

Impact of Different Photo Conditions on Social Interaction between Grandparents and  
Grandchildren with Disabilities

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**Abstract**

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Grandparents can be important supports for children with disabilities, however they do not always know how to interact with children with difficulties in social interaction. Photos are a form of visual supports that may facilitate the interactions between a grandparent and the grandchild. In this mixed methods study, the effects of three different types of photo conditions on the social interaction between grandparents and their grandchild were examined using a single case alternating treatments design. Additionally, the perspectives of grandparents on their relationship with the child and factors influencing that relationship were elicited through qualitative interviews. The findings from the quantitative, single case design strand indicated that the children preferred looking at recent photos of themselves although qualitative interview data suggested children also enjoyed looking at photos that the grandparent shared. Photos provide a promising avenue for future research on grandparent and grandchild relationships.

Key words: photo; social interaction, grandparents, mixed methods (single case and qualitative), disabilities

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## **Chapter One: Introduction**

### **Background and Problem Statement**

Grandparents have traditionally filled a variety of roles in the family unit and in society as a whole. Roles include sharing their experiences meaningfully, reconnecting with the past, fulfilling or continuing a family legacy, and indulging in their grandchildren without the responsibilities of parenting (Hillman, 2007; Pruchno & Johnson, 1996). Grandparents can be critical supports for families, as well. They can serve the role of supporting parents who now have children of their own, as well as nurturing a new addition to the family. The roles grandparents take on, and the extent to which they are involved in the family, may vary depending on the closeness of the relationship between the parents and the grandparents (Mirfin-Veitch, Bray & Watson, 1997), as well as the cultural norms and expectations of the family (Gardner et al., 2004).

Grandparents are increasingly assuming caregiving responsibilities for their grandchildren (Laughlin, 2013). According to a survey conducted by the U.S. Census Bureau on child care arrangements in 2011, the percentage of preschool children with employed mothers being cared for by their grandparent has generally increased over the past 20 years, from 15.9% in 1985 to 21.1% in 2011 (Laughlin, 2013). In 2011, 4.8 million (24%) children under the age of 5 were cared for by a grandparent, and grandparents were among the top three child care arrangements regardless of whether or not the mother was employed (Laughlin, 2013). The same survey found that approximately 14% of older children between the ages of 5 and 14 were cared for by their grandparents while their parents were at work. These numbers concur with findings from an earlier survey conducted in 2008 by the National Association of Child Care Resource &

Referral Agencies (NACCRRRA) with 500 grandparents across the U.S. about their involvement in providing child care to their grandchildren (NACCRRRA, 2008).

Participants in the NACCRRRA survey did not include grandparents who were primary caregivers. The results from this survey show that more than half of grandparents with grandchildren 13 and younger who live within an hour away provide some form of child care to their grandchild every week. A third of grandparents had indicated changing their work schedule to care for the grandchildren. Approximately 40% of grandparents surveyed who have grandchildren younger than 13 and live within an hour of the family were providing child care support while the children's parents were employed or at school. An additional 19% had provided child care in the past. In other words, of the grandparents surveyed, approximately 60% of grandparents had either provided child care or were providing child care at the time of the survey (NACCRRRA, 2008). Although the surveys from the U.S. Census Bureau (Laughlin, 2013) and the NACCRRRA (NACCRRRA, 2008) did not distinguish between children with and without disabilities, their findings together indicate that a significant number of grandparents provide caregiving support for their grandchildren regardless of their age. In families of children with disabilities, it is possible that grandparents also provide child care and can be an important source of support to the child with disabilities and their family.

For grandparents providing caregiving support to children with disabilities, however, the meaning of grandparenthood and the nature of the role they take on may differ greatly from the role of grandparents with typically developing children. Grandparents may serve as critical supports to families of children with disabilities, which can come in the form of instrumental (practical) supports and/or emotional supports. Instrumental support refers to practical forms of help such as babysitting, running household chores and errands, and could include financial

support. Emotional support refers to the more intangible aspects such as being available for the parents and to discuss problems, being understanding of the challenges parents face, being accepting of the grandchild's condition, and helping parents feel less isolated (Hornby & Ashworth, 1994; Lee & Gardner, 2010).

Despite the many ways they provide support to the child and the family, grandparents still encounter difficulties in knowing the specific ways they can provide support to the child, especially when their grandchild has difficulties in social interaction. In particular, grandparents may not know how to talk or interact with their grandchild who has limited social skills, or who does not respond in a socially expected manner. They may not feel comfortable taking a grandchild on traditional outings if they are concerned about the child's safety or about public behavior. For some grandparents, daily interactions can be challenging if grandchildren lack the social skills that support interactions such as eye contact and social reciprocity (Yang, 2016). They seek ideas to encourage sustained interactions or conversations, but there are few resources available targeted specifically at grandparents.

One way to support social interactions is the use of visual strategies such as photographs. These have been used to encourage social interactions between children with disabilities and their peers (Johnston, Nelson, Evans, & Palazolo, 2003), as well as children and parents (Krantz, MacDuff, & McClannahan, 1993). However, these have not been extended to grandparents. Given their important roles as family historians, major family support systems, and their desire to nurture and indulge in their grandchildren, the lack of supports in facilitating grandparent-grandchild interactions can be a barrier to grandparents fulfilling their desired roles.

In light of the importance of grandparents in families of children with disabilities, there is a need to better understand how to support their roles with the child and the family. In particular,

providing grandparents with ways to facilitate the social interaction between grandparent and grandchild can be useful in strengthening the grandparent-grandchild relationship.

### **Purpose of Present Study**

The purpose of the present study was to examine the effect of three types of photos on the social interaction between grandparents and their grandchild with difficulties in social interaction. Additionally, the study also sought to understand the extent to which the photo interaction activity supported the grandparent-grandchild interaction. More broadly, this study also explored grandparents' perceptions of their relationship with their grandchild and the factors influencing the grandparent-grandchild relationship through interviews with not only the grandparent, but also the parent and, where possible, the child.

Two research questions guided this study: What are the immediate and proximal effects of a social interaction intervention on the social interaction between a grandparent and a grandchild with disabilities? And, how do grandparents perceive their relationship with their grandchild? What factors influence the grandparent-grandchild relationship?

To answer these questions, I used a mixed methods study combining a single case alternating treatments design with qualitative methods. The single case alternating treatments design examined specifically the effects of different types of photos on grandparent-grandchild social interactions while qualitative interviews with grandparent, parent, and child provided insight into their perceptions about the grandparent-grandchild relationship as well as feedback on how the photo interaction activity influenced their relationship.

More specifically, the following sub-questions guiding this study were explored within two methodological strands:

#### **Quantitative Strand**

R1: To what extent do three different photo conditions yield differential effects on the social interaction of a child with disabilities with the grandparent?

R2: To what extent do three different photo conditions yield differential effects on the social interaction of the grandparent with the grandchild with disabilities?

#### Qualitative Strand

R3: What are the perceptions of grandparents regarding the utility, feasibility, and acceptability of the photo interaction intervention? (Social validity)

R4: How do grandparents understand their relationship with their grandchild?

R5: How did an intentional structured photo activity support the grandparent-grandchild relationship?

#### **Significance of Present Study**

Much of the current research on grandparents supporting children with disabilities has focused either on the perspectives of the parents (e.g., Bruns & Foerster, 2011; Dyches et al., 2016) or the grandparents themselves (e.g., Findler, 2014; Samuel et al., 2017; Woodbridge, Buys, & Miller, 2011) or both parents and grandparents (e.g., Sullivan, Winograd, Verkuilen, & Fish, 2012; Yamashiro & Matsukura, 2014). To my knowledge, only one study has examined perspectives of family members across three generations. This study focused on the role of grandparents in hearing/deaf families through qualitative interviews conducted with three-generation triads (grandparent, parent, and deaf grandchildren) from six families (Nybo, Scherman, & Freeman, 1998). In the present study, I intentionally include voices across three generations in the qualitative strand to provide a platform for the voices of grandparents, parents, and children from the same family to be featured in a research study. Having multigenerational perspectives within the same study allows for a fuller understanding of how the family, as a

whole, may perceive the grandparent-grandchild relationship and the grandparent's role in the family. Hearing from the three generations may also be particularly useful in understanding nuanced differences in perspectives because each family member would likely present perspectives from their respective positions as grandparent, parent, or child. The present study not only examined the extent to which a photo interaction activity supports the grandparent-grandchild interaction, but also gathered the perspectives of the grandparent, parent, and child specifically about the photo activity as well as their understanding of the grandparent's existing relationship with the grandchild and how the photo activity influenced that relationship.

### **Overview**

In Chapter Two, I describe the conceptual framework framing this study and synthesize the bodies of literature supporting this research. In Chapter Three, I describe the research methods used. Chapter Four presents the results of the quantitative and qualitative strands. In Chapter Five, I interpret the findings from the different method strands and situate them within my conceptual framework, concluding with a discussion of the study limitations and implications for future research and practice.

## **Chapter Two: Literature review**

In this chapter, I present a theoretical framework within which this study is conceptualized. I then present informing literature on what we currently know about grandparents' roles and involvement in families of children with disabilities. I also discuss the role that culture plays in family's interactions. Next, I explore the research on the use of visual supports or photographs to facilitate social interactions.

### **Theoretical Base and Conceptual Framework**

The conceptual framing of this study is based on the family systems theory, and extended by the larger environmental context of the ecological systems theory (see Figure 1). The family systems theory is described first, followed by a description of the ecological systems theory and how it extends the family systems theory in relation to grandparents supporting children with disabilities.

**Family systems theory.** Family systems theory provides a basis for understanding families as a series of interconnected relationships, known as subsystems. These subsystems contribute to the family functioning through their cohesion and adaptability. Specific to this study are the parental subsystem and the extended family subsystem (Turnbull & Turnbull, 1997).

The family systems framework provides an understanding of how a family responds to change either from within the family or from external sources that impact the family's ability to function effectively (Bigner, 2010). Turnbull and Turnbull (1997) articulate three assumptions of the family systems framework that can impact the functioning of a family of a child with disability: (a) input/output, (b) wholeness and subsystems, and (c) boundaries. The first assumption of input/output posits that characteristics of the family serve as input into the family system. An example of a characteristic could be the limited social reciprocity or interaction skills

of a child with autism, which could influence their interaction with parent (parental subsystem) and grandparents (extended subsystem). The interaction between the family system and the input produces output that impacts the family functioning. This is observed when family members interact with one another through their respective roles. For example, grandparents who are unsure of how to interact with their grandchild who has limited social interaction skills may question their grandparenting self-esteem and may withdraw from or limit their future interactions with their grandchild, which can affect the cohesion and adaptability of the family unit.

The second assumption of wholeness and subsystems is based on the understanding that the system must be understood as a whole and not by its individual components (Turnbull & Turnbull, 1997). A core understanding of the family systems framework is that the subsystems are interdependent, which means that changes affecting one subsystem will also impact other subsystems. It is important to understand the family as a whole, in its entirety, rather than through studying only a specific member of the family, or specific subsystems. As Turnbull and Turnbull (1997) state, “the family consists of the sum of its members’ mutual and reciprocal interactions” (p. 97). In other words, understanding how to support the interactions between a grandparent and their grandchild with social interaction difficulties requires an examination of the other systems such as the parental subsystems and the extended family subsystems, and how these interact with each other.

The third assumption is that boundaries exist between specific family subsystems which help define the roles and relationships family members take on within the family system such as the boundaries between parents and children, and between parents and grandparents (Turnbull & Turnbull, 1997). Boundaries can also range from being flexible to being rigid, hence regulating the degree of closeness among family members of different subsystems (Bigner, 2010). Families

with more flexible boundaries have more open family systems which allow for new input external to the system or subsystem. For example, families with open family systems may find more overlap in the parenting and grandparenting roles whereas families that are closed may have clearer distinctions between the parent and grandparent role in the child's life.

**Ecological systems theory.** While the family systems theory provides a means to examine specific relationships such as the child and parent relationship, and the child and grandparent relationship, the ecological systems theory offers a way to examine these interrelated family subsystems in a broader context. Bronfenbrenner (1977, 1986) examined human development through the interactions between the individual and the environments in which the individual is growing and changing. These include the immediate environments around the individual as well as the larger social contexts (Bronfenbrenner, 1977). Bronfenbrenner described four systems in which the individual is situated ranging from the most immediate to the most distal setting: the microsystem, mesosystem, ecosystem, and the macrosystem (see Figure 1). At the core is the microsystem level, consisting of interactions between the child and the immediate systems around him/her – the family, child care centers or schools, and hospitals. The mesosystem consists of (both one-way and two-way) interactions between the family and professionals in the various settings. The exosystem consists of the larger community in which the child and family live, such as neighborhood organizations, social groups, churches, media, transportation, and local, state, and federal agencies. The macrosystem refers to the larger governing structures and influences on the educational experiences, such as federal and state legislations, agency regulations, court rulings, societal attitudes, values and ethics. These larger governing structures can influence the amount of access grandparent have to resources depending on their position in relation to the child (i.e., whether the grandparents are custodial caregivers or active caregivers providing assistance to

support the grandchild), which in turn affects their grandparenting experience. The ecological systems model hence also presents an overview of the nature of structures and contexts that can frame the grandparents' interactions and experiences with their grandchild.

Of interest to this study are the interactions at the microsystem level, namely the interactions between the child and grandparent, and between the parent and grandparent (see Figure 1). Since this is an interdependent system, the interactions between the grandchild and grandparent are not independent of the parental subsystems and extended family subsystems, as well as the interactions between the parent and grandparent. The ecological systems theory extends our understanding of the individual relationships the child has with each family member (i.e., the parental and extended family subsystems), to an understanding of the context or environment within which these relationships interact and occur (Bigner, 2010). The use of these two frameworks provides insight into the grandparent's positioning in relation to the grandchild and the other people and systems in the grandchild's life.

### **Grandparenting Styles: How Do Grandparents Grandparent?**

Given the important roles grandparents can play in the lives of families of children with disabilities, it is helpful to consider the styles of grandparenting that can influence how they interact with the child. Research based on grandmothers and grandfathers of typically developing children suggests there are five grandparenting styles: a) the Formal, b) the Fun Seeker, c) the Distant Figure, d) the Reservoir of Family Wisdom, and e) the Surrogate Parent (Neugarten & Weinstein, 1964). The formal grandparenting style refers to when grandparents adhere to boundaries that clearly delineate the roles of the parent and grandparent. The fun-seeking grandparent is informal and playful, with a focus on developing friendship with the child rather than the authority of the parent. The distant figure is the grandparent who has infrequent contact

with the child, such as meeting with the child only on holidays or special occasions. The reservoir of family wisdom refers to the grandparent who serves the role of the family historian and possesses knowledge and family wisdom. In the last grandparenting style, grandparents are surrogate parents who care for the child when the parents are not able to. These five styles have been used in a variety of combinations to describe different grandparenting styles, acknowledging that these combinations could change over time depending on the needs of the grandparents and the family (Woodbridge et al., 2011).

Based on this set of grandparenting styles, Woodbridge et al. (2011) interviewed grandparents of children with intellectual disability and/or physical disability. They found that grandparents in the study adopted three of the grandparenting styles: surrogate parent, fun-seeking, and being the reservoir of family wisdom. While these roles make sense considering that the grandparents self-selected into the study and were likely to be more involved in their grandchildren's life, this also points to the fact that grandparenting styles are fluid and can be combined in various ways. The combination of grandparenting styles can also change over time, depending on the needs of the grandparents and the family (Woodbridge et al., 2011).

Given the societal shifts in acceptance and inclusion of individuals with disabilities in the U.S. over the past 40 years, it is possible that many current grandparents have had little experience with individuals with disabilities. During many grandparents' upbringings, it may have been common for children with disabilities to stay in the home or live in institutions. As a result, many grandparents in the current generation may have little experience with individuals with disabilities (Woodbridge et al., 2011). This could influence their understanding of disability and how to interact with children who interact in ways different from what they are used to.

Hence it is important to facilitate their understanding of disability and the abilities and strengths children with disabilities possess.

### **Grandparents' Influence on Family Functioning**

Much of the research has examined grandparents' support and involvement in the context of disabilities in general. These have pointed out that grandparents can be valuable sources of support for the family. However, they can also contribute to parental stress.

**Grandparents as supports.** In families of children with disabilities, salient aspects of grandparent support to the family include primarily instrumental (or practical) and emotional support (Hornby & Ashworth, 1994; Lee & Gardner, 2010). Instrumental support is the practical forms of help such as babysitting, financial support (e.g., provision of monetary support for therapies, equipment, or daily needs), providing transport for the child to and from school or therapy sessions, helping with household chores and errands, and caring for other children in the family while the parent cares for the child with disability. Grandparents also provide emotional support for parents in more intangible ways in terms of providing parents a listening ear and being understanding of the difficulties parents encounter, accepting the grandchild's condition, offering comfort, sharing their own experience of parenting, and helping parents feel less isolated.

Studies have also generally found a hierarchy of support (Hillman, 2007). Maternal grandparents, particularly grandmothers, have been found to provide more support to families, with grandmothers generally reported as offering more support than grandfathers. Harris, Handleman, and Palmer (1985) examined the perceptions of parents and grandparents of children with autism regarding the parents' experiences and of the grandparent-adult child relationship. Maternal grandparents were found to be more sensitive to their daughters' needs and with higher

levels of accuracy in understanding their daughter's experiences. Maternal grandparents were also reported to visit more frequently than paternal grandparents. This finding was echoed by Hornby and Ashworth's study (1994) on parents' perception of grandparents of children with disabilities. However, they also found that while parents were generally satisfied with the amount of grandparent support offered, many would have liked more support from the grandparents. A study by Katz and Kessel (2002) examining the perceptions and beliefs of grandparents of children with developmental disabilities found that paternal grandparent involvement with the child and access to information about the child's disability was dependent on their relationships with their daughter-in-law.

Grandparents can also be important sources of support to parents when they act as advocates for the child and family (Margetts, Le Couteur, & Croom, 2006). This position of grandparents as advocates is not widely explored in the literature. However, when parents are overwhelmed by the stressors they currently have, grandparents' presence at IEP meetings, or help with contacting local senators to advocate for their grandchild's health insurance can be tremendous supports for the family.

**Grandparents as stressors: When challenges arise.** In addition to the supportive role they play, grandparents may at times be a source of stress for parents of children with disabilities. Challenges in grandparent involvement arise when grandparents and parents have different perspectives of disability and its etiology, when grandparents have difficulty accepting the disability or trivialize the severity of the condition (Hillman, 2007; Seligman, 1991). In an informal discussion with parents of children with autism, Harris, Handleman, and Palmer (1985) noted that several parents found that grandparents stayed in denial of the child's disability for a longer period than the parents themselves. This was potentially a source of stress or tension

because there were discrepancies in their perspectives of the child, and parents may have had to manage grandparents' expectations as well.

As mothers in Green's (2001) qualitative interviews noted, they felt assured when grandparents had "normalized" attitudes toward their grandchild and were able to talk about their grandchild with pride and also treat him like they would their other typically developing grandchildren. Conversely when grandparents are in denial about the child's diagnosis, or do not understand the nature of the disability, parents may find it difficult to explain the challenges they are facing. This also occurs when grandparents have limited contact with the grandchild and do not have firsthand experience and understanding of the characteristics of the grandchild's disability.

Vadasy, Fewell, & Meyer (1986) point out that an initial reaction grandparents may have to the birth of a child with disabilities can be one of "double grief" (p. 36), for the child and for the parent of the child. As Seligman (1991) noted, when grandparents are going through the process of grieving (similar to parents), they may be unable to offer much support to the parents. Vadasy (1987) also noted that while grandparents experience emotional reactions similar to parents, less emotional supports (e.g., parent support groups and networks) and informational supports (e.g., ready access to interventionists for information) are available to non-custodial grandparents. Practitioners need to be aware of the possibility that grandparents themselves may need support in accepting the child's disability and coming to terms with that that means for the family.

Parents' concern for the grandparents may also contribute to their stress. For example, some mothers in Green's (2001) interviews raised concerns that they would not be able to adequately care for and support the grandparents when they faced health issues of their own.

