facilitate topic maintenance, as well as turn-taking. Schleppegrell (2004) refers to Snow (1983, 1987) and Snow and colleagues’ (1989) descriptions of decontextualized language. Decontextualized language is explicit with regards to lexical references and use; distanced where there is no immediate reference in the environment or a common, shared understanding; and complex and highly structured with intricate syntactic and lexical uses. Decontextualized language is essentially language void of cues that can be gleaned from conversation, or context (Schleppegrell, 2004; Snow, 1983). Examples of decontextualized language include monologues (i.e., narratives), definitions (i.e., explanations), abstract reasoning (i.e., science talk), and metalinguistic analyses (i.e., talking about talking, or, rather, talking about language, as occurs when critically unpacking language input, at the sentence and word levels; Schleppegrell, 2004; Snow, 1983).

Cummins (1992) also offers a useful framework for looking at the language competency continuum. Language happens at varying levels of complexity: at the surface level, basic
conversational proficiency, and below the surface, cognitive academic language proficiency (Cummins, 1992). Cummins (1992) coined the terms “surface fluency” and “conceptual-linguistic knowledge” to distinguish between basic interpersonal communication skills (BICS) and cognitive/academic language proficiency (CALP). Surface fluency by virtue of basic vocabulary and grammar is more visible and therefore easier to measure than the semantic and functional meanings of pragmatics (Cummins, 1992).

Halliday (1993) offers another continuum model of language competency, specifically a systematic-functional framework. This continuum is framed by developmental stages: learning language, learning through language, and learning about language. Halliday (1993) places emphasis on looking at language in natural settings, (i.e., in context, spontaneous, and unedited). In addition, Halliday (1993) stresses language as a means of knowledge supported by experience and the study of language serving a bigger picture. Gee (1994) contributes to the discussion of the study of language and adds cultural domains, which cannot be overlooked. Language involves people, and as such, involves subjective factors at play, shaped by intersections of time and place, as well as knowledge and beliefs gleaned through lived experiences and walks of life (Gee, 1994). Studying language cannot be isolated from these external factors and is never just one thing, void of influence (Gee, 1994). Language is influenced and shaped by context or a point in time. Together, Halliday (1993) and Gee (1994) create a strong argument for the systemic-functional and socio-historical framework looking at “Discourses (ways of being), not just discourses (ways of using words)” (Gee, 1994, p. 39). Halliday (1993) and Gee (1994) remind us to carefully look at the parts and functions of language and discourse, and the ways in which language and discourse are shaped by external factors.
1.5.2 The Human Brain’s Language Capacity

Human beings’ innate language mechanisms have no bias or preferential language (Easterbrooks & Baker, 2002; Petitto et al., 2012). In addition, human brains, especially very young brains, have the ability to learn more than one language (second language; L2), given there is a strong foundation in their first language (L1): a process that can happen simultaneously and arguably preferably so (Cummins, 1978). Indeed, research has found benefits to learning more than one language: increased neural plasticity and creative thinking (Petitto et al., 2012). Recent findings in brain science suggest that bilingual brains have neural and language processing advantages over monolingual brains (Petitto et al., 2012).

Cummins (1992) framed bilingual proficiency as a dual iceberg where one mediates languages. L1 and L2 acquisition are not parallel and separate processes but, rather, intersectional and intertwining. If one has little understanding or proficiency in L1, it then becomes very difficult to acquire conceptual understanding in L2. Minority students struggling with academics benefit from language mediation, or the advantageous use of the dual iceberg framework, where a student’s L1 provides a cognitive map and starting place from which L2 literacy can be mediated and expanded (Cummins, 1992).

1.6 Significance of Study

This study will offer a unique perspective and strives to generate new knowledge about the roots of language competency in DHH children. This study contributes to researchers’, early intervention practitioners’, parents’, and other interested parties’ understanding of parental discourse specific to contexts involving DHH children and their parents. Research has indicated that for DHH children to develop language equitably to their hearing peers, the language used must be accessible (Beal-Alvarez & Easterbrooks, 2013; Garrison, Long, & Dowaliby, 1997). In
addition, for DHH children to develop language, the language must be modelled and mediated (Beal-Alvarez & Easterbrooks, 2013). Since children spend thousands of hours with their families before they even set foot in an educational program, it is highly prudent to investigate parental language complexity and the type of discourse in a variety of contexts in the early years. In addition, ASL-English linking strategies provide codeswitching opportunities (i.e., using an L1, ASL, to mediate meaning within an English text), a vital skill that is required for academic success in later school years (Andrews & Rusher, 2010).

This study’s findings have potential future applications. Patterns in language analyses and the contexts in which language occurs can inform intervention approaches and foci. Since early intervention professionals are with parents for a limited window of time in the thousands of hours of language opportunities, it is advantageous to model the types and contexts in which rich discourse occurs. In addition, early intervention professionals can support parents with self-assessment of their language competency and assist them in modifying language habits to better enrich their child’s language exposure.

A major goal of the field of the education of the DHH is to “close the gap” between language impoverished childhoods and language enriched lives, and the desire to add to the research base is what drives this research study. Any insights or patterns found may have implications that can be built upon in future research of the language and socio-emotional lives of DHH children and their families.

1.7 Description of Structure of the Thesis

This thesis is organized in chapters. First, Chapter 1 outlines the basis for my research interests, purpose and rationale, research questions, and theoretical framework. In Chapter 2, I conduct a thorough review of the literature surrounding the research questions. In Chapter 3, I
outline the methodology of the study. In Chapter 4, I present the results of my research study. In Chapter 5, I interpret and discuss the findings, then finally, consider recommendations for future research.
Chapter 2: Literature Review

2.1 Setting the Stage

Human beings connect with one another and experience the world around them through language. This relationship with language starts in-vitro where genetic blueprints determine cognitive wiring, and environmental factors begin to shape how the brain uses this wiring (Easterbrooks & Baker, 2002; Petitto et al., 2012). It appears that infants come equipped with innate, biological language capacity, ready to tackle the language puzzle. In fact, infants have been found to start out life with infinite language potential, with the ability to discriminate phonemes in any language (Petitto et al., 2012). Petitto et al. (2012) coined the term “wedge” to describe bilingual brains’ flexible linguistic processing. This stems from the brain’s working in neuroplasticity and processing the various components or rules of language, from the word to syntactic level (Petito et al., 2012). This “wedge” keeps the doors open to language potential, and is engineered before an infant takes her first breath. Potential does not equate capacity and competency, however. The capacity for language depends heavily on an infant’s language environment: “the world in which a child is born greatly influences how the brain forms and functions—this is, environment is central in shaping the brain” (Easterbrooks & Baker, 2002, p. 41). Early language development correlates with later language acquisition and academic success (Bailes et al., 2009; Marschark, Spencer, Adams, & Sapere, 2011; Perfetti & Sandak, 2000). Access to language models is paramount to the language acquisition machine. Ultimately, the brain does not care what language or modality is used so long as a complete language system exists and is accessible (Easterbrooks & Baker, 2002; Pettito et al., 2012). Dr. Laura Ann Pettito, based on findings from revolutionary brain science studies, has been reported as saying:
“The human brain does not discriminate between the hands and the tongue. People discriminate, but not our biological human brain” (Polk, 2012).

Historically, for the majority of DHH children, identification of hearing status was delayed in childhood because the average age of identification was around 2 years old (Yoshinaga-Itano, 2003). Identification usually came about as a result of parents’ concerns about their children’s lags in achieving spoken language milestones. As a consequence of timing, parents depended on schools to address later language starts. This belief is still prevalent: parents still view schools as primarily responsible for DHH children’s early literacy (Calderon, 2000; Stobbart & Alant, 2008). More recently, with universal newborn hearing screening (UNHS), identification takes place much earlier, often in the first days of an infant’s life. Families are aware of hearing status earlier than ever before, even before parents anticipate their infant’s first word. The average age of identification of hearing status is now as early as two - four months of age, depending on the source (Durieux-Smith, Fitzpatrick, & Whittingham, 2008; Nikolopoulos, 2015; Yoshinaga-Itano, 2003). The stage for early language development is now in the praxis of the home, when, historically, because of later identification, language development was addressed primarily in the context of the educational environment (Stobbart & Alant, 2008).

With the praxis or responsibility of early language acquisition shifting from school entry to the home, parents become children’s first language models and key early facilitators in the beginning stages of language acquisition (Yoshinaga-Itano, 2003). To be sure, early intervention services play a key role in providing support, but the home is nevertheless the main playing field where the majority of early language growth takes place. Early language acquisition in the home and community is viewed as critical for later language and literacy development (Antia, Jones, Reed, & Kreimeyer, 2009). Hearing parents of newly identified DHH children typically do not
come equipped with knowledge about language deprivation or how to facilitate language acquisition (Bailes et al., 2009; Koester & Lahti-Harper, 2010; Marschark et al., 2011). Deaf parents of deaf children are typically able to provide rich early language environments and utilize child-directed signing and joint attention to ensure an accessible modality for their deaf children (Bailes et al., 2009; Koester & Lahti-Harper, 2010; Lieberman, 2012; Lieberman, Hatrak, & Mayberry, 2014).

Although there is general consensus that early language exposure is important, parents require additional support to understand just what constitutes rich, early language exposure. On top of this, parents compel an understanding of the ingredients and techniques to use in the context of their home, a rich petri dish where the potential for growth is exponential. The review of the literature is organized in topics from the larger umbrella of language forms and functions for development to the subsequent ingredients or factors at play.

### 2.2 Emergent Literacy: Forms and Functions of Early Language Development

Researchers have found language-rich, or academic language, exposure in the home and school predicted later literacy success, where exposure to language-rich preschools with low exposure in home environments came in a close second, followed by language rich-homes with low language exposure in preschools, then low home and preschool language environments coming in last (Dickinson & Tabors, 1991, 2001, 2002). Specifically, three types of language and literacy dimensions, or experiences, predicted later literacy success: “exposure to varied vocabulary,” “opportunities to be part of conversations that use extended discourse,” and “home and classroom environments that are cognitively and linguistically stimulating” (Dickinson & Tabors, 2002, p. 12). Children variably experience decontextualized language that is rich in
lexicon and structured through various registers. A large part of this is due to a result of variations in early language environments (Schleppegrell, 2004).

Language use is tangible, with the ability to refer to things in the here and now. Language use is also intangible, referring to things in the there and then. The here and now can be classified as surface-level conversation use, and the there and then can be identified with a deeper-level academic language (Cummins, 1992). Shuy’s (1978, 1981) iceberg metaphor serves as a vertical register where at the surface, the more visible aspects of language (e.g., basic vocabulary and syntax) can be related to basic interpersonal communicative skills (BICS), and below the surface, not as easily seen, lie the intangible semantics and pragmatics found in cognitive academic language proficiency (CALP; Cummins, 1992; Shuy, 1978, 1981). Most often, children first encounter academic language before even setting foot in a school; the depth to which children experience this academic language varies, however. A family with strong academic language models within language registers produces children who begin school with a language advantage, as the children have already incidentally experienced this type of language use (Schleppegrell, 2012).

Definitions of academic language, particularly “academic English” (AE; Schleppegrell, 2012) across the literature include:

- An umbrella term referring to “the particular ways in which language is used in school contexts” (Achugar & Carpenter, 2014, p. 61; see also DiCerbo, Anstrom, Baker, & Rivera, 2010; Schleppegrell, 2012)
- A new set of registers (i.e., authoritative stances encountered upon school entry; Scheele, Leseman, Mayo, & Elbers, 2012; Schleppegrell, 2012)
- Language with “cognitively complex and decontextualized content” (Scheele et al., 2012)
• “Islands of expertise” in which young children need to be prepared early on to become “little experts” (Crowley & Jacobs, 2002; Gee, 2008, p. 62)

• Varied, complex language: “‘booklike’ talk” with longer discourse turns, inquiry-based learning, multiple language models and contexts, talking about talking (i.e., metalanguage; Gee, 2008, p. 62)

• Advanced literacy tasks using language with condensed information where lexicon and clause structures differ from everyday language (Schleppegrell, 2004)

• Decontextualized language where language is used without the support of conversational context (Schleppegrell, 2004; Snow, 1983)

Academic language competency lies on a developmental continuum from early language acquisition toward using language to learn and decontextualize it (Halliday, 1993). Halliday (1993) conceptualizes learning as a semiotic process whereby language is learning to mean. Cummins’ (1992) concepts of surface fluency and conceptual-linguistic knowledge conceptualize academic language constituents. BICS and CALP function on a horizontal language proficiency continuum going from a more controlled, negotiated meaning through context-embedded language to context-reduced academic language involving deeper-level competency and knowledge to infer meaning (Cummins, 1992). In this same representation, on the vertical axis lies a continuum of communicative tasks ranging from the internalized or automated to the more cognitively involved (Cummins, 1992). Surface fluency can act as a linguistic façade (Cummins, 1978), which could explain the arguably insufficient attention to emergent academic language development early on in DHH children’s formative years.

Extending discourse, a vehicle of providing incidental access to academic language, is an issue of pragmatics (Dickinson & Tabors, 2001; Smith & Ramsey, 2004).
At first look, academic language use and modeling in the early years can be fallaciously seen as preemptive, particularly in the context of the home. It is helpful, then, to consider the above definitions of academic language to deconstruct this assumption. And, in fact, many families unknowingly socialize their children into various styles of academic language prior to preschool and kindergarten entry (Schleppegrell, 2012). This early socialization falls within the functional linguistics framework, in regards to “meaning making process[es] as a socio-cultural practice” (Achugar & Carpenter, 2014, p. 61). Meaning-making continues throughout the school years where students continue to be “socialized into content, language and activities” in various subject areas at school (Achugar & Carpenter, 2014, p. 61). Admittedly, early academic language socialization depends to a large degree on the academic language competency of parents themselves to transmit this knowledge or language know-how (Gee, 2008; see also Dickinson & Tabors, 2002). Emergent academic language is an oft-overlooked concept. Indeed, children’s school readiness is shaped by early academic language experiences in language and literacy activities at home (Scheele et al., 2012; see also Dickinson & Tabors, 1991, 2001, 2002; see also Gee, 2008).

These dimensions show extended discourse as a useful language and literacy development skill, for both parent and child. Parental competency in strategies extending discourse offer children enriched language experiences as well as the opportunity to stay on a topic for a longer period of time, and in more depth. Children’s extended discourse competency and strategies become tools in which they can share or gain information that is decontextualized and intangible.
2.3 Emergent Literacy and Academic Language: When and Where Do These Happen?

Learning to use academic language is “especially difficult for those who have little opportunity for exposure to and use of such language outside school” (Schleppegrell, 2004, p. 6). Children require academic language exposure through opportunities to actively participate within academic language-rich contexts (Schleppegrell, 2012). Oftentimes, parents socialize their children into academic language upon preschool or kindergarten entry. The extent to which children are exposed to academic language lexicon varies significantly, and not all children enter kindergarten prepared, much less children who have variable access to language, and opportunities to use and engage in language (Schleppegrell, 2012). Children enter school with varying competency at the lexical and syntactic levels, as well as language mediation and construction, and do not experience a level playing field in regards to academic language readiness (Scheele et al., 2012). Understanding what emergent academic language occurs in the home setting can better facilitate school readiness in family and preschool contexts (Scheele et al., 2012).

Another benefit of studying academic language use with DHH children is that professionals can better understand the features and functions of academic language when preparing teaching materials and literacy intervention practices. In addition, through metalanguage, professionals can explicitly deconstruct features of academic language, and make expectations of learners (i.e., parents) clear by giving them tools to employ strategies and registers in decontextualized contexts (Marschark et al., 2011; Schleppegrell, 2012).

Language acquisition is more environmentally sensitive than posited by most cognitive-linguistic theorists (Paul, 2009). Metalinguistic knowledge is acquired socially, through interactions between a child and her world; examples of metalinguistic skills include “playing
with and talking about language” as early as age three (Paul, 2009 p. 102). Generally speaking, “most children internalize much of the grammar of the language by the age of 4 or 5 years” (Paul, 2009, p. 102).

Other critical environmental factors in emergent literacy include: parent involvement, language-rich environments, storybook reading, supportive class environment, and explicit instruction (Easterbrooks, Lederberg, & Connor, 2010). Vocabulary and rhyming skills are also correlated with emergent literacy activities (Easterbrooks et al., 2010). Research has examined tasks such as free-play using toys (Bailes et al., 2009; Barker et al., 2009; Cruz, Quittner, Marker, & DesJardin, 2013; Quittner et al., 2013), problem-solving using puzzles (Barker et al., 2009; Quittner et al., 2013), an art gallery walk (Barker et al., 2009; Cruz et al., 2013; Quittner et al., 2013), and using posters to collect data on emergent literacy skills in environmental settings. Other studies use natural events in a child’s life to look at discourse, for instance, observing home video recordings of mealtimes, book sharing, and play time (Bailes et al., 2009). Activities can be designed to optimize emergent academic language opportunities for investigating various genres (social purposes) and registers (different lexical and grammatical choices). Genres can be categorized as “personal narrative; impersonal narrative; and instruction” in play (Scheele et al., 2012; Schleppegrell, 2012, p. 414). Teachers often hold expectations for students to use lexical and grammatical structures in narrative talk regarding experiences in which the student is an expert (Scheele et al., 2012). Emergent academic language, however, mandates language input and an assurance of language uptake within the context of language-specific lexical, syntactic, and output forms (Scheele et al., 2012). Scheele et al. (2012) found that home activities that allowed for rich academic language opportunities included verbal reconstructions of memories and personal experiences with opportunities for narration and sequencing; shared narrative book
reading; introducing and practicing rare words; daily family routines allowing for educational or instructional talk; and shared play setting the stage for spatial action verb use. These home activities offer scaffolding experiences for children prior to entering school. Cruz et al. (2013) looked at the scaffolding techniques that parents use at home to extend discourse. These parental Facilitative Language Techniques (FLTs) include strategies such as:

- Parallel talk (i.e., narrating the child’s task at hand or context)
- Open-ended questions (i.e., using a question or phrase eliciting various possible responses)
- Expansion (i.e., the parent uses a child’s expressive language utterance to model syntactically correct and complete language use)
- Expatriation (i.e., expanding, then adding new information)
- Recast (i.e., restating as a question)

These higher-level FLT strategies offer children the opportunity to experience academic language use, as well as the introduction of new vocabulary or concepts.

2.4 Family-Child Interactions as a Course for Emerging Academic Language

Gee (1994) posits language as inherently social, interactional, and cultural, as indicated by a capital D “Discourse” (p. 36). “D”iscourses refer to ways of being and “d”iscourses relate to ways of using words (p. 39). The framework of the social-historical nature of Discourse lends itself well to the role of parents or more knowledgeable others (MKOs; Beal-Alvarez & Easterbooks, 2013). Parents or MKOs mediate language opportunities at certain times and places shaped by certain feelings, values, and interactions: language does not develop independently or in a decontextualized manner (Gee, 1994). Parental uses of such strategies as FLT’s are required to scaffold emerging academic language skills.
The theoretical frameworks around academic language and extended discourse offer a lens of looking at the nuances and features of adult communication skills, adult-child discourse, and conversational turns and contexts (Gee, 2008; Smith & Ramsey, 2004; Wood & Wood, 1997). Gee (2008) lists key factors to children’s exposure to academic language: parental complex language and booklike talk; parental facilitation or “coaching” of child’s usage of longer discourse turns; inquiry-based opportunities; multiple models and contexts; and metalanguage (i.e., shared language that is used to discuss language). Snow and colleagues (1991) found that young children’s language-rich environments included a thick (i.e., complex and dense) lexicon used during interesting conversations, enriched by stories and explanations. Additionally, parents are less controlling resulting in children’s increased interaction (Stobbart & Alant, 2008; Webster & Heineman-Gosschalk, 2000). Smith and Ramsey’s (2004) study of a deaf teacher’s use of extended discourse as an instructional strategy in a fifth-grade class of deaf students supported the preceding findings that Deaf teachers with ASL competency have more success with maintaining discourse with deaf students (Lang, Dowaliby, & Anderson, 1994; Lang, McKee, & Conner, 1993; Lartz & Lestina, 1995; Smith & Ramsey, 2004; Stokoe, 1960). Here, extended discourse was facilitated “through persistent, contingent comments and questions” (Smith & Ramsey, 2004 p. 50). In addition, not only is ASL competency important but also the manner and quality of ASL has been referred to as an additional requirement in maintaining discourse (Akamatsu, Stewart, & Mayer, 2002; Smith & Ramsey, 2004).