Similarly, mothers were concerned that grandparents would not reach out to them for help as they aged. They feared their parents would avoid placing an additional burden on the family unit, but mothers reported a strong desire to support and assist their parents.

Grandparents may also serve as sources of stress when they have conflicting views on intervention and behavior management or hold unrealistic expectations for the child and family (Hillman, 2007; Seligman, 1991). Parents may experience the stress of having to manage the expectations of the grandparents, particularly in families where grandparents play a more prominent role in offering caregiving advice. For instance, a grandparent who does not understand that a child's behavioral challenges are a symptom of the disability may instead view the behaviors as a lack of discipline. This could lead to differences in how the grandparent and parent perceive the purpose and utility of intervention.

Additionally, when there was a prior relational history of conflict, the event of having a grandchild with a disability "provided another arena in which the long-term patterns of the relationship were repeated" (Mirfin-Veitch, Bray, & Watson, 1997, p. 309). In other words, if parents' relationship with grandparents was conflicted before the child was diagnosed, the relationships was likely to be challenging after the diagnosis because the patterns in their earlier relationship history merely replayed themselves when the child with disability was diagnosed.

### **Factors Influencing Grandparent Involvement**

Given what we have learned about grandparents being supports or stressors, it is important to understand that there are several factors contributing to grandparents' willingness and ability to be involved in supporting the child and family and the extent to which they may be able to offer help. The literature indicates several factors influence the extent to which grandparents are able or willing to be involved. Factors such as affectional solidarity (i.e., the

relational quality of the grandparent-parent relationship), family dynamics, attitudes toward disability and child-rearing practices, prior life experiences and general world views can influence the extent to which grandparents are willing to or are comfortable with being involved in supporting the child and family (Katz & Kessel, 2002; Seligman, 1991). Other factors such as residential proximity and grandparent's health can affect the extent to which they are able to support the family (Lee & Gardner, 2010; Schilmoeller & Baranowski, 1998).

**Pre-existing relationships.** As mentioned earlier, pre-existing relationships between grandparent and parents may be stronger predictors of the extent of grandparent involvement than the child's condition (Lee & Gardner, 2010; Mitchell, 2007). Good grandparent-parent relationships led to greater support and involvement of the grandparents. However, in cases where conflicted relations existed between grandparents and parents, having less involvement from those grandparents may turn out to be less stressful for the parents (Mirfin-Veitch, Bray, & Watson, 1997). Echoing Mirfin-Veitch et al.'s (1997) findings, Findler (2014) found no significant differences between grandparents of children with disabilities and grandparents of children who were typically developing on stress and growth. In both groups, the most important contributors to stress or growth were the grandparents' personal resources and history of family dynamics. These findings point towards the importance of facilitating communication and strengthening relational ties between parents and grandparents.

**Demographic factors.** Family characteristics such as socio-economic status and residential proximity may influence the ability of grandparents to provide some supports to families, but research suggests demographic factors may not play a large role in other important grandparent-family interactions. Schilmoeller and Baranowski (1998) examined the influence of several variables including grandparent age, health status and educational levels on grandparent

support and involvement. They found that affectional solidarity was the only predictor of grandparent support, and grandparent educational level and affectional solidarity predicted level of involvement with the grandchild. Age and health status were not predictors of either support or involvement. However, caution should be taken in interpreting results of such studies.

Grandparents who are in poor health are not as likely to be participating in studies and hence their point of view may not be well represented. It is likely that grandparents in poor health would not be able to be actively involved in supporting the grandchild. Physical proximity to the family is a potential demographic factor influencing the grandparent support. Grandparents who live further away tend to offer less support, especially practical support. However, the amount of emotional support may not be affected (Lee & Gardner, 2010; Scherman, Gardner, Brown, & Schutter, 1995) since technology advances such as emails, telephones and even free video calls, have made it easier to communicate with parents and maintain contact.

**Perceptions of and agreement on child abilities.** The degree to which grandparents were seen to be helpful depended on how realistic parents felt their perceptions of the child's abilities and limitations were (Trute, 2003). As Katz and Kessel (2002) found, grandparents were more involved when parents perceived them to be more accepting and nonjudgmental of the child and when there was greater agreement on knowledge of the condition and how best to help the child.

**Evolving needs of family.** The amount of grandparent involvement and the nature of involvement can evolve over time, depending on the needs of the child and family as the child develops and matures (Katz & Kessel, 2002). For instance, Katz and Kessel (2002) found that at the initial post-diagnosis stage, parents were in greater need of grandparents' instrumental and emotional support while they dealt with their shock and grief. However, as parents began to

accept their child's condition and adapt to it, they may require less help from grandparents. Additionally, grandparents' needs also change with time, which can influence the extent to which they can offer instrumental support (Katz & Kessel, 2002). Their findings concur with the findings from Heller, Hsieh, and Rowitz's (2000) study examining the supports mothers received from grandparents of children with intellectual disability who ranged in age from 5 months to 43 years old. The authors found that while grandparents of younger children provided more instrumental support than those of adult children, the amount of emotional support remained the same across grandparents of children from different ages.

### **Cultural Considerations**

The culture one comes from can influence the interactions among family members as well as their attitudes and beliefs. While culture refers not only to a shared pool of knowledge, beliefs, values, and understandings (Peregoy and Boyle, 2017; Ting-Toomey, 1999), it also includes the ways in which members of a culture interact with one another, which has implications for how they adapt to their environment and to non-members of their culture (Cartledge, Gardner, & Ford, 2009). Cultural norms, values, and beliefs can influence how a family member perceives and responds to the presence of a child with a disability. With grandparents, culture can play a role in influencing the expectations of grandparenting, perceptions of disability, and subsequent responses to having a child with a disability.

Since much of the research has been conducted on grandparents from White descent (Hillman, 2007; Mitchell, 2007), the roles, expectations, and experiences of grandparents reported in the literature may not be representative of grandparents across different cultural groups. For instance, in a study by Scherman, Efthimiadis, Gardner, and McLean (1998), Panamanian grandmothers of grandchildren with disabilities viewed it as their responsibility to be

involved and intervene in their children's families, although the children can decide whether or not to accept their input. This may be different from cultures where boundaries of the parent's roles are more highly emphasized and grandparents may hesitate to intervene unless parents request first. Nonetheless, given the paucity of literature on grandparents from different cultural backgrounds, it is important to understand how grandparents' culture influences their perspectives about matters such as disability, child rearing practices, their role as a grandparent, as well as their interaction with their grandchild with disability.

### **Interventions involving Grandparents of Children with Disabilities**

The current research base on interventions conducted specifically with grandparents and grandchildren however, is limited. To my knowledge, only one intervention with experimental control has been conducted for grandparents. McCallion, Janicki, and Kolomer (2004) conducted a randomized controlled trial of a support group intervention for 97 grandparents caring for at least one child with a developmental delay or disability. Grandparents were randomly assigned to either a treatment or wait-list control condition. While both groups received case management services, only the treatment group received support group intervention during the three-month experimental phase. The wait-list control group received support group intervention 3 months later. Support groups were held twice a month for at least six times. Each group had between 8 and 10 grandparents and each group selected six topics addressing their grandchild's needs and their own needs. Examples of topics included learning about the grandchild's disability or developmental delay, accessing services, caregiving skills, challenging behaviors, or planning for the future. Each session also included a self-care component that addressed the grandparent's own needs.

Results at the three-month time point indicated that the treatment was effective in alleviating depression symptoms, increasing grandparents' sense of family empowerment and caregiving mastery. During this period, the wait-list control group demonstrated either no change or a reduction in their sense of empowerment and caregiving mastery. Similar positive outcomes were observed at the 6-month time point when the control group had received three months of the support group intervention condition, highlighting the importance and effects of providing informational and emotional support to grandparents.

While few studies examine interventions at the grandparent-grandchild level, Wright and colleagues (Wright, C. et al., 2011; Wright, S. D., et al., 2012) explored the effects of a technology workshop for children with autism on the grandparent-grandchild relationship. Using a participatory action research approach, Wright and colleagues (Wright, C. et al., 2011; Wright, S. D., et al., 2012) worked with parents of children with ASD as advisors and designed a workshop that built on the visual-spatial strengths of children with ASD. The five-session workshop focused on teaching seven boys aged 8 to 17 to create design projects using tools in the Google SketchUp™ program, a 3D modeling program. Part of the workshop included a sharing component where the children presented their designs to their peers and to family members who attended the sharing sessions.

In this study, two focus groups were conducted with six grandparents from four families who attended at least one of the presentations, once after the completion of the 6-week workshops, and a follow-up session was conducted three months later. Although this intervention was targeted specifically at the children with ASD, grandparents in the study reported that they had reframed their expectations of their grandchild. They acknowledged the limited social skills and past “failures” their grandchild had had, but saw that through this program, the grandchild

was able to build on their strengths with technology and develop friendships with other peers in the workshops. What is interesting to note is that although the grandparents were not the direct recipients of the intervention, they began to see technology as a “communication bridge” where their grandchild taught them about using the program and about technology in general, leading to an increase in their social engagement (Wright et al., 2012).

Despite the merits of Wright and colleague’s (2011) study, the data were limited to focus group interviews about the grandparents’ perspectives on the relationship with their grandchild. The authors triangulated data from focus groups with parents as well as grandparents, presenting the additional parent perspective of the effects of the intervention on family relationships. However, no observable data of the grandparent-grandchild relationship was reported and the grandchild’s perspective was not presented.

This body of research indicates grandparents often want to be involved in supporting and caring for their grandchild. However, they may feel limited in their abilities to do so. While only one study has provided direct intervention to improve the grandparent-grandchild relationship, this is a promising area for research and practice. In particular, grandparent-grandchild social interaction and communication may be one area of focus for interventions involving grandparents who are involved in supporting their grandchildren with disabilities.

### **Photographs as a Means of Facilitating Social Interaction**

One practice that has been found useful in facilitating communication is the use of visual supports. Visual supports are an evidence-based practice used to facilitate communication of children who have limited or little receptive or expressive language, or whose home language is not English. According to the report on Evidence-Based Practices for Children, Youth, and Young Adults with Autism Spectrum Disorders (Wong et al., 2014), visual supports are “any

visual display that supports the learner engaging in a desired behavior or skills independent of prompts. Examples of visual supports include pictures, written words, objects within the environment, arrangement of the environment or visual boundaries, schedules, maps, labels, organization systems, and timelines.” (p. 22). Visual supports have been found effective with a wide age range, from toddlers (aged 0-2 years) to young adults (aged 18-22 years), and have been found to improve communication and social interactions with parents, teachers, and peers (Johnston, Nelson, Evans, & Palazolo, 2003; Krantz, MacDuff, & McClannahan, 1993; Morrison, Sainato, BenChaaban, & Endo, 2002), as well as to improve on-task behaviors (Bryan & Gast, 2000; Massey & Wheeler, 2000).

Several studies have examined the use of different types of visual supports to improve social communication or on-task behaviors in children with autism. Using a multiple baseline across communicative responses design, Ganz et al. (2012) examined the use of peer-mediated implementation of visual scripts on a 15-year-old middle school student with autism, intellectual impairments, and speech impairment. Visual scripts included a picture representing the script such as a drawing of a child with a raised hand and a question mark to indicate “help please!” Intervention consisted of the trained peer pointing to the visual script if the target student did not use them at appropriate times during a craft activity. Although the three communicative behaviors (question, praise, request for help) of the target student increased during intervention, they did not generalize to an untrained peer, suggesting that training may be needed for the peer in learning to implement the use of visual scripts.

Bryan and Gast (2000) examined the use of graduated guidance and visual activity schedules to increase on-task and on-schedule behaviors in elementary school children. The study found that student performance increased with graduated guidance and were maintained

with the use of the picture activity schedule. These behaviors dropped with the removal of the picture activity schedule, suggesting that the visual support was an important component in supporting the students' on-task and on-schedule behaviors.

Krantz, MacDuff, and McClannahan (1993) conducted a study to increase participation in social and housekeeping family activities for three boys with autism (aged 6 to 8 years) by using photographic activity schedules. Results indicated an increase in engagement and social initiations as well as a decrease in disruptive behavior, all of which were maintained up to 10 months later. Visual supports such as checklists, scripts, and graphic organizers were can also be used to promote science discourse in the middle and high school science classrooms (Barnett, Trillo, & More, 2018).

Gauvreau (2017) describes a visual support called "Snack Talk" intended to facilitate and increase social communication among children during mealtimes in the classroom. "Snack Talk" cards contain a question and nine to 12 photos or symbols for supporting a child's response. To facilitate communication, teachers provide instruction on how the visuals can be used through modeling, asking the children questions or prompting a child to ask a peer when needed. Once children are able to converse with each other using "Snack Talk" cards, the teacher can fade their support so children can independently talk with one another. Gauvreau and Sandall (2017) also describe the use of mobile technology to share photos of children engaged in activities, paired with short descriptions of the photo, to facilitate accurate recall of the day's activities and support parent-child conversations. These two studies demonstrate how visuals can be used as a conversational cue with young children and support social communication.

In another example, Murdock and Hobbs (2011) examined the effect of a visual cueing strategy (VCS) on the ability to retell the events of the school day for three children with autism

spectrum disorder. The VCS used nine picture symbols of common daily activities were used for the classroom's daily schedule. Text for each day would change depending on the activities the child engaged in for the day and a blank line was provided for additional events that could be recorded. Phases of the intervention included baseline, a complete cue phase (using a complete VCS), partial cue phase (using an incomplete VCS), generalization, and follow up. All three children demonstrated increases in the number of events reported from the complete cue phase onwards. The findings in this study suggest that using partially complete picture cues may be sufficient to facilitate recall of events. However, the mere recall of events may not lead to extended conversations, and hence increase in social interactions.

In a study that focused on using visual supports to facilitate social interactions, Johnston et al. (2003) used a multiple probe design across participants to measure the effect of using a graphic symbol on the initiation of interaction by three preschoolers. The graphic symbol represented a request to enter a playgroup. Results indicated that the use of the visual with least to most prompting led to increases in prompted initiation and subsequent independent initiation. High levels of independent initiation were maintained a week after the intervention. However, the authors found that each of the children had different symbolic communication profiles, with one child using primarily the graphic symbol with verbal language, the second child using primarily verbal language, and the third child using a combination of the graphic symbol and verbal or only verbal language. The authors explain that this variability could reflect the differences in what each individual perceives as most efficient in achieving their desired outcome.

Photos are a particularly promising way to structure visual supports. One intervention and research methodology, photovoice, has been used as a participatory research method to where

marginalized populations can “identify, represent, and enhance their community through a specific photographic technique” (Wang & Burris, 1997, p. 369). Participants in this methodology use cameras to take photos of aspects of their lives. They select photos for sharing in a group discussion and, with the group, identify areas or issues for further action. Carnahan (2006) used this method with teachers and students from the general education classroom. Five teachers participated in using photos to share and discuss their practices and experiences on including students with autism in their general education classrooms. Two kindergartners with autism and five typically developing peers were also given cameras to photograph items they were interested in. The students then selected 10 photos to create a photo journal, which they then used to share with their peers in the group. The author found increases in engagement and participation with the others in the group. An analysis of the videos of the student photovoice sessions suggests that having structured membership activities and having topics that based on the students’ interest supported this increase in engagement and participation. What this suggests is that when the photographs are aligned with a child’s interests, it can increase the child’s responsivity to the activity in which the photographs are used.

While the above studies demonstrate the usefulness of visual supports, whether through symbolic pictures or photographs, on increasing on-task behaviors, increasing recall, and facilitating initiation of social interactions and engagement, these have been focused on child-peer, child-parent or child-teacher behaviors. What is needed is research around how visual supports, specifically photographs, can be used to facilitate the interaction between grandparents and grandchildren. Furthermore, photographs have been used functionally, as a means to facilitate communication or increase appropriate behaviors, but less is known about how photographs can be used relationally, to increase the conversational quality between grandparent

and grandchildren. In the present study, I used photographs as a means to facilitate extended conversation and social interaction between the grandparent and grandchild. Hence, this study aims to use photographs as a visual support to facilitate communication between grandparents and grandchildren with limited social communication skills.

### **Purpose of the Current Study**

The purpose of this study was twofold. First, I aimed to address a gap in literature that presents the perspectives of grandparents, parents, and grandchild within the *same* family to offer a more nuanced understanding of the perspectives and experiences within a family unit. Second, grandparents who have grandchildren with limited social interaction skills may find it difficult to know how to interact with their grandchildren. Yet, they often want to and can be critical supports for the child and family. Hence, the second purpose of this study was to offer a practical way to facilitate their communication and strengthen the grandparent-grandchild relationship through the use of photographs.

### **Research Questions**

Two research questions guided this study: What are the immediate and proximal effects of a social interaction intervention on the social interaction between a grandparent and a grandchild with disabilities? And, how do grandparents perceive their relationship with their grandchild? What factors influence the grandparent-grandchild relationship? More specifically, I explored this through the following sub-questions within two methodological strands:

#### *Quantitative Strand*

R1: To what extent do three different photo conditions yield differential effects on the social interaction of a child with disabilities with the grandparent?

R2: To what extent do three different photo conditions yield differential effects on the social interaction of the grandparent with the grandchild with disabilities?

*Qualitative Strand*

R3: What are the perceptions of grandparents regarding the utility, feasibility, and acceptability of the photo interaction intervention? (Social validity)

R4: How do grandparents understand their relationship with their grandchild?

R5: How did an intentional structured photo activity support the grandparent-grandchild relationship?

## **Chapter Three: Method**

### **Research Design**

This study used an embedded mixed methods design (Creswell & Plano-Clark, 2011) proceeding in 3 phases. Phase 1 consisted of qualitative interviews; Phase 2 consisted of a single case alternating treatment design; Phase 3 also consisted of qualitative interviews. Integration of the qualitative and quantitative strands of the research occurred in the sequencing of the phases (Phase 1 informed Phase 2 and 3; Phase 2 informed Phase 3), as well as in the interpretation of the findings. R1 and R2 were explored in the intervention phase (Phase 2), while R3 was examined in Phase 3. R4 and R5 were addressed in Phases 1 and 3, bookending the quantitative strand (see Figure 2). In the next sections, I explain the rationale for using mixed methods research, describe the participants, and present the study procedure before describing the qualitative strand of the study, followed by the quantitative strand. This chapter ends with an explanation of how the qualitative and quantitative study components were integrated.

### **Rationale for Mixed Methods Research**

A mixed methods design, consisting of qualitative interviews and a single case alternating treatments design, was essential for addressing the study's research questions. An alternating treatment design is useful in comparing interventions for reversible behaviors (Wolery, Gast, & Ledford, 2014) and was used to compare the effects of three photo conditions across two grandparent-grandchild dyads. Although the experimental approach is useful in highlighting the effects of different photo conditions, it does not capture other potential influences on the grandparent's experience and their perceptions of the intervention, nor does it examine the more distal effects of the intervention on other family members.

Qualitative interviews provide the opportunity to explore participants' perspectives on the intervention and their perceived impact of the intervention on variables not examined within the intervention. Qualitative interviews also offer rich data on the ways pre-existing family contexts may contribute to the acceptability and outcomes of the intervention. I conducted two semi-structured interviews with each family member (the parent, grandparent and child from Family 1, and the parent and grandparent from Family 2). These interviews were intended to provide rich descriptions of aspects of communication and interaction grandparents have found challenging (Phase 1), and how the intervention influenced their experience (Phase 3). Hence, the mixed methods approach allowed for a more holistic understanding of the impact of the intervention.

Complementarity was the main purpose for conducting mixed methods research in the present study (Greene, Caracelli, & Graham, 1989). When the aim is to complement findings, the researcher seeks to increase the meaningfulness of findings from one method with the results from the other method. Therefore, complementarity was a valuable aim in this study because the results from the pre- and post-intervention interviews with family members could enhance and elaborate on findings from the single case design intervention, potentially explaining unexpected findings. The interviews also helped situate the intervention in the context of the family's background and dynamics, which could provide an additional layer of understanding for the findings.

### **Participants**

Participants in the study were grandparents, parents, and children from two families. The purpose of including family members from three generations was to provide triangulation of data sources, to offer data around the family context, and to examine if there was alignment of perceptions about the intervention effects. In this section, I describe the sampling and

recruitment strategy before describing the members in the two families. Demographic information about the families is presented in Table 1.

**Sampling/recruitment.** A purposive sampling strategy was used to select cases representative of the population I was seeking to study—namely grandparents actively involved in supporting their grandchildren who have social interaction difficulties. Due to the small population under study, purposive sampling was appropriate. As Tashakkori and Teddlie (2003) note, the sampling is “based on a specific purpose rather than randomly” (p. 713) and the intent is to collect data that explores depth (during the qualitative phase) rather than generating a breadth of information (Teddlie & Yu, 2007). Participants were recruited through emails and flyers to centers and organizations working with families who have children with disabilities in the U.S. Pacific Northwest. I also used the snowballing method to increase the possibility of recruiting participants. While a single dyad will serve as its own experimental control in an alternating treatment design, I attempted to over-sample participants to ensure cross-subject replication.

The inclusion criteria for grandparents were:

- they were grandparents of children identified as having difficulties in social communication/interaction (see inclusion criteria for grandchildren),
- they were currently involved in their grandchild’s lives (saw their grandchild frequently and were willing to see them at least 2 to 3 times a week for the duration of the intervention),
- they were not the legal guardians of the grandchild and did not live full time with the grandchild, and

- they were willing to share photos from the past (more than a year ago) that they would like to share with the grandchild.

The inclusion criteria for grandchildren were:

- they were age 5 to age 21,
- they had been identified by caregivers as having difficulties in social communication/interaction.

The inclusion criterion for the parent was:

- they were willing to take and provide recent photos of the child engaged in different activities within the past year.

At the end of the study, participants were given gift cards to local grocery stores in appreciation for their participation in the study. Grandparents were given a \$50 gift card; parents were given a \$25 gift card; and grandchildren were given a \$35 gift card.

**Family 1: Noah, Will, & Emily.** Noah was a 10-year-old White boy and described himself as such, “I have autism, ADHD and anxiety” (Noah, Interview 1). He was the only child to Emily (age 34) and her husband, Dylan. Noah’s family was close to their extended family members. They lived next to their maternal grandparents and great grandparents. Noah’s family also attended church service with Emily’s sister’s family. Emily described Noah as being “high functioning” and “a bundle of energy”, while also being “very rigid with his behaviors” (Emily, Interview 1). Emily described his social interactions with people as such:

“it’s very much on his level, his terms... When he’s having a good day and he’s a little more relaxed, he will be more conversational, more flexible thinking, more... okay, we will... I’ll let it... we’ll do something your way, and then we’ll do something my way.

Kind of that reciprocal attention. Otherwise he tends to be very demanding, very “no I want to do it first, and we’re all going to do it my way”.

Emily was a counselor and runs a clinic for children with autism. She came to the realization that Noah likely had autism when she was working on a paper on autism for her counseling degree when Noah was two and a half. As she described: “[Noah] was lining up his cars like he had always done. And I was just kind of watching him. And all of a sudden, I went back to my paper and I realized, I think he has a diagnosis of autism” (Emily, Interview 1). Noah received his diagnosis of autism at age 3, and the diagnoses of ADHD and anxiety at age 5.

Will was Emily’s father and was grandfather to three children, Noah being the oldest. Noah and Will had a close relationship. As Emily explained, “With my dad, his grandpa, he’s a little bit more calm, and often a little bit more go-with-the-flow, just because they have a really good close relationship.” Being retired from the police force, Will was the one Emily and Dylan called on for help with caring for Noah if needed. Noah often helps with yard work and “jobs” in Will’s house (e.g., painting a mobile house, mowing the lawn, etc.).

**Family 2: Lucas, Beth, & Clara.** Lucas was a 14-year-old White boy with autism, intellectual disability, speech language impairment, and ADHD. He had an older brother aged 17 and lived with his parents and brother, and their dog, Buddy. Lucas received a diagnosis of developmental delay at 10 months and the autism diagnosis at around age 11. Lucas’ mother, Clara (aged 43), described Lucas as being “really funny and really charming and has a great sense of humor”, while also having some challenges: “he is very limited verbally and has really challenging behaviors. Very oppositional and non-compliant in general” (Clara, Interview 1). He was also described as having difficulties with transition. Lucas learned to talk at around age 11 and uses words more often when communicating with his family.

Lucas had a girlfriend and was affectionate with family members and peers he liked. For example, with his parents and closest friends, “he wants to hug and kiss, snuggle, and lean into, and kiss their cheek or kiss their hand. So it looks very loving” (Clara, Interview 1). However, because those behaviors were not age appropriate for a boy aged 13 (Lucas turned 14 during the study), “it also looks like a lot of me [Clara] trying to pull him away. Or us trying to put some space” (Clara, Interview 1).

Clara was a social worker and an advocate for individuals with disabilities. Her mother-in-law, Beth (aged 70) was the grandparent who participated in the study. Beth shared a close relationship with her son and daughter-in-law, and attributed the closeness to the open communication they have. Beth and her husband, Mark, used to visit the family monthly when they lived in another state. One year prior to the study, they moved to be closer to the family. Now that she was semi-retired, she visited their house once a week when school ended early to help look after Lucas while his parents were at work. For those few hours, her interaction with Lucas consisted mainly of getting him his milk, and sitting close to him while he played a video game or is on his iPad. Clara described the typical scene when she got home from work as such: “they’re always seated right next to each other on a couch, like pushed up next to each other” (Clara, Interview 1).

## **Measures**

Parents were asked to complete two assessments at the beginning of the study to describe the child’s verbal ability and social responsiveness

### **Intelligibility in Context Scale (ICS; McLeod, Harrison, & McCormack, 2012).**

Developed to measure the intelligibility of children with speech sound disorders, the purpose of the ICS is to provide a parent-reported measure of the extent to which a child’s speech is

understood. The ICS has been tested with children aged 4 to 5 years, but should be completed by parents of preschool to school-aged children, although it can be adapted for adults. The scale consists of 7 questions on a 5-point Likert scale that asks about the degree to which different communication partners understand the child's speech (1 = never to 5 = always). The ICS takes 5 minutes to be completed. An example of a question is "*do extended members of your family understand your child?*". The ICS will be scored by adding the ratings and averaging them, providing a mean score. A score of 3.5 indicates the child is usually to sometimes understood by others around him/her. Further information can be found at the website:

<http://www.csu.edu.au/research/multilingual-speech/ics>. The ICS was used to provide descriptive information about how well the child's communication is usually understood by different people. Noah scored an average of 3.29 while Lucas scored an average of 2.71. The results suggest that Noah was more often understood by his communication partners than Lucas, although both of them scored below the average of 3.5.

**Social Responsiveness Scale – second edition (SRS-2; Constantino & Gruber, 2012).**

The SRS-2 is a parent-report measure intended to identify the presence and the severity of social impairment in autism spectrum disorder. The SRS-2 takes about 15-20 minutes to complete. The 65-item SRS-2 contains five subscales: social awareness, social cognition, social communication, social motivation, and restricted interests and repetitive behavior. While the SRS-2 is intended to be used specifically within the context of autism spectrum disorders, the subscale of social communication can provide a descriptive measure of the child's social responsiveness. The SRS-2 consists of forms for specific age groups: preschool (ages 2.5-4.5), school-aged (ages 4-18), and adult (ages 19 and above). Internal consistency ratings for each of these parent-report forms have been reported to be .88 for the preschool form, .91 to .97 for the

school-age form, and .89 to .96 for the adult form (Constantino & Gruber, 2012). For this study, the school-aged forms were used, which provided descriptive information about the child's social responsive skills.

The *T*-scores for both Noah and Lucas fell in the severe range. Noah's *T*-score was 81 while Lucas' *T*-score was 76. A *T*-score of 76 or higher indicates "deficiencies in reciprocal social behavior that are clinically significant and lead to severe interference with everyday social interactions. Such scores are strongly associated with clinical diagnosis of an autism spectrum disorder" (Constantino & Gruber, 2012, Profile Sheet description).

### **Study Procedure**

This study proceeded in three phases. Figure 2 illustrates the three phases and the research questions each phase addresses while Figure 3 presents the phases and their associated components. In Phase 1, I conducted individual interviews with the grandparent, parent, and grandchild from Family 1 and the grandparent and parent from Family 2. Because Clara (mother from Family 2) did not think that it would be appropriate to conduct an interview with her son, Lucas, who was nonverbal and could not yet read or write, I did not conduct an interview with him. The parent and grandparent interviews focused on the parent and grandparent's perceptions of the child's disability, their current level and quality of social interaction with their grandchild, and their perceptions on the impact of their grandchild's social interaction skills on the interpersonal relationships in the family. I also asked them about their perceptions on how their family culture influenced the role of the grandparent and the interactions between the grandparent and their grandchild and the family. In a prior qualitative study I conducted examining the roles and experiences of grandparents supporting children with disabilities (Yang, Artman-Meeker, & Roberts, 2018), White grandparents from the dominant culture in the U.S.

had difficulty articulating how their culture influenced their perceptions of their roles and their experiences. Instead, my interview questions were rephrased to ask about “family traditions and rituals” instead of “culture”. Since both families in this study were White, I used the terms “family traditions and rituals” or “family background” to understand how they perceived cultural influences. The child interview, conducted with Noah, was about his perception of his relationship with his family members, in particular with his grandfather, the grandparent participating in the study.

Phase 2 consisted of the single case design (SCD) intervention. Within the SCD were four phases: Pre-baseline, Baseline, Comparative Photo Phase (Intervention Phase I), and Preferred Photo Phase (Intervention Phase II). These phases are described in greater detail in the quantitative section of this chapter.

In Phase 3, I interviewed the grandparents individually to obtain their perceptions on the level and quality of the social interaction with their grandchild, and their thoughts about the immediate and longer-term or distal effects of the intervention. I also interviewed parents on their perceptions of the effects of the intervention on the grandchild and grandparent’s interactions as well as their thoughts on whether they saw any effects on their own relationship with the grandparent. I also asked Noah (Family 1) his thoughts about the intervention and how he perceived his relationship with his grandparent.

In the next section, the qualitative and quantitative strands will be described separately. This chapter will conclude with how the two strands were integrated.

## **Qualitative Strand**

### **Participants**

Participants in the qualitative strand consisted of the grandparents and parents from each family (Will and Emily from Family 1, and Beth and Clara from Family 2). The study design included interviews with the child only where possible. As mentioned earlier, Clara (mother from Family 2) had not felt it would be appropriate for me to conduct an interview with her son Lucas since he was not verbal. Hence, I only interviewed Noah (child from Family 1).

### **Setting**

Interviews with Noah's family took place in available rooms in Emily's office as it was most convenient for the family. The interviews with Emily took place in a room with two couches and a small drawer. The interview with Noah and Will took place in a larger room, also with two couches and a small drawer. For Lucas' family, interviews with his mother and grandmother were conducted at cafés located either near their house or their workplace for their convenience.

### **Semi-structured interviews**

The first principle of the ecological system is that of ecological sensitivity, where a change in one part of the system effects changes in other parts. This also means that changes in the relationship between grandparent and grandchild have potential to influence the parent-grandparent relationship (or even that of other family members) and vice versa. Semi-structured interviews provide a means to access the perceptions of parents and grandparents regarding how and why they interact and support the child with disabilities. Hence, I conducted individual semi-structured interviews with the grandparent, parent, and grandchild from Family 1 and the grandparent and parent from Family 2 before and after the intervention. All interviews were audio recorded and transcribed verbatim. The interview protocol can be found in Appendix A.

Next, I describe in more detail the nature of the interviews with the grandparents, parents, and grandchild.

**With grandparents.** A semi-structured interview was conducted with each grandparent at the start (Phase 1) and at the end (Phase 3) of the study. Initial interview questions asked about their experiences in interacting with their grandchild. The purpose of the initial interview was to build rapport with the grandparent and allow me to better understand the family context and culture as well as the grandparent's current level of interactions with their grandchild before proceeding with the study. The average length of these interviews was 1h 50min 36s (range: 1h 47min 2s to 1h 54min 10s).

Interview questions at the end of the study included questions on social validity as well as their perceptions about any effect they had observed on the family relationships. Social validity questions include their perceptions of the ease of use, how acceptable they found the intervention, and how feasible it was for use in their everyday lives. Other qualitative questions include if there were changes in the quality of the interaction during the intervention, and if and how they could see using this intervention or an adapted version of the intervention in subsequent interactions. I also presented preliminary results from the intervention and asked their thoughts about it (e.g., *we found that X condition led to higher social interaction but child indicated that he preferred the other condition during the interview. What were your thoughts about this?*). Additionally, I asked if there had been other effects of the photo interaction on their communication with the other individuals in their grandchild's life (e.g., with parents or other family members). The average length of these interviews was 1h 16min 12s (range: 50min 52s to 1h 14min 32s).

Grandparents who are actively involved in the lives of their grandchildren are often part of the child's microsystem (i.e., grandparent-grandchild interaction), as well as the child's mesosystem (i.e., grandparent-parent interaction). As a part of the child's microsystem, the interviews provided insight into how they perceive their role and their direct interactions with the child, including their interactions with regards to the photo intervention. Additionally, the interview questions also asked about parent-grandparent relationships to provide a fuller picture of one of the mesosystem interactions that influence the child's system of supports. Research has shown that the relational history of the grandparent and parents can influence the extent to which parents view grandparent support favorably. It is likely that a prior history of positive relations is associated with higher involvement from grandparents, and stronger relational ties between parents and grandparents.

**With parents.** Similar to grandparents, a semi-structured interview was conducted with each parent at the start (Phase 1) and end (Phase 3) of the study. Initial interview questions asked about their perceptions about their relationship with the grandparent and their perception of the grandparent-grandchild relationship. Initial interviews with parents lasted on average 52min 25s (range: 46min 54s to 57min 56s). Interviews at the end of the study included questions about social validity similar to those asked of grandparents. The average length of these interviews was 34min 13s (range: 26min 39s to 41min 47s). Since parents are in the child's immediate system of supports (microsystem), understanding how they perceive the involvement of the grandparents can provide insight into how they allow for grandparents to be involved in the child's lives. Additionally, within the microsystems surrounding the child, it is helpful to understand the kinds of supports that parents have from other family members, which will not be captured in the single case research design.

**With grandchildren.** Semi-structured interviews were conducted with Noah at the start and at the end of the study. As mentioned earlier, Lucas was not interviewed because his mother, Clara, felt that it would not be appropriate since he had limited verbal ability. In the first interview, I asked Noah about his relationship with his grandparent and the activities he enjoyed doing with his grandfather. During the interview, Will was present as he was concerned that Noah's language might not be clear enough. Will also provided some context when Noah talked about a favorite music activity on an iPad (his dad had downloaded a software allowing him to listen to various types of music genres). This interview lasted 13min 51s. At the end of the study, I interviewed Noah again, asking his thoughts about the different types of photos, what he enjoyed about them, whether he would do more of similar activities, and what made him enjoy spending that time with his grandpa. Photos from the sessions were available for him to look through. Will was again present in case he needed to interpret some of Noah's speech, but did not intervene during the session. This last interview lasted 13min 13s. At the heart of the ecological systems framework is the child himself/herself. Since it is the child who is the recipient of the effects of the intervention, including their voice provided a better understanding of how they perceive not only the intervention, but also their thoughts about their relationships with the grandparent who are part of their microsystem and mesosystem.

### **Materials**

**Audio recorder.** An Olympus DS-40 Digital Voice Recorder was used to record the Phase 1 and 3 interviews with participants. During all interviews, the audio recorder was placed on the table between the participant and myself.

### **Field notes**

As the interviewer, I took brief notes during the interview with the participants, and also wrote short memos immediately or soon after the interview to record my thoughts on potential themes for data analysis.

### **Data Analysis of Qualitative Data**

All interviews were audio recorded and transcribed using a Rev.com transcription service. First level member checking was used to establish trustworthiness of the data (Brantlinger et al., 2005). I checked the transcripts for accuracy, before sending them to the participants for verification. Participants were asked to check the transcripts for accuracy and to let me know if there was sensitive information they wanted to omit from the transcript. Only one transcript had a few lines removed because of sensitive information. Due to the small sample size, no further information is provided to protect confidentiality of the participants. Once participants verified that the content was accurate, identifiers were replaced with pseudonyms and the transcripts were coded using NVivo 11 (QSR International, 2016), a qualitative analysis software tool.

I coded transcripts starting with open coding to explore potential themes I may not have anticipated when planning my interview questions. This first round of coding generated a list of codes (see “Round 1 Coding” in Table 2) which I presented to a qualitative research writing group I was a part of. The purpose of inviting the research group was similar to Brantlinger et al.’s (2005) notion of having external auditors, or outsiders, to the research to confirm if the findings are “logical and grounded in findings” (p. 201). The group had some general knowledge of the study based on feedback they had provided around the initial conceptualization of the study. I presented updated background information to the study purpose and design, along with the codes and selected accompanying quotes. The group members provided feedback generally

affirming that the codes made sense based on the quotes presented. However, they suggested changing “effect of photo intervention” to “meaning making of photo intervention” since the qualitative transcripts were not about measuring outcomes of the intervention.

In my second round of coding, I used a more deductive approach, including codes based on my research questions as well as potential themes from the initial coding. Hence the second round of coding included from the first round, with edits suggested by the qualitative writing group, and codes from the research and interview questions (see “Round 2 Coding” in Table 2).

After the second round of coding, a second coder was recruited who coded 70% of the transcripts. The second coder had experience in the field of early childhood special education and prior experience with qualitative coding in NVivo. She was also the primary coder in the quantitative strand and had watched all the videos of the dyads, giving her some understanding of the child and grandparent behaviors. Her insight into the relationships between the grandparent and grandchild in the two dyads because of the video coding allowed her to be a collaborative partner in the research which allowed for “inter-rater reliability checks on ... the coding of the data” (Brantlinger et al., 2005, p. 201). As the primary coder, I provided the list of codes generated from the second round of coding. The second coder was encouraged to suggest new codes not provided in the list. After an initial round of coding, we met to discuss the codes, clarify code definitions, and make revisions.

Based on this third round of coding, we came to consensus on disagreements for the most part. We also added two codes “background information” and “relationships – others”.

“Background information” referred to information from the grandparent or parent’s past. This was included because it seemed to be relevant in shaping how grandparents and parents saw the grandparent role in the family. “Relationships – others” was added because there were other

relationships in the two families that seemed pertinent to understanding the family as a whole that were not part of the existing codes, such as relationships with other members of the extended family.

We also decided to combine the codes “period of adjustment” and “period of learning” because they seemed to overlap in terms of the how each was understood. One example of this was a quote from when Will was talking about physical discipline:

“I was raised in a home environment where there was physical discipline for poor behavior. ... But what I found out with him and it took me, I had to learn quickly, is that spanking in other words or any other kind of physical discipline makes it worse with him. You got to be very, very patient. Not all children, in my opinion not all of them, should be dealt with exactly the same. Every one of the children are different. So with him, we learned quickly that we had to figure out things that would work better.”

In this case, the second coder had coded it as a period of adjustment because Will had seemed to be talking about how he adjusted his manner of interacting with Noah. I had coded it as period of learning because Will had seemed to be talking about his learning how to change how he interacted with Noah. In this case, and in several other instances, it seemed to boil down to a matter of semantics. Hence, we decided to combine the two codes. The list of codes with the definitions are presented in “Final list of codes and definitions from Round 3 Coding” in Table 2.

In the fourth round of coding, I went back into each code and the accompanying data to examine the relationships between the codes and to make sense of the themes in light of the two qualitative research questions: a) How do grandparents understand their relationships with their grandchild, and b) what were the participants’ perspectives on how the photo activity supported the grandparent-grandchild relationship. The themes of the “learning journey”, “grandparent

roles”, “the grandparent-grandchild relationship” and “the grandparent-parent relationship” addressed the first research question, while the themes on “meaning making of the photo intervention session” and “outcomes of the photo interaction intervention” addressed the second research question (see Round 4 Coding in Table 2).