2.5 Language Features: Closer Examinations in Semantics, Syntax, and Pragmatics

2.5.1 Semantics at the Lexical Level: Vocabulary

For many DHH children, insufficient and inconsistent access to English lexicon results in smaller English vocabulary bases (Cruz et al., 2013; Singleton, Morgan, DiGello, Wiles, &
Many DHH children struggle with reading, particularly vocabulary and comprehension (Antia et al., 2009; Cruz et al., 2013; Easterbrooks & Baker, 2002; Marschark et al., 2011). DHH children have the potential to learn vocabulary at an exponential rate and generalize patterns.

ASL is a relatively new language with 8,700 listed lexical signs in The Canadian Dictionary of ASL that are supplemented by fingerspelling and nonmanual features and use of space and movement to convey meaning (Bailey & Dolby, 2002). Many English words have multiple meanings for a given word resulting in high frustration levels and stilted reading fluency for DHH children who may attribute one meaning to a word with multiple meanings (Easterbrooks & Baker, 2002; Paul, 2009). In addition, idiomatic language is thick in the English lexicon, and is difficult to discern from literal verb and preposition use (Berent, 1996; Easterbrooks & Baker, 2002; Kluwin, 1982; Quigley, Wilbur, & Montanelli, 1976). English words have base forms expanded by compound, noun adjunct, and derived forms (Berent, 1996; Easterbrooks & Baker, 2002; Kluwin, 1982; Quigley, Wilbur, & Montanelli, 1976). The bulk of opportunities to access this knowledge is not explicitly taught in school. This comes from incidental learning experiences: day-to-day sponge access to English lexicon.

Interestingly, in a study analyzing the quantity of parental language (English) in families with HH children ages 24-36 months, child receptive language abilities were reported to be correlated with conversational turns, but not adult word counts (VanDam et al., 2012). Turn-taking becomes an opportunity for children to have lexicon modeled in repeated utterances or contexts. Not only that, but also, turn-taking becomes an opportunity for children to themselves mediate with the lexicon and engage in meaningful meaning-making with a MKO who can then employ various strategies to mirror whether the child is using this lexicon correctly. This is
fleshed out in the pragmatics section but warrants discussion within the semantic category, too. After all, language is interconnected, intersectional and various elements and functions of language spiral outwards and back again.

2.5.1.1 Academic Vocabulary: Content and Function Words

Across the literature there are various referents to what “academic vocabulary” constitutes (Echevarria, Vogt, & Short, 2008). Scheele et al. (2012) refer to an example of academic language seen in a kindergarten class’s sharing time. Here, technical vocabulary and definitions were found, “lexically dense sentences” (i.e., thick sentences) were used to convey “complex meaning,” and the child was viewed as an “authority” (Scheele et al., 2012, p. 420); similar to the “little expert” definition found elsewhere (Gee, 2008, p. 63). Scheele and colleagues (2012) do not provide an extensive academic vocabulary definition, so for the purposes of this study, the definition by Echevarria and colleagues (2008) is utilized. Echevarria and colleagues (2008) define content vocabulary as relating to key vocabulary words, terms, and concepts connected with a topic being taught. In the context of this study function words are those related to functional language (e.g., requesting information, justifying opinions); language used in the classroom for processes and tasks; and language processes (e.g., scanning, skimming, questioning, debating, arguing, summarizing).

Echevarria et al. (2008) define academic vocabulary as content words, process/function words, and word or word parts teaching structure. In addition, Scheele et al. (2012) include connectives as an additional example of academic word use. Baker (2010) and Stone, Kartheiser, Hauser, Petitto, and Allen (2015) posit ASL fingerspelling as an orthographic awareness strategy that supports English vocabulary development, and is included in this study in the morphology realm of academic vocabulary. More specifically, Stone et al. (2015) describe
fingerspelling as a metalinguistic skill whereby the interlocutor uses visual-orthography to decode vocabulary and recognize words. Baker (2010) outlines the ways that teachers use fingerspelling in academic contexts: *chaining* links signs, fingerspelling, and text, and sometimes, objects, pictures or digital media; *sandwiching* uses a sign or fingerspelled word sandwiched between two instances of the fingerspelled word, or two instances of the sign; and *lexicalized fingerspelling* (or loan signs) where fingerspelled words take on the quality of signed words.

Academic language is inundated with content words that reflect context-specific lexicon and concepts (Echevarria, et al., 2008). This, more specifically, is reflected in noun, verb, adjective, count word, connective use, and in some cases, adverbs having semantic meaning (Scheele et al., 2012). Academic vocabulary does not include adverbs or function words that have a mainly grammatical meaning.

2.5.1.2 Academic Vocabulary: Morphology

Kieffer and Lesaux (2012) reviewed the literature involving key factors of language and define morphological awareness as “the understanding of complex words as combinations of meaningful units or morphemes that contribute to the words’ meanings and functions” (p. 520). Academic language includes word or word parts that teach language structure. Echevarria et al. (2008) flesh this out and identify key components of academic language: a) morphology (base words, roots, prefixes, suffixes); b) tense (past, present, future); and c) syntax (word order, asking questions, adjectives, adverbs, articles).

2.5.1.3 How Does One Become Morphologically Aware?

Kieffer and Lesaux (2012) list four stepping stones to morphological awareness in elementary-aged language learners: 1) varied contextual experiences with academic words and
their specific meanings; 2) seeing steps of morphological awareness explicitly modeled; 3)
understanding affixes and root meanings; and 4) opportunities for practice, both written and
through-the-air. While this speaks to elementary-aged language learners, and this research study
looks at children’s emerging academic language before they enter school, it is prudent to look
ahead and identify the morphological skills required in the language of school.

Kieffer and Lesaux (2012) as well as Townsend, Filippini, Collins, and Biancarosa
(2012) refer to the Coxhead (2000) academic word list of frequently used word families in
academic texts. There is no ASL version of a comprehensive academic word list, so for the
purposes of this study, morphological awareness skills and abstract or specialized vocabulary is
examined. Academic word meanings have a tendency to be more abstract, technical or
specialized (Kieffer & Lesaux, 2012, p. 500). In this vein, young children who have an
opportunity to play with language and become morphologically aware at the emerging academic
language level will be well prepared for academic word development later in their school years.

2.5.2 Syntax: Sentence Types and Parts of Speech in English and ASL

Studies in the English language have resulted in a general consensus on the basic
sentence types. Before these sentence types are looked at in depth, some background
understanding is important. It is useful to note that studies around syntactic structures in ASL
and English do not come from balanced corpus in reference to size or time. Admittedly,
consensus on what constitutes English sentence pattern conventions have basis in a substantive,
long-standing, and widely used corpus.

Berent (1996) refers to Heider and Heider’s (1940) finding that DHH children tended to
use more simple sentences, fewer compound sentences, and fewer complex sentences in English
than hearing students. Written samples found overgeneralization of shorter and simpler sentences
with parts of speech structured unconventionally (Berent, 1996; Cooper & Rosenstein, 1966 in Berent, 1996; Mykleburst, 1964). DHH learners struggled with the overuse of simple sentences with limited levels of complexity in patterns as well as parts of speech 50 years ago (Cooper & Rosenstein, 1966 in Berent, 1996) and this is still evident today (Cannon & Kirby, 2013).

2.5.2.1 English Sentence Patterns

There are five basic English sentence patterns (see Appendix A for examples). These sentence patterns provide a basis to construct ever-increasingly complex language. For example, language users first learn sentences in which a noun precedes a verb (e.g., She made Alex smile) before learning sentences in which a noun clause precedes a verb (e.g., That she won the debate made Alex smile). DHH students tend to make distinctive error patterns in their basic sentence construction and comprehension (Berent, Kelly, Albertini, & Toscano, 2013; Kluwin, 1982; Quigley & King, 1980). These error patterns are not helped by the misleading construction and meaning-making conventions of the English language. For example, English tends to be perceived as linear; for instance, passive voices tend to be read as active (Berent, 1996; Quigley & King, 1980).

The constituents utilized within these sentence patterns include multiple forms of verbs. The first sentence pattern contains intransitive verbs ($V_i$), which do not necessitate a noun phrase (NP) or adverbial (Adv) complement. The ‘linking’ or ‘be’ verb develops late in both hearing and DHH populations (Heidinger, 1984). Linking verbs are the most difficult for DHH English language learners and this could be due to syntactic and semantic features in that forms of the ‘be’ verb give no additional meaning, are unstressed, and often appear in the contracted form (i.e., baby’s, dog’s). To complicate matters, a message can still be clear without ‘be’ verbs.
‘Be’ verbs, or linking verbs, link an attribute (adjective) to the NP, the subject of the sentence.

Berent (1996) describes Mykleburst’s (1964), Heider and Heider’s (1940), and Brannon’s (1968) findings that adverbs were not used by DHH participants until age 13, and were scarcely used then. Sentences tended to be short and simple, with overused nouns and articles.

2.5.2.2 ASL Sentence Patterns

As stated earlier, ASL is a newer language and has been researched for a relatively short period of time, in contrast to other languages, especially with regards to emergent and early ASL acquisition. Generally, ASL is thought to have a subject-verb-object (SVO) syntactic structure; however, there are multiple layers of linguistic functions beyond word order (Schick, 2011). See Appendix B for a list of five sentence patterns commonly found in ASL. The visual-manual nature of ASL mandates spatial mapping at the morpheme and syntactic level (Schick, 2011). In addition, ASL is a visual-manual language based not only in signs, but also in nonmanual features, which modify the meaning of signs (Johnston & Schembri, 2007; Stone et al., 2015). Nonmanual signs in and of themselves are not common, (i.e., signs indicated only by headshakes or nods, for example) and which can be considered universal gestures, or in ASL, (e.g., a puffing of one cheek to indicate menstrual period; Johnston & Schembri, 2007). More often, nonmanual features accompany signs, typically verbs or adjectives (Johnston & Schembri, 2007). Sometimes nonmanual features occur with nouns, modifying their size and shape (Beal-Alvarez, 2014; Johnston & Schembri, 2007).

Nonmanual signals (NMS) have several roles, including “reflections of emotional states, constructed action, conversation regulators, lexical, grammatical markers, and modifiers such as adverbs” (Bridges & Metzger, 1996, p. 8). Here, grammatical markers and modifiers will be
focused on. Grammatical markers differentiate questions from statements, and between
statements (Bridges & Metzger 1996). Mouthing NMS can accompany nouns, numbers, question
words and fingerspelling (Bridges & Metzger, 1996). Mouthing can demonstrate information
similar to intonation in English and changes the meaning of a sentence significantly (Bridges &
Metzger, 1996):

- IS – One car almost hit another car.
- OOO – One car almost hit another car.
- SOA – One car almost hit another car.

Adverbs in ASL describe an adjective or verb through nonmanual signals (Easterbrooks
& Baker, 2002). Appendix B lists nonmanual markers commonly found in ASL. Typically, in
gloss conventions, the nonmanual signal is indicated directly above the V, and is underlined
(adv). Nonmanual markers are often expressed through mouthing (Baker-Shenk & Cokely, 1980;
Bridges & Metzger, 1996; Easterbrooks & Baker, 2002; Johnston & Schembri, 2007; Kegl,
2004). Nonmanual modifiers (Bridges & Metzger, 1996; Easterbrooks & Baker, 2002; Smith,
Lentz, & Mikos, 1988) accompany adverbs, adjectives, or nouns.

Adjectives are indicated through ASL lexicon, signs, and can be modified using adverb
signs (e.g., very, more, most, worse, and intensification; or with rapid repetition). Adjectives
appear before (to specify) a noun, or after (to describe) a noun (Easterbook & Baker, 2002).
Multiple adjectives fall in an order from topic (accompanied by NMS eyebrow rise), trait, size, to
number.

ASL has two classes of verbs: indicating (body locating or directional) verbs and
classifier (or depicting) verbs (including motion/location; handling; size and shape specifiers
(SASS; Johnston & Schembri, 2007, p. 147). Aspect marking (tense in English more commonly
used) gives information about duration and frequency of an event, not the actual time it occurred (Johnston & Schembri, 2007, p. 151).

2.5.3 Pragmatics

Language does not happen in a vacuum. Language is, rather, a social machine. Meaning-making vis-à-vis semantic bits or “cogs” and the syntactic rules of order in which these “cogs” are arranged have no function without hands to turn the machine. Pragmatics, then, is the hand that turns the machine.

Facilitative Language Techniques (FLT; Cruz et al., 2013; DesJardin, 2006) are labeled as being either lower-level or higher-level where lower-level techniques are highly controlled and do not propel turn-taking or child-directed signing. Higher-level techniques include parallel talk, open-ended questions, expansion, expatiation, and recasting.

2.6 The Bilingual Factor: ASL-English Mediation

In the field of deaf education, there has been a long-standing debate about communication methodology (i.e., listening and speaking, sign language, or some combination of the two) and the roots of deaf children’s and adults’ disproportionately low literacy levels (Marschark et al., 2011; Stobbart & Alant, 2008; Wood & Wood, 1997). At any given time in recent history there have been at least two contrasting philosophies. Perspectives to this debate, then and now, vary depending on an onlooker’s framework around deaf children and adults: medical, audiological, educational, or cultural.

More recent research indicates that early language acquisition and access are the keystones to language and literacy development (Bailes et al., 2009; Marschark et al., 2011; Perfetti & Sandak, 2000). Current research has found that language acquisition is positively correlated with language experiences (Marschark et al., 2011). The first few years of a deaf
child’s life consist of a critical language acquisition window that is wide open in the early years and may close over time (Mayberry & Lock, 2003). Language-impoverished early years have significant implications for later language and literacy development (Bailes et al., 2009; Calderon, 2000; Marschark, 1993; Mayberry & Lock, 2003). Foundational conceptual language acquisition in the early years precedes English literacy development (Cummins, 2006). Deaf children who have early, rich ASL experiences can reach the same developmental milestones as those of hearing children (Bailes et al., 2009). With regards to English literacy skills, a review of the literature resulted in Spencer and Marschark’s (2010) identification of three factors contributing to deaf children’s literacy challenges (Marschark et al., 2011; Spencer & Marschark, 2010). These interrelated factors include: 1) impoverished academic and world knowledge, 2) cognitive wiring based on this world knowledge and incidental learning through life experiences, and 3) teacher factors, that is, “what is taught, where it is taught, and how it is taught” (Marschark et al., 2011, p. 5).

2.6.1 Codeswitching

Bilingual-bimodal education programs offer a glimpse into teaching approaches mediating rich language experiences. Here, educators model “codeswitching,” the act of moving between two languages to glean deeper meaning in one (or both). In fact, brain imaging shows that the bimodal-bilingual brain can handle dual language development (Petitto et al., 2001). Not only is ASL a means of achieving English mastery, but also a vital port for access to incidental learning and critical thinking in addition to the way in which one navigates through the world, interacts with others, and develops identity (Cummins, 2006). Cross-language mediation “codeswitching” can be used as a strategy at the word, phrase, and story levels to build English reading skills and vocabulary development (Andrews & Rusher, 2010). Visual strategies used by
a MKO during story-reading include signing on storybooks, visual expansion or making connections between text in the book and corresponding action, relating to the child’s lived experiences, joint attention, visible embodiment of characters in a story, and NMS use to ask questions (Lartz & Lestina, 1995).

2.7 Deaf and Hard of Hearing Factors

Children who are DHH have varying levels of access to language in their home environments. The effects of the façade of surface-level competency in day-to-day life consisting of mostly BICS are further compounded when considering the distinction between language exposure and access. This may be a result of early intervention programs’ focus on parent support and adjustment, understanding of their child’s hearing level and technology, as well as basic communication skills (Calderon & Bargones, 1998). Child-directed talk, or talk directly involving a child, promotes language skills, particularly later expressive vocabulary skills. Language exposure, or input does not necessitate language access, or uptake (Beal-Alvarez & Easterbrooks, 2013; Easterbrooks & Baker, 2002; VanDam et al., 2012).

2.7.1 Access to Incidental Learning and World Knowledge

Language access is necessary to tap into background knowledge required for learning (Beal-Alvarez & Easterbrooks, 2013). Incidental learning and world knowledge also depend on accessible language. Language development is correlated with language experiences (Marschark et al., 2011). Some DHH children, regardless of modality, continue to lag behind hearing counterparts in all forms of expressive communication (Bebko, Calderon, & Treder, 2003). For DHH children to develop language on par with hearing peers, parents and professionals need to understand how DHH children access and make sense of the world around them. Research and
evidence-based practice need to inform pedagogies around teaching or early intervention services.

Families of DHH children make use of various strategies to make language more accessible for the DHH child. The extent to which these strategies challenge a DHH child’s brainpower varies, however. On one end of the continuum, at the surface fluency level, information is front-loaded and explicitly provided to the child (Farran, Lederberg, & Jackson, 2009). At the other end of the spectrum, the child is required to tap into their conceptual-linguistic knowledge to infer and map information from the world around them. Here, the MKO utilizes the zone of proximal development (ZPD) in requiring that children use their brainpower.

Child-oriented signing can be appealing and interesting through-the-air language (e.g., the use of repetition and prosody; Bailes et al., 2009). Child-involved access rather than outlier access to language promotes language skills and later vocabulary development (VanDam et al., 2012). Both child-oriented signing and access require language mediation from a MKO. Past findings on early parent-infant interaction where a parent appears unresponsive imply that DHH infants may learn to be more passive and inwardly attuned (Koester, 1995). The onus of communication responsibility or power falls on the parent, or MKO, to tune into the ways that the DHH child can access and engage in early language opportunities (Koester, 1995).

Farran et al. (2009) found that while hearing parents of deaf preschoolers demonstrated a heightened awareness and sensitivity to the extent to which their child accesses incidental learning and world knowledge, they were not providing the deaf child with cognitively challenging opportunities to exercise novel mapping skills. There is a language competency and use distinction where language skills do not necessarily equate language mediation proficiency. Yoshinaga-Itano (2003) collected data about parental language competency, parental expressive
language volume and accuracy; however, “analysis of these measures has yet to be accomplished” (p. 28). This study emphasized the need for more research in skills in using language to communicate, not just language competencies. In fact, in at least one study, the use of visual language with a deaf child using a cochlear implant was found to alleviate parental stress stemming from language breakdowns or frustrations as a result of insufficient or inconsistent access via other channels (Mouvet, Matthijs, Loots, Taverniers, & Van Herreweghe, 2013).

While research shows a positive correlation between parental communication competency and participation and a child’s access to language with later language development and academic progress (Antia, Jones, Reed, & Kreimeyer, 2009; Calderon, 2000; VanDam et al., 2012), there is a need for further research relating to the particular qualities of linguistic features used in through-the-air communication in families with children who are DHH. The communicative competency of parent-child dyads depends on a multitude of factors, particularly the socio-emotional elements in the parent-child “dance.” Support systems and maternal problem-solving skills have been found to be predictors of child socio-emotional development (Calderon & Greenberg, 1999). It is impossible to remove the social nature of language where socio-emotional well-being and problem-solving skills can alleviate communication challenges between parent and child, and in fact, enrich the quality of discourse.

In the current context of UNHS where most DHH children are born to hearing families and now identified early in infancy, the home becomes the critical site of early language development. This is not to say the home has never been a critical site of language development, but that where, in the past, DHH children were identified after age 2, they had access to school-based supports and supports at home. Since the introduction of UNHS, however, and being that
early intervention is family-centered, the home becomes the focus of early DHH education. It is prudent, then, that in-situ tools and supports are provided to families. This is a critical time in the infant’s development and families variably have the ability to learn all there is to know about DHH children and language acquisition. Emergent literacy is facilitated through language used in daily activities at home where MKOs act as rich language models and language mediators, stimulating a child’s cognitive map and language stores. This exposure becomes important as language used in school, or academic language, is socialized first in the home and correlated with later reading and school success. MKO strategies induce a child’s deeper-level cognitive processing and can be offered in the form of extended discourse. The types of sentences and strategies MKOs use in ASL language interactions in the home with very young DHH children may shine a light on avenues families can utilize to maximize early language potential in the home.

2.7.2 What’s in a Name? Academic English, Academic ASL, or Academic Language?

In recent years, the idea of academic ASL as a unique register has been floating around and the research body has grown in this context (Harris, 2011; Ross & Berkowitz, 2008). It does seem, however, that the use of “academic ASL” relates more to the discourse style used at the collegial level (i.e., when presenting academic research to an audience; Harris, 2017) often mediated by ASL interpreters. This is not the focus of the research at hand, but this needs to be recognized and addressed as an emerging field of research. That being said, here, “academic language” is referred to as relating to the (emerging) academic language used in parent-child home environments and early education environments. As such, this research contributes to the academic ASL research literature, and existing academic ASL definitions are referred to when looking at the academic language in the research participants, mediated in ASL.
Chapter 3: Methods

3.1 Overview and Framework

The purpose of this research is to examine the cognitive academic language proficiency of a DHH child’s parent or MKO. The research questions for the study are:

1. What are the parent-child language interactions that occur in a home setting?
   a. What components of language-rich activities (booklike talk, science process talk, and shared reading talk) do parents use during interactions with their children during each setting (mealtime, storytime, and playtime)?

2. What are the academic language features used during parent-child interactions (semantic, syntactic, and pragmatic)?
   a. What semantic features of academic language (e.g., content words, function words, and word or word parts that teach word structure) do parents use in these interactions?
   b. What syntactic language features (e.g., ASL Sentence Patterns, simple vs. complex sentences) do parents use in these interactions?
   c. What pragmatic approaches to language (e.g., parallel talk, open-ended questions, expansion, expatiation, and recasting) do parents use in these interactions?

The key concepts in the first research question address instances of and, if relevant, components of extended discourse (booklike talk, science process talk, and shared reading talk) during three different settings (mealtime, storytime, and playtime). The key concepts in the second research question include characteristics of extended discourse (linguistic features,
sentence types, and ASL-English connections). A mixed methods approach to the research was used and descriptive statistics were employed to analyze data.

The approach to this research was social constructivist. There is no one deaf “story.” There are countless deaf stories and ways of telling these stories offer great potential in investigating the formation of these stories, knowledge(s) and the ways that people come to know what it is they know. An anti-racist feminist framework cautions against “rigid definitions” of identity, and “disregard[ing the] fluidity of categories” (Dua, 1999, p. 19). An intersectionality framework facilitates the unpacking of praxes of identity, social lives, and experiences: how a deaf life is not “one” thing, but rather, many multi-layered things.

This study employs an interpretive and critical research lens informed by social constructivist epistemology. A social-interactive framework highlights social interactions as the crux triggering the maturation of innate cognitive language capacities (Paul, 2009). At the same time, Chomsky’s (1975) idea of human language having roots in a universal grammar with innate language mechanisms can be used in analyzing linguistic features of early language acquisition (Paul, 2009).

The use of this particular framework does not mean I discard other approaches to research. I embrace these approaches, and attempt to contribute to the discussion vis-à-vis another lens. Evans (1998) employs a useful social-semiotics framework that investigates the “interrelationship of language, context, and text” (p. 250). Evans’ (1998) research methodology addresses the problematic nature of quantitative research and deaf education where “family dynamics, parental response to deafness, … as well as the pragmatic dimensions of a child’s language use” cannot be sufficiently measured through quantitative data (p. 247). At the same time, Evans (1998) does not cast aside quantitative research: she asserts that numbers have a
place in “discourse analysis of pragmatic dimensions, … categories of interactive episodes, group size, and the proportion of time” (p. 252).

Evans (1998), Tracy (2010), and Flyvbjerg (2006) offer insight into the design of case study research. This insight includes a caution against random sampling. Because the goal of the proposed research study is to find out as much as possible about the features and quality of language interactions in parent-child communication, random sampling may not achieve this objective. Focusing on a small number of case studies that differ significantly on one dimension may flesh out more significant findings. Evans’ (1998) recommends data collection that includes observations, interviews, and videotaping. This allows for data triangulation. Data logs can be documented via field notes, interview and language sample transcripts, and analytical memos (separate from field notes: pattern-finding, theme-sorting, and finding connections between pieces of data). Videotaping can be vital when studying deaf participants who use ASL due to the visual nature of the language. DHH children’s language use and “style” will vary, as will parental language competency, and videotaping allows for a closer analysis (Evans, 1998, p. 248). Using an anti-racist feminist construct of intersecting axes of identity parallels Flyvberg’s (2006) recommendation that case studies not be one-dimensional, but rather, investigated in different ways: “allowing the study to be different things to different people” (p. 238). This research study aims to investigate features of language interactions and share the findings with different people who may take different insights from the results.

3.2 Recruitment

The study set out to recruit one parent-child dyad (i.e., one parent or primary caregiver of a DHH child, and the DHH child). The family that volunteered to participate in the study had two Deaf parents with two Deaf children. Inclusionary criteria for participants included: a)
parents with competency in English sufficient to complete English-based forms and questionnaires (assessed during recruitment and first observation session; see Appendices D, E, F and G); b) parents with competency in ASL sufficient to communicate with their child (assessed using an ASL self-rating scale; see Appendix G); c) parents who are motivated and committed to participating in the study; d) children who are DHH and use ASL for part or all of their communication, receptively and/or expressively; and e) children between the ages of 3 and 5 years old who have not yet entered a full-time school setting.

Exclusionary criteria for participants included: a) parents who are not fluent in English; b) parents who do not utilize ASL with competency sufficient to communicate with their child; c) parents who are not able to commit to participating in the study; d) children who are not DHH and do not use ASL for part or all of their communication, receptively and/or expressively; e) children who are younger than 3 years old or older than 5 years old, and those who have entered a full-time school setting; and f) children who are DHH and have a disability (e.g., cerebral palsy, autism).

The researcher employed strategic sampling through a letter of invitation sent to various persons, groups, programs and agencies in Canada and the United States. Locally, this included the Family Network for Deaf Children; British Columbia Hands and Voices; Provincial Deaf and Hard of Hearing Services; Deaf Children’s Society of BC; and the BC Family Hearing Resource Centre.

3.3 Setting and Participants

One, four-member family (mother [Macy], father [Dani], sons [Ali and Bo]) was observed during five home visits. Demographic information, including an ASL self-evaluation scale and family language survey, was collected during the pre- and post-interview sessions (first
and fifth home visits). All members of the family were present at each home visit. The family lives in a large metropolitan city in North America. At the time of the data collection, Ali was 4 years; 2 months and Bo was 2 years; 0 months. Data were not collected on the adult participants’ age but they are estimated to be in their mid- to late- 30s at the time of the data collection. While exclusionary criteria ruled out families with a DHH child under the age of 3, or older than the age of 5, this family presented a unique opportunity to research a family with two Deaf children, ages 2 and 4, and in the nature of eliciting natural language samples, the two-year-old was present during the language observations.

Macy, Dani, Ali and Bo are Deaf. Ali’s and Bo’s hearing levels were identified as profound at three months of age and the etiology is congenital. Macy has no history of family hearing loss; however, she reports her father mentioning an aunt with “no tongue” which leads Macy to wonder if this referred to not speaking, and perhaps, being deaf. Dani has DHH extended family members: two hard of hearing cousins, a deaf great-aunt, and a father who is partially deaf. The family’s primary home language and mode of communication is ASL.

As reported in the demographic questionnaire (Appendix E), the children use bilateral hearing aids in the community: Ali, almost always, and Bo, occasionally. They never wear them at home. Ali first wore hearing aids at 9 months, and Bo at 12 months. Ali and Bo do not have any additional needs.

At the time of the data collection, Ali attended a pre-kindergarten program in a local school for the deaf, and Bo had access to early intervention services that included speech sessions and parent-infant/toddler services offered by the same school for the deaf that Ali attended. While the parents report being satisfied with the pre-kindergarten and parent-infant/toddler programs, they report that the speech services did not meet their expectations. This
is discussed in more depth in the post-interview section. Other early intervention services were also provided by a sub-contracted agency; however, Macy reports experiencing no benefit from this service. Again, this will be examined in more depth in the post-interview data analysis in Chapter 4.

Macy and Dani are teachers. Before having children, Macy taught kindergarten and first grade for 9 years at a program in a local school with an ASL specialization. She worked with a mixed class of students: deaf children, children of deaf adults (CODAs), and hearing children who were interested in learning ASL. At the time of the data collection, Macy had been an educator, on and off, at a local museum for four years. Dani taught for 12 years, with older students. He taught at different schools, in both a mainstream program and at schools for the deaf. He taught P.E. and teaches ASL. He also worked with a vocational program for a brief period. Dani is also a performance artist and travels for work in this capacity.

At the time of the data collection, Macy was on leave from teaching to be at home with Ali and Bo, while Dani was working full-time. The post-interview expands on information about their teaching background and how this experience informs their approaches to parenting, and will be discussed in Chapter 4.

The parents were the participants in the research study. While the children were active communication partners, their language samples were not the focus of the research study. As such, “participants” refers to the parents. Family members were given the pseudonyms Macy, Dani, Ali, and Bo. Each will be represented as Macy (additionally, M or Mom), Dani (D or Dad or Pop), Ali (A), and Bo (B). In this vein, identifying information is also replaced, for example, in the mention of cities and events in the transcripts.
3.4 Research Methods and Overview of Data Collection

Data collection was conducted over a period of one week with five sessions (i.e., a pre-interview, observation 1 [mealtime], observation 2 [storytime], observation 3 [playtime], and a post-interview). The observation sessions included a 15-minute observation in the respective setting.

The first visit consisted of a pre-interview in the afternoon (4:00 pm, day 1). The next day, playtime was observed in the afternoon (4:00 pm, day 2). The storytime observation took place three days later, in the morning (10:30 am, day 5). The mealtime visit was conducted the following day, in the evening (6:00 pm, day 6). The last visit consisted of a post-interview the next day (4:00 pm, day 7).

The pre- and post-interviews took approximately 60 minutes and were videotaped. The observations to collect language samples were 15 minutes in length and videotaped. Data from the middle 8 minutes of each language sample video were analyzed, as well as field notes following each session.

At the pre-interview session, the parents were asked to complete the consent form (see Appendix D) to participate in the study, the demographic questionnaire (see Appendix E) regarding their children, and the family language survey (see Appendix F) regarding their home environment. The researcher established rapport with the participants and the children during this first meeting and confirmed eligibility for the study based on responses to the questionnaire and language survey. Field notes were collected during the first session and added to the survey data for analysis.

Field notes were completed using a checklist (see Appendix H and I) immediately after each observation to organize records and data. Equipment was checked and maintained before
and after each home visit, (i.e., fully charged, set up, and ready to go). Data was uploaded to a secure storage device for analyses. A session to practice the research procedures was conducted to ensure streamlined practices ahead of time (e.g., with technology and setting up/positioning of video recording devices).

The post-interview (see Appendix J) was semi-structured with questions about each research question accompanying short 1-2 minute clips of parent-child interactions collected in visits 2, 3 and 4. The participants were asked what strategy they used in each clip, as well as where they learned these strategies. The interview was videotaped and transcribed. Anzul, Evans, King, and Tellier-Robinson (2001) began data analysis while collecting data as part of an ongoing, recursive process in their study of a young deaf child in a hearing family. As part of this early data collection, the researcher reviewed video data in preparation for analysis.

3.4.1 Collection of Language Samples from Observations

The language samples were collected from home visit observations during mealtime, storytime and playtime. The parents were instructed to act as they typically would in each setting. During the first language sample collection (playtime) both Macy and Dani were at home. Macy planned a plant potting activity; this activity was reported as something the children show interest in and have participated in previously. Dani was in the living room, yet not directly involved. During the second language sample collection (storytime) both parents facilitated the story sharing activity, which was set in the living room. Storybooks were readily available in the living room. The first book chosen did not gain the children’s interest, so another book was chosen. During the third language sample collection (mealtime) the family ate dinner together. Macy and Dani sat side-by-side with Ali and Bo seated across the dining table from them.
3.4.2 Videotaping

Video cameras were introduced during the pre-interview to offer the participants an opportunity to become accustomed to the presence of video cameras and the experience of being videotaped. This was particularly beneficial for the children. Dani and Macy were able to explain to the children what would be happening during the visits, and that they would be videotaped. In addition, the children had the opportunity to observe how a camera works, look from behind the lens, and learn about careful handling of or moving around a video camera.

Appendix K illustrates the camera vantage points and configuration in each of the observations. Three video cameras were used for the language sample collection sessions (mealtime, storytime, and playtime): 1) a hand-held camera, 2) a tripod camera (GoPro), and 3) a tabletop camera (GoPro). The third camera provided a back up in case a video camera did not function properly during data collection, and a triangle was created in each of the observations, providing visual access of the participants from three vantage points. This allowed for the 360-degree capture of ASL and parent-child dialogue in the middle three observations (i.e., the second, third, and fourth home visits).

For the majority of the data collection, participants (parent/s) and the children stayed in the same general area during each of the observations (mealtime: kitchen table; storytime: living room; and playtime: small table in the dining room next to the kitchen). The family moved around the living room during the storytime observation, and from time to time, walked to the kitchen. During the playtime observation, Ali and Bo mostly stayed at the children’s art table situated in the dining room, near the kitchen.

Two video cameras were also used during the post-interview. It was agreed that Dani and Macy would be seated side-by-side with the interviewer sitting perpendicular to them and that
two cameras would be sufficient. The tripod camera captured a wide-angle vantage of the room, showing Dani, Macy and the researcher, and the hand-held camera was attached to a tabletop tripod and captured the vantage of Dani and Macy sitting side-by-side. The children were present and freely moved around the room. The tripod camera battery gave out five minutes prior to the post-interview’s end. With the researcher field notes, list of planned questions, and tabletop camera capturing all of the parent dialogue, gaps were filled and a complete picture was captured.

### 3.4.3 Pre- and Post-Interviews

The pre-interview and post-interview were videotaped, and subsequently, the pre-interview was reviewed and notes taken and the post-interview was transcribed by the researcher. The pre-interview was viewed following the first visit, and reviewed during data analysis. Notes were taken to support information collected in the forms (demographic questionnaire, ASL self-evaluation, and family language survey). The post-interview video was viewed following the last visit, transcribed using InqScribe, and reviewed multiple times during data analysis. The post-interview transcript includes time codes and is translated from ASL to English (rather than using gloss).

Excerpts from videotaped pre- and post-interview data will be reported when they substantiate parental FLTs or relate to other aspects of the research questions. At times, in the thesis, the children’s language features are discussed, but only in reference to strategies the parents use.

### 3.4.4 Language Sample Transcription: Mealtime, Storytime, and Playtime

In the research study, the video footage was glossed for the purpose of transcription and subsequent data analysis (i.e., frequency counts, coding, and exemplars). Glossing is a process
whereby English text is used to represent ASL, but in no way reflects a written form of ASL. Glossing benefits bilinguals with English and ASL competency, and, to a lesser degree, those who do not have ASL fluency. Reading and making sense of gloss requires confidence in both English and ASL. When exemplars are introduced in the thesis, they are accompanied by a brief description or descriptor.

In the process of glossing, an English word is used to represent ASL lexicon, and ASL syntactic conventions are presented to the best ability that the linear, sequential nature of text allows. Additional information is added in brackets or parentheses. In most cases, the word closest to the ASL meaning is used, but in some cases, the best meaning is chosen and may not be an exact ASL-English transliterated match. For these reasons, glossing is to be taken with caution, and needs to be buffered with additional data, and if possible, video examples.

In spite of the above limitations, Chen Pichler, Hochgesang, Lillo-Martin, and Quadros (2010) refer to the Ochs (1979) contention that transcription is vital and should be done in a straightforward or basic sense to allow outliers’ ability to read and understand the data. In future studies with multiple researchers and coders, the Chen Pichler et al. (2010) recommendations will be key to the consistency of data analysis. For the purpose of this study, however, transcription conventions from various sources were reviewed and a set of gloss conventions were developed to support the data analysis of the research questions (based on Baker-Shenk & Cokely, 1980; Chen Pichler et al., 2010; Easterbrooks & Baker, 2002; Johnston & Schembri, 2007; Neidle, 2002, 2007; Pittman, 2001; Valli et al., 2011).

The goal of transcription was to capture parental academic language at the semantic (word) level, syntax (sentence) level, and pragmatic level (i.e., the use of extended discourse and parental facilitative techniques). Here, gloss conventions were developed to a point of necessity.
This means that they could have gone further, become significantly more intrinsic, representing the complex features of ASL. In fact, glossing did go further, to a somewhat more complex level with regards to lexical variants. During transcription, it became clear that the participants used various sign variations for some concepts. Here, handshapes and classifiers were made more specific to distinguish the difference between the two for the purposes of coding and frequency counts. For example, this allows the reader to determine by gloss alone whether lexicon, as in the case of “EAT” or “BECAUSE,” was produced with one handshape or multiple variants.

Table 1 summarizes the glossing conventions used, cites sources when pertinent and lists additional notes where appropriate.

Table 1. *Transcription conventions used in parent academic language discourse analysis*

<table>
<thead>
<tr>
<th>Transcription convention</th>
<th>Examples from transcripts</th>
<th>Description &amp; usage notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPERCASE</td>
<td>EAT</td>
<td>Uppercase letters are used to depict signs’ (closest) English equivalent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Note:</em> When no handshape is specified, the gloss denotes the generally accepted convention e.g., “EAT” is typically depicted with the handshape flat-O.</td>
</tr>
<tr>
<td>–</td>
<td>HOW-MANY</td>
<td>Hyphens are used when two or more words represent one sign.</td>
</tr>
</tbody>
</table>
Fingerspelling is used for various purposes:

<table>
<thead>
<tr>
<th>Fingerspelling</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>fs-K-R-I-L-L-L</td>
<td>• Depicting the English equivalent for words without an equivalent sign (Easterbrooks &amp; Baker, 2002).</td>
</tr>
<tr>
<td>fs-R-O-O-T-S</td>
<td>• Demonstrating or teaching a metalinguistic skill (Stone et al., 2015).</td>
</tr>
<tr>
<td>fs-I-C-E</td>
<td>• Representing proper nouns (Easterbrooks &amp; Baker, 2002).</td>
</tr>
<tr>
<td>fs-S-E-A-L</td>
<td></td>
</tr>
<tr>
<td>fs-W-E-D-E-L-L-L</td>
<td></td>
</tr>
<tr>
<td>fs-O-K-O-K</td>
<td>Note: In the transcription, for simplicity, loan signs and name signs are included under fingerspelling. Other sources use the abbreviation “ns” to depict name signs (e.g., ns-ALI) and pound symbols shown with “#” to depict fingerspelled loan signs (e.g., #OK).</td>
</tr>
</tbody>
</table>
Brackets denote additional information, as in the case of the use of:

[nods]  •  Gestures

[walks away to kitchen]  •  Actions

IX-THERE[page]  •  Referents

[nms-pth]  •  Nonmanual signals

hs  Handshape

Note: Lexical variants (Neidle, 2007) are differentiated by handshape or classifier notations.