### **Quantitative Strand**

#### **Participants**

Participants in the single case design section (Phase 2) included only the grandparents and grandchildren: Will and Noah from Family 1, and Beth and Lucas from Family 2.

#### **Setting**

For Noah, the photo study was carried out in a room in his mother’s office, approximately 8ft by 11ft. Noah was frequently in the office and was comfortable with the setting and the staff working there. The room consisted of a round table with four chairs, as well as toys placed in the corner of the room. During the sessions, Noah would sit next to his grandfather at the round table to look at the photos.

For Lucas, the study was carried out in the family’s home, in the TV room, which was approximately 11ft by 15ft. Although Clara had initially thought to have him at the breakfast table in the kitchen, Lucas preferred the couch, which was also where he usually sat with his grandmother on her weekly visits. Because Lucas would display challenging behaviors with transitions, he was initially offered choices in the first and second baseline session on where he preferred to have the study (breakfast table or couch in TV room) to ease the transition. Subsequently, when he always selected the couch, he had the choice of sitting at either leg of the L-shaped couch.

Each session lasted between 3-5 minutes, depending on the child's attention span and ability to communicate. All sessions were videotaped and coded.

## **Materials**

**Photographs.** Three types of photos (or photo conditions) were used: 1) non-familiar photos, 2) photos of the child, and 3) photos selected by the grandparent.

*Non-familiar photos [Condition 1].* Non-familiar photos referred to photos of no personal relevance or significance to the child. These were generic photos of animals, food, or places. Non-familiar photos were used in the first photo condition in Baseline phase as a way to establish if the presence of photos made a difference on the child's social interaction from Pre-Baseline phase where no photos were used.

Photos for the non-familiar condition were gathered from Pxhere (<https://pxhere.com/>), a website where images are free of copyright and are released under Creative Commons CCO into the public domain. Fourteen photos per category (animals, food, and places) were gathered, with seven containing at least one child, and the other seven without any children or persons. A total of 42 photos were selected for the pool of non-familiar photos.

Selection rules for the three non-familiar photos for each session was as follows: (a) randomly select first photo from first category, (b) randomly select second photo from second category, (c) randomly select third photo from third category, with the caveat that at least one photo out of the three should include a child and one photo without a child. In other words, if the photos from the first two categories had a child in them, the photo from the third category would be from the photos without a child, and vice versa. The order of photo conditions presented at each session can be found in Appendix B.

*Photos of the child [Condition 2].* For the second type of photo condition, parents were requested to provide photos that had been taken within the last 12 months. The purpose of this condition was to examine if the child would be more interested in looking and talking about photos of themselves or if they would be more interested in the kinds of photos selected by grandparents. The one-year time span was to ensure that the photos could include major moments in the past year that the child could remember. This time span was also developed as a result of previous research (Yang, 2016) in which grandparents had noted the difficulty of finding photos of regular activities with the grandchild when asked to share recent photos from the past two weeks because they found that they were usually engaged in the same activities each time they met with their grandchild. Those participants had indicated finding it difficult to avoid repeating the types of photos shown (e.g., weekly walks, meal times, shopping outings, etc.). In the present study, parents were asked to share recent photos taken within the last 12 months rather than a week in order to avoid having too much repetition of activities that the children were regularly engaged in. Instead, parents were able to share photos that showed the child engaged in activities such as birthday celebrations, summer camps, etc. Parents in both families had many recent photos of their child stored on their phone and did not report difficulty finding photos to share.

*Photos selected by grandparent [Condition 3].* For the third photo condition, grandparents were asked to share photos that were meaningful or important to them or their family, and that they want to share with the grandchild. Since the grandparents in this study tended to meet with their grandchild at least once a week, I asked that they share photos from more than a year ago so that the photos would not overlap with those sent by the parents. Photos in this condition included photos of the grandchild as a young child, at past events or activities,

or of other family members. The guidelines offered to grandparents were: (a) photos contained a memory or story they wanted to share with the grandchild, (b) the photos were of a significant/important event in their life they wanted to share with the grandchild, (c) the photo was from more than a year ago, and (d) the photo may or may not include the child. The literature suggests that one of the roles of a grandparent is to be the family historian and to pass on family wisdom and traditions. The photographs that grandparents share can offer a chance for family stories to be passed on. Examples of photos that grandparents decided to share included photos of family traditions (cruises), rituals (bar mitzvah), baby photos, family photos, etc. A description of the photos shared in each condition is presented in Appendix C.

Families were asked to send the photos to me prior to the session so I could print them out. Because the sessions occurred twice a week, parents and grandparents frequently sent 4-10 photos in advance so that they did not have to send photos between sessions. Hard copies of the photos were printed on 8x11 office paper with at least a 1-inch margin. The sizes of the photos varied depending on what the parents and grandparents sent. All were enlarged so that there was at least a 1-inch margin on one side. Orientation of the photos were either landscape or portrait. No photos were edited. Photos were placed in clear plastic folders so that the interaction around each photo condition was more clearly captured on the camera. I had also offered the option of using an iPad in both families, but they both felt that using a paper copy would be less distracting for the child.

**Video cameras.** The video camera function on two Apple iPods were used during the sessions to capture the interactions between grandparent and grandchild in the single case design (Phase 2). Having a second camera allowed for a backup in the event that there were technical difficulties with one camera. Each iPod was mounted on a tripod and placed either on a table or a

high desk in the room such that they were at eye level with the participants. For Noah and Will, the two iPods were set up about 7-8 feet away, one angled from the right of the pair and the other from the left. Both cameras were positioned to capture both the grandparent and grandchild's faces.

For Lucas and Beth, the set-up of the video cameras depended on the location Lucas sat. One video camera was set between 7-8 feet away from Lucas and Beth. Beth and Lucas' interactions were sometimes blocked when Beth positioned the photo in front of Lucas in order to capture his attention, or when Lucas had slouched so that his mouth was tucked into his shirt and it was difficult to see if he was smiling. In those instances, I would lift the other camera so the video would capture both their faces. This was important as the behaviors coded included smiling and eye contact which required their faces to be visible. Data from the iPods were immediately transferred to a password protected computer after each session.

**Audio recorders.** The same digital voice recorder used in the interviews (Phase 1 and 3) was used to record the intervention sessions during Phase 2. For Noah, the audio recorder was placed on the table between him and Will. For Lucas, the audio recorder was placed on the coffee table in front of where they were on the couch.

### **Description of the Dependent Variables**

In single case research designs, one variable is identified as the primary variable upon which phase change decisions are made. In the present study, child behaviors were used as the intervening variable to determine phase changes. However, data was collected on both child and grandparent behaviors. While the intervention sought to increase socially responsive behaviors from the child, grandparent behaviors could influence the extent to which the child responds or initiates. Additionally, collecting data on grandparent behaviors could reveal if the different

photo conditions influence the type of grandparent social behaviors exhibited. As this intervention focused on the social interaction between grandparents and grandchildren, the single case research design component of this study examined specifically the microsystem of the grandparent and grandchild relationship.

**Child dependent variables.** Social interaction behaviors of the child were measured, as well as avoidance behaviors. These behaviors were classified into positive social interactions, low level social interactions, negative interactions, and topic content extension (see Table 3). The first three categories were based on Bauminger (2002) and Hauck et al.'s (1995) definitions of positive, low level, and negative interactions. Each of these three categories had sub-categories such as eye contact with smile, yes/no only responses, and avoidance. Topic content extension was included to examine the extent to which the dyad would converse about topics not directly related to the photo. Appendix D contains the coding manual which outlines the definitions of each behavior and provides examples and non-examples of the behavior.

All behaviors were coded using partial interval coding with 10s intervals. While both child and grandparent social interaction behaviors were of interest in this study, the intervening variable was based on a composite of the child's social interaction behaviors. In other words, if any behavior classified under positive social interaction occurred during an interval (i.e., eye contact, eye contact with smile, smile with no eye contact, affection, social communication/talk), that interval was marked as having positive social interaction. If none of the behaviors classified under positive social interaction occurred during the interval, that interval was marked as not having any positive social interaction occurring.

**Grandparent dependent variables.** The social interaction behaviors of the grandparents were similar to those of the child behaviors with the exception of negative social interactions

category and the “repetitive behavior” and “idiosyncratic language” from the low level social interactions category because these behaviors seemed unlikely to occur with the grandparent. These behaviors were also coded using a 10s partial interval coding. A summary of the grandparent dependent variables can be found in Table 2 and examples and non-examples can be found in the coding manual (see Appendix D).

During the session, if the grandparent or grandchild directed attention or comments toward me, I briefly redirected them back to each other (e.g., “Talk to your grandma about that”, “that’s cool”, “Uh huh”). This was not coded as social interaction. This happened 1-2 times in the first sessions for both families when the grandparent asked if they should provide more information about the events they were talking about (e.g., that cruises were a big family event).

**Rating of photos.** At the end of each session in Baseline, and Intervention Phases I and II, the child and grandparent were asked to rate, using their respective rating scales: a) their experience of chatting with each other that session (i.e., “*How did you feel about chatting with your grandparent just now?*”), and b) their feelings about the types of photos discussed (i.e., “*How did you feel about the photos you just talked about?*”) (See Appendices E and F respectively). Grandparents were also asked to indicate how easy they found it to initiate the conversation and to maintain it.

**Child Rating Scale of Photos.** The Child Rating Scale was used to ask the child how they felt about: a) chatting with their grandparent that session, and b) the photos for that session (see Appendix E). The first question could help explain potential outlier data (e.g., if the child was feeling chatty or was upset that day), while the second would provide an additional data source about the usefulness of the type of photo used. For Noah, a 5-point rating scale using smiley faces, with the leftmost face being an angry face, and the rightmost face being an excited face

was used. Based on feedback from Lucas' mother who suggested offering only two options, the rating scale was adapted to reflect two choices: (i) a happy, green face, and (ii) sad, red face (see Appendix E).

After every photo condition session, each child was asked to circle or indicate the smiley face that most represented how they felt about each question. During the Intervention I phase where three conditions were presented in the same day, the rating scale for the third session included a ranking of the photo conditions, which provided information on which type of photo condition the child preferred that day (see Appendix E). Noah indicated his ranking on the rating scale. Lucas was asked to select his favorite photo for each condition and then asked to select his favorite photo from the three conditions.

**Grandparent Rating Scale of Photo and Ease of interaction.** Similar to the Child Rating Scale of Photos, grandparents were asked to rate each photo condition using the same smiley faces on how they felt about: a) chatting with their grandchild for that session, and b) the photos used for that session. Additionally, grandparents were asked to rate on a 5-point rating scale (with 1 being *very difficult* and 5 being *very easy*), how easy they found it c) to initiate the conversation around that photo condition, and d) to maintain the conversation around that photo condition (See Appendix F). During the Intervention I phase where three conditions were presented in the same day, the rating scale for the third session included a ranking of the photo conditions, which provided information on which type of photo condition the grandparent preferred that day, and why.

### **Procedure / Description of Independent Variable (Intervention)**

As illustrated in Figure 2, the intervention in Phase 2 proceeded in the following order: Pre-Baseline Phase (with no photos), Baseline Phase (with non-familiar photos), Intervention

Phase I: Alternating Treatments (three conditions), and Intervention Phase II: Preferred Treatment (selected condition).

**Pre-baseline Phase (with no photos).** Each grandparent and grandchild dyad were observed during a 3- to 5-minute session to collect a sample of their interaction and communication exchange. During the session, I asked the grandparent and grandchild to discuss a topic (e.g., “*Let’s talk about [animal/place/food].*” Although I had prepared a list of prompts in case grandparents felt a loss at what to say, (see Figure 4 for a list of prompts), it was not used as both grandparents were able to continue the conversation with their grandchild. This phase served as a pre-baseline measure of the grandparent and grandchild’s current levels of communication and interaction. Data were collected on both child and grandparent behaviors.

**Baseline Phase (with non-familiar photos).** Prior to the start of Phase 2, the pool of non-familiar photos was shared with parents. They were asked to identify any photos that may be familiar to the child and any photos that may trigger an overly positive or negative response from the child. This condition was intended to control for possible reactivity to photos during the intervention conditions and to control for possible variability due to familiarity or interest in a particular topic. Both parents confirmed that the photos were unfamiliar and that none of the photos would likely trigger any overly positive or negative reactions from their child.

During the session, I presented three non-familiar photos one by one to each grandparent and grandchild dyad and asked them to talk about each: “Here’s a photo of [animal/food/place]. Talk about what you see in this photo.” Each session was recorded for approximately 3-5 minutes for a minimum of 3 sessions to establish a stable baseline. When a stable trend (at least 3 consecutive data points) on child’s social interaction behaviors was demonstrated, the dyad

proceeded on to Intervention Phase I. All phase change decisions were based upon the child's social interaction behaviors (intervening variable).

**Intervention Phase I: Comparative Photos Phase.** During Intervention Phase I, all three conditions were presented in the same day, with a short break between each condition. Parents of both children were consulted on the appropriate time for the break. Both parents recommended short break periods, with a break of 2-3min for Noah and 1-2 minutes for Lucas. A random sequence generator (<https://www.randomizer.org/>) was used to randomize the order in which conditions were presented (see Appendix B). At least five data points were collected for each condition.

The procedures for each of the conditions were the same as baseline. I presented each photo individually and asked the grandparent and grandchild to discuss the photos, using the same prompts as in baseline phase. The Non-familiar Photo Condition [Condition 1] was a continuation of baseline condition.

At the end of each 3-5min session, grandparent and grandchildren were asked to indicate their perspectives on the session using their respective rating scales (Child Rating Scale and Grandparent Rating Scale).

When a minimum of five demonstrations of effect (i.e., 5 consecutive data points that demonstrate the effect of one preferred treatment) was shown on child social interaction (Kratochwill, et al., 2013), the dyad proceeded on Intervention Phase II. The condition with that showed the highest level relative to the other conditions was used in Intervention Phase II.

**Intervention Phase II: Preferred Photo Phase.** The condition with better results (increased level, trend, or stability relative to the other conditions across at least 5 data points)

for the dyad was selected for this final phase. At least 3 sessions were conducted for this phase, using the same procedure as in the previous intervention phase (Kratochwill et al., 2013).

### **Procedural Fidelity**

Procedural fidelity was assessed by completing a procedural fidelity checklist (see Appendix G). The checklist consisted of 14 items for Pre-Baseline phase, 19 items for Baseline phase, 48 for Intervention Phase I (Comparative Photo Phase), and 18 for Intervention Phase II (Preferred Photo phase). Areas to be assessed include the steps to be taken for each day and each of the three sessions within a day, as well as after the day's sessions have been completed. The primary researcher completed the checklist during each session, across all conditions. The primary coder completed the sections of the checklist that could be observed from the video (see sections in gray). A percentage fidelity for each session was calculated by calculating the number of items marked "yes" and dividing this sum by the total number of items (Yes + No) and multiplying by 100. Procedural fidelity was 94% across 28 sessions (range: 72.7-100%).

### **Data Analysis of Quantitative Data**

All data were coded from video clips of the sessions. A trained graduate student coded all videos and another graduate student, a faculty member, and the researcher coded 37% (20 videos) of the 54 videos across phases and conditions for interobserver agreement. Videos were coded in two passes: coding for child behaviors, and coding for grandparent behaviors.

**Observer training.** Observers were provided with a copy of the coding manual and data sheets for the child and grandparent behaviors. The primary coder was a graduate student who coded all videos and provided training for the two secondary coders. Components of the training included: (a) an explanation of the operational definitions of the codes, (b) coding 2 min of video on child behaviors and on grandparent behaviors with the observers. During the coding with

observers, examples and non-examples of the operational definitions were pointed out and the coding rules were discussed. Observers were trained on two videos from the data (one from baseline and one from intervention). They could seek clarification at any point in the training. The coders then each coded two video sessions independently. The secondary coders' coding was compared to the primary coder's using the point-by-point agreement method (Kazdin, 2011). The coders were considered to be sufficiently reliable when they coded two videos at 90% agreement on all variables. If IOA was lower than 90% agreement, the coder was re-trained and given another video to recode. Coders were reliable across the two videos ( $m = 93.6%$ ; range: 92.5-96.3%). Coders used the data sheet in Appendix H to code target social interaction behaviors, social initiation, as well as non-desired behaviors. IOA was calculated by first summing the total number of intervals with agreements on social interaction behavior, social initiation, and avoidance/escape behaviors. This figure was then divided by the total number of intervals with agreement and disagreement, multiplied by 100, to get a percentage of agreement (Ayres & Ledford, 2014).

**Interobserver agreement.** The primary coder viewed each video at least 2 times. The first viewing was to code for child behaviors and the second viewing was to code for grandparent behaviors. A secondary coder, with some experience or knowledge of video coding of behaviors was recruited to establish inter-observer agreement. The secondary coders coded at least 30% of videos in each phase, for each dyad. At least 30% of videos was randomly selected from the Baseline and Preferred Condition Phases. For the Comparative Photo Phase (Intervention Phase I), at least 30% of the videos for each condition were selected for interobserver coding. On average, IOA across both dyads and conditions was 92.53% for child behaviors (range: 87.78%-97.11%) and 91.98% for grandparent behaviors (range: 83.03%-97.55%). Table 4 presents the

percent of videos coded per condition, across phases, as well as the results of interobserver agreement by participant and conditions.

**Visual analysis.** Visual analysis of graphic data was used for formative and summative data analysis (Gast & Spriggs, 2014). Data were plotted on a line graph after each session was coded. The primary researcher consulted with the faculty single case researcher advisor to visually analyze data for pattern in trend, level, and/or variability within and across conditions. Phase change decisions were made based on the primary intervening variable: child social interactions.

### **Integration of Qualitative and Quantitative Study Components**

The integration of the components in this study occurred in two ways. First, during the data collection, analysis of each phase informed the data collection method and variables of the next phase. Second, while analysis and representation of the analysis of each phase was conducted separately, interpretation of the results were conducted more holistically, looking at the findings across phases.

In the exploratory segment of the study design, the first set of interview questions (Phase 1) provided a basis for the nature of the intervention (Phase 2). The dependent variables in Phase 2 were based on common indicators of social interaction. In Family 2's case, however, Clara had mentioned during her first interview that Lucas was very affectionate with people he was close to. Hence, although the codes did not change, the coders were informed that for Lucas, he demonstrated affection through touch, such as kissing, licking, snuggling. This was important to note, since during an initial viewing of the video, it was sometimes unclear if he was biting or kissing his grandma, unless grandma responded with an "ow" or asked him to stop biting. The information from the initial interviews provided additional insight into what the behaviors, and

hence the coding of behaviors, could look like for each child. For Noah, his grandpa had mentioned that Noah did not always know how or was not comfortable demonstrating certain emotions. This information might have explained why even though the coded behavior data suggested he preferred the Child photo condition, he stated in his final interview that he preferred the Grandparent photo condition.

With the explanatory portion of my study design, a set of questions had been developed for the second interview (Phase 3) with the aim of understanding the participants' perception of the intervention procedures and the effect on the grandparent-grandchild relationship. I also asked the parents and grandparents their thoughts about preliminary results from the intervention (Phase 2). Hence the second round of qualitative data was influenced by the analysis of the quantitative data.

Integration of the components in the interpretation of the results occurred in the form of considering how my research questions were answered and relating the findings back to extant literature (Creswell & Plano-Clark, 2011). For instance, the "meta-inferences" (Cresswell & Plano-Clark, 2011, p. 237) in this study were related to larger interpretations that I made about the effects of the intervention on the quality and nature of the interactions between the grandparent and grandchild (R1, R2, R4, and R5), the extended effects of the intervention in terms of its likelihood of future use and the grandparent's interactions with other individuals in the child's life (R3, R4, and R5).

## **Chapter Four: Results**

In this chapter, findings from the quantitative strand in Phase 2 are presented first. These include a description of the social interaction behaviors of the child and grandparent from each family and their respective ratings of the conversations and the photos. Next, the social validity of the photo interaction intervention are discussed. Lastly, findings from the qualitative strand of Phase 2 are presented. The findings in this section discuss themes that address how grandparents understand their relationship with their grandchild and factors that influence it, and conclude with the participants' perspectives about the photo interaction activity.