,  hs-CLAW,CLAW  Commas denote the handshapes in a two-handed sign. The first position represents the non-dominant hand where the second position depicts the dominant hand.
Classifiers (Johnston & Schembri, 2007) can be organized into three categories:

<table>
<thead>
<tr>
<th>CL</th>
<th>Entity (representations; e.g., car, camera, person)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CL-3-CAMERA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CL-ILY-FLY</strong></td>
<td>• Handling (hand-object interactions)</td>
</tr>
<tr>
<td><strong>CL-F-PICK-EAT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FAT[CL-C-nms-puff]</strong></td>
<td>• SASS (Size and Shape Specifiers; adjectives or nouns depicted using handshapes representing surface, depth and width, and perimeter-shape).</td>
</tr>
<tr>
<td><strong>CL-C,C-JUMBO-PLANE</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IX-</th>
<th>Indexing (refers to pronouns or noun determiners)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IX-THAT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>IX-YOU</strong></td>
<td></td>
</tr>
<tr>
<td><strong>IX-HE</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>+</th>
<th>Sign repetition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMALL+++</strong></td>
<td></td>
</tr>
</tbody>
</table>
3.4.5 Consultation by ASL Experts

Two ASL experts were consulted during the data analysis process. A Deaf professor of ASL informally consulted on the ASL sentence patterns used in the analysis. This professor also offered some recommendations that will be discussed in the future directions segment of Chapter 5. Another Deaf ASL expert who is an ASL instructor at a community college reviewed and consulted on the syntactic section of mealtime, storytime, and playtime. This ASL expert reviewed sentence pattern designations and offered feedback. During this time, the expert commented that the transcripts were, at times, difficult to follow because of the multiple communication participants and simultaneous conversation threads that took place. From this feedback, the transcripts were then reviewed and revised to better indicate the cross talk that took place and identify the communication partner(s) being directed to in the dialogue.

This recursive process of transcription offered heightened insights and perspectives into the data. While not the focus initially, through this process, it became clear that, in multiple
instances, various signs were used for one concept, as mentioned earlier in the discussion of lexical variants. So then, additional edits to the first-edition transcription were made as far as sign choice being used, and the classifiers or handshapes being used for certain signs. This allowed the semantic section of the research to be increasingly fleshed out and significantly more robust.

3.5 Analysis

Data analysis was conducted utilizing qualitative methods on the demographic questionnaires, family language surveys, field notes, and post-interview transcripts with all identifying information removed. The transcripts of three observations across three different settings were analyzed using descriptive statistics in regards to the use of type and frequency counts of academic language features, ASL sentence types, and ASL-English connections. Only the middle 8 minutes of each 15-minute session from visits 2, 3, and 4 were analyzed. Transcription was conducted using InQscribe. Video and transcripts were coded and analyzed for type and frequency counts.

The research supervisor conducted an inter-observer agreement (IOA) for 20% (i.e., 1 minute, 6 seconds) of the middle 8 minutes from each observation (mealtime, storytime, and playtime) for each of the research questions with 100% IOA using the operational definitions provided in Appendix L.
Chapter 4: Findings

The Findings chapter includes an in-depth review of the findings and a presentation of the best examples as they relate to the research questions. The data is presented using tables and figures to answer each research question. The chapter closes with a discussion of parental reports of strategies used during the observations.

4.1 Representation of the Findings

The findings are presented using descriptive statistics, that is, they are outlined through text-based analyses and interpretations, summarized using tables and figures, and supported with examples that best demonstrate evidence of the findings relating to each research question.

4.1.1 Pre-interview

4.1.1.1 ASL Self-evaluation Scale

During the pre-interview, the participants, Macy and Dani each completed a self-evaluation using the ASL Self-evaluation Scale (Appendix G). This is an informal self evaluation based on language benchmarks and adapted to through-the-air ASL use. The participants read four descriptors of ASL competency and indicated the descriptor they most identified with. The descriptors were not numbered but were ordered in a hierarchy scale from having little to no language competency in ASL to being fluent, sophisticated users of ASL. Both chose the latter descriptor and identify as fluent ASL users. Their fluency was also observed in the home.

4.1.1.2 Family Language Survey: Home and Community Language Environment

A family language survey was given during the pre-interview (Appendix F). The parents were provided with a blank family language survey to fill out (one for each child, Ali, and Bo). The survey was designed for parents to rate their home language behaviours (i.e., the way in which parents interact with their children). This survey does not evaluate children’s language,
but, rather, focuses on parental language mediation. The family language survey, overall, reflected Dani and Macy’s confidence with language use and language interactions with their children.

Results from the survey indicated that Dani and Macy communicate with Ali and Bo using ASL. They feel that they communicate with their children constantly and find communicating easy. The children are reported to always be included in activities of daily living (e.g., making shopping lists, cooking, and decision making) and the participants gave examples of other activities where the children were included. Ali and Bo have language-rich experiences while travelling, at cultural events, as well as through experiences with storytelling and poetry. Communication appears to be a challenge only when lines of sight are obstructed based on participants’ description of situations where the children are in a stroller facing away from the parents, or in the car with parents looking ahead. The participants report always signing when their children are present. Dani and Macy report they always explain to their children what is happening around them, in the children’s home, community and world. Dani and Macy use language to prepare the children for imminent family holidays, or special visitors to the home.

Although Dani and Macy read with their children, they report that reading to themselves (i.e., books, newspapers, magazines), in sight of their children, comes as a challenge and is something they rarely do. That being said, Dani does use his iPad to read, and Macy reads some technical material related to her work and hobbies. Macy shared that she was an avid reader prior to having children and believes she will read more frequently in the future. Macy communicated information on an article she read about the impact of technology on reading and the importance for parents who read using smart technology (e.g., tablets) to announce what they are doing, to ensure children are aware that parents are actively reading.
The participants report understanding their child’s language age (Cejas, Barker, Quittner, & Niparko, 2014). Dani and Macy are able to use ASL to joke around with Ali and Bo. They gave examples of fun language production activities using pretend play and nursery rhymes. They use ASL to discuss difficult topics with their children. For example, to alleviate sibling separation issues, they explain to Bo that Ali is in school, and that he will come back home soon. Another example of difficult topics was talking about a family member being sick.

Additional information around the topics of parent mediation of children’s interests and language milestones was revealed during the pre-interview. For example, the children’s fingerspelling and handshape development milestones inform the way in which their parents interact with them. So then, in some instances, when Ali or Bo use modified versions of handshapes, Macy or Dani mirror the correct handshape.

In the pre-interview, the participants reported that Ali is particularly observant and takes a keen interest in household plants. An example given was that when the family gets a new plant, Ali immediately notices and asks: “Is this new?” He also advises Macy if a plant needs watering. In the post-interview, this was reinforced. This becomes important when considering Macy’s activity choice for playtime (i.e., repotting plants). With this background information, Macy’s choice seems appropriate and a typical playtime activity for the family.

During the pre-interview, Dani reported that Ali loves letters, fingerspelled words, and names with invented spelling. Macy added that, from an early age, Ali demonstrated manual babbling (i.e., sign babbling). At two-and-a-half years old, Ali used more clearly formed handshapes and began fingerspelling. His first fingerspelled words were fs-B-U-S and fs-Z-O-O. Macy shared that, since infancy, Ali has been a very cautious communicator. He would not attempt signs until he was confident. His first word was bird, formed correctly but with the
location reversed. Dani added that Ali’s early default handshape was “L” for example, L-WATER, L-JUICE, L-VEHICLE-MOVING. The participants reported Bo sign babbled much more than Ali did at two years old. Additionally, they reported that whereas Ali used the classifier “L” handshape, Bo used the classifier “3” handshape. In the pre-interview, Dani gave the example that Bo consistently used the handshape “3” to sign juice and water.

4.1.2 **Research Question 1: Language-rich Features of Parent-Child Language Interactions in the Home**

The first research question looks at each setting and the types of extended discourse (booklike talk, science process talk, and shared reading talk) present in each interaction. The type of discourse was coded in the transcripts and analyzed using frequency counts to identify the number of times each feature presented. Booklike talk and shared reading talk have multiple layers and are subsequently broken down into sub-categories. Booklike talk entails varied, complex turns, conversational turns, themes or topics, coaching, and metalanguage (i.e., talking about talking; Gee, 2008). Shared reading talk includes signing on storybook; making connections between the conversation and the child’s life; visual embodiment of characters (i.e., making the story or narrative come alive); and asking questions (Lartz & Lestina, 1995). In the research study data analysis, signing on storybook coding (e.g., IX-THERE[page]) was also applied to objects that functioned as a reference point. For example, if a bowl was signed on, (e.g., VANISH[bowl]) this was coded as signing on storybook. Table 2 summarizes the frequency counts of extended discourse features that were found in each of the settings.
Table 2. *Frequency of extended discourse features across settings (RQ1)*

RQ1: Summary of booklike talk, science process talk, and shared reading talk in parental extended discourse

<table>
<thead>
<tr>
<th>Feature:</th>
<th>Booklike talk:</th>
<th>Science process talk:</th>
<th>Shared reading talk:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* (varied, complex)</td>
<td>CT (conversational turns)</td>
<td>SS (signing on storybook)</td>
</tr>
<tr>
<td></td>
<td>highlighted text (themes/topics)</td>
<td>QQ (coaching)</td>
<td>R (relating to child’s lived experiences)</td>
</tr>
<tr>
<td></td>
<td>ML (metalanguage)</td>
<td></td>
<td>VE (visible embodiment of characters)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AQ (asking questions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>*</th>
<th>CT</th>
<th>ML</th>
<th>SCT</th>
<th>SS</th>
<th>R</th>
<th>VE</th>
<th>AQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime</td>
<td>12</td>
<td>204 CTs</td>
<td>3</td>
<td>13</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>12 topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 QQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Storytime</td>
<td>16</td>
<td>165 CTs</td>
<td>2</td>
<td>3</td>
<td>93</td>
<td>4</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>11 topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 QQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playtime</td>
<td>6</td>
<td>92 CTs</td>
<td>1</td>
<td>10</td>
<td>25</td>
<td>0</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>6 topics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17 QQ</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

To illustrate the nuances of each category, the following sections include tables and figures that allow a closer look at each of these extended discourse features. Exemplars from the transcripts.
further illuminate each feature. At times, sections of the exemplars are bolded to bring attention to the particular feature being used.

4.1.2.1 Booklike Talk

The first category of extended discourse uses the concept of “booklike talk” to refer to academic language, or the type of language that is later seen in school (Gee, 2008). Booklike talk can be divided into sub-categories: varied, complex language; use of conversational turns and coaching; and metalanguage. The following sections are organized with descriptions, tables, and exemplars to bring attention to the booklike talk facet of extended discourse as observed in the participants’ home life.

4.1.2.1.1 Parents’ Use of Varied, Complex Turns in Parent-Child Conversations

The first sub-category refers to the nature of booklike talk to be inundated with thicker discourse turns, that is, instances where varied, complex language is used in one conversational turn (Gee, 2008; Snow et al., 1991). Each observation was coded for parents’ use of varied, complex turns, and was identified with an asterisk preceding the discourse turn in question.

The visual representation of counts of varied, complex turns in Table 2 is supported by the following exemplars where parents demonstrate deeper-level academic language use across settings. During mealtime, the family talks about hot air balloons, a conversation that is then followed by a discussion about the mechanics of flight. Macy subsequently ties the conversation about flight to the family’s imminent trip to San Diego. Macy refers to the “there and then,” makes the intangible personal, and in one conversational unit, or turn, uses varied, deeper-level language:
The use of varied, complex language to allude to the “there and then” also surfaces in storytime. Here, Dani interacts with the storybook and directs Ali’s attention to a new “cold place,” giving the place a name, and asking Ali whether he wants to “go there.” By “going there” Dani could be referring not only to actual travel, but also to interaction with the text, moving to the back of the book where “there” is. This is an example of the nuanced, multi-layered academic language that is commonly found in school, and Dani uses it here with his four-year-old.

Similarly, during playtime, Macy uses a significantly varied, complex conversational turn to explain to Ali, in-depth, the reason for soil requiring loose packing. This exemplar is a particularly thick discourse turn where Macy provides in-depth reasoning for not packing in soil too much, that loose and lightly packed soil allows roots to “breathe” and grow.

*M: [ag-hand-wave, both A & B watching] **SIMILAR**[hs-Y] **IX-THE FRIDAY WILL FLY-TO SAN DIEGO** [ag-hand-wave] **SOON**[hs-F] **APPROACHING / WHEN** [ag-hand-wave to Bo] **YES**

B: **YES** ++ [nodding] **CL-3** [ag-hand-wave] **YES SAN DIEGO ABUELA**[hs-A-GRANDMA] **hs-F-SOON**


4.1.2.1.2 Conversation Turns and Unique Topics

The next sub-category of booklike talk is concerned with conversational turns and topics, and parents’ use of coaching to extend discourse. Table 3 shows the complex, often recursive nature of discourse. Some topics are maintained across several conversational turns, then dropped and do not come up again in the dialogue. Other topics come up again at some point in the conversation reflecting a recursive spiraling of sorts. The term “unique topic” is used here to refer to a new topic that comes up in the interaction, and perhaps surfaces in the conversation more than one time. In Table 3, a frequency count of a topic that was maintained and had no breaks has one figure depicting the number of turns (i.e., 13). However, in recursive instances where conversations took another direction and later returned to a topic, the frequency counts are separated with a semi-colon to depict a break between another set of uninterrupted turns (i.e., 2; 7; 14; 2; 2; 14; 10) with a total number of turns (i.e., …=51). In the case where conversations are initiated, but not carried on by a conversational partner, the attempt is listed but is not counted (i.e., 0).

Table 3. Conversational turns and topics across settings (RQ1)

<table>
<thead>
<tr>
<th>RQ1: Conversation turns and unique topics across settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique</td>
</tr>
<tr>
<td>--------</td>
</tr>
</tbody>
</table>

60
<table>
<thead>
<tr>
<th>topic</th>
<th>of turns</th>
<th>of turns</th>
<th>of turns</th>
<th>of turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. balloons</td>
<td>13</td>
<td>blueberries</td>
<td>3</td>
<td>packing soil</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. flying</td>
<td>67</td>
<td>ice cubes</td>
<td>0; 3; 1;</td>
<td>roots</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5; 0; 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=12</td>
<td></td>
</tr>
<tr>
<td>3. seat</td>
<td>5; 4</td>
<td>wrong time</td>
<td>0</td>
<td>plant-pot fit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. peas</td>
<td>2</td>
<td>camera</td>
<td>7</td>
<td>breaking off leaf</td>
</tr>
<tr>
<td>5. language play</td>
<td>1; 13</td>
<td>MAPS (cold all year)</td>
<td>13</td>
<td>saucer</td>
</tr>
<tr>
<td></td>
<td>=14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. watch Ali</td>
<td>6</td>
<td>iceberg</td>
<td>12</td>
<td>cleaning person</td>
</tr>
</tbody>
</table>
### Coaching in Parent-Child Discourse

A feature accompanying extended discourse and booklike talk is the use of coaching by a MKO to facilitate longer conversational turns (Gee, 2008). Coaching is used to prompt the child to communicate as if her communication partners have no background information or context.
(Gee, 2008; Schleppegrell, 2004; Snow, 1983). This directs communication into the realm of the “there and then” and reflects the varied, complex nature of academic language. Coaching was used in all settings. During mealtime, Dani asks Ali and Bo whom they can expect to see in San Diego:

D: [to Bo, both A & B watching] **SEE WHO whq SEE WHO whq [open hands]**

Another example of coaching during mealtime demonstrates Dani’s tying in concrete contextual cues, as depicted by Bo’s struggling with his straps, and request for “help,” to units of discourse that require abstract reasoning. In reference to these cues, Dani coaches Bo to express, first, why he wants out of his seat, and, second, where he plans to go:

B: [struggling to get straps off] [to Dad] HELP++ IX-THAT HELP[one hand]
D: **WHY whq HELP WHY whq**
B: HELP++

D: **WHERE GO HANDS-OPEN whq**

During storytime, Macy coaches Bo to expand on his reference to “two” creatures, as well as where the “small” creature can be found. In one discourse turn, Macy is able to elicit, or coach, Bo’s description of what is being referred to “there” (i.e., penguins). In addition, she is facilitating longer units of discourse that include increasingly complete and robust pieces of information:

B: [moves for a better look at the book]
B: [to Mom] IX-THERE[page] TWO [SEAL or PENGUIN-indiscernible] TWO
M: [to Bo] **TWO WHERE whq**
B: [to Mom] BIG++ IX-THERE[page]

M: YES [nooding] TWO BIG PENGUINS IX-THERE[page]

B: [While Mom points, Bo signs] SMALL

M: [to Bo] YES [nooding] SMALL++ ONE SMALL WHERE BIG whq

B: [Bo looks at the book closer]

Coaching is also evident in playtime. Macy uses coaching to encourage Ali’s critical thinking skills, and they both share in the humour of burying a plant in soil (i.e., forgetting to put the soil in first):

A: [to Mom] IDEA! IX-THERE NO-NO CROWDED[CL-S,S-squished]+++ 


A: [to Mom] IDEA! IX-THERE IX-THAT-ONE[pot]

M: [to Ali] q [raised eyebrows, holds leaf in pot] IX-THERE[plant near pot]

A: IX-THERE[different pot] PUT-THERE[pot]

M: [to Ali] [nods] GOOD IDEA fs-O-K [puts leaf in Ali's suggested pot]

A: SPACIOUS/ROOMY[CL-S,S-opposite of crowded, nms-happy]

M: [ag-hand-wave to Ali] PUT-IN-POT[leaf] q

A: [tentative headshake, nod... headshake, smile]

M: [to Ali, smiles, headshake] q OPEN-HANDS

A: SPOON-IN-DIRT! IX-THERE!

M: [to Ali, smiles] [pushes pot towards Ali]

A: [to Mom] FUNNY

4.1.2.1.4 Metalanguage: Instances of Parental “Talking about Talking” in Parent-Child Discourse
The next sub-category in extended discourse booklike talk is metalanguage (i.e., talking about talking). The data across settings were coded for instances of parental language mediation or language play. This component of the first research question had the least counts during the observations. Exemplars of metalanguage observed are listed here.

During mealtime, Macy addresses Bo’s use of CL-3 to represent an airplane and explains to Bo that an airplane is shown with the CL-ILY handshape while CL-3 depicts a helicopter:

B: CL-3 RIDE-IN-AIR CL-3-HELICOPTER FLY-IN-AIR HELICOPTER

[sideways helicopter]

M: [ag-hand-wave to Bo] NOT RIDE HELICOPTER FLY-HELICOPTER /
DIFFERENT RIDE CL-C,C-JUMBO-PLANE BIG PLANE CL-5,ILY,TAKE-OFF-FLY-IN-AIR ANYWAY [continues...]

During storytime, Macy draws Bo’s attention to various depictions that CL-3 represents (i.e., a video camera panning and a car driving), illustrates the difference between the two, and demonstrates that the CL-5,5++ also depicts a camera running or a car’s lights blinking. Macy unpacks language input, at the word and sentence level.

B: [to Mom] CL-3-CAMERA

M: [to Bo] CL-5, 5++ [camera running]

M: [to Bo] DRIVING-CL-3 WHAT whq

B: [to Mom] CL-3-ZOOM-AWAY IX-TABLE IX-THAT[camera] YES++

*M: [to Bo] OH-I-SEE RED LIGHT CL-CLOSED-0-5 LIKE CAR q DRIVE

CL-3 CL-CLOSED-0-5 BLINK-BLINK IX-THAT NO++ IX-THAT RED MEANS RUNNING IF LIGHT OFF MEANS NOT RUNNING
During playtime Macy tries to recall the English word “saucer” and thinks out loud (i.e., “pan” isn’t the word she is looking for). Macy uses a shared language (ASL) to talk about language, here, the desired lexicon for “pan.”


4.1.2.2 Science Process Talk: Modelling of “Becoming Scientists” in Parent-Child Discourse

The second category of extended discourse refers to science process talk. Science process talk involves the use of abstract reasoning (Gee, 2008; Schleppegrell, 2004; Snow, 1983). Figure 1 shows the counts of science process talk during mealtime, storytime, and playtime.

Figure 1. Frequency of parental science process talk across settings

<table>
<thead>
<tr>
<th></th>
<th>Science Process Talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playtime</td>
<td>10</td>
</tr>
<tr>
<td>Storytime</td>
<td>3</td>
</tr>
<tr>
<td>Mealtime</td>
<td>13</td>
</tr>
</tbody>
</table>

During science process talk, participants model “becoming scientists” in parent-child discourse (Gee, 2008). In this study, “becoming scientists” refers to taking on a lens of working out of meanings for ideas and using language to think and problem solve.
During mealtime, Macy alludes to theory of mind and, to some degree, physics, in that she speaks to a sophisticated level of object permanence, the idea that events happen outside of our frame or point of view (Astington & Baird, 2005). Macy asks Ali whether an airplane actually vanishes or if it is just that an airplane is no longer in our frame of vision:

A: PLANE-TAKE-OFF, FLY-OFF-INTO-HORIZON CL-G-CLOSED-G
BECOME NOTHING CL-ILY-G

*M: [ag-hand-wave to Bo then looks at Ali] THAT PLANE TRU-BIZ GONE[hs-C,50] VANISH[hs-0A] TRU-BIZ VANISH[hs-0A] q ASK-ASK[hs-XX] [looks at Bo, then Ali] NO WE JUST CAN’T SEE ANY-MORE

... VANISH[hs-0A]

In the next excerpt from the transcript, Ali initiates discussion around gravitational pull. Here, Macy uses science process talk to explain gravity and forces of flight, (i.e., an airplane’s engine thrust and speed allows gravitational release from the earth’s gravitational pull):

A: [to Mom] WHY BECAUSE PLANE FAST CL-ILY-FLY BEAT CAR [smile]
M: RIGHT[table]
M: [to Ali] PLANE FASTER THAN CAR [nods]
A: [to Mom] WHY whq
SQUINCH] CL-1,L-G-TAKE-OFF-FAST CL-ILY-SQUIGGLE-INTO-AIR /

In the next example, also from mealtime, Macy, Dani, and Ali touch on a synthesis of numeracy concepts around age and time, the idea of “becoming”:

A: [to Mom] FOUR[HE] … IX-I WILL fs-B[at chin] [holds "B"]

*D: [to Ali] [ag-hand-wave to Ali] IX-YOU [ag-hand-wave-to-Ali] IX-YOU WILL fs-B-E WHAT whq WHAT

A: [to Dad now] IX-ME WILL fs-B-E AGE-FIVE IX-HE [nods] THREE

D: [to Ali] fs-Y-E-S [nods]

M: [to Ali, nods]

D: [nods] RIGHT

M: YES

D: fs-Y-E-S

A: [to both] [HE]-THREE [ME]-FIVE WHY rhq I BORN FIRST

M: [to Ali, signing at the same time] TWO-OF-YOU TWO YEARS APART

M: [to Ali] YES YOU BORN FIRST

A: [to both] SECOND IX-HE

Later in the storytime observation, Macy explains how baleen whales eat considering that they don’t have teeth:

In the playtime observation, Macy comments on the quality of a plant’s fleshy leaves and how this is a result of being imbued with water.


4.1.2.3 Shared Reading Talk: Parental Use of Cross-Language Mediation or “Codeswitching” in Parent-Child Discourse

The third category of extended discourse includes shared reading talk. Shared reading talk relates to the kind of discourse that a MKO uses during story sharing time (Lartz & Lestina, 1995). A phenomenon that occurs in this discourse is “codeswitching,” which, here, alludes to cross-language mediation (Andrews & Rusher, 2010). Shared reading talk has several sub-categories: signing on storybook, relating to a child’s lived experiences, the visual embodiment of characters, and asking questions (Lartz & Lestina, 1995).

4.1.2.3.1 Signing on Storybook

The data was analyzed for instances where parents signed on a storybook, or, in other contexts, demonstrated mediation with a reference point (see Figure 2).
The exemplars illustrate this in depth. During mealtime, Dani demonstrates “signing on storybook” cross-language mediation by signing on an object. Dani signs on dinnerware and uses a bowl as a base for the sign “ALL-GONE”:

D: [to Bo, on bowl]-ALL-GONE! WHY whq IX-YOU BO

B: [to Dad] IX-THAT DUMP++

D: [to Bo] YES fs-Y-E-S DID THAT THAT WHY ALL-GONE[bowl]

During storytime, Dani and Macy use concrete representations at hand in relation to abstract concepts beyond the here and now, intangible concepts. Icebergs illustrated in the story are related to blocks of ice at hand in the children’s immediate environment.

D: [to Bo] THAT ICE IX-THERE[page]

A: [moves to look at what Dad is pointing at]

M: [to Bo] SAME IX-THAT[Bo's ice]

D: [to Bo] fs-I-C-E ICE+ SAME IX-THERE[Bo's ice] SAME[ice-page-ice]
Several examples of “signing on storybook” strategies are evident during playtime. As with storytime, various immediate references are used to tie in language with physical representations. Macy connects the sign IX-THERE and indexes-touches objects, making the connection between the lexical and physical. Macy uses a sequence of reference points to instruct Ali what needs to be done. She signs on a potted plant and water jug.


Later, Macy makes the connection between what Bo is doing (i.e., getting dirt on himself) and the actual dirt on his shirt. She signs on his shirt in the following instance:

M: [shoulder-taps Bo] CAREFUL IX-THERE IX-THERE[shirt]

B: [Bo gazes down to dirt on shirt]

M: [Mom brushes dirt off]

4.1.2.3.2 Relating to Child’s Lived Experiences

The next sub-category of shared reading talk is reflected in parental relating to children’s lived experiences. Exemplars highlighting these features are provided.

During mealtime, Macy makes connections from the previous conversations about the perspective of the earth from space, and plans to travel by plane to San Diego.

During storytime, Dani relates the memory of a family holiday to the Netherlands to the map of the Netherlands in the book. Additionally, Dani uses relation as a starting point to prompt Ali’s recollection of whether the Netherlands was cold, and as a contrast for a place that was cold.

D: [ag-hand-tap to Ali] REMEMBER NETHERLANDS IX-THERE[page]++
D: [to Ali] COLD [ag-shoulder-tap] NETHERLANDS COLD ASK-YOU++ q
A: [HEAD-SHAKE NO]
D: [to Ali] NO IX-THERE WHERE COLD PLACE WHERE whq
A: [to Dad] IX-THERE[page]

Macy connects whales in the book to Bo's love for whales.


There were no instances observed during playtime of relating to a child’s lived experiences.

4.1.2.3.3 Visual Embodiment of Characters

The next sub-category of shared reading talk relates to the visual embodiment of characters, visually expanding or connecting the story (or topic) with corresponding actions (Lartz & Lestina, 1995). During mealtime, Dani role-plays a two-year-old who behaves as if he does not know any better.

D: [ag-hand-wave to Bo] IX-YOU [ag-hand-wave] [Bo looks up] [roleshift, looking to Ali] IX-YOU WHY whq NOD-HEAD BECAUSE[hs-1A] IX-ME TWO-YEARS-OLD [nods and smiles] [looks at Bo, then at Ali]
Soon after, during the mealtime conversation, Dani pretends he is Ali and has been cryopreserved, or “frozen,” in a four-year-old-body:

D: [to both] **IX-ME SPRAY-ON-YOU-BOTH FROZEN SPRAY-ON-YOU**

**FROZEN-LIKE-THIS** [pantomime] **FOUR FOREVER!**

During storytime, Macy demonstrates the massive size of blue whales (i.e., that they could consume a building):

B: [to Mom] **IX-THERE[page]**

M: [ag-shoulder-tap to Bo] BUT UNDERSTAND THAT WHALE BIG[emphasis i.e. MASSIVE] **IF OPEN-MOUTH GULP BUILDING GULP-TAKE-ALL**

During playtime, Macy uses visual embodiment of characters to demonstrate a plant-pot misfit, and how to alleviate this so that the plant can thrive.


**COMFORTABLE[hs-5,5] [smiling] IX-THERE WILL HAPPY IX-THERE** [nods]

### 4.1.2.3.4 Asking Questions

The final sub-category of shared reading talk looks at asking questions as a means of mediating the text, or in the case of mealtime and playtime, dialogue.

During mealtime, Macy asks Ali to clarify his statement.

A: [to Mom] **MAN WILL / IX-ME THINK WILL WOMAN fs-B-E IX-HE**

[…]

73
*M: [to Ali] IX-YOU THINK IX-HE WILL fs-B-E WOMAN q IX-HE q

WHY whq

A: [to Mom] IX-HE WHY BECAUSE[hs-1A] CURIOUS IX-ME CURIOUS

In storytime, Macy uses questions to clarify and tease out Bo’s reference to “scary seals.” Here, Macy also demonstrates metacognition or “thinking out loud” when she leans in and cross-references what Bo has referred to in the text.

B: [to Mom] IX-THERE[page] SCARY

M: [to Bo] WHY SCARY whq WHY

B: [to Mom] CL-5,5-TEETH IX-THERE

M: [to Bo] IX-THAT THAT SEAL HAS TEETH q [looks at book closer] YES [nods] SEAL HAS TEETH

During playtime, Macy shares her opinion with Ali, but also elicits self-reflection, as well, by asking him what he thinks.


Similarly, also during playtime, Macy asks Bo why he does not want the pot in a specific location.

M: [to Bo] WHY DON'T-WANT[hs-claw] IX-THERE[pot] whq

B: [headshake]

M: [to Bo] WHY whq

4.1.3 Research Question 2a: Semantic Features of Academic Language

Understanding the nuances of language at the lexical level and the ways in which words and word parts function provides an early advantage in meaning making and prepares learners
for the use of academic language at school. The data were analyzed for parental use of academic vocabulary. This section is organized by presenting a summary of the data in Table 4, exemplars that illustrate the types of content or function words present in parental academic language use, as well as the words or word parts parents use in demonstrating morphological awareness. Exemplars include frequently occurring unique counts, repeats, and variants in the lexicon.

In the coding, because parental use of academic language in a home setting was being analyzed, adaptations were made to the Echevarria et al. (2008) definitions of what constitutes academic vocabulary in the classroom. Words relating to the topic at hand (i.e., nouns and adjectives) were coded as content words while verbs were coded as function words, and words demonstrating morphological awareness were coded as words or word parts.

Repeats in the lexicon were included in “total” counts while distinct counts were coded as “unique” counts. For example, STRANGE has one unique word count, yet occurs twice in the transcript, resulting in a total count of two. Variants of words are counted as unique words. For example, HARD (i.e., depicting the quality of a surface) using the handshape A,A and HARD (i.e., challenging) depicted by the handshape ZZ,ZZ is listed as having two unique counts. The nuanced meaning of each is not equivalent to the other, and these lexical variants are coded as individual words. Fingerspelled words are counted both as content or function words, as well as under the morphological awareness category.
Table 4. *Parental semantic categories across settings (RQ2a)*

<table>
<thead>
<tr>
<th>RQ2a: Summary of semantic features in parental academic language</th>
<th>Content Words</th>
<th>Function Words</th>
<th>Morphological Awareness: Word/ Word Part</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unique</td>
<td>Total</td>
<td>Unique</td>
</tr>
<tr>
<td>Mealtime</td>
<td>113</td>
<td>215</td>
<td>97</td>
</tr>
<tr>
<td>Storytime</td>
<td>99</td>
<td>272</td>
<td>62</td>
</tr>
<tr>
<td>Playtime</td>
<td>74</td>
<td>165</td>
<td>65</td>
</tr>
</tbody>
</table>

The following sections look at content words, function words, and words/ word parts respectively. Each section uses tables to summarize the data, and in some cases, exemplars.

### 4.1.3.1 Content Words

#### 4.1.3.1.1 Frequency and Exemplars

As summarized in Table 5 in each setting, some words came up frequently, and other words were rarely used. In the first column, the total count is listed (T). In the second column, the number of unique content words with the corresponding total count is listed (U). In the third column, examples are given. If only one unique word is listed, there is one example. If there are a number of different unique words for any given total count, only a selection is listed. For example, in mealtime, the most frequently used content word was PLANE (14 counts), followed by RIGHT (11 counts). Thirteen unique words each had a total count of 3; for example, BORN had a total count of 3. Seventy-one unique words had a total count of 1. For example, GRAVITY had a count of 1, as did COLLEGE and CRUST.
Table 5. *Parental use of content words (RQ2a)*

RQ2a: Examples of content words across settings

<table>
<thead>
<tr>
<th></th>
<th>Mealtime</th>
<th></th>
<th>Storytime</th>
<th></th>
<th>Playtime</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>U</td>
<td>Example(s)</td>
<td>T</td>
<td>U</td>
<td>Example(s)</td>
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<td>RIGHT</td>
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<td>NOT</td>
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<tr>
<td>6</td>
<td>1</td>
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<td>AND</td>
<td>14</td>
<td>1</td>
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</tr>
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T: Total Count

U: Unique Count
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<td>COLLEGE</td>
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<td>SOUTH</td>
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<td></td>
<td>CRUST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td>DIFFERENT</td>
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<td>GRAVITY</td>
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<td>BLUEBERRIES</td>
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</table>
4.1.3.1.2 Lexical Variants

The following section includes examples of lexical variants used in mealtime, storytime, and playtime. Content word variants are summarized in Table 6. Function word variants are summarized in Table 8.

In the case of “FAR,” two lexical variants were used. The following mealtime excerpt illustrates FAR[hs-1] and FAR[CL-LG]:

D: [nods to Ali, both Bo and Ali watching] FAR[hs-1]++ CL-LG-FAR[-IN-DISTANCE]

M: [to Ali] FAR[hs-1]

[...]

*D: [to Ali, Ali & Bo watching] FAR[hs-1] [ag-hand-wave] FAR[hs-1]

WORLD[CL-CLAW] FAR[hs-1onworld] SEE NOTHING [open hand]


CL-1-DOT IX-THERE [...]

Selected examples of lexical variants during mealtime, storytime and playtime are listed in the table below. The word is listed in the first column, the handshape or classifier variant in the second column, and the total counts of each variant use are listed in the third column.
Table 6. *Selected examples of parental use of content word variants (RQ2a)*

**RQ2a: Lexical variants of content words across settings**

<table>
<thead>
<tr>
<th>T: Total count</th>
<th>Mealtime</th>
<th>Storytime</th>
<th>Playtime</th>
</tr>
</thead>
<tbody>
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<td>Word Variant</td>
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<td>Word Variant</td>
<td>T</td>
</tr>
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<td>TEETH</td>
</tr>
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<td>hs-LA</td>
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<td>TEETH</td>
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<td></td>
</tr>
<tr>
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<td>hs-1</td>
<td>5</td>
<td>TEETH</td>
</tr>
<tr>
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<td>CL-LG</td>
<td>1</td>
<td>MANY</td>
</tr>
<tr>
<td>FAST</td>
<td>hs-CLAW-S, CLAW-S</td>
<td>1</td>
<td>MANY</td>
</tr>
<tr>
<td>FAST</td>
<td>hs-DA</td>
<td>1</td>
<td>FINS</td>
</tr>
<tr>
<td>FASTER</td>
<td>hs-5A,5A</td>
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<td>FINS</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>PEAS</td>
<td>hs-1,20</td>
<td>5</td>
<td>FINS</td>
</tr>
<tr>
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<td></td>
<td></td>
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</tr>
<tr>
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<td>LEOPARD</td>
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<td>LEOPARD</td>
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</table>
4.1.3.2 Function Words

4.1.3.2.1 Frequency and Exemplars

As with content words, function words had a range of use. Some were used only once, and others were used repeatedly, as seen in Table 4. Exemplars are listed below, in Table 7.

Table 7. Parental use of function words (RQ2a)

<table>
<thead>
<tr>
<th>RQ2a: Examples of function words across settings</th>
</tr>
</thead>
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<td>T: Total Count</td>
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<td>8</td>
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</tbody>
</table>

<table>
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<tr>
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<td>SHOW-YOU</td>
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<table>
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<td>WHEN</td>
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<td></td>
<td>WHERE</td>
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<table>
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4.1.3.2.2 Lexical Variants

Table 8. Selected examples of parental use of function word variants (RQ2a)

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<td>WHO</td>
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<td>GROW-UP</td>
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<td>LET-GO[hs-85,85]</td>
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<td>hs-FLAT-O</td>
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<tr>
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<td>CL-F[PICK-AND-EAT]</td>
<td>2</td>
<td>LIKE</td>
</tr>
<tr>
<td>EAT</td>
<td>CL-A</td>
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<td>SEE</td>
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<td>[PLATE-TO-MOUTH]</td>
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<td>CL-ILY</td>
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<td>LOOK</td>
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<td>LOOK</td>
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</table>
AIR  SQUIGGLE

FLY-TO  CL-  2  WHAT  hs-5,5  4  GROW  CL-  1
ILY[point A-B]  05[down-roots]

FLYING-  CL-ILY-  1  WHAT  hs-L-20  1  SCRAPE  hs-A  3
HIGHER  UPWARDS

VANISH  hs-25-A  4  SCRAPE  CL-5+++  1
[DIG]
VANISH  hs-OA  4  WHAT  hs-1  1
WHAT  hs-5  4

4.1.3.3  Morphological Awareness

4.1.3.3.1  Fingerspelling and ASL-English Links

Table 9. Parental use of fingerspelling as a course of morphological awareness in parent-child discourse across setting (RQ2a)

RQ2a: Fingerspelling in morphological awareness (word/word part)

<table>
<thead>
<tr>
<th>Mealtime</th>
<th>#</th>
<th>Storytime</th>
<th>#</th>
<th>Playtime</th>
<th>#</th>
</tr>
</thead>
</table>
Table 4 summarizes morphological awareness data, and Table 9 presents examples of using fingerspelling to refer to concepts that perhaps do not have an ASL equivalent, or signs that are spelled (i.e., as in the case of lexicalized fingerspelling; Baker, 2010 & Stone et al., 2015). These are ways that ASL provides an opportunity for morphological awareness, a way of navigating English text. To add to fingerspelling, semantic nuances are fleshed out using morphological techniques. Exemplars are organized in morphological categories.
English can be mediated using ASL with chaining and sandwiching techniques (Baker, 2010 & Stone et al., 2015). Chaining was found in several instances across settings. For example, in mealtime, the word gravity is signed, GRAVITY-hs-5S,5S then fingerspelled, fs-G-R-A-V-I-T-Y. In storytime, the word seal is fingerspelled first, then signed. During playtime, “pot” is fingerspelled, then followed by the sign. Sandwiching seems less frequent, and appears in storytime, but not mealtime or playtime. Dani demonstrates chaining in two storytime exemplars:

fs-M-A-P-S GLOBE-WORLD fs-M-A-P-S

Fingerspelling is chained with descriptors of the word being depicted. For example, in storytime, Macy refers to an orca, first by pointing to it “THAT IX-THERE” then fingerspelling: fs-O-R-C-A and describing it as a whale that is black and white: WHALE BLACK WHITE.