### **Quantitative Strand: Single Case Design**

In this section, results from the quantitative strand of the study are presented. First, the social interaction behaviors of the grandparent-grandchild dyads are discussed. Next, their ratings of the conversation and photos are presented. Graphs for each participant's social interaction behaviors are presented in Figure 5.

#### **Dyad 1: Noah and Will's Behavior Data**

Data are presented for Noah and Will's respective positive social interactions, low level social interactions, topic extension, and negative social interactions (child behaviors only) from the photos during four phases: Pre-baseline, Baseline Phase, Comparative Photo Phase, and Preferred Photo Phase. Full codes were provided in Table 3.

**Noah's behavior data.** During the Pre-baseline session (Non-familiar Photo Condition only), Noah engaged in positive interactions during 97% of intervals. Low level interactions occurred during 17% of intervals. He also extended topics of conversation from the photo in 23% of intervals during the pre-baseline session.

During the Baseline Phase (Non-familiar Photo Condition only), visual analysis showed that Noah's positive interaction behaviors were high in level but showed a downward trend (range: 96% -81% of intervals). His low level interactions were low and variable (range: 7-20% of intervals). His extension of topics of conversation from the photos were also low (range: 10-33% of intervals). The decision to make a phase change to Intervention Phase 1 was made for two reasons. First, the data were generally stable for the child and grandparent data. Second, the research team agreed the child's engagement or interest may decline if the Non-familiar Photo Condition continued.

During the Comparative Photo Phase (Intervention Phase 1), visual analysis of Noah's data remained consistent with baseline levels of responding. There was not a clear effect of photo-type on positive interaction, low level interactions, or topic extension. Since there was no clear separation between photo conditions for positive interaction behaviors by Intervention Session 5, the decision was made to continue with the three conditions. By Intervention Session 7, the Child Photo condition showed a more stable trend (range: 90-97% of intervals) compared to the Grandparent Photo Condition (range: 78-100% of intervals) and the Non-familiar Photo Condition (range: 67-96% of intervals) and was on average at a higher level than the other two conditions. The Grandparent Photo condition showed a decreasing trend from Intervention Session 1 to 5 before increasing at Intervention Sessions 6 and 7. The Non-familiar Photo Condition showed a stable trend in the first half of Intervention Phase 1, before decreasing in Intervention Sessions 5 and 6, and increasing in Intervention Session 7.

There was no clear separation of data for low level interactions. The Child and Non-familiar Photo Conditions showed a low and generally stable trend (range: 9-36% of intervals, and range: 4-32% of intervals, respectively) and the Grandparent Photo Condition showed a

stable trend until Intervention Session 5, before increasing in Intervention Sessions 6 and 7 (range: 11-40% of intervals). Although Noah engaged in low levels of topic extensions during Intervention Phase 1 across all conditions (Non-familiar Photo Condition range: 4-39% of intervals; Child Photo Condition range: 0-13% of intervals; Grandparent Photo Condition range: 0-15% of intervals), his extension of topics was higher for the Non-familiar Photo Condition in three out of seven of the intervention sessions (Intervention Sessions 3, 4, and 6). There was no clear separation of data among the other two conditions. Noah had very few negative interaction behaviors, apart from Intervention Session 5, where he engaged in negative interaction behaviors 8% of intervals in the Non-familiar Photo Condition, and 4% of intervals in the Child Photo Condition. No negative behaviors were observed in the Grandparent Photo Condition.

The decision to continue with the Child Photo Condition in the next phase was based on the positive interaction behaviors of the child since that variable was the most representative of the kind of interaction this study was focusing on. Since Noah's positive interaction behaviors were on a higher level for the Child Photo Condition than the other two conditions, the decision was made to continue with the Child Photo Condition in the Preferred Photo Phase (Intervention II). During the Preferred Photo Phase (Intervention Phase II), Noah's positive interaction behaviors showed a slight downward trend (range: 86-96% of intervals) while his low level interaction behaviors showed an upward trend (range: 13-25% of intervals). He engaged in topic extension only in Intervention Session 9 (32% of intervals). No negative interaction behaviors were observed in this phase.

**Will's behavior data.** At the Pre-baseline session (Non-familiar Photo Condition only), Will engaged in positive interaction behaviors 93% of intervals, and in low level interaction behaviors 87% of intervals. He also engaged in topic extension at 17% of intervals. During

Baseline Phase (Non-familiar Photo Condition only), Will's positive interaction behaviors showed a downward trend (range: 81-97% of intervals), although his low level behaviors increased at Baseline Session 3. He also engaged in topic extension during baseline (range: 3-22% of intervals).

During the Comparative Photo Phase (Intervention Phase I), Will's positive interaction behaviors were high across the three photo conditions and there was no clear separation of data across the three photo conditions (Non-familiar Photo Condition range: 88-100% of intervals; Child Photo Condition range: 96-100% of intervals; Grandparent Photo Condition range: 96-100% of intervals). His low level interaction behaviors were variable and had no clear separation of data (Non-familiar Photo Condition range: 39-82% of intervals; Child Photo Condition range: 38-75% of intervals; Grandparent Photo Condition range: 23-85% of intervals). Although the data points for the three conditions overlapped for topic extension, Will engaged in higher levels of topic extension in the non-familiar condition (range: 4-46% of intervals) than in the Child Photo Condition (range: 0-17% of intervals) and in the Grandparent Photo Condition (range: 0-26% of intervals).

During the Preferred Photo Phase (Intervention Phase II), Will's positive interaction behaviors showed a high level but decreasing trend (range: 85-100% of intervals), with low level interaction behaviors showing a moderate but stable trend (range: 68-70% of intervals). Similar to Noah, Will also engaged in topic extension only in Intervention Session 9 (27% of intervals).

### **Dyad 2: Lucas and Beth's Behavior Data**

Similar to Dyad 1, data are presented for Lucas and Beth's respective positive social interactions, low level social interactions, topic extension, and negative social interactions (child

behaviors only) from the photos during four phases: Pre-baseline, Baseline Phase, Comparative Photo Phase, and Preferred Photo Phase.

**Lucas' behavior data.** During the Pre-baseline Phase (Non-familiar Photo Condition only), Lucas demonstrated positive interactions for 70% of intervals and low level interactions for 7% of intervals, while also demonstrating negative behaviors for 47% of intervals. Much of Lucas' positive interactions during Pre-baseline Phase were from his responses and smiles with his grandmother, whom he enjoyed being with. The relatively high negative behaviors may be due to the Pre-baseline session being the first session. Lucas' difficulty with transition had been highlighted by both his mother and grandmother.

During the Baseline Phase (Non-familiar Photo Condition only), visual analysis of the data showed that Lucas' positive interactions were high and showed an upward trend (range: 61-93% of intervals), while his low level interactions were variable (range: 37-57% of intervals). His negative behaviors generally decreased although they spiked to 37% of intervals in Session 3 of Baseline Phase (range: 0-14% of intervals excluding Session 3's behaviors). The decision to make a phase change after the fourth session despite the upward trend in baseline was due to two reasons. First, the alternating treatments design is driven by separation between conditions rather than a baseline comparison. Second, Lucas would start school in a month and it seemed that the benefits of moving on to intervention phase outweighed the risk of losing experimental control due to a change in environment and fatigue.

During the Comparative Photo Phase (Intervention Phase I), visual analysis of the data for the Child Photo Condition (range: 73-100% of intervals) and Non-familiar Photo Condition (range: 71-97% of intervals) showed separation from the Grandparent Photo condition (range: 61-86% of intervals) for positive interactions. The exception to this trend was in Intervention

session 5 where the Child condition dipped below the Grandparent and Non-familiar conditions. Although there was no clear separation between the Child and Non-familiar Photos Conditions, data points for the Child Photo Condition were higher than Non-familiar Photo condition for 4 out of 6 sessions. Data points for low level interaction overlapped for all three conditions, although the Non-familiar Photo Condition appeared to be higher (range: 24-59% of intervals) than the Child Photo Condition (range: 12-60% of intervals) and the Grandparent Photo Condition (range: 11-33% of intervals) for half of the sessions (Intervention Sessions 2, 4, and 5).

Lucas displayed higher levels of negative interaction behaviors during the Non-familiar Photo Condition for Intervention Sessions 1 and 4 (range: 0-24% of intervals) compared to the Child Photo Condition (range: 0-17% of intervals) and Grandparent Photo Condition (range: 0-35%). His negative interaction behavior was only higher in Grandparent Photo Condition in Intervention Session 5 at 12% of intervals and higher for the Child Photo Condition in Intervention Session 6 (35% of intervals).

Similar to Noah, the decision to continue with the Child Photo Condition in the next phase was based on the positive interaction behaviors of the child. Since Lucas' positive interaction behaviors were higher than the other two condition in four out of six sessions, the decision was made to continue with the Child Photo Condition in the Preferred Photo Phase. During the Preferred Photo Phase (Intervention Phase II), Lucas' positive interaction behaviors increased in Session 7, but demonstrated a downward trend over the next two sessions (range: 70-100% of intervals). A similar trend was observed for his low level interactions (range: 40-48% of intervals). Lucas displayed a low level of negative interaction at Session 7, and none in the last two sessions (range: 0-4% of intervals). Although Lucas' level of positive interactions

for the Grandparent Photo Condition were the lowest among the three condition, observational notes suggest that he had nonetheless demonstrated marked interest in the photos in the Grandparent Photo Condition.

**Beth's behavior data.** At Pre-baseline phase, Beth demonstrated positive interaction behaviors during 83% of intervals. Her positive interaction behaviors showed an upward trend in the first three sessions of Baseline Phase, with a dip at Baseline Session 4 (range: 80-100% of intervals). Her low level interactions showed an upward trend over pre-baseline and baseline sessions, with a similar dip at Baseline Session 4 (range: 67-100% of intervals). Beth also engaged in some topic extension in Pre-baseline and Baseline phases, although there was a downward trend (range: 0-10% of intervals).

During the Comparative Photo Phase (Intervention Phase I), visual analysis of the data indicated there was no clear separation between the conditions for positive interaction behaviors. The data points for positive interaction behaviors were high and stable for all three conditions (Non-familiar Photo Condition range: 90-100% of intervals; Child Photo Condition range: 89-100% of intervals; Grandparent Photo Condition range: range: 80-100% of intervals) although the Grandparent Photo Condition had a downward trend from Intervention Session 5, dropping to 80% of intervals in Intervention Session 6. Beth's low level interactions were more variable across conditions, although there was still no clear separation between the conditions. On average, the Grandparent Photo Condition showed an upward trend from Intervention Session 3 onwards (range: 64-100% of intervals), while the Child Photo Condition remained relatively high, with a dip at Intervention Session 4 (range: 61-93% of intervals). The Non-familiar Photo Condition showed an increase from Intervention Session 1 to 4, before dipping at Intervention Session 5, and increasing again at Session 6 (range: 45-90% of intervals). Beth extended topics

in conversation in the Child Photo Condition at higher levels than in the Non-familiar photo condition (range: 0-17% and 0-5% of intervals, respectively). She did not engage in topic extension in the Grandparent photo condition.

### **Dyad 1: Noah and Will's rating scale data**

Data were collected on Noah and Will's feelings about chatting with each other and their feelings about the photos. Both were asked to rank the photo conditions. Will was also asked additional questions about initiating and maintaining conversations with his grandson. Noah's ratings are presented first, followed by Will's ratings.

**Noah's ratings.** After every session, Noah was asked to rate his feelings about chatting with his grandfather on a 5-point scale. Across Pre-Baseline and Baseline, Noah consistently rated a 5 (most positive) on how he felt about chatting with his grandfather. In the Comparative Photo Phase (Intervention Phase I), his ratings across the three Photo Conditions dropped, with a mean rating of 4.4 for the Non-Familiar Photo Condition, a mean rating of 4.6 for the Child Photo Condition, and a mean rating of 4.5 for the Grandparent Photo Condition. His ratings increased to 5.0 across session in the Preferred Photo Phase (Intervention Phase II). The high ratings in the single condition phases may have reflected Noah's preference for sessions with only one condition rather than three conditions. This was echoed in his statement that he preferred having one longer session with many photos compared to several short sessions with a few photos per session.

Noah was also asked to rate how he felt about the photos for each 3-5min session. His mean ratings for the Non-Familiar Photo Condition was 4.5 at Pre-baseline Phase and 4.2 at Baseline Phase. During the Comparative Photo Phase (Intervention Phase I), Noah's average rating for the Non-familiar Photo Condition ( $m = 3.7$ ) was lower than his ratings for the Child

Photo Condition ( $m = 4.5$ ) and for the Grandparent Photo Condition ( $m = 4.6$ ). Across the three conditions, Noah gave a higher rating for the Grandparent Photo condition 2 out of 4 times, and a higher rating for the Child Photo Condition 2 out of 4 times. The ratings were tied for three out of seven sessions in this phase (Intervention Sessions 2, 3, and 5). Of these three times, Noah rated both Child and Grandparent Photo Condition higher than the Non-familiar Photo Condition. Together the ratings indicated a preference for the Child Photo Condition and the Grandparent Photo Condition relative to the Non-familiar Photo Condition. In the Preferred Photo Phase (Intervention Phase II), Noah's mean rating for the Child Photo Condition dropped to an average of 4.3.

Noah was also asked to rank the three photo conditions in order of preference after each session during the Comparative Photo Phase (Intervention Phase I). He ranked the Grandparent Photo Condition first 57% of the time, (4 out of 7 times) and ranked the Child Photo Condition first 43% of the time (3 out of 7 times). The Non-familiar Photo Condition was consistently ranked last except in Intervention Session 2 when it was ranked second.

**Will's ratings.** Similarly, Will was asked to rate his feelings about chatting with Noah after each session. His ratings for the Non-familiar Photo Condition were generally high in Pre-baseline Phase ( $m = 5.0$ ) and Baseline Phase ( $m = 4.7$ ). During the Comparative Photo Phase (Intervention Phase I), his ratings for chatting with his grandson were higher in the Child and Grandparent Photo Conditions ( $m = 5.0$  for both) than for the Non-familiar Photo Condition ( $m = 4.7$ ). His mean ratings for the Child Photo Condition in the Preferred Photo Phase (Intervention Phase II) was 4.7.

Will's feelings about the photo showed a more marked distinction between the three conditions. In Pre-baseline and Baseline Phases, his mean ratings were 5.0 and 3.7 respectively.

During the Comparative Photo Phase (Intervention Phase I), his average ratings for the Grandparent Photo Condition was the highest ( $m = 5.0$ ), followed by the Child Photo Condition ( $m = 4.7$ ), and the Non-familiar Photo Condition ( $m = 4.0$ ). During the Preferred Photo Phase (Intervention Phase II), his ratings for the Child Photo Condition remained consistent ( $m = 4.7$ ).

Will was also asked about his ease of initiating and maintaining conversation with Noah. His ratings in Pre-baseline was 5.0 for ease of initiating and 4.0 for ease of maintaining conversations with Noah. His ratings were similar for both in Baseline phases ( $m = 3.7$  for both). During the Comparative Photo Phase (Intervention Phase I), Will's ratings for ease of initiating were highest for the Grandparent Photo Condition ( $m = 4.7$ ), followed by the Non-familiar Photo Condition ( $m = 4.4$ ), and the Child Photo Condition ( $m = 4.3$ ). His ratings for ease of maintaining conversation with Noah was also highest in the Grandparent Photo Condition ( $m = 4.4$ ), followed by the Child Photo Condition ( $m = 4.3$ ), and the Non-familiar Photo Condition ( $m = 3.7$ ). His ratings may reflect his preference for the Grandparent Photo Condition above the other two conditions as explained next.

Will was asked to rank the photo conditions in order of preference. He ranked the Grandparent Photo Condition first 72% of the time (5 out of 7 times), and the Child Photo Condition first 29% of the time (2 out of 7 times). The Non-familiar Photo Condition was consistently ranked the last.

## **Dyad 2: Lucas and Beth**

Data were collected on Lucas and Beth's feelings about chatting with each other and their feelings about the photos. Both were asked to rank the photo conditions. Like Will, Beth was also asked additional questions about initiating and maintaining conversations with her grandson. Lucas' ratings are presented first, followed by Beth's ratings.

**Lucas' ratings.** Lucas was asked to indicate his feelings about chatting with his grandmother, and about his feelings about the photos with an adapted rating scale with two options (happy face and sad face) as suggested by his mother. Across all phases and conditions, he indicated a happy face for both chatting with Beth and for his feelings about the photos. He was asked to select one photo he preferred out of the three conditions. In the first two sessions, he indicated liking all three. Over the next four sessions, he selected a photo from each condition, with only one more photo from the Child condition than the others.

**Beth's ratings.** Beth's data for her feelings about chatting with Lucas were consistently at 5.0 across all phases and conditions. Her ratings for feelings about the photos were similarly consistent at 5.0 except for the Pre-Baseline session (4.0).

Like Will, Beth was asked to rate how easy she found it to initiate and maintain conversation with her grandson. Overall, Beth seemed to find it easier to initiate than to maintain conversation with her grandson. During the Pre-baseline condition, Beth's rating for ease of initiating conversation was higher than that of maintaining conversation ( $m = 4.0$  and  $2.0$  respectively). A similar pattern was observed for baseline, with a higher rating for initiating conversation ( $m = 4.8$ ) than maintaining conversation ( $m = 4.3$ ). During the Comparative Photo Phase (Intervention Phase I), Beth gave the Child Photo Condition the highest rating for ease of initiating conversation ( $m = 4.7$ ), followed by the Grandparent Photo Condition ( $m = 4.3$ ), and the Non-familiar Photo Condition ( $m = 4.0$ ). Her ratings for ease of maintaining conversation were highest for the Grandparent Photo Condition ( $m = 4.7$ ), followed by the Child Photo Condition ( $m = 4.5$ ), and the Non-familiar Photo Condition ( $m = 2.8$ ). Her ratings for both initiating and maintaining conversation were the same ( $m = 5.0$  for both) in the Preferred Photo Phase (Intervention Phase II).

Similar to Will, Beth preferred the Grandparent Photo Condition, ranking it first 83% of the time (6 out of 7 times), followed by the Child Photo Condition, ranking it 17% of the time (1 out of 7 times). Non-familiar Photo Condition was ranked last for all sessions.

### **Social Validity**

Both grandparents completed a social validity survey at the end of the study and were also asked about their thoughts about the study in the second interview. Both Will and Beth strongly agreed (rating of 5) that they enjoyed using photos to talk with their respective grandsons. Both grandparents reported high ratings for the Child Photo Condition and the Grandparent selected photo condition. They gave a rating of 5 with regards to (a) the ease, and (b) their enjoyment in using photos to talk with their grandchild in both conditions. In contrast, they had lower ratings for their ease and enjoyment in using non-familiar photos (Will gave a 3, and Beth gave a 4).

Beth reported finding it easy to find photos to share with her grandson (rating 5) whereas Will, as mentioned in his second interview, rated this as a 2 (somewhat disagree). In his second interview, Will had noted that he had found it difficult to find photos that weren't repetitive (e.g., photos of family cruises) and that he could tell age-appropriate stories about. Interestingly, while Beth indicated that she somewhat agreed she would use more photos in her future interactions with Lucas, Will neither agreed nor disagreed (rating of 3) that he would use more photos in his interactions with Noah in future. This was despite the fact that Will had indicated during his second interview that he was planning to show Noah a photo album of his great grandfather in the Air Force rescuing people when Mt. Torlis, an active stratovolcano, erupted:

“one of the pictures I should have brought down that I never did, was his Great-Grandpa Carl flew helicopters for the Air Force, and flew when Mt. Torlis blew up. He rescued

people and stuff. we have a photo album with lots of pictures of his helicopters and rescue and all that. So that's one that I plan on taking the time to sit down with Noah and go through them with him.” (Will, Interview 2)

Will felt that his grandson had the “best reaction” to and “was much more engaged’ with photos of himself (Child Photo Condition) and found the Non-familiar Photo Condition the most challenging to use because “the more non-familiar the subject matter there was a tendency for less engagement on my grandson’s part”. Beth had a similar answer, although she noted that she enjoyed talking about either photos of Lucas or when it included family members (i.e., Child photo condition and grandparent photo condition). Nonetheless, both grandparents indicated either on the survey or during the interview that although their grandsons were engaged in talking about the photos, they also appeared to be more fatigued toward the end of the study. As Will said of Noah, “he was starting to lose interest the last few sessions. His interest length on any subject can be real limited, except for his Pokémon and Minecraft. [laughs]” Noah himself said he would do the intervention again, but would prefer one round with many more photos as seen in his response when asked if he would do this study again: “Sure, why not? As long as they are not three rounds. ... [because] It took so long.”