Another example of a descriptor being used surfaces when Dani gleans into the meaning of krill:


In storytime, chaining is paired with definitions or descriptors: CL-B,B with fs-F-I-N and fs-T-A-I-L with CL-B-TAIL. Also in storytime, fs-K-R-I-L-L SAME GROUP FAMILY.

Another example of chaining with a reference point was observed in playtime. Macy fingerspelled, signed, then referred to a plant’s roots: fs-R-O-O-T-S ROOTS IX-THERE[roots].

Meaning making by way of using definitions takes another route with the use of polar examples. For example, as in mealtime, VANISH is explained with polarity (i.e., explaining what something is, then explaining what something is not). Here, VANISH is followed by CAN’T SEE ANYMORE and subsequently VANISH-FROM-OUR-SIGHT. Similarly, GRAVITY is explained, first by chaining (signed, then fingerspelled) followed by an explanation
of the effect of gravitational forces on objects: if a plane takes off fast, it will fly, if it is fs-T-O-O SLOW, it will not be able to LET-GO[hs-85-85] of the LAND.

In some instances, signs are modified in contextually accurate uses and, thus, create lexical variants. During playtime, in ASL, the sign for “grow” is depicted with the conventional upwards direction of growing. Here, the sign GROW was followed with a variant of GROW, growing downwards, as roots do:


Additional morphological techniques were found in the data in the form of compound signs, the use of suffixes, and the spelling of “to be” verbs. In storytime, compound signs were found in the use of Dani’s HOW-MANY, then HOW MANY. Similarly, the compound word “blueberries” was signed BLUE + BERRIES. The “er” morpheme was used with its agent and superlative meanings, respectively. Dani describes the crab eater seal as a CRAB EAT-ER[hs-5,5]. Ali uses the -er morpheme three times following Dani’s use of the morpheme, in the context of “BUG-ER.” During mealtime, Macy describes to Ali the speed of planes being FAST-ER than cars, and uses the hs-A superlative morpheme to depict “er.” During storytime, Dani explains that an illustration on the page “fs-I-S” a seal, a south elephant seal. During mealtime, Ali starts spelling “fs-B” and Dani, perhaps predicting Ali’s meaning, asks him “IX-YOU WILL fs-B-E whq WHAT.” These are examples of codeswitching and cross-language morphological awareness mediation found in the data.

4.1.4 Research Question 2b: Parental Syntactic Language Features

A key component of academic language is the manipulation of lexicon to create syntactic chains of expression. ASL has five sentence patterns (SP; Easterbrooks & Baker, 2002). The first
The sentence pattern is comprised of questions. These are further categorized into yes/no questions (YNQ), wh-questions (WHQ, i.e., who, what, why, when, where) and rhetorical questions (RHQ, i.e., asking, then giving an answer; Easterbrooks & Baker, 2002). Table 10 illustrates the frequency of ASL sentence patterns in each setting.

Table 10. *Frequency of parental use of ASL sentence patterns across settings (RQ2b)*

<table>
<thead>
<tr>
<th>RQ2b: Summary of syntactic features in parental academic language</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1</td>
</tr>
<tr>
<td>Questions (YNQ, WHQ, RHQ)</td>
</tr>
<tr>
<td>Mealtime</td>
</tr>
<tr>
<td>Storytime</td>
</tr>
<tr>
<td>Playtime</td>
</tr>
</tbody>
</table>

4.1.4.1 **Sentence Pattern 1: Questions**

This section provides exemplars of parental use of ASL sentence types across settings.

The first sentence pattern looks at questions. Figure 3 illustrates the frequency of ASL question types (SP1) across settings.

Figure 3. *Frequency of ASL question types across settings*
**Mealtime**

WHQ: M: [to Ali] WHY whq DO-YOU-THINK IX-YOU OLDER THAN IX-HIM whq


YNQ: M: [to Ali, eyebrows raised] PLANE-MOVE-BACK-AND-FORTH q

**Storytime**

WHQ: D: [to Ali] YOU HAVE-IDEA BLUEBERRIES WHAT whq

RHQ: M: [to Bo] WANT fs-I-C-E q IX-THERE GO

YNQ: M: [to Bo] YOU-WANT MORE ICE q

**Playtime**

RHQ: A: [exclaims, trying to get pot from Bo]
M: [gazes left to Ali, ag-hand-wave nmsOH-OH-OH] WHO HAS fs-P-O-T whq
YNQ: M: IX-THERE FINISHED q IX-THERE

4.1.4.2 Sentence Pattern 2: Negation

Mealtime: M: [ag-hand-wave to Bo] PLEASE UNBUCKLE-neg […]
Storytime: M: [ag-shoulder-tap to Bo] IX-THAT WHALE TEETH [shakes head] NONE
Playtime: M: [ag-hand-wave to Ali] DON'T UNDERSTAND[neg] WHAT[hs-1]
MEAN[hs-2] whq

4.1.4.3 Sentence Pattern 3: Commands

Mealtime: D: [to Ali] IX-THAT WANT SEE IX-THAT VANISH[hs-25-A]
Storytime: B: [to Mom] NO [reaches for camera] [looks-right] CL-5-OPEN
M: [to Bo] COME-ON
Playtime: M: [to Bo] NO-NO CAN BREAK[hs-S,S] LEAF[hs-1,5] [wincses] LEAVE[hs-5,5] [i.e., “Leave it alone!”]

4.1.4.4 Sentence Pattern 4: Topicalization

Mealtime: M: [to Ali] CL-ILY-PLANE-STAY CL-CLOSED-5-LAND-MOVE-BACK-
AND-FORTH
CL-5 MAP-SPREAD-OUT [ag-hand-wave] SHOW-YOU WHERE COLD
CONTINUOUS YEAR-ROUND

4.1.4.5  **Sentence Pattern 5: Conditionals**


Storytime:  M: [ag-shoulder-tap to Bo] BUT UNDERSTAND THAT WHALE BIG[emphasis i.e., MASSIVE] -- IF OPEN-MOUTH GULP, BUILDING GULP-TAKE-ALL


4.1.5  **Research Question 2c: Parental Pragmatic Language Approaches**

Developing academic language requires language input from a MKO and an assurance of language uptake supported by context-specific lexicon, syntactic uses, and forms. Home contexts can allow for rich academic language opportunities by means of parental scaffolding. Parental use of higher-level FLTs (Cruz et al., 2013; DesJardin, 2006) in extended discourse then mediates academic language development. Table 11 illustrates higher-level FLT types and frequency counts across settings.
Table 11. *Frequency of parental pragmatic language use across settings (RQ2c)*

<table>
<thead>
<tr>
<th>Parental Facilitative Language Technique:</th>
<th>Parallel Talk</th>
<th>Open-ended Questions</th>
<th>Expansion</th>
<th>Expatriation</th>
<th>Recasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime</td>
<td>4</td>
<td>13</td>
<td>11</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Storytime</td>
<td>12</td>
<td>9</td>
<td>4</td>
<td>53</td>
<td>14</td>
</tr>
<tr>
<td>Playtime</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>16</td>
<td>12</td>
</tr>
</tbody>
</table>

1.4.5.1 Exemplars: Parental use of Facilitative Language Techniques (FLTs) Across Settings

4.1.5.1 Facilitative Language Technique: Parallel Talk

Parallel talk is evidenced when parents mirror the child’s actions, reference points, and/or displays of interests (Cruz et al., 2013; DesJardin, 2006). The exemplars below illustrate ways that participants use parallel talk across settings.

During mealtime, Macy gives Bo the vocabulary that mirrors Ali’s expressive display of elation:

A: [to Mom] [indiscernible] [I-CHEEK-NAME]! +++ [repeats sign continuously]

... 

M: [to Bo] **ALI EXCITED**!

A: [to Mom] L-CHEEK!
During storytime, Macy narrates Bo’s interest (pointing to the video camera) and narrates what is happening with the video camera:

B: IX-THERE [pointing to camera]

[…]

*M: [ag-shoulder-tap to Bo] IX-THAT CAMERA IX-THAT FASCINATING
SEE CAMERA WITH RED LIGHT CL-5-FLASH+++ RED LIGHT MEANS
WHAT fs-O-N

Later, in the same interaction, Macy narrates Ali’s action by inputting language for what he is holding. She also uses fingerspelling in this instance:

A: [Ali arrives from kitchen]

M: [to Ali] BIG fs-B-L-O-C-K ICE

D: [Dad arrives and gives Ali bowl for ice]

During playtime, Macy narrates Bo’s careful use of a spoon to scoop out soil:

M: [looking in pot] GOOD WORK, IX-YOU SCRAPING++[CL-A-nmsMM]

SCRAPING[DIG-CL-5+++]

4.1.5.2 Facilitative Language Technique: Open-ended Questions

Open-ended questions are the kind of questions parents use that children can answer in two or more words, or, in this study, signs (Cruz et al., 2013; DesJardin, 2006). During mealtime, Dani and Macy demonstrate use of open-ended questions to extend discourse. Here, Dani asks Bo what he will see in San Diego.

D: [to Bo] SAN DIEGO WHAT SEE whq [open hands]

During storytime, Dani uses an open-ended question to initiate a new conversation:

D: [to Ali] WHY WHITE WHY whq
A: [to Dad] COLD

D: [nods to Ali] RIGHT

Below is an example of an open-ended question Dani used during the middle of a conversation:

A: [ag-arm-tap to Dad] THAT BUG-ER[hs-5,5]

D: [to Ali] CL-L-WHAT whq

A: [to Dad] BUG-ER EAT BUG LIKE [ag-arm-tap] KNOW LITTLE-BIT DIFFERENT hs-5-LOOKING LITTLE-BIT DIFFERENT IX-THAT

During playtime, Macy uses an open-ended question to ask for clarification:

[00:04:05.10] A: [to Mom] POT MORE...


4.1.5.3 Facilitative Language Technique: Expansion

Expansion occurs when a parent mirrors a child’s language albeit in a complete, syntactically true form (Cruz et al., 2013; DesJardin, 2006). The child’s meaning and sign order is preserved. During mealtime, Macy uses expansion to rephrase Bo’s language use, both in the referring to the plane, and the attention drawn to the floor.

B: [to Mom] CL-3-PLANE-MOVE-BACK-AND-FORTH / IX-THERE

During storytime, Dani expands on Ali’s indexing to an image on the page, and identifies the animal.

A: IX-THAT[page]
D: IX-THAT[page]

D: [to Ali] fs-K-R-I-L-L

During storytime, Macy uses expansion followed by recasting. Macy is double-checking her understanding of Bo’s utterance. She demonstrates critical thinking, theory of mind, and thinking aloud in the following example.

B: [to Mom] CL-5,5-TEETH IX-THERE
M: [to Bo] IX-THAT THAT SEAL HAS TEETH q [looks at book closer] YES [nods] SEAL HAS TEETH

During playtime, Macy gives Bo the appropriate language or expected behaviour in her expansion:

B: [to Mom] FUNNY!
M: [to Bo] CHERISH[hs-5S,5S] [nodding]

4.1.5.4 Facilitative Language Technique: Expatiation

Expatriation is defined as being the same as expansion, but adding new information (Cruz et al., 2013; DesJardin, 2006). During mealtime, Macy expands and adds on Ali’s language use around Bo’s birthday.

A: [to Mom] IX-HE OLD BIRTHDAY IN IX-HE FOURTH IX-HE++

[...]
M: [to Ali] FOURTH whq WHICH MONTH
A: [to Mom] IX-HE fs-F...
During storytime, Dani uses expatiation to add information about strange-looking krill.

A: [to Dad] STRANGE IX-THERE [page]


**CL-5,5 [legs] CL 1 [swim downwards]**

During playtime, Macy mirrors Ali’s language use and adds information about a plant, that the soil needs to be packed in, and more soil added:

B: [ag-hand-wave to researcher], at [00:04:12.26] B: CL-5[VIDEO?]  
[shows adding more soil]

**4.1.5.5 Facilitative Language Technique: Recasting**

Recasting happens when parents use questions to mirror child’s in-the-air utterances (Cruz et al., 2013; DesJardin, 2006). During mealtime, Macy rephrases Bo’s statement into a question:

A: [ag-shoulder-tap to Bo] WHY FINGERS-IN-FOOD WHY whq
During storytime, Bo makes an observation about a seal, and Macy recasts this observation into a question.

B: [to Ali] WHY[hs-5-INDEX-DOWN-5] FINGERS-FOOD WHY[hs-5-INDEX-DOWN-5] [smiles, looks at Dad]

M: [to Bo] WHY open-hands whq / IX-HE ALI CURIOUS WHY FINGERS-FOOD FOR-FOR whq open-hands

During playtime, Macy expands on Bo’s statement about not wanting a plant on the table in his proximity and asks him why:

B: [to Mom] IX-THERE[page] SCARY

M: [to Bo] WHY SCARY whq WHY

During playtime, Macy expands on Bo’s statement about not wanting a plant on the table in his proximity and asks him why:

B: [to Mom] WHERE SPOON whq SPOON, HEY[pushes plant away] DON'T-WANT[hs-claw,claw]

M: [to Bo] WHY DON'T-WANT[hs-claw] IX-THERE[pot] whq

B: [headshake]

M: [to Bo] WHY whq

4.1.6 Post-interview

4.1.6.1.1 Planned Questions

During the post-interview, the interaction was semi-structured with questions about each research question following short clips of parent-child discourse across settings. Parents were asked to consider strategies they used, if any, and where these strategies were learned. Appendix J lists the post-interview questions.

First, parents were asked to what degree they felt the home visits mirrored what typically happens at home. This was followed by the second part of the question, asking about the
children’s response to the presence of recording devices during the visits. The participants expressed that, generally, the home visits were a fair reflection of their everyday family life. Macy stated that mealtime was a “tame” version, and that the children are usually more boisterous. Dani shared a slightly different perspective in that there are ebbs and flows: some days the children are mellow, and other days, more expressive during mealtime. As for storytime, Dani shared that they usually read books at night, or early in the morning. Macy added that she takes advantage of moments in the day where the children are mellow, or if a child is upset. Dani stated that they also read when the children show initiative. The participants follow their children’s lead but are consistent about reading before bedtime. The playtime observation was implied to be typical of the after-school activities that occur in the home. Macy explained that there is usually a project of some kind, or the preparation of a snack or meal. The day of the observation, it happened that there was a planting activity planned. The participants were asked how the children, and they, responded to video presence during the visits. Dani and Macy shared that the children seemed fine with the video presence, and that they, too, were accustomed to being in front of the camera.

Next, parents viewed clips from playtime, storytime, and mealtime and, following each clip, were asked to share thoughts they had running through their head in each clip, and to share strategies they might be using. Following the mealtime clips, the topic of turn taking, using eye gaze and tracking came up. Macy shared that, while not present in the clip, she encourages her children to engage in dialogue with one another, and will direct one child to what the other is saying. Dani also observed that he rephrases what the children say. He stated that he uses this technique as a teacher, mirroring to elicit children to see what and how they communicate. He
thought he could use videotaping as a reflection strategy with his children, as he does with his students.

After the storytime clip, Dani expressed that he felt the storytime experience was somewhat forced. The set up was not typical (having the book propped on the couch). Usually he sits with the children side by side with the book in front of them. Additionally, Dani reflected he connects what is happening in the story with what the children experience or would likely do. He talked about applying berry picking every summer, a family activity, with the events in *Blueberries for Sal.* When asked where Dani learned to apply children’s experiences to what is being talked about or read, Dani referred to his work as a teacher where he learned strategies to pull out language, to elicit thinking, instead of feeding everything. Additionally, his graduate studies and years of experience, professional development, and collegial discussions about best practices have all informed his approaches with his own children.

In relation to the second storytime clip, Dani reflected that he referred to the Netherlands in reading *MAPS* with the children and connected this experience to the Antarctica and ice. Macy shared her observation that it appeared as though Ali had some familiarity with the topic, but Dani stated this was an introduction to the topic. When asked about connecting the ice to “cold places,” Dani shared that he has good improvisational skills and was able to elicit interest and motivation to make connections and visualize.

Here, Macy added that when they read to the children at night, they take turns. And in doing that, the children access varied experiences with storytelling styles. While Macy uses, in her own words, “more ‘old-school’ straightforward storytelling,” Dani has a different reading style and interacts with the children in a different way. She believes the children benefit from the varied storytelling styles.
After the playtime clips, Macy shared that she lets Ali decide some things for himself because she wants him to show her what he understands following her explanations. From there, she can offer language support. If there are concepts Ali understands but does not quite have the language yet to express himself, Macy is then able to support that and give him language. When asked where she learned this strategy, Macy referred to her day-to-day work as a teacher, and the literacy coach that worked with her on using dialogue to pull out language. She shared she uses Reggio Emilia approaches to inform her teaching, and that this is reflected in the planting activity during playtime.

Finally, parents were asked, “What was your general experience being observed and a participant in this study?” Macy said that overall, it had been a great experience, that scheduling went smoothly, and was adhered to. The children took to having a visitor well. Macy shared that she especially appreciated the ability to reflect through viewing the clips, and to observe some things that she may have overlooked or not noticed while in the moment.

Additional follow up questions were asked, beyond the pre-planned post-interview questions. The participants were asked if they found themselves communicating with the children in the same way. Dani and Macy responded:

D: The same. It's the same- I sign the same with them.

M: Yeah. When we are all together, it's the same. But during the day, when I'm alone with Bo, it's a little different because I have a purpose; I want him to learn specific things. So I give him more language support during the day. But there [at dinnertime], it's sink or swim... swim or sink. However that saying goes. So we just immerse him and he seems to keep up just fine. Yeah.

D: (Nods.)
Parents bring varied, rich lived experiences to the table. Macy grew up mostly mainstreamed, and attended a hearing university with a large deaf population while Dani attended deaf schools all his life and went to a deaf university. They have different storytelling styles, and interact in various ways with their children. They provide the children with a rich language environment, and varied language experiences. The family has done some travel, both overseas, and in the country. These travels are usually organized around work opportunities. Dani expressed that he wants to expose his children to various experiences.

Macy and Dani shared their experience with early intervention services from the perspective of Deaf parents who happen to be teachers. Dani states that Macy has a stronger foundation in early childhood education, and has taught him, shared tips which he has taken to heart in his interactions with his children. Macy acknowledges that the parent-infant/toddler early intervention sessions were of benefit in regards to ideas for in-home projects or activities. Additionally, the parent-infant/toddler program gave Macy some parenting ideas for navigating Ali’s separation anxiety when Dani went to work. But as far as how to interact with deaf children, she reports early intervention services providing no benefit in that regard.

Macy speaks to the importance of language models in the pre-interview. When she found out Ali was deaf, she decided to stay home so that he would have a language model, and this was also the case when she had Bo. She expects to go back to work at the same program when her youngest child starts school.

Macy and Dani understand how deaf children acquire language. They stated that once children understand eye gaze, language becomes explosive with exponential language growth. They speak to the importance of having communication at home.
D: Not just pointing, or forcibly moving [children]. *It's explaining why, the reason behind things*, and all of that.

### 4.2 Putting It All Together

The first research question examines language-rich parent-child interactions in a home setting. Booklike talk found varied, complex turns occurring more frequently in storytime, yet, more conversation turns overall occurring during mealtime. Mealtime had slightly more unique topics brought up than during storytime. Mealtime presented more parental instances of metalanguage, or “talking about talking.” Science process talk, or “becoming scientists” was more frequently modelled by parents in mealtime, but closely followed by playtime (one parent).

The signing on storybook feature of shared reading talk was used most during storytime, but also during playtime, and less so during mealtime. Parents related to children’s lived experiences more frequently during storytime, followed by mealtime and not at all during playtime. Visual embodiment was used more frequently during storytime, followed by mealtime and playtime. Questions were used most during mealtime.

The second research question investigates the academic language features used during parent-child home interactions. With regards to semantic features in academic language, mealtime had the highest counts of unique content and function words; storytime presented the most use of morphological awareness. Syntactic analysis revealed that questions were more frequently used during mealtime, negation similarly used during playtime and mealtime, commands also similarly used during mealtime and playtime, topicalization more frequently found in storytime, and conditionals used similarly across contexts.

Data analysis of pragmatic approaches found that parallel talk was frequently used during storytime, closely followed by playtime. Open-ended questions and expansion were used more in
mealtime. Expatriation was much more frequently found during storytime. Recasting was used most during mealtime. The findings and implications leading from the research study will be discussed in Chapter 5.
Chapter 5: Discussion

5.1 Discussion of the Purpose and Findings

The central purpose of this thesis was to investigate the ways in which parents use academic language and extended discourse with their DHH children. The framework for this research study is rooted in the findings that young children who are socialized early in academic language (i.e., the language of school) prior to school entry are at an advantage (Dickinson & Tabors, 1991, 2001, 2002; Scheele, et al., 2012; Schleppegrell, 2004, 2012). The study was conducted using an in-depth examination of parental expressive language in the child’s primary language, looking at parental use of discourse, and the features and contexts that offered the most opportunity for rich language interactions with their deaf child. Participant interviews highlighted the ways the participants developed the necessary skills to use academic language and extended discourse with their children. The data reveal key insights into parental language features, pragmatic approaches, and home contexts that may facilitate academic language in the early years. The participants’ acquisition of approaches to academic language modelling and facilitative language use provides an opportunity for future recommendations and directions for both research and early intervention practices.

This chapter is guided by the research questions, provides an overview of the main findings, considers themes that have emerged in the research, synthesizes or contrasts the findings’ relationship with the existing research literature, outlines the strengths and limitations of the research, offers implications of the findings, and, finally, offers recommendations for further research and implications for practice.
5.2 Overview of Main Findings

Table 12 summarizes the findings and suggests that the data reveal the mealtime setting offered a significant bulk of extended discourse opportunity, particularly within the booklike talk and science process talk domains. Extended discourse offers a means for facilitating academic language opportunities, and Table 12 presents linguistic features present in academic discourse (semantic, syntactic, and pragmatic domains). The first column looks at the domains of parental language interactions that promote deaf children’s language and literacy development. The next column outlines the features and skills that can be taught, coached, or mentored and are evident in interactions using academic language and extended discourse. The final column outlines the contexts (i.e., home environments and activities) that were found to lend the most parental academic language opportunities.

Table 12. Overview of findings: Extended discourse and academic language domains across features and skills during home contexts

<table>
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<tr>
<th>Domains</th>
<th>Features &amp; Skills</th>
<th>Contexts</th>
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<td>RQ1: Parental extended discourse</td>
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<td>Booklike talk</td>
<td>Varied, complex discourse turns</td>
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<td>Topics and conversational turns</td>
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<td>Science process talk</td>
<td>Abstract reasoning, problem</td>
<td>Mealtime</td>
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<tr>
<td>Topic</td>
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<td>Context</td>
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<td>solving, critical thinking</td>
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<td>Shared reading talk</td>
<td>Signing on storybook</td>
<td>Storytime</td>
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<td>Relating to child’s lived experience</td>
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<td>Storytime</td>
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<td>Visual embodiment of characters</td>
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<td>Storytime &amp; Mealtime</td>
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<td>Asking questions</td>
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<td>Mealtime</td>
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<tr>
<td>RQ2a: Semantics</td>
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<tr>
<td>Academic vocabulary</td>
<td>Content words</td>
<td>Mealtime (unique)</td>
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<td>Words or word parts</td>
<td>Storytime (unique &amp; total)</td>
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<td>RQ2b: Syntax</td>
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<td>Sentence patterns</td>
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<td>RQ2c: Pragmatics</td>
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<td>Higher-Level Facilitative Language</td>
<td>Parallel Talk</td>
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<td>Techniques</td>
<td>Open-ended Questions</td>
<td>Mealtime</td>
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<tr>
<td></td>
<td>Expansion</td>
<td>Mealtime</td>
</tr>
</tbody>
</table>
Significant opportunities in the shared reading talk realm of extended discourse were evident during both mealtime and storytime. While mealtime presented the most academic language features, the variation between settings was not as pronounced as was found in extended discourse. Storytime followed mealtime in regards to parental academic language, followed by playtime. It could be said that academic language was evident across settings, but extended discourse was prevalent in mealtime. It needs to be emphasized, however, that because the playtime interaction had one parent actively involved, where the mealtime and storytime interactions had both parents involved, these findings must be interpreted with caution.

That mealtime presented multiple opportunities across extended discourse and academic language domains with varied features and skills is in line with Beals’ (2001) discussion of mealtime as a reflection of the kinds of talk found in schools (i.e., inundated in explanatory and narrative talk, wide-ranging in topics, with decontextualized connection-making and varied time referents). Beals (2001) suggests that “the family environment, not simply the child’s language sophistication, sets the stage for later literacy development” (p. 91). The current findings further contribute to this line of research.

5.2.1 Research Question 1: Language-rich Activity Components

The number of conversational turns appears significant, especially for mealtime (204) considering only 8 minutes of the recorded language sample was transcribed. Previous studies report that increases in conversational turns correlate with children’s receptive language ability (VanDam et al., 2012). Van Dam et al. (2012) used all-day recordings of parent-child dyad spoken-language samples and counted conversational turns longer than 5 seconds. This time
limit was not set in the current research study, and there were more conversational partners, so there is variance in the methodologies. Caution in interpreting data is recommended in that language input does not necessitate uptake. The participants used a language that was accessible to DHH children in the home environment. Since there is a high number of conversational turns, the participants appear to be modeling thick lexicon which allows the children to mediate vocabulary in a meaningful way with a MKO, thereby increasing their receptive language skills (VanDam et al., 2012).

Considering the context of playtime was a plant-based activity, at first glance, it is curious that this setting contained the fewest themes and minimal metalanguage, yet the frequency of science-process talk was high. After some consideration, however, to the singular goal of the activity, and noting that there was only one parent actively involved in the observation, variance can then perhaps be explained. This could allude to the benefit of having two language models at a given time and account for some of the proportional discrepancy between two-parent and one-parent family observations. Also, the playtime activity was focused around the repotting of plants, where mealtime and storytime observations appeared open-ended without set goals. With this in mind, predetermined outcomes could account for the reduced use of decontextualized language and relating to lived experiences in playtime. It should be noted that the playtime activity is in alignment with the types of oft-recommended activities in family-centered early intervention.

Shared reading features of the data revealed the participants utilized these features as recommended for DHH children (Webster & Heineman-Gosschalk, 2000), particularly with the high frequency of signing on the storybook during the storytime observation. The high frequency of questions during mealtime and storytime reveal the participants asked their children at least 4-
5 questions per minute of the analyzed sample which likely facilitated extended discourse (Smith & Ramsey, 2004).

5.2.2 **Research Question 2: Academic Language Features**

The high frequency of vocabulary in the 8-minute transcribed sample (see Table 4) provides a model of the varied content and function words that can be utilized with children under the age of 5. The participants model sophisticated vocabulary use with sign variants, particularly evident during mealtime. They also provided their children with connections between ASL and English through increased morphological awareness via fingerspelling, chaining, sandwiching, depicting word parts, and using definitions, particularly in storytime (Fingerspelling; total=29). The frequency of ASL sentence patterns highlighted that pattern #1 (Questions; total=96) and #5 (Topicalization; total=71) were utilized the most by the participants, with storytime as the setting with the highest frequency of sentence patterns (128). Wh-questions (who, what, why, when, where) were asked most frequently (total=43), yet are the most difficult for DHH learners to answer (Easterbrooks & Baker, 2002). Again, the participants are modeling high expectations and varied questioning techniques to facilitate communication with their children. The results of the pragmatic analysis show the high frequency of the participants’ use of open-ended questions (total=25), expatiation (with high frequency during story time; total=53; see Table 11), and recasting (total=45) as FLTs. Participants modeled FLTs mindfully, and with a purpose (e.g., correct use of ASL handshapes or fingerspelling conventions), explaining, and eliciting academic language.

5.2.3 **Pre- and Post-Interview Data**

While not the initial goal, or listed as required inclusionary criteria, it was by chance that the participants happened to be teachers of the DHH. This information was discovered in the pre-
The family holds a value of varied lived experiences, incidental language opportunities, and critical thinking. They are intentional about making connections between their children’s immediate environment and the world around them (e.g., family trips to San Diego and the Netherlands). There is a significant degree of reflective language use as evidenced in the interviews. The participants mindfully use higher-level facilitative strategies, in varied contexts, and are aware that they each bring their own language (i.e., storytelling) styles and lived experiences (e.g., education and teaching focuses) to the table. There is a value in the distinction, a celebration of differences, rather than a focus on the uniform, an agreed, predetermined set of lexicon, sign variants, syntactic conventions, pragmatic uses, or discourse styles. They demonstrate a belief in immersing their children in language, academic language at that, and that their children will “keep up just fine.” This expectation seems to set the stage for early academic language experiences. The participants use thick lexicon inundated with academic vocabulary and varied discourse structures. They model the kinds of language forms found in school.

The theme of early intervention services came up in the interviews as well. They reported benefitting from the social opportunities offered by the parent-infant/toddler program housed in the school for the deaf that the oldest child attends. The majority of parental pragmatic language
skills and attention to language modeling comes from their experience as teachers and was not reported as being offered by the early intervention agency, or the parent-infant/toddler program at the school for the deaf. It may be critical to note that the majority of early intervention services are designed for hearing parents of DHH children, and the participants’ background in education and personal experience being deaf provided them with insight and skills perhaps beyond what early intervention services typically teach (hearing) parents of DHH children. This result may deserve further research regarding how early intervention agencies work with deaf parents. Early intervention providers may also want to ensure that they are using modelling and teaching parents extended discourse strategies, academic language features, and higher-level facilitative language mediation skills during intervention sessions to promote academic language.

5.3 Themes Emerging from the Research and Connections to the Literature

Several themes emerged from data analysis including: a) the importance of setting and context in facilitating language; b) modeling and mediating language via turn-taking and questioning techniques; c) varying use of lexicon and sentences to provide language-rich interactions; and d) influence of background on the MKO facilitation of language. Each setting provided unique and varied opportunities for academic language mediation, and lexical, syntactic, and pragmatic strategy use. These results align with Scheele et al. (2012) and Schleppegrell (2012) ideas of academic language genres (social purposes) and registers (different lexical and grammatical choices). Cruz et al. (2013) also highlight the importance of using higher-level FLTs to pinpoint ways in which parents or MKOs tweak or fine tune emergent academic language experiences across settings.

The findings in this study are consistent with previous research contending that parents use academic language with their children well before they enter school (Scheele et al., 2012; see
also Dickinson & Tabors, 1991, 2001, 2002; see also Gee, 2008). The first research question examined parental use of academic language across home settings and found that academic language was present in parental language use through booklike talk, coaching, science talk, and metalanguage, which is consistent with the research literature (Gee, 2008). Indeed, the participants offered daily family routines providing their children with opportunities for educational or instructional talk as evidenced in mealtime, storytime, and playtime contexts (Scheele et al., 2012). Children in the study were actively involved and exposed to academic language in rich language contexts (Schleppegrell, 2012). The participants demonstrated academic language and extended discourse talk with the use of metalanguage (talking about talking) thereby demonstrating the unlocking of the academic language puzzle and use of language tools (Marschark et al., 2011; Schleppegrell, 2012). The parents, who are deaf and competent language users, demonstrated extended discourse and language mediation proficiency in carrying conversations while using thick discourse turns (Gee, 2008; Smith & Ramsey, 2004; Wood & Wood, 1997). Decontextualized language was found across settings: parents used narratives, explanations, science talk, and talking about language at the sentence and word levels (Schleppegrell, 2004; Snow, 1983).

The second research question examines the linguistic features of parental language, and academic language in each of these features. Scheele et al. (2012) found that shared narrative book reading introduced and provided practice of rare words and shared play sets the stage for spatial action verb use. In the semantic domain of academic language, the participants demonstrated the use of a thick lexicon during conversation in the context of stories and explanations (Snow et al., 1991). More specifically this lexicon took the form of content words relating to the concepts at hand, function words found in school contexts (i.e., asking, supporting,
The participants demonstrated meta-language that benefits elementary learners when they provided varied, in-situ experiences with academic language and semantics, and “talked out loud” about morphological awareness (Kieffer & Lesaux, 2012). During mealtime, the use of morphological play was evident (Easterbrooks et al., 2010). Parents demonstrated proficiency with using word or word parts, including fingerspelling, to facilitate deeper understanding of language structure (Baker, 2010; Stone et al., 2015).

The second component of the second research question examines syntactic conventions in parental use of academic language. The participants modeled early academic language syntax, a vital component of language exposure, considering grammar is largely internalized by age 4 or 5 (Paul, 2009). The participants competence in ASL and educational background influenced their success in maintaining extended discourse with their deaf children and their use of FLTs in their persistent and contingent comments and questions (Lang et al., 1994; Lartz & Lestina, 1995; Smith & Ramsey, 2004; Stokoe, 1960). The quality of the ASL data collected supports discourse maintenance and the sophisticated use of discourse structures (e.g., Akamatsu et al., 2012; Smith & Ramsey, 2004). The participants demonstrated use of rich, often decontextualized lexicon in a variety of sentence patterns to formulate lines of discourse that were syntactically varied. There is some variation in the research literature around adult word counts and child language abilities. Where VanDam et al. (2012) found that in DHH children ages 24-36 months, receptive language abilities were correlated with conversational turns but not adult word counts, generally, academic language is defined as varied, and complex with longer discourse turns thick in decontextualized language (Gee, 2008) and is not defined by rapid-fire back-and-forth communication.
The last component of the second research question looks at parental pragmatic language use. Cruz and colleagues (2013) and DesJardin (2006) use the framework of lower-level and higher-level techniques. The frame of higher-level FLTs overlaps with parental extended discourse talk and pragmatic features of academic language. This study found that the participants used facilitative higher-level techniques as scaffolding opportunities for extending discourse. Stobbart and Alant (2008) and Webster and Heineman-Gosschalk (2000) contend that less controlling parents correlate with increased interactions. Although not the focus of the current study, the data exhibited evidence that the participants were able to follow their children’s lead and use FLTs to mediate discourse and elicit language. In this research study, the participants demonstrated proficiency with language mediations strategies as evidenced in their mediation with text during storytime, and use of metalanguage in all settings, as well as morphological awareness (Cummins, 2006; Petitto et al., 2001).

There is no one way to read a story with a child and this was present in the home observations across settings, perhaps more so in storytime. In the post-interview, this was reinforced by the parents where they alluded to the variations between their storytelling styles. Dickinson and Tabors (1991) speak to the nature of storytelling to have the potential for different ways of sharing a book together. Where Dickinson and Tabors (1991) referred to different families and their storytelling styles, it was especially interesting for the children in the study to experience different styles within their family unit.

5.4 Strengths and Limitations of the Findings

This is a unique study with two Deaf participants who have two Deaf children (ages 2 and 4). Considering the majority of grammar is internalized by age 4 or 5, the findings are
captured at a critical age and provide important insights into language environments and strategies for family-centered early intervention.

Strengths of the current study included: a) the participants were exceptional models of academic language, with teaching backgrounds and experience; b) the participants approached interactions in various ways because the children were at different language stages; c) authentic language samples were collected within the natural, home setting, enhancing the validity of the current findings; d) the study participants, methodology, and results are unique contributions to the literature in the field that we have not reported before; and e) the researcher is Deaf and a proficient ASL user, adding a critical lens in the analysis and discussion.

Limitations of the current study included: a) the small sample size of the study, while appropriate for the research design, reduces the generalizability of the results and should be considered when reviewing the findings; b) the data was collected over a one-week period; and c) minimal research literature exists to guide the methodology regarding measuring ASL academic language and categorizing ASL syntax. This study is not meant to reflect the early language experiences of all DHH children, but to provide a case study examination of a family’s language interactions in order to contribute to the best practice literature in early intervention.

5.5 Implications of Findings

The findings offer new insights into a language-rich early language environment for DHH children. Impoverished academic language opportunities in the early years have significant implications for academic and learning opportunities in the school years (Scheele et al., 2012). This is further compounded when considering the tendency for DHH children to experience language-impoverished early environments. These challenges can be mitigated through early years and preschool programs that provide academic ASL opportunities. Utilizing a framework
focused on increasing academic ASL in parents and children that includes parent training and a mentoring program could target vital areas of language development and school-readiness skills. Parents can be taught facilitative language techniques and provided support via language mentoring for themselves, their children and their families.

In addition, conversational feedback, the synthesis of lexicon, syntax, metacognition, and incidental learning are important elements in early language acquisition. Early language acquisition requires communication partners who are MKOs and can provide incidental teaching and language learning opportunities.

5.6 Recommendations for Future Research

Yoshinaga-Itano (2003) suggested that more research was required in the investigation of skills using language to communicate, not just research into language competencies. Longitudinal research would support if the current findings influence social and academic outcomes at school age for the participants’ children. The participants demonstrated language unlocking, language learning, and creating language. The next step would be to investigate children’s use of academic language, particularly registering differences (using vocabulary and language features in specialized contexts) and pragmatic awareness of how words are used in various contexts.

Possible areas for further research include: a) measuring ASL academic language and categorizing ASL syntax; b) examining the variants observed in the ASL lexicon; c) turn-taking and its role in extended discourse; and d) longitudinal studies with repeated observations, examining family units and conducting follow-up interviews with language samples across varying ages. Attention-getting facilitates turn-taking and joint attention and was found in the research data, but is not discussed here.
5.7 **Implications for Practice**

Since early intervention professionals are with parents for a limited window of time in the thousands of hours of language opportunities, it is advantageous to model the types and contexts in which rich discourse occurs. Based on the findings of the frequency of conversational turns and asking questions, providing families with techniques to enhance storytime and mealtime discussions would be most time-efficient for families and early interventionists during this critical period of language acquisition. Home-based approaches should utilize varied and complex language regarding varied themes and topics of interest to the learner. Coaching and metalanguage can be utilized during mealtime discussions and other authentic daily activities. Furthermore, asking questions in any setting could enhance language, but understanding the breadth and depth necessary to promote higher order thinking and problem-solving skills is crucial.

Promoting the use of high-level vocabulary exposure in authentic settings and context in order to provide a bridge between ASL and English in parent mentoring could increase preschool literacy skills. Varying the use of ASL sentence patterns beyond questions and topicalization to explicitly focus on negation and conditionals may provide another bridge to features of English that DHH learners have historically struggled to acquire (Berent, 1996; Cannon & Kirby, 2013). Another challenging area for DHH learners has been questions and the results of this study reveal the participants asked wh-questions most often, revealing how easily higher-level questioning techniques can be incorporated into conversations with early language learners.