### **Qualitative strand**

The qualitative strand of this study had two purposes. First, I wanted to examine how grandparents understand their relationship with their grandchild. Second, I wanted to elicit their perspectives on how an intentional structured photo activity supported or hindered their relationship. The findings for this strand are presented in two sections. The first focuses on how grandparents understand their relationship with their grandchild, and the factors that influence it. The second section examines the participants’ perspectives on how the photo activity influenced

the grandparent-grandchild relationship, as well as their thoughts about the usefulness of the activity itself.

### **A Learning Journey**

**Learning how to support the child.** Both grandparents talked about having to learn about the disability their grandchild had and, more specifically, how to support the grandchild. For instance, Will had no prior knowledge of what autism was. He described having to learn how to support Noah's behavior in a way that ran counter to his own intuition:

I default to more of a 'type A directive, give orders' personality. As a child, you either follow my direction and what I told you to do or there's going to be consequences. With Noah, I've had to learn to learn how to completely change my dynamics if I want to be successful in dealing with him. I'm not perfect at that, that's a struggle constantly for me.

(Will, Interview 1)

Nonetheless, he was motivated to learn and took on a "roll your sleeve up, let's figure out what we need to do, what this all really means and do it" attitude toward learning about the diagnoses Noah had and how he could support Noah.

For Will, this journey of learning was a continuous one. For example, prior to the interview, he had taken Noah on a fishing trip and had viewed Noah's signs of stress or his "fluttering" as indicators that he did not enjoy it. However, when asked what he enjoyed doing with his grandpa, Noah declared: "Fishing! I *love* fishing." This was a surprise to Will and he subsequently planned to bring Noah on another fishing trip:

"That was news to me ... that he loves it, is looking forward again. Because I kind of got the idea, "This is probably the last time we're going fishing." (Will, Interview 1)

In fact, Will articulated his personal goals around learning how to support Noah as such:

“I want to be able to say next year that I'm looking back and been more successful at dealing with Noah on a day to day basis this year than I was last year. I mean, I'm always trying to move forward” (Will, Interview 1)

In Beth's case, she had not known how to manage Lucas' behaviors in the beginning. Although she would willingly help care for Lucas, she had to overcome her anxiety about the possibility of making mistakes or having something negative happen:

I watched him like a hawk, because I was just afraid that something would happen.

Nothing ever did, but it would take me weeks to recuperate emotionally. But I never told the kids that. If they asked, I'd be there. I could do it. That was a challenge, and it made me very anxious when the full responsibility was on me, because I didn't know how to really manage all of his behaviors. (Beth, Interview 1)

In order to learn, she would observe the parents to see how they interacted with the child: “I would observe. I would watch what Logan would do. I would watch what Clara would do, in terms of how they interacted, and see if I could learn from them. What are things that work? What doesn't work?”

Like Will, Beth had to learn to change her style of interacting with Lucas, especially when Lucas spilt his milk deliberately, which was one of her pet peeves (spilt milk). As she acknowledged, “I'm a pretty intense personality, so there are times when I can feel myself getting frustrated. It's harder, then, not to raise my voice or say something in a hostile way. I'm not perfect. I'm not the grandma that's always just mellow and fine.” As such, she would have likely responded, “Lucas, that's really ... Why did you do that? It was so unnecessary.” That kind of, “I'm so disappointed.” Following Logan and Clara's model, however, she learnt to respond differently:

“what I've done is now work hard at just following what they do. I'll say, "Okay, Lucas, we need to clean this up. I'll take the iPad until it's done." He'll be mad, and whatever, and I'll get down and help him clean it, but he'll clean it. So I'm learning how to do those things in a more constructive way.” (Beth, Interview 1)

**Adjusting expectations and dreams.** They also had to learn to adjust their expectations and dreams and were cautious in discussing their hopes and dreams for their grandchildren. For example, Will acknowledged that “This (dream) is mine but it is his life.” Although he does not equate college with success, Will’s dream, especially for Noah, is for him to go to college and “to be successful doing something that makes a positive difference for a career. I just don't want him flipping hamburgers, his brain, he’s smarter than that.” Similarly, Beth’s hope for Lucas is that he become self-sufficient and that he has a “full life with activities and things in it that he enjoyed, and a social life, a life partner”. Nonetheless, when asked what her dream for her grandson was, she acknowledged that “it's hard, because what it would be [a fulfilled life] is my fantasy for him, which isn't fair, because he may have, and I hope has, different ideas for himself.” In other words, Will and Beth recognized that their hopes and dreams for their grandchildren were their own. Ultimately, they both wanted their grandsons to have some form of independence with a job and a life that they enjoy.

### **Grandparent Roles and How They Took Them On**

**Type of roles.** In relation to the child, both grandparents noted that they played a variety of roles including being the “fun” grandma (Beth), or the “buddy”, occasionally with “a disciplinary role” (Will). Additionally, Beth explicitly stated that one of her roles as a grandparent was to be the one to pass on histories of their family: “I see myself as the connector between their family line, from my side of the family. My parents, and my grandparents, and all

that. I see myself as being that through line that connects the family heritage and keeps that live for them” (Interview 1). Although Will did not mention being a family historian as one of his roles in the first interview, one outcome of the study was that he found value in sharing family stories through photos that could share the “family history, maintaining that historical line of stories.” Essentially, grandparents felt it was important as grandparents to be present in their grandchildren’s lives. This commitment to be present was encapsulated by Beth, who had up to a year ago lived several hours away from her grandchildren – “I made a promise to myself that we would come up to see the kids once a month. One weekend a month.”

In relation to the parents of the child with disability, both grandparents saw their position as one of supporting the parents. For example, now that Beth and her husband live geographically closer to the family she has more availability and is willing to help with the family however she can: “I see myself as kind of the go-to person. The one who can pick up the slack at any moment, day or night. If Logan and Clara, for some reason, in the middle of the night, had to go somewhere, they could call me. They know that I’m a very light sleeper, and I’d be there in 10 minutes.”

For Will, his idea of a family was a family unit, “you use the tools that are in your tool belt basically as a family and we function more as a family unit for us”. Hence, one of his roles was to “help mom and dad relieve some of that stress that’s normal in a home”, especially when Noah was escalated or had difficulties with self-regulation due to his changing medical needs. In fact, because he was retired – “I’m the only retired person in the immediate family dealing with this” – and always willing to help when needed, the parents (Emily and her husband) “get very concerned about constantly about overdoing it and asking me too much.” Will’s notion of the family as a bigger family unit was mirrored in Emily’s perception of the role of the grandparent,

which was “to support the parents in the means of offering advice, or thoughts on childcare, child raising. But also being almost like pseudo parents. Because you know, the saying that it takes a village to raise a kid? [...] So it’s not just the small family unit of parents and child, but it’s the whole big family unit.”

**Reversal of roles.** One notable aspect when discussing grandparent roles was how there was a reversal of roles in terms of authority and knowledge, when it came to the child with disability. In both families, the parents were the ones who had knowledge about raising the particular child. Both grandparents noted that the parents were their main resource when it came to the knowledge and authority on caring for the child. For instance, Will commented that “truthfully, when it comes to Noah, I find the roles, for the most part, reversed, where I find myself looking for information from Emily, or asking her, or saying I had a particular situation with how Noah responded to something”. In contrast, he has more of “a normal from top-down” relationship with the parents of his other grandchildren (his other daughter and son-in-law). This role reversal was echoed in Emily’s statement of her relationship with her father:

“my dad respects us as Noah’s parents pretty well. And also because of Noah’s special needs, my dad often is kind of like, “I don’t really know what to do in this situation”. So he often refers to us and will say, “what do you want me to do?” He raised two girls who were pretty mellow and independent and did their own thing. So compared to this, he’s like, “I have no idea what to do.” So yeah, he generally will refer to us, like “what do you want me to do.”

In Beth’s case, Clara summarized the situation as such: “as Lucas’s issues became more and more pronounced, No one knew what to do. So I think there was a lot like, “tell me what to do and I’ll do it”, from her [Beth].” Beth, in her interview, explained that from the time Lucas was

around two years old, Clara and Logan would talk to them about meeting with doctors to understand what was happening with Lucas. As she said, ““That began the dialogue that still goes on today, in terms of them explaining to us what's going on, and us helping where we can.” Instead of being in a position of authority on child-raising, she described her initial experience as: “I was really flying blind ... I felt like a newbie, I felt like a new mom instead of a seasoned grandmother.” As such, she would follow the parents’ lead on how to support Lucas: “I really watched their lead ... I would just watch how she [Clara] handled things so that I would mimic when she wasn't there, I'd try to do the same.”

**Shaped by personal experiences.** The grandparenting styles of both grandparents were influenced by their past experiences in different ways. For Will, coming from a dysfunctional home environment, he was determined to turn a negative from his past into a positive for his future generations. As he mentioned,

“rather than continue the dysfunctional into a next generation, I reversed it, and used it in a positive thing. That's exactly how I looked at it. As a young, new husband, from the very beginning, that's exactly how I remember thinking and trying to do as a husband, and a dad, and a grandpa. I remember how dysfunctional things were here, and I'm going to do the opposite here.”

He acknowledged that it was not always easy, “It's hard sometimes. Sometimes it's just kind of really instilled in you. You grew up in it. That's what you ... you consciously think about it all the time.” Nonetheless, he was determined that how he treated his wife, his children, and grandchildren would be different from the environment he grew up in.

Beth had a more positive experience with her grandmother and took on values that she learned from her such as, “the way to just be connected with your grandchildren. To think that

everything that they said or did was so special, and so amazing. To just really be non-judgmental, and just love them. I learned a lot from her in that way.” This perspective of viewing the grandchild as special and to love them without judgement was evident in how Beth viewed the time spent with Lucas during the photo intervention, where the main reason she enjoyed the sessions was seeing that *he* enjoyed them:

“I just like seeing him when he's happy, so he'd look at some photos, and whatever the reason, those photos made him beam and laugh, and he jokes about it and stuff. So anything that makes him happy, I like it.”

### **The Grandparent-Grandchild Relationship**

**Family 1: “their kind of thing.”** Noah had a very close relationship with his grandfather. His mother explained that when Noah was born, “[Will] was like the first person to really hold him. And I kind of think that they just have that instantaneous bond.” She described how Noah, as a young child, would follow her dad around as he did chores around the house:

“my dad would go outside to mow the lawn, and Noah was always following him around in his little rubber boots. My dad would... be mowing the lawn on his riding lawn mower, and Noah would just be sitting on his lap, drinking his soda, my dad’s soda. And that was just kind of their thing. Or my dad would run into town into the hardware store and Noah would go with him. And they would stop for ice cream. Like it was a true like grandpa-grandson relationship, and they just always had that.”

Noah himself, when asked what he enjoyed doing with his grandpa, listed in order of preference, “fishing, MacDonald’s, and then jobs.” Fishing referred to the recent trip he took with his grandpa. As mentioned earlier, Will had been surprised that he enjoyed it that much, and said, “I suspect it's really more that he loves spending time with me [fishing trip], and that's one

place we get it at. My guess is that's probably more what that's about. Noah doesn't share his feelings with people easily.”

Will and Noah also have a “thing” which is to go to MacDonald’s to eat apple pie, as Emily explained, “when Noah has a half day at school, my dad will go pick him up from school. And their thing is to go to MacDonald’s and get their apple pies at MacDonald’s.” Will explained it this way: Noah’s parents do not enjoy MacDonald’s but Will does – “I love MacDonald’s. He loves MacDonald’s. So that’s, when he gets to go to MacDonald’s, it’s a special time”.

Noah also enjoyed doing “jobs” with his grandpa, which include working on jobs around the house such as painting, working on the fence, learning to mow the lawn, etc. He took pride in the fact that “I actually helped paint a mobile home” belonging to his great grandparents. Noah’s relationship with his grandpa can be summed in his wry statement about his family, “My family is probably a little bit lame, except for him [points to grandpa]” (Noah, Interview 1).

The closeness between Noah and Will is also evident in Will’s desire to be a mentor to Noah as he matures:

“I want to be the grandpa that Noah needs to go to when he's got a question or something is bugging him or he can't figure something out. I want to be that mentor for him... it could be something for some reason he's not asking mom or dad but he's comfortable coming to me.” (Will, Interview 1)

**Family 2: Snuggling on the Couch.** The closeness of Beth and Lucas’ relationship was demonstrated in a different way. In the one year that Beth had moved to be closer to Lucas’ family, she had started to watch Lucas for a few hours when school ended early once a week until Clara reaches home. During this time, Beth usually sits beside him on the couch while he

watches the TV or plays a video game. As Beth explained, “he's aware that I'm there, and he likes it. He's content. ... if I go to move away, he'll, "Grandma. Mama." He puts his arm out and he pats the couch to tell me to sit here” (Beth, Interview 1) In fact, Clara described the usual scene when she reaches home as follows, “they’re always seated right next to each other on a couch, like pushed up next to each other” (Clara, Interview 1). She explains, “the reason Beth has gotten to that point where they can snuggle on the couch like that in a low-stress way, is because she’s there every week, alone with him” (Clara, Interview 1).

Although Lucas was not interviewed in this study, his affection for his grandma was demonstrated in his behavior when Beth broke her leg and a babysitter came over for five weeks: “Lucas would just go upstairs to his room. He wouldn't interact. When I came back, he was very happy to see me, and sat on the couch, ... I think he counts on that, and he missed it” (Beth, Interview 1).

Her love for her Lucas was also demonstrated in an incident with photo albums when Lucas was about 6 years old. The whole family, together with Beth and Mark, had been looking through old family albums when “suddenly, Lucas goes running from the room and throws himself on his bed, crying.” When asked what was the matter, Lucas’ response was “No me”, indicating that he had not seen himself represented in the pictures of his family. That evening, Beth went home and created “an album of "me", an album of Lucas”. She recounted,

“I'm not particularly creative, but I got a picture of Lucas, ... all different pictures of him from the time he was an infant until whatever age he was now. And he had a whole book. I mailed it to him overnight. Mark (Beth’s husband) thought I was crazy, but ... Then he had it. He loved it. He carried it around with him, which made me very happy. ... it was that awareness that he didn't see himself in the family, and that it hurt his feelings. And so

it was very important to me that I made sure that he knew that there were pictures of him.”

Beth’s relationship with her grandson can be illustrated in her statement, “when Lucas's snuggling next to me, it's like, "It doesn't get any better than that." It really doesn't.” This corroborated with Clara’s statement of how she saw the grandparents’ role in the grandchild’s life: “I think grandparents’ role is just abundantly loving unconditionally ... their role is to be way less intentional [than parents]. You know, way less like working on things and goal oriented. Just more unconditional love and presence. And that’s what I think our grandparents have done.”

### **Grandparent-Parent Relationship**

In both families, parents and grandparents described their relationship with each other as close, illustrated in various ways. As Emily’s father, Will had always been involved in her life and had maintained an open communication from the beginning – “We talk about pretty much anything and everything”. On the other hand, Beth was Clara’s mother-in-law and they had developed a close and loving relationship through being very open in their communication with each other as well as with Logan, Beth’s son. Below I describe how the two parent-grandparent relationships were described in this study as they pertain to supporting the grandchild.

**Family 1: Involved and close.** Emily’s dad had always been “very involved in my life” (Emily, Interview 1), so the relationship between Will and Emily was close from the start: “My dad and I are very close. We talk, probably almost every day” (Emily, Interview 1). This closeness was also extended to Emily’s husband, Dylan. When asked about his relationship with his son-in-law, Will said, “Dylan, he's like a son to me”.

The closeness between the parents and grandparents was demonstrated through the extent of comfort Emily and her husband, Dylan, felt in reaching out to Will and Charlotte for any kind of support: “We always reach out for help whether it’s ‘hey, I need help financially this month’, or ‘we need help with this project at the house’. Anything really.” (Emily, Interview 1). Specific to Emily, she noted that the support her parents provided were not just with the support needs for her nuclear family, but also with just being a parent to her as their daughter: “they’re good about supporting with whatever needs. And ... being my parents still, whenever I need that structure, or that relationship.”

Will, on his part, echoed the comfort level of their relational dynamics: “They actually will reach out to us sometimes and say, ‘if you don’t mind, can he just stay tonight at your house? Those kinds of things” (Will, Interview 1). Will’s support for Emily and Dylan was also illustrated in his willingness to respect their roles as parents, while being available whenever needed to “help mom and dad relieve some of that stress that’s normal in a home” (Will, Interview 1).

**Family 2: Communication and respecting boundaries.** The relationship between Beth and Lucas’ parents, Logan and Clara, was one of love, respect, admiration, and open communication. As the grandparent, Beth’s support of Logan and Clara was demonstrated in her confidence in their parenting competence and judgement, “I know that Logan and Clara explore and investigate all kinds of things, so I trust them that if they feel confident, that they’re willing to try this, then I’m very supportive of them.” When asked to describe her relationship with them, she said, “[it is] Very close. Very loving and respectful. I admire them, and they know it. They feel comfortable telling me to back off a bit, like I’m hovering a little.” (“Hovering” referred to

instances when she asked “too many questions in what they're feeling is more personal to their relationship”.)

Although Beth and Clara had different personalities and ways of interacting, they were able to reach the point in their relationship where they trusted and respected each other. Beth was candid about her personality being “intense” and having to learn to respect boundaries of the nuclear family. She explained,

“Logan and I would have occasional conversations where he said, "Clara is not a planner." I'm a planner three years in advance. So to learn how to accommodate and adjust to that ... I learned how, with his guidance, to back off and let Clara come to me.”

For example, Beth had recently wanted to go to the movies with Lucas' family. When Lucas' family decided they wanted to go as a nuclear family, she described her response as such:

“my initial response is, "Oh, I'm sad," but my second response, and the one that I texted back to him, is, "Not a problem. Go. Have a great time. I totally understand.”

As she explained, “They have a right to be as a family. I can't be included in everything. And so that's where the boundary and recognizing that is. That's an example of Logan setting something and saying, "We're going to do this as a family," and me needing to learn how to accept that”.

Clara recognized Beth's efforts to respect the family's boundaries while giving her time and energy to loving Lucas and the family as they are. While Clara joked about “having to control her [Beth] on her boundless love. [laughs]”, she also acknowledged, “But I think our kids are really lucky to have that.” In fact, her hope was that Beth and her husband would “continue to be a source of unwavering love. ... loving him for who he is, without wishing he was someone else, or different, or better. Continuing to emanate pride about him and being impressed by him. I

mean, I think if they do that for the rest of their lives, he'll be a really lucky kid for having had that."

Clara also explained why Beth's support for Lucas was so important to her as a mother:

"My love [for Lucas] has never been wavering. But when my confidence in my ability to manage him, or my confidence in my ability to do this for a long, long time, or whatever...

When they're [Beth and Mark] so unconditionally loving it's helpful. I think that's like, if they can love them, I can keep loving him and keep doing this."

Clara's statement indicated that the unconditional love that Beth and Mark gave to Lucas (and Michael their other son) was a form of emotional and motivational support for her to keep going when her parenting self-confidence wavered or when she felt overwhelmed by the long-term possibilities and struggles.

More specifically, Beth's admiration and respect for Clara was a support the latter appreciated. In describing her relationship with Beth, Clara said, "I feel very lucky in the mother-in-law department. Because I feel that she values me and she trusts me. But mainly she just does a really great job of making me feel like she thinks I'm a good mom." When asked how Beth made her feel valued as a mother, Clara explained, "She's always complimenting, she's not second-guessing or criticizing, ever. Never. And she's always pointing out things that I do that are great, that she would have never done as a parent. She's just very complimentary towards me, which goes a long way. [laughs]"

### **Making Meaning of the Photo Intervention Sessions**

Both families were asked about their perceptions on the photo intervention sessions and what made it meaningful for them. In both families, grandparents reported that having time set aside to spend with the child and being able to tell (or create) stories to share with the child

helped strengthen the connection between the grandparent and grandchild. Both grandparents also discussed some goals they had for their future interactions with their grandchild as a result of the photo intervention sessions.

**Time with the child.** One of the factors that made the photo intervention sessions meaningful was not just the content of the photos, but that the sessions involved having to intentionally set aside time to spend with their grandchild. To Will, being able to spend time with his grandson in this manner was important “because we get so busy in our lives that we're rushing here and rushing there”. In fact, during the study and toward the end of the study, Will's family had been involved in a wedding, and were about to have a big family event right after completion of the study, with about 50 extended family members and friends coming from out of town. Having the photo intervention sessions “made me slow down a little bit and spend quality time talking with him.” (Will, Interview 2)

For Beth, the time taken for the photo intervention allowed her to be with Lucas more than her usual once a week. “I think it gave us a chance to be together, just us, and not anybody else.” Beth also appreciated not only the additional time with Lucas, but that the family was welcoming of her additional presence in their home – “It was nice to see him twice a week and have that be okay with the family and stuff, just showing up and not sending me out.” (Beth, Interview 2). The importance of allowing time for the grandparent and grandchild together was echoed in Clara's suggestion that one way to build the grandparent-grandchild relationship was to “allow them alone time together” because “I think Beth is much more comfortable and uninhibited when she's able to be with Lucas alone, or without us [parents].”

**A different kind of activity.** The grandparents also saw the photo intervention sessions as a different kind of activity through which they could interact with their grandchild. Although

both Will and Beth have activities that they engage in with their respective grandchildren, this specific activity had different meanings for each family.

Noah's usual activities with his grandpa include doing chores and helping with work around the house or doing fun activities such as movies or getting food. As Emily explained, "I think it helped him to bond a little bit more, over something different, other than chores and yard work and watching a movie" (Emily, Interview 2). Will elaborated on this further:

"He was very interested in doing this [study] when his mom approached us with this idea to participate in this thing. He was *very* excited. ... He's been telling people this whole time that we run into ... "My grandpa and I are involved in a study right now. We're having lots of fun."

The photo intervention provided a platform for Noah and Will to interact over photos, something Noah himself enjoyed, as well as learn about family history, which both of them enjoyed. Additionally, this was a special activity that was specific to him and his grandpa. Emily explained, "I think he found it special, because his two cousins weren't involved in this. It was just Noah and grandpa. Then afterwards, often, they would go out and get a special treat or something" (Emily, Interview 2).

Beth, on the other hand, saw the photo intervention sessions as a means to more actively engage with Lucas compared to the other activities they usually engage in (e.g., sitting on the couch together, but each doing their own thing): "I loved doing it, I loved ... having something that we were both sharing that was important and that we were both engaged in and that he was cooperative with." Being able to share and talk about the photos was a way for her to learn more about her grandson in a way that was accessible to both of them:

“I just enjoyed having that chance to sit with him and look at the pictures and make up funny stories or see what he thinks is funny. It's just another way of getting to know him without really asking or delving into questions that he can't answer. With a nonverbal child, I feel like I do so much imagining or guessing, and who knows if I'm correct but it was fun to be with him and watch him try and communicate and be willing to point out things (Beth, Interview 2)

Additionally, she viewed the photo intervention as a means “for him [Lucas] to just see me not as taking care of him, not as babysitting him, but that we were just hanging out together. And there aren't very many times when you just come over and hangout, because a lot of times he hangs out with his iPad and stuff” (Beth, Interview 2). In other words, the photo intervention sessions provided a means for Beth to spend time with Lucas in activity that required active engagement from both of them, where they “were actually doing something together” (Beth, Interview 2).

**Telling stories through the photos.** The content of the photos was another key factor contributing to the meaningfulness of the photo intervention sessions. In both families, the photos (especially those of the child or family members) allowed the grandparents the opportunity to share stories about the past.

For Will, the photos, particularly those in the grandparent photo condition, were a way for him to share with Noah about their family history. As Will explained,

“during the study I was struggling with so many photos of on the cruises, cruises, cruises, because that's a big thing in our family life. But at some point, I wanted to break out of that pattern and go into more personal family historical stories that would interest him more.” (Will, Interview 2)

Although the photos Will chose to share did not always elicit the kind of interest he was hoping from Noah (expressed through questions), the few memorable photos that Noah had enjoyed were mostly from the grandparent photo condition—namely “the long-haired hippie one” (Noah, Interview 2) of the back of his grandma with waist-long hair, or the photo of his Grandpa Carl receiving a Silver Star for his military endeavors. He also enjoyed the photo of his mom at her piano recital with what Noah called “pink elf ears” (which was actually a pink bow), and one of him with his science project (in the child photo condition) which he was very proud of. As Will explained, having photos from the past of the family allowed them to share in something personal – “you can study about the Civil War, Revolutionary War all you want, but if there's family history connected to something, then it's more personal. You connect even more to it.” For Will, the sharing photos from the past was a way to maintain the important connection to their family history:

“Family history, maintaining that historical line of stories. If we have a photo that there's an actual story behind it, whether it be a humorous story or a sad story or, you know, just maintaining that history.”

As for Beth, she viewed the photos of Lucas as a child (from the Grandparent Photo Condition) and the recent photos (from the Child Photo Condition) as a way “maybe for him, to self-identify and go, “Oh, I recognize that's me,” and the concept of self, him as a self. ... going from somebody little to somebody big, I think is kind of fascinating to him” (Beth, Interview 2). She also enjoyed being able to reminisce about old memories that were important to her. For example, she talked about a photo of Lucas at age one or two on holiday with her parents:

“It was the first time he really had gotten to be with my parents, so his great grandparents. And to be able to tell him and show him, “This is your great grandpa, this

is your great grandma”. He was interested for a nanosecond but he was fascinated with him, how he looked too, so those were fun. Those are always fun to reminisce about.”

When asked why the photos was important to her, she explained, “because then I could tell him stories about his great grandfather, that he would never know, and not that he's going to remember but it made me feel good. [laughs]” This tied in with her perception of herself as a connector through the generations in the family.

### **Outcomes of the Photo Interaction Intervention**

Both families talked about some outcomes of the photo interaction intervention, including strengthening an already close bond with their grandchild and a plan for future interactions with their grandchild.

**A stronger bond.** One of the purposes of the photo interaction intervention was to strengthen the bond between the grandparent and grandchild. In both families, the grandparents affirmed that they had grown closer to their grandchild. For Will, although he and Noah were close in the first place, he mused, “I think we've gotten closer. It's helped us get closer, even closer.” In fact, Emily’s observation was that,

“Noah was able to value and appreciate grandpa a little bit more because of pictures that he brought up, maybe from his past or something. So Noah was able to understand like, "Grandpa used to be young. Grandpa used to be like me," instead of just the here and now. I think he was able to not only understand grandpa more, but relate to him better, whether it's through conversation or a story or something like that.” (Emily, Interview 2)

With Beth, she felt the photo interaction intervention “gave us a chance to be together, just us, and not anybody else. Whether or not that makes any kind of impact on him, it made an impact on me, and I liked it” (Beth, Interview 2). Furthermore, it provided an opportunity for Beth to

“see how I could connect with Lucas in a way that was different than babysitting him or caretaking him, but was actually something that it was more like a task ... where we were doing a project together”

**Planning the next steps.** Another outcome of the photo intervention was the grandparents’ plans for their future interactions with their respective grandchildren. For Will, the photos were a launching pad for two projects. One was to connect Noah with his great grandpa, Grandpa Carl, whom Noah admired greatly because of the Silver Star. Although Grandpa Carl lives across the street from Noah, he had been hesitant in his interactions with him because “he's afraid of "making a mistake" and having Noah go off [display challenging behavior] on him” (Will, Interview 2). Will’s hope is to find a time for both Noah and Grandpa Carl to look at photos together, either of his time in the Air Force, or of the professional photos Grandpa Carl has taken of flowers. As he explained, “I've tried to explain to my father-in-law how to deal with it [Noah’s behaviors] and try to avoid it. And I don't like seeing that relationship challenge. I want them to be able to function together” (Will Interview 2).

Will’s second project is to prepare Noah for the family history project that his school hosts each year for seventh graders, which is a “huge deal” (Interview 2). He sees the photos as a starting point to be able to share with Noah about his family history and to prepare him for the family history project to come:

“that's going to happen just in a few years, and it's either going to be probably me or my father-in-law that he will choose to do that with, because we'll have trinkets and emblems and things that he can display in his project, so I want to start thinking about that, so in a few years he's got an idea of what he wants to do.”

For Beth, the photo intervention had led her to be more aware of how she interacts with him, specifically with regards to the types of questions she asks him and the answers she is trying to elicit. For example, she explained,

“I think I am more aware of asking him questions, like identifying something. Like, what is that? Who is that? What's happening? And then being quiet and giving him a chance to answer. Otherwise, no, I think that I'm just more aware that sometimes it seems as though he isn't listening but then if I stop talking long enough, he'll say something, like he'll respond to something. I think if he's going to respond, at all, I have been aware of working on pacing my questions so I don't just bombard him.”

Specifically for herself, she wanted to be able to engage in deeper conversations with Lucas and reduce the number of straight forward questions with Yes/No answers. As she explained, “it's that kind of [open-ended] questions I'm trying to remember to do with him more. It's easy to get into the yes, no questions but that doesn't engage in conversation very much, so I'm trying to expand that.”

### **Chapter Five: Discussion**

In the results chapter, I presented the analysis from the quantitative, single case design strand and the themes arising from the qualitative semi-structured interviews about the grandparent-grandchild relationship and themes around the photo intervention and its outcomes. In this section, I discuss the findings from the different strands and highlight ways in which these findings can be understood together. This chapter will conclude with a discussion of the limitations of the study and implications for future research and practice.

The two overarching research questions of this study were: (a) to examine the immediate and proximal effects of a photo interaction intervention on the social interaction between a grandparent and grandchild with disabilities, and (b) to examine how grandparents perceive their relationship with their grandchildren and the factors that influenced that relationship. These two overarching questions were answered through two method strands: (i) a quantitative strand using a single subject, alternating treatments design, and (ii) a qualitative strand using semi-structured interviews before and after the photo interaction intervention. The quantitative strand addressed the first overarching question in examining the observable behavioral outcomes of the photo intervention – the social interactions of both child and grandparent. More specifically, the research questions in this strand asked to what extent three different photo conditions yielded differential effects on the social interaction between a child with disabilities and the grandparent (R1 & R2). The data from the qualitative strand (the interviews pre- and post-intervention) were used to address both the overarching questions in two ways. First, much of the initial interviews were aimed at understanding how grandparents perceived their relationship with the grandchild and what factors influenced their interactions with the child (R4). Second, the post-intervention interviews also provided a richer source of data around the grandparents, parents, and child's

thoughts on the social validity of the intervention (R3), as well as how it influenced the grandparent-grandchild relationship (R5).

### **Recalling the Purpose for Mixing Methods: Complementarity**

The primary purpose for mixing methods in this study was that of complementarity – examining different facets or dimensions of the same complex phenomenon” (Greene, 2007, p. 101). In this study, the main phenomenon of interest was the relationship between the grandparent and grandchild, with the quantitative strand examining the specific grandparent-grandchild social interactions and the qualitative interviews examining how the family members perceived their family dynamics and context and existing interactions with one another, which then influenced the grandparent-grandchild relationship. These different methods allowed an examination of the different dimensions to the grandparent-grandchild relationship. The findings from the qualitative interviews and the single case design had convergence in that the grandparents in this study had a generally positive relationship with their grandchild as demonstrated behaviorally in the quantitative observations (high level of positive social interactions) as well as the statements made by participants in the interviews. Greene (2007) noted that the pattern of results could range from convergence to divergence when the mixing of methods was intended to be complementary. This was true in the present study, with divergence in the data around preference for photo conditions, and convergence around the benefit of the photo interaction study and a fatigue effect of the multiple conditions and sessions. There were two ways in which the interpretation of the findings benefitted from the mixed methods nature of the study: (a) addressing discrepancies between the findings from each strand and, (b) understanding the meaningfulness of the intervention beyond what is usually reported in a social validity measure.

### **Addressing Discrepancies**

One notable way the use of two methods contributed to the interpretation of the findings was around the preference for the types of photo conditions. Although the findings from the quantitative strand indicated that the child photo condition elicited slightly higher positive social interaction behaviors compared to the other two conditions, it did not mean that the child necessarily preferred the child photo condition. In fact, Noah declared that his favorite photos were the ones of “family history” – in other words, he preferred the photos from the grandparent photo condition. This was supported by my fieldnotes written after some of the sessions, in which I had observed Noah intently listen to his grandfather tell stories of Noah’s mom as a child, of his grandmother as a “long-haired hippie” (Noah, Interview 2), or of his Great Grandpa Carl receiving the Silver Star. However, this interest was not detected in the codes for positive social interaction behaviors (eye contact, smile, social communication/talk, affection). Instead, Noah’s posture was often one of looking at the photo or looking across the room while listening to his grandpa talk about the stories in the photos. This discrepancy in the results from each strand indicate that while each strand offers insight into the preference of the child, it is possible that together, they provide a fuller understanding, not only around photo condition preferences, but also the recognition that each method can be limited in how a phenomenon is measured and/or understood.

### **Meaningfulness of Photo Intervention: Beyond Social Validity**

Social validity measures are often viewed in single case designs as a means of understanding how feasible and acceptable the participants found the intervention. In this study, the social validity data indicated that both grandparents enjoyed using the photos from the child photo condition and the grandparent photo condition. However, Beth indicated she might use

photos; while Will was neutral about the use of photos. This was in contrast to their comments in the interview, in which Will noted that he was intending to have Noah look at photos of Great Grandpa Carl *with* Great Grandpa Carl as a way of facilitating *their* interactions with each other. It is possible that Will did not view the activity of sitting Noah with Great Grandpa Carl as the same kind of activity as the photo interaction procedure, since he had wanted to use a photo album rather than single photos. Nonetheless, the themes that emerged from the second interview suggested that both grandparents had found the photo interaction session to be a positive and meaningful experience that provided a means to strengthen the grandparent-grandchild relationship. The finding that the photo interaction section had been a meaningful experience that strengthened the grandparent-grandchild relationship parallels Wright and colleagues' (2011) findings that grandparents of children with ASD in a technology workshop saw the technology as a "communication bridge" to develop their social engagement (Wright et al., 2012) In other words, the structured photo interaction activity in the present study served as a shared activity of interest, or talking points for grandparent and grandchild to engage in.

Although parents were not asked to complete the survey, Emily had mentioned in her second interview, "I liked that it was an opportunity for a grandparent to participate in a study rather than... It's always the parents that have to take them everywhere and do everything and fill out forms." This comment spoke to the importance of including grandparents as part of research efforts around supports for children with disabilities. Much of research focuses on the parental subsystems and focus to a lesser extent on the other subsystems in the family, such as the extended family subsystem which can impact the adaptation and cohesiveness of the family. Recalling the assumption of wholeness in family systems theory (Turnbull & Turnbull, 1997), supports for the child within the family context needs to include not only perspectives of the

parental subsystem, but also other subsystems that frame the child's interactions with their environment.

The close grandparent-parent relationships observed in this study support earlier research findings that pre-existing relationships is a key factor in the extent of grandparents' involvement in their grandchild's life. The two families in this study had strong relationships between the parent and grandparent regardless of whether they were in-laws. The close parent and grandparent family ties can facilitate increased and deeper interactions between the grandparent and child. Situating this within family systems theory, the results suggest that the *input* from the positive interactions between parent and grandparent had lead to *output* such as time with the grandchild, trust from the parents and increased ability to support and engage with the grandchild (Turnbull & Turnbull, 1997).

### **Limitations of the Study**

One limitation of this study was the lack of cultural diversity represented in this study. Both families identified as being from the dominant white American ethnic background. It is possible that their perceptions of how grandparents should interact with their grandchild, and of the grandparent's role in the nuclear family unit may be more like each other than with grandparents from other cultures with different values and understandings of the grandparent role. For instance, both grandparents noted the importance of maintaining parenting boundaries in that they were navigating the balance between respecting the parent's authority as the parent, and wanting to provide sufficient amount of support to the child and family. Grandparents from a culture that highlights the authority of the grandparent may see parenting boundaries as a less important aspect compared to the expectation that grandparents are highly involved in the child and family's lives.

Additionally, the study participants had self-selected to be in the study and were likely to be highly motivated in their interactions with their grandchild. This was seen as a strength in that it provided positive examples of what the social interaction between a grandchild and grandparent could look like. The data from the two families also provided insight into the factors that influence and support positive relationships between the grandparent and grandchild. However, grandparents with limited interactions with their grandchild with disabilities may have very different reasons for not interacting with their grandchild, such as not knowing how to interact with the child, being afraid to trigger challenging behaviors, having limited time and ability to interact with the child, and so on. Additionally, there were only two families in this study. Hence, the findings in this study are not generalizable to all grandparents, nor was the purpose of this study to generalize findings. Rather, the findings provide insight into the ways in which grandparent-grandchild relationships can be supported, either through relationships with the parents, or through a structured photo interaction activity.

Another limitation of the study was the lack of a clear separation of data points in the single subject design. Since the photos that grandparents chose to share included older photos of the child, it is possible that there was too much of an overlap in the features of the grandparent photo condition and the child photo condition, which was of recent photos of the child. Additionally, the photos were not controlled for the number of persons in the photo (e.g., photo of one person vs. a large group photo), and for the angle at which photos were taken (e.g., close up photos vs. photos from a distance). Future studies examining the influence of specific types of photos may wish to control for the features of the photos themselves.

It was possible that there was a fatigue effect on both child and grandparent during the photo interaction intervention due to the many sessions involved in the intervention phase (3

sessions of 3 photos per session) and the number of days of the study (at least 10 or 11 days in total). Toward the end of the study, both grandparents indicated that they felt their grandchild was getting tired and were less engaged than they had been in the middle of the study. In fact, Noah himself articulated a preference for a longer session with more photos within a day – “one round with more photos” (Noah, Interview 2) – to several short sessions with fewer photos in a day.

Interestingly, during the photo interaction intervention phase (with all three photo conditions), Lucas’ behaviors during the photo interaction intervention phase showed an increase in percentage of intervals with positive behaviors and decreased in percentage of negative behaviors across the three sessions. In other words, of the three conditions presented in one day of the intervention phase, the first condition presented had more challenging behaviors compared to the last condition for two out of six days in intervention phase, and the last condition had higher percentage of positive social interactions than the first in four out of six days in intervention phase. Although the order of the conditions was randomized, and the difference in percent of positive behaviors from one condition to the next condition could be as small as a 3 percent point, it is necessary to acknowledge that Lucas’ difficulty with transitions (transitioning to the photo interaction sessions from whatever he was engaged in prior to the session) could have influenced his behaviors in the first session. As Beth noted in her second interview, “there were the times when in the beginning it was hard to get him to settle down for that first set but then he got into it.”

Beth herself indicated in the second interview that she herself experienced fatigue during the intervention phase with three conditions. As she explained,

“I think it was harder for me [when there were three conditions], because my stress level was probably higher as we went along and wanting him to be more engaged, less combative. I think it was more me than him that was feeling the fatigue level on the third [condition]. I think that was totally me and I think I was more prepared in the beginning for him to be combative and then had more patience to engage that and be tolerant of it till we got to the next one” (Beth, Interview 2)

These findings point to a need to consider the appropriate balance between the number of photos used, amount of time spent, number of times this activity was carried out, and the capacity of the child and grandparent engaged in the activity.