Early intervention professionals could also support parents with self-assessment of their language competency, and assist them in modifying language habits to better enrich their child’s language exposure. The lines of discussion in the post-interview provided an example of how
early intervention professionals can use recorded observations as a forum for reflecting on parental academic language use as a reflective approach to service provision. This is further supported by the participants’ reference to the parent-infant/toddler program being of more benefit than early intervention home visits.

Using academic language and extended discourse with their two-year-old and four-year-old, the participants in this study mirrored the type of language that is commonly found in school. In three 8-minute episodes, they covered a range of decontextualized content in talking about distant places in the world and the nature of things. They engaged in language play and language unpacking, that is, talking about talking. And, even with routines found in day-to-day family life, they elicited varying levels of abstract reasoning.

Language-rich activities were utilized by the participants to model booklike talk, science process talk, and shared reading talk as observed during mealtime, storytime and playtime. Language-rich talk was observed in the participants’ interactions with their children, as seen in the semantic and syntactic features of their academic language use. Cognitively challenging extended discourse talk and academic language use was spiraled through complex, dialectic uses of higher-level facilitative language techniques.

The early years are critical. Human minds are engineered for language; however, the environment shapes innate cognitive language capacities (Easterbrooks & Baker, 2002; Paul, 2009; Petitto et al., 2012). An accessible language and social environment with more knowledgeable language models is paramount to the workings of the language acquisition machine. By observing parent-child language use in natural home environments, the study contributes to the existing literature in offering nuanced insights into specific features of parental academic language and extended discourse use with DHH children in various home contexts.
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doi:10.1086/663300


doi:10.1093/deafed/enh011


Appendices

Appendix A  English Sentence Patterns

Sentence Pattern 1 (SP1) _Eng_: Noun Phrase (NP) + Intransitive verb (V <sub>i</sub>) (+/-) Adverb (Adv.)

Examples:
The baby / cried.
The baby / might have been crying.
The baby / might have been crying / in her bedroom.
Children / can play.
Dad / slept / all day.

Sentence Pattern 2 (SP2) _Eng_: Noun Phrase (NP<sup>1</sup>) + Transitive Verb (V<sub>t</sub>) + Noun Phrase (NP<sup>2</sup>)

Example:
The baby / spilled / all her milk.

Sentence Pattern 3 (SP3) _Eng_: Noun Phrase (NP<sup>1</sup>) + Copula ‘be’ (V<sub>b</sub>) + Adjective (Adj)

Examples:
Evie / is / tired.
Your dog / is / very sweet.

Sentence Pattern 4 (SP4) _Eng_: Noun Phrase (NP<sup>1</sup>) + Copula ‘be’ (V<sub>b</sub>) + Noun Phrase (NP<sup>1</sup>)

Examples:
Evie / is / my dog.

Sentence Pattern 5 (SP5) _Eng_: Noun Phrase (NP<sup>1</sup>) + Copula ‘be’ (V<sub>b</sub>) + Adverb (Adv)

Examples:
Evie / is / eating quickly.
Appendix B  ASL Sentence Patterns

Sentence Pattern 1<sub>ASL</sub>: Questions

Yes/No Questions
Example: BATH WANT q
Translation: Do you want a bath?

Wh-Questions
Example: fs-R-U-B-B-E-R DUCK WHERE whq
Translation: Where’s your rubber duck?

Rhetorical Questions
Example: fs-R-U-B-B-E-R DUCK WHERE rhq BEHIND IX-THERE
Translation: The rubber duck is behind you, over there.

Sentence Pattern 2<sub>ASL</sub>: Negation

Example: BATHTUB STAND-UP-neg
Translation: Don’t stand up in the bathtub.

Sentence Pattern 3<sub>ASL</sub>: Commands

Example: CAREFUL! SIT STAY TUB
Translation: Be careful! Stay sitting in the bathtub.

Sentence Pattern 4<sub>ASL</sub>: Topicalization

Example: WATER, IX-YOU LOVE
Translation: You love water.

Sentence Pattern 5<sub>ASL</sub>: Conditionals

Example: fs-I-F BATHTUB STAND-UP, SLIP-FALL-DOWN IX-YOU
Translation: If you stand up in the bathtub, you can slip and fall.
Appendix C  Nonmanual Signals

**MM**: normal or regular occurrence, proceeding as expected

**CS**: nearby in time or space

**TH**: careless, without attention

**Puffed Cheek**: large amount or size, far away in space or time, great duration

**Intense**: great magnitude, awfully far away in space or time, great duration

**Pursed Lips (OO)**: very small, thin, narrow, smooth

**STA**: unusually long or intense occurrence

**CHA**: thick or big

**IS**: accompanies signs such as GETTING-BY, SMART, PRACTICE, DIRTY, SORRY

**BRR**: denoting a lot of people, signs such as BEAUTIFUL, STUPID, DIRTY, AWFUL

**SOA**: accompanies signs such as PEEVED, SMART, CHEAP, EXPENSIVE, PROUD, FULL, LUCKY

**Far Away**: marker for “off in the distance”

**Tight Lips**: assertion (often accompanied with nod)
Appendix D  Consent Form

Consent Form

Discourse and Language in Parent/Deaf Child Home Interactions

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Purpose:
You are invited to have you and your child participate in a research study. The purpose of this study is to gather data about how parents use language during home interactions with their deaf child.

Study Procedures:
I would like to ask you and your child to participate in this research study. You and your child will be observed using language in three different home interactions (dinnertime, storytime, and playtime). In addition, you would be interviewed in a visit prior to observations, as well as a visit after the observations. There would be five separate sessions in total, between 30-60 minutes each session, over a 1-4 week period.

You and your child would be video recorded during the observations, and you would be video recorded during the interviews to check for accuracy in transcriptions. The video recordings would only be used for research analyses, would not be published or distributed, and would be destroyed upon completion of the study.

Potential Risks:
In this study, you and your child will not have any more risks than you would in a normal day at home. There are no apparent risks for you and your child’s participation in the current study. If you decline to have you and your child participate, there will be no
negative consequences for you or your child. The information you would provide during the pre/post interviews is similar to the information you would share with early interventionists or teachers.

Potential Benefits:
If you decide to participate in the study, you might benefit from the opportunity to reflect on language and discourse with your child in home settings.

Confidentiality:
All documents would be assigned an identification number and kept in a locked filing cabinet. You and your child would not be identified by name in any reports of the completed study.

Remuneration or compensation:
You will not receive compensation for participating in this study.

Contact for information about the study:
If you have any questions or desire further information with respect to this study, you may contact Dr. Joanna Cannon at 604-822-1645.

Contact for concerns about the right of the research participants:
If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Services at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598

Consent:
Participation in this research is voluntary. You and your child do not have to be in this study. If you decide you want you and your child to be in the study and change your mind, you have the right to drop out at any time. You may stop your participation at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled or be in jeopardy in your relationship with the Principal Investigator.

I give consent for my child and myself to be video recorded during the administration of the assessments. The video material will be only be used to validate the data collection process and to verify responses in the event of a misunderstanding of a sign used in a parent or child’s response. No video images will be used in presentations or publications.

☐ Yes  ☐ No

In addition, your signature below indicates that you have received a copy of this consent form for your own records. Please keep this copy of the consent form for your records and return the signature page attached.

Signature Page

Page 2 of 3
Version 1: August 4, 2015
Your signature indicates that you give consent for you and your child to participate in this study.

Parent or Guardian Signature           Date

Child’s Name
Appendix E  Demographic Questionnaire

Child’s Name: ________________________  Today’s Date: ________________________

Child’s Date of Birth (mm/dd/yyyy): _____  Sex (circle):  Male / Female

Early Intervention Agency: ______________  Early Interventionist: ________________

Preschool: ____________________________  Teacher: ____________________________

Person completing form:
Name: ________________________________  Relation to child: ______________________

1. At what age was the child identified as deaf or hard of hearing? __________

2. What was the cause of the child’s deaf or hard of hearing status? _______________

3. What is the level of hearing? (circle):  Mild  Moderate  Severe  Profound

4. What age did the child first use amplification (e.g. hearing aids, cochlear implant, FM)?
   __________

5. What type of amplification is currently used? (circle all that apply; if hearing aids or
   cochlear implants see # 6 or 7):
   Hearing Aids  Cochlear Implants  FM  None

6. Does the child wear hearing aid(s) now?   YES  NO
   If yes how many? (circle):  one or two
   How much does s/he use it in the community? (circle):
   Never  Occasionally  Almost Always
   How much does s/he use it at home? (circle):
   Never  Occasionally  Almost Always

7. Does the child have a cochlear implant(s)?   YES  NO
   If yes (circle):  one or two
   At what age did the child get the implants? ______________
   How much does s/he use it in the community? (circle):
   Never  Occasionally  Almost Always
How much does s/he use it at home? (circle):

Never          Occasionally        Almost Always

9. What is the child’s current mode of communication (circle):

Listening & Spoken Language   ASL   Bimodal

11. What is the primary language used in the home? ________________________________

12. What is the parental hearing status?

Parent 1 ____________   Parent 2 ____________

13. Please list any areas that the child has additional needs:

________________________________________________________________________
Appendix F  Family Language Survey

This survey will help me understand your child’s language environment.

**Home and community language environment**

I communicate with my child using ____________

<table>
<thead>
<tr>
<th>ASL</th>
<th>Signed Exact English</th>
<th>Sign key vocabulary</th>
<th>Signs to support speech</th>
</tr>
</thead>
<tbody>
<tr>
<td>(American Sign Language)</td>
<td>(Signing each word)</td>
<td>(Signing only the key words)</td>
<td>(Signing to help oral understanding)</td>
</tr>
</tbody>
</table>

I feel like I communicate with my child:

- Constantly
- A lot
- Enough
- Not enough, not as much as I wish I could

I find communicating with my child:

- Easy
- Challenging
- Frustrating
- A real struggle

I read when my child is around (e.g. books, newspapers, magazines that I read to myself).

- Always
- Sometimes
- Rarely
- Never

I include my child in activities of daily living (examples: making shopping lists, cooking, decision-making).

- Always
- Sometimes
- Rarely
- Never

Other activities I include my child in are: _______________________________________________________

I find communication challenging when ________________________________________________________

I sign when my child is present.

- Always
- Sometimes
- Rarely
- Never
I explain to and communicate with my child what is happening around them (in their home, community, and world).

*Always*        *Sometimes*        *Rarely*        *Never*

*An example would be* ________________________________

I understand my child’s language age.

*Very much so*        *Somewhat*        *A bit*        *Not at all*

*My understanding would be that* ________________________________

I can use sign language to joke around with my child.

*Yes*        *No*

*An example would be* ________________________________

I can use sign language to discuss difficult topics with my child.

*Yes*        *No*

*An example would be* ________________________________
Appendix G  ASL Self-evaluation Scale

☐ I can sign hello and goodbye. I know a few basic signs. I know the alphabet and can fingerspell my name.

☐ I can recognize and use common words and simple phrases. I can introduce myself. I can ask and answer basic questions about my home, family, and familiar surroundings. I can communicate in a basic way when another person signs slowly and clearly.

☐ I can understand the main points of clear, standard sign language expression on familiar subjects, including work, school and leisure activities. I can manage in most situations. I can express simple and cohesive ideas on familiar topics, or topics that I am personally interested in. I can narrate an event, an experience or a dream. I can describe a desire or goal, and outline reasons or explanations behind a project or idea.

☐ I can understand a wide range of long and complex sign language expression, including between-the-lines nuances or artistic forms of sign language. I can express myself freely and fluidly, without struggling to think of signs. I can use sign language effectively and fluently in social, professional or academic contexts. I can sign in a clear, organized way about complex topics, and develop a well-structured argument.
### Appendix H  Data Collection/Observation Checklist

1. The day before scheduled visit: Contact the family to confirm date and time  
   - Y  
   - N

2. The morning of scheduled visit:  
   - Charge videocameras  
     - Y  
     - N
   - Ensure SD cards are empty  
     - Y  
     - N
   - Prepare clipboard & writing materials  
     - Y  
     - N
   - Collect tripods & videocameras  
     - Y  
     - N

3. The evening of scheduled visit: Arrive 10-15 minutes early  
   - Y  
   - N

4. During scheduled visit:  
   - Prep and situate cameras in context  
     - Y  
     - N
   - Keep cameras in view of family members  
     - Y  
     - N
   - Take field notes (FN)  
     - Y  
     - N

5. Immediately after visit: Complete observation notes as needed  
   - Y  
   - N
   - Jot down reflections in field notes  
     - Y  
     - N

6. After visit:  
   - Transfer SD card data to hard drive  
     - Y  
     - N
   - Transfer copy to researcher laptop  
     - Y  
     - N
   - Begin video transcription  
     - Y  
     - N
Appendix I  Field Notes Template

Family #

Field Notes

<table>
<thead>
<tr>
<th>Date</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annotation marks (Flick, 2014)

“___”  Verbatim quotes
‘___’  Paraphrases
(____)  Contextual information
[]  Researcher reflections
<__>  Emic concepts (participant perspective e.g. deaf people value communication)
/__/  Etic concepts (observer perspective e.g. deaf children access incidental learning on a lesser scale than do hearing children or children in language-same homes)
—  Beginning or end of segment

Terms of reference (for researcher; Flick, 2014)

- Listen as much as possible
- Notes as exact as possible
- Write early
- Thick reports (complete and candid)
- Confer with advisor for feedback on notes early in data collection
Appendix J  Post-Interview Sample Questions

1. To what degree do you feel that home visits mirrored what typically happens at home? How did your child respond to being videotaped? You?

2. What were some thoughts you had running through your mind during mealtime? Play time? Shared reading time?

3. What was your general experience being observed and a participant in this study?
Appendix K  Camera Vantage Points

Participants:

Dani  Macy  Ali  Bo  Researcher

Camera types:

Handheld  Tripod (GoPro)  Tabletop (GoPro)

Vantage points:

Mealtime  Storytime  Playtime
Appendix L  Operational Definitions

RQ1

Booklike talk

<table>
<thead>
<tr>
<th>Notation</th>
<th>Definition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>varied, complex</td>
<td>Decontextualized language, thick (information-dense) discourse turns (What this is NOT… Shorter turns, rapid back-and-forth, quick bouncing around topics, with reference points in the immediate environment.)</td>
</tr>
<tr>
<td>CT</td>
<td>conversational turn</td>
<td>Highlighting denotes a topic: When a topic is initiated, the transcript time stamp is highlighted and the topic is noted under the CT column of the M8M chart. A conversation “bout” (Meadow, Greenberg, Erting, and Carmichael, 1981) is initiated when a participant directs a word, phrase, gesture or movement related to the topic, and is considered carried with the same metrics. When this communicative attempt is reciprocated, this counts as one conversational turn. If no reciprocation occurs, the conversation initiation is considered dropped, with zero conversational turns. Where Meadow et al., 1981 used a 5-second limit (with no interactive activity), this study does not measure lulls in conversations.</td>
</tr>
<tr>
<td>QQ</td>
<td>coaching</td>
<td>Pulling out language (essentially mediating the child to explicitly tell the story without assuming the conversational partner knows what happened) e.g. “Tell Daddy about what happened when we went to the store today” or “And what happened next” or “Who did that” (Gee, 2008 p. 63)</td>
</tr>
<tr>
<td>ML</td>
<td>metalanguage</td>
<td>Playing with language or talking about language</td>
</tr>
</tbody>
</table>

Science process talk
Notation | Definition | Notes
--- | --- | ---
SCT | science talk | Becoming “scientists”
 | | Working out meanings for scientific ideas (using language to think and problem solve)

**Shared reading talk**

Cross-language mediation or “codeswitching” can be used as a strategy at the word, phrase, and story levels to build English reading skills and vocabulary development (Andrews & Rushner, 2010). Visual strategies (Lartz & Lestina, 1995) used by a MKO during story reading include:

<table>
<thead>
<tr>
<th>Notation</th>
<th>Definition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>Signing on storybook</td>
<td>(or a reference point)</td>
</tr>
<tr>
<td>R</td>
<td>Relating to child’s lived experiences</td>
<td></td>
</tr>
<tr>
<td>VE</td>
<td>Visible embodiment of characters</td>
<td>Visual expansion or making connections between text in the book (or dialogue) and corresponding action</td>
</tr>
<tr>
<td>AQ</td>
<td>Asking questions</td>
<td></td>
</tr>
</tbody>
</table>

**RQ2a**

Content words: key words, terms, concepts associated with particular topic being taught (or in the case of this study, being talked about, mostly nouns and adjectives).

Function words: words that have to do with functional language (e.g. how to request information, justify opinions, state conclusions); language used for processes and tasks (e.g. share, discuss, graph, list, line up); and language processes (e.g. scan, skim, question, debate, argue). In the case of this study, doing words (verbs and adverbs).

Words that teach English structure e.g. future, present, past tense; declarative, interrogatory, persuasion, etc. (and in this study, fingerspelling)

**RQ2b**
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ynq</td>
<td>eyebrows raised, head tilted forward</td>
</tr>
<tr>
<td>whq</td>
<td>eyebrows furrowed, head titled forward</td>
</tr>
<tr>
<td>rhq</td>
<td>asked &amp; answered (often, eyebrows raised with whq)</td>
</tr>
<tr>
<td>neg</td>
<td>head shake, frown, squint</td>
</tr>
<tr>
<td>comm</td>
<td>e.g. SIT or SIT!</td>
</tr>
<tr>
<td></td>
<td>direct eye contact</td>
</tr>
<tr>
<td></td>
<td>(sometimes frowning)</td>
</tr>
<tr>
<td>t</td>
<td>e.g. HOMEWORK, IX-ME DETEST</td>
</tr>
<tr>
<td>top</td>
<td>e.g. HOMEWORK, IX-ME DETEST</td>
</tr>
<tr>
<td>cond</td>
<td>Sometimes shown with fs-IF</td>
</tr>
<tr>
<td></td>
<td>e.g. fs-IF TOMORROW RAIN, HOME STAY</td>
</tr>
</tbody>
</table>

(Easterbrooks & Baker, 2002 p. 101)

**Simple sentences:**
- Talking about sequencing, seriation (ordering) of events, cause-effect awareness, categorizing
- Negation
- Simple question forms
- Topic-comment

**Complex sentences have dependent clauses:**
- Talking about time:
  - (Early clauses) –
    - Before, because, after, until, when, while
- Talking about thought
  - (Later clauses) –
    - Analysis and synthesis & Problem-solving
      - although, as long as, even if, as if, whenever;
    - Abstract coding, creativity
• WH-infinitives (additional verb in its base form i.e. to ____)
  clauses e.g. know how to, show me what to do

**RQ2c**

**Parallel talk:**
Parent mirrors (in-the-air) what the child is doing, looking at or referring to.
E.g. Child is eating goldfish crackers and parent signs: “IX-YOU EAT-EAT FISH CRACKERS”

**Open-ended questions:**
Parent provides phrase/question that child can answer using two or more words.
E.g. Parent signs: “CURIOUS, DINOSAUR GO WHERE? whq”

**Expansion:**
Parent repeats child’s utterances in a way that is more complete and grammatically accurate. Child’s meaning or word order is not lost.
E.g. Child signs “IX-THERE FISH,” and parent signs: “IX-THERE FISH, YOU GOBBLE-UP!”

**Expatriation:**
Same as Expansion, but adding new information.
E.g. Child looks at picture and signs “WATER SWIM” and parent says “YES NEXT-WEEK SWIM FS-P-O-O-L IX-WE GO”

**Recasting:**
Restating child’s utterances into a question.
E.g. Child signs: “DINOSAUR HIDE” and parent signs: “DINOSAUR HIDE ymq”