### **Implications for Practice**

The findings from this study suggest some implications for practitioners. First, the involvement of grandparents in this study indicate that grandparents of children with disability can be invested in their grandchildren and the family. Grandparents serve as an individual separate from their parents who can provide love and care to the child. The fact that both grandparents had mentioned needing and wanting to learn about the disability and how to support their grandchild suggests that there is a gap that practitioners can fill. Grandparents may need to learn specific strategies to support and interact with their grandchild. This can be accomplished in a few ways. First, through directly teaching grandparents specific strategies they can use to interact with the child (e.g., ways to get child to request for items, types of questions to elicit different types of responses from the child in a shared activity). Second, if practitioners are not likely to meet the grandparents, making the information sharable could make it easier for parents to share information or strategies with the grandparent. This could come in the form of a short pamphlet of ways to interact with the child, or a video demonstrating specific strategies.

Second, it would be helpful for practitioners to ask parents (primary caregivers) about other family members who are involved and whether they are ways that parents would like to involve them in the classroom or in intervention settings. This allows practitioners to avoid making assumptions while tapping on the grandparents if they are already involved in the child's life. Practitioners' interactions with family members occur at the mesosystems level of the ecological framework (Bronfenbrenner, 1977) and contribute to the environment that can frame a grandparent's interactions with the child. Viewing grandparents as a source of strength for the child and family can enhance the potential for maximizing the support a child receives, not just from practitioners but also from the informal supports available such as grandparents.

Third, as observed in this study, photos can be a valuable means to elicit communication. Including photos in home-school communication or inviting families to share photos from home can open communication between the home and school. Not only do photos represent a part of the sharer's lives, it is a way to preserve a memory that can be shared again at a later time. The positive findings in this study around the use of photos about the child and grandparents or family members suggest that photos can be used not only as visual supports for communicative purposes as observed in previous studies (e.g., Murdock & Hobbs, 2011) but also for developing stronger relationships between the child and grandparents. In fact, although this study did not employ photovoice methodology, Wang and Burris's (1997) purpose of "identifying, representing, and enhancing community" appear relevant to the outcomes of this study. First, grandparents had to identify specific photos that represented stories they wanted to share with the child. In addition, they each ended up with next steps for their future interactions with their grandchild, one of whom was around the specific use of more photos from the past.

### **Implications for Future Research**

This study has implications for future research. First, it would be important for future studies to examine the ways in which a family's culture(s) could influence expectations and practices around the roles of grandparents in the family, perceptions of disability, and how these influence the involvement that grandparents have in the lives of children with disabilities and their families.

Second, future studies examining the involvement and needs of grandparents should prioritize the voices of the grandparents themselves beyond just parent perspectives of how they view the grandparents' roles. As an understudied population in research, grandparents offer insight into the multiple positions they see themselves in relation to the child with disability, the parents and siblings of the child with disabilities, as well as other family members (extended family) across the generations.

Third, the findings from this study has methodological implications for research. Although each method strand produced qualitative and quantitative results that could be understood individually, it was in using both method strands to interpret the data that a fuller and deeper understanding of the grandparent-grandchild relationship and the implications of the photo intervention was gained. The findings from this study suggests that a mixed methods approach can be useful when research aims to explore a phenomenon beyond the outcomes a specific intervention, as was the case in this study.

Finally, this study is one of very few studies that offer a platform for the voices of the different generations from the same family to be *heard* together and to be *understood* together. To understand how the supports around a child can be strengthened, it is important to not only examine the individual relationships between a child and a parent, or a child and the grandparent.

Rather, in the same way that we understand that parent-professional relationships can influence how the child is supported, it is important to strengthen the relationships between the parents and grandparents, and to acknowledge that these relationships are intricately interconnected.

Grandparents have more intimate relationships with both the parent and the child, and are likely to be more invested in the child and family than professionals are.

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Table 1

*Participant Demographics*

		Family 1		Family 2	
		Will	Emily	Beth	Clara
Participant characteristics	Relationship to the child	Grandfather	Mom	Grandmother	Mom
	Age	59	34	70	43
	Ethnicity	White	White	White	White
	Nationality	American	American	American	American
	Marital status	Married	Married	Married	Married
	Education	4-year college	Masters	Professional	4-year college
	Health	Good	Fair	Good	Good
	Occupation	Retired	Counselor	Retired	Social Worker
	Household income range	less than \$125,000	\$90,000 - \$124,000	\$50,000 - \$69,000	\$125,000
	Do you live with grandchildren Do other members provide care?	No Yes	No Yes	No No	No Yes
Family characteristics	# of grandchildren/children	3	1	2	2
	Age, gender	5yM, 6yF, 10yM	10M	17yM, 13yM,	14yM, 17yM
	# of children with a disability in the family		1		1
Child characteristics (reported by parent)		Noah		Lucas	
	age	10		14	
	gender	Male		Male	
	diagnosis	ASD, ADHD, Anxiety		ASD, ID, SLI, ADHD	
	age of primary diagnosis	3		10 months	
	severity	Moderate		Moderate	
	other disabilities present	None		None	
	Current educational level	Elementary		Middle school	
	SRS-2 T-scores	81T (Severe range)		76T (Severe range)	
ICS mean scores	3.29		2.71		

Table 2

*Qualitative Coding Process and Codes Generated*

<b>Round 1 Coding: Original list of codes based on open coding</b>	
Original list of codes	<ul style="list-style-type: none"> <li>• Learning to adjust own expectations (period of adjustment)</li> <li>• Learning how to support (period of learning)</li> <li>• Role of gdp – gp perspective</li> <li>• Role of gp – p perspective</li> <li>• Gp-gc relationship</li> <li>• Gp-p relationship</li> <li>• Effect of photo intervention</li> </ul>
<b>Round 2 Coding: List of additional codes (from interview and research questions)</b>	
<ul style="list-style-type: none"> <li>• Original list</li> <li>• New codes</li> </ul>	<ul style="list-style-type: none"> <li>• Learning to adjust own expectations (period of adjustment)</li> <li>• Learning how to support (period of learning)</li> <li>• Role of gdp – gp perspective</li> <li>• Role of gp – p perspective</li> <li>• Gp-gc relationship</li> <li>• Gp-p relationship</li> <li>• Making meaning of photo intervention (<i>edited from Round 1</i>)</li> <li>• Beliefs &amp; understanding about disability</li> <li>• Child characteristics</li> <li>• Hopes, dreams, goals for child</li> <li>• Family traditions, rituals</li> <li>• Initial response to diagnosis</li> <li>• Photos – use of</li> </ul>
<b>Round 3 Coding: Refining codes through discussion &amp; clarification with second coder</b>	
<ul style="list-style-type: none"> <li>• Original edited list</li> <li>• New codes</li> </ul>	<ul style="list-style-type: none"> <li>• Period of learning and adjustment (<i>combined Period of adjustment and Period of learning</i>)</li> <li>• Role of gdp – gp perspective</li> <li>• Role of gp – p perspective</li> <li>• Gp-gc relationship</li> <li>• Gp-p relationship</li> <li>• Making meaning of photo intervention</li> <li>• Beliefs &amp; understanding about disability</li> <li>• Child characteristics</li> <li>• Hopes, dreams, goals for child</li> <li>• Family traditions, rituals</li> <li>• Initial response to diagnosis</li> <li>• Photos – use of</li> <li>• Relationships – others</li> <li>• Background info</li> </ul>

<b>Final list of codes and definitions from Round 3 Coding</b>	
<b>Big theme</b>	<b>Description of theme</b>
beliefs, understanding about disability	initial beliefs and current understandings about disability
child characteristics	description of child, e.g., strengths, challenges, behaviors, description of the child as a person
family traditions, rituals	family traditions and rituals that are important to the family
hopes, dreams, goals for child	how interviewee talks about their hopes, dreams, and goals for child, whether they think it is realistic or otherwise
initial response to diagnosis	Initial reactions and responses to diagnosis
period of adjustment & learning & acceptance	adjusting own expectations, hopes, dreams; period of learning about disability, learning how to support child and family; accepting the child as he is
photo intervention - meaning making	How participants perceive the meaningfulness and/or relevance of the photo intervention
photos - use of	use of photos for interacting with child
relationships - grandparent-grandchild	description of the grandparent-grandchild relationship
relationships - grandparent-parent	description of the relationship between grandparent and parent
relationships - others	Description of the relationship with other family members
role of grandparent - gp perspective	How grandparents perceive their role as a grandparent in relation to the child and in relation to the family. This includes the types of support they provide, the position of the grandparent (e.g., buddy, mentor), includes role reversal
role of grandparent - parent perspective	How parent perceives the role of the grandparent to be. This includes both ideal and current situations.
Background information	Background of parent/grandparent - information about own family, their family situation in the past, etc.
<b>Round 4 Coding: Answering the research questions</b>	
<ul style="list-style-type: none"> <li>• Research Question 1</li> </ul>	<ul style="list-style-type: none"> <li>• Learning journey:                             <ul style="list-style-type: none"> <li>○ Learning how to support the child</li> </ul> </li> </ul>

<ul style="list-style-type: none"><li>• Research Question 2</li></ul>	<ul style="list-style-type: none"><li>○ Adjusting expectations and dreams</li><li>• Grandparent roles and how they took them on<ul style="list-style-type: none"><li>○ Type of roles</li><li>○ Reversal of roles</li><li>○ Shaped by personal experiences</li></ul></li><li>• Grandparent-Grandchild relationship<ul style="list-style-type: none"><li>○ Family 1: “their kind of thing”</li><li>○ Family 2: “snuggling on the couch”</li></ul></li><li>• Grandparent-parent relationship<ul style="list-style-type: none"><li>○ Family 1: Involved and close</li><li>○ Family 2: Communication and respecting boundaries</li></ul></li><li>• Making meaning of the photo intervention sessions<ul style="list-style-type: none"><li>○ Time with child</li><li>○ A different kind of activity</li><li>○ Telling stories through the photos</li></ul></li><li>• Outcomes of photo interaction intervention<ul style="list-style-type: none"><li>○ A stronger bond</li><li>○ Planning the next steps</li></ul></li></ul>
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Table 3

*Operational Definitions of Child and Grandparent Social Interaction Behaviors*

<b>Positive Social Interactions</b>
<p>Child/grandparent exhibits verbal or nonverbal social behaviors that lead to effective social process with grandparent/child. These behaviors <u>serve to start or maintain social interaction</u></p> <ul style="list-style-type: none"> <li>- <b>Eye contact:</b> Child looks into eyes of grandparent (eye contact is only coded if both parties are looking at each other)</li> <li>- <b>Eye contact with smile:</b> Child/grandparent looks at and smiles/laughs toward grandparent/child (both parties should be looking at each other)</li> <li>- <b>Smile with no eye contact:</b> Child/grandparent smiles/laughs but does not look into the other person's eyes</li> <li>- <b>Affection:</b> Child/grandparent expresses affection <u>toward grandparent/child</u> either verbally (e.g., "I like you") or nonverbally (e.g., hug, touch, high-fives, playful gestures)</li> <li>- <b>Social communication/talk:</b> Child/grandparent approaches or responds to the other person with social (rather than functional) intention (e.g., "look at that xx in the photo"). This includes verbal and nonverbal forms of communication.</li> </ul>
<b>Extension of Topic</b>
<p>Conversation topic is extended from photo but not directly related to photo</p>
<b>Low Level Interaction</b>
<p>Child/grandparent exhibits behaviors that indicate social intention but with minimal social enactment</p> <ul style="list-style-type: none"> <li>- <b>Looking:</b> Child/grandparent looks at the other's face or body, or action, without establishing eye contact (when one party looks at the other, but the other is not looking.)</li> <li>- <b>Functional communication:</b> <u>Child</u> initiates/responds (<i>verbal or nonverbal</i>) to grandparent with intention to fulfill his/her own needs, and with no social intention, unrelated to photo or content of conversation. Or, if <u>Grandparent</u> responds to child's negative behaviors</li> <li>- <b>Neutral physical contact:</b> Child/grandparent makes physical contact with the other person which is not overtly aggressive, affectionate, ritualistic, or provocative</li> <li>- <b>"Yes" and "no" ONLY:</b> Child says "yes" or "no" OR nods their head for yes and shakes it for no, without extending the conversation (verbally or non-verbally) <u>within 3 seconds</u></li> <li>- <b>Imitation:</b> Child/grandparent imitates the other person's utterance, talk or actions</li> <li>- <b>Idiosyncratic language*:</b> Child uses utterances with no clear meaning [<i>child only</i>]</li> <li>- <b>Repetitive behavior*:</b> Child behaves in repetitive manner with no clear communication intent (<i>i.e., stimming behaviors</i>) [<i>child only</i>]</li> </ul> <p><i>*Note: only applies to child social interactions</i></p>
<b>Negative Social Interaction [<i>child only</i>]</b>
<p>Child exhibits unpleasant social behaviors that operate <u>to stop or decrease the likelihood of the development of an adequate social interaction</u></p> <ul style="list-style-type: none"> <li>- <b>Physical or verbal aggressiveness:</b> Child behaves in malicious intrusive ways toward grandparent, or <i>child destroys property</i></li> <li>- <b>Physical or verbal aggressiveness:</b> Child behaves in malicious intrusive ways toward grandparent, or <i>child destroys property</i></li> </ul>

Table 4  
Interobserver Agreement

Condition	Noah		Will		% of observations with IOA (across phases)
	IOA	Range	IOA	Range	
Non-familiar Photo Condition	91.43%	88.81-93.64%	92.99%	86.69-96.67%	40%
Child Photo Condition	94.43%	91.67-96.33%	94.91%	92.93-97.55%	40%
Grandparent Photo Condition	94.62%	92.89-97.11%	94.69%	91.96-97.27%	43%
Condition	Lucas		Beth		% of observations with IOA (across phases)
	IOA	Range	IOA	Range	
Non-familiar Photo Condition	91.31%	87.78-93.33%	85.63%	83.03-89.34%	40%
Child Photo Condition	91.44%	89.56-92.67%	91.63%	91.25-91.82%	33%
Grandparent Photo Condition	91.11%	90.33-91.88%	90.57%	88.64-92.49%	33%

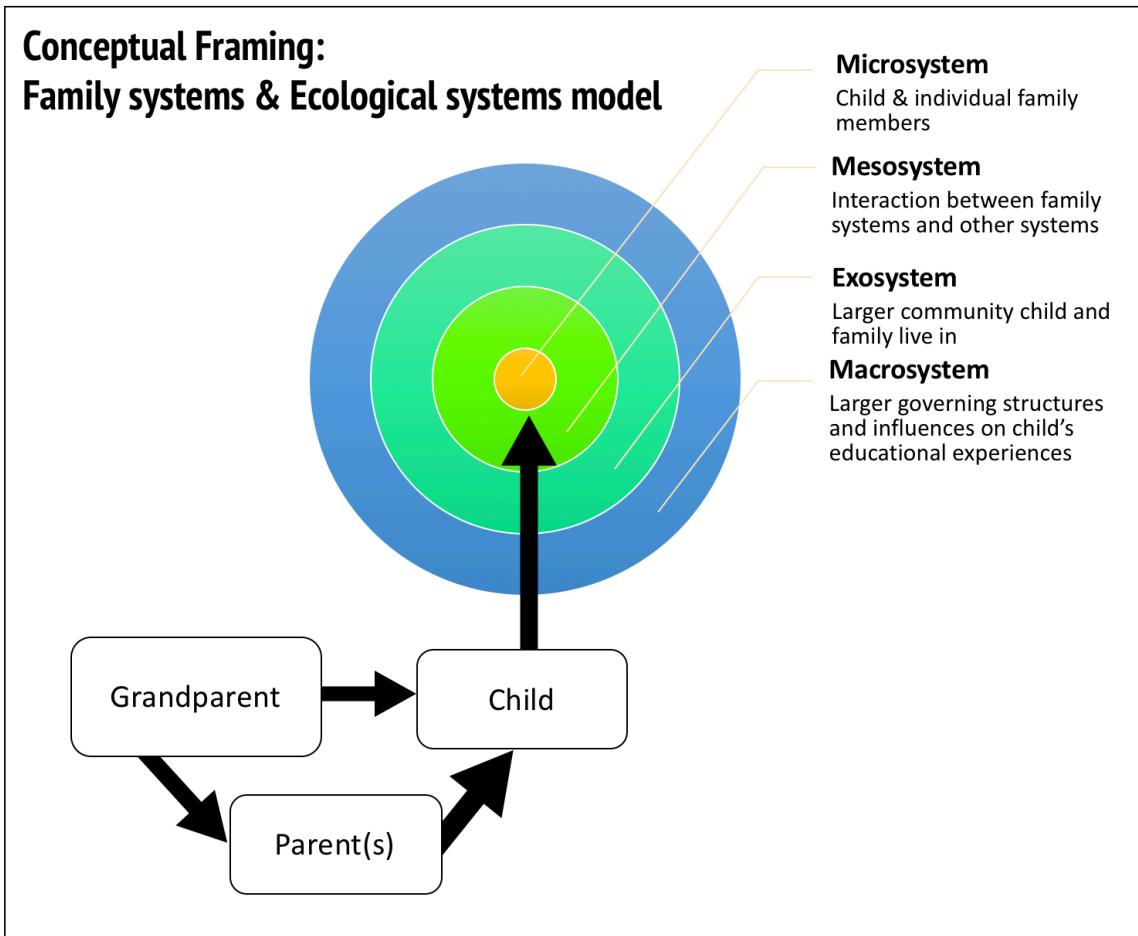


Figure 1. Conceptual framework: Family systems theory and ecological systems model.

**Impact of Different Photo Conditions on Social Interaction between Grandparents and Grandchildren with Disabilities**

Overarching Question:

What are the immediate and proximal effects of three photo conditions on the social interaction between a grandparent and a grandchild with disabilities?

How do grandparents perceive their relationship with their grandchild?

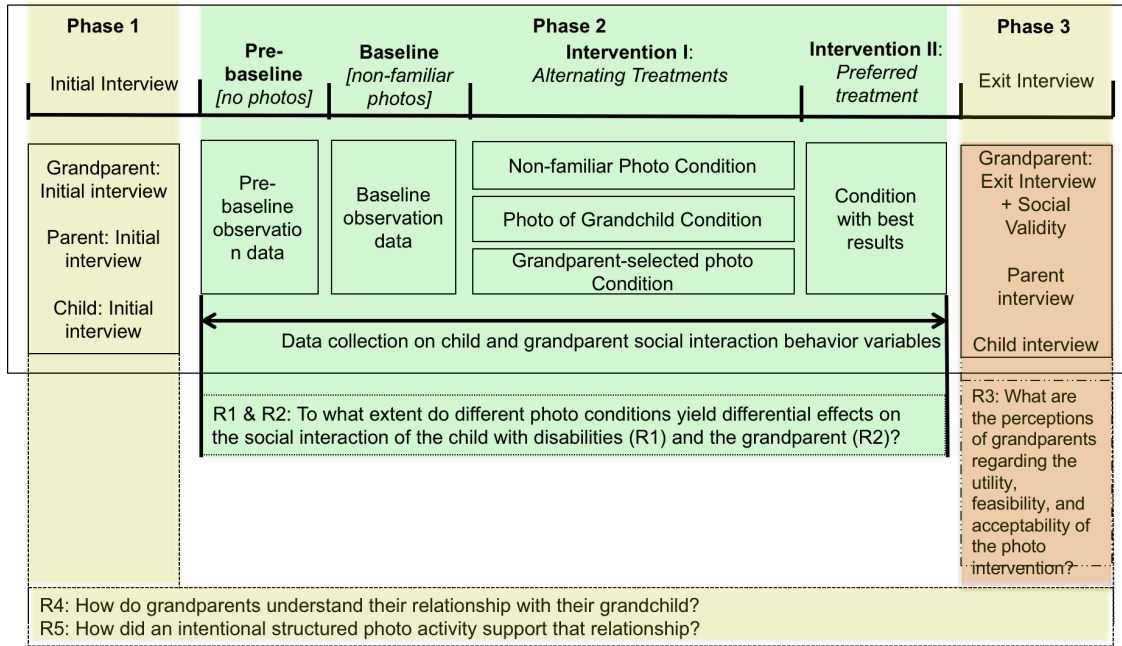


Figure 2. Study phases and research questions.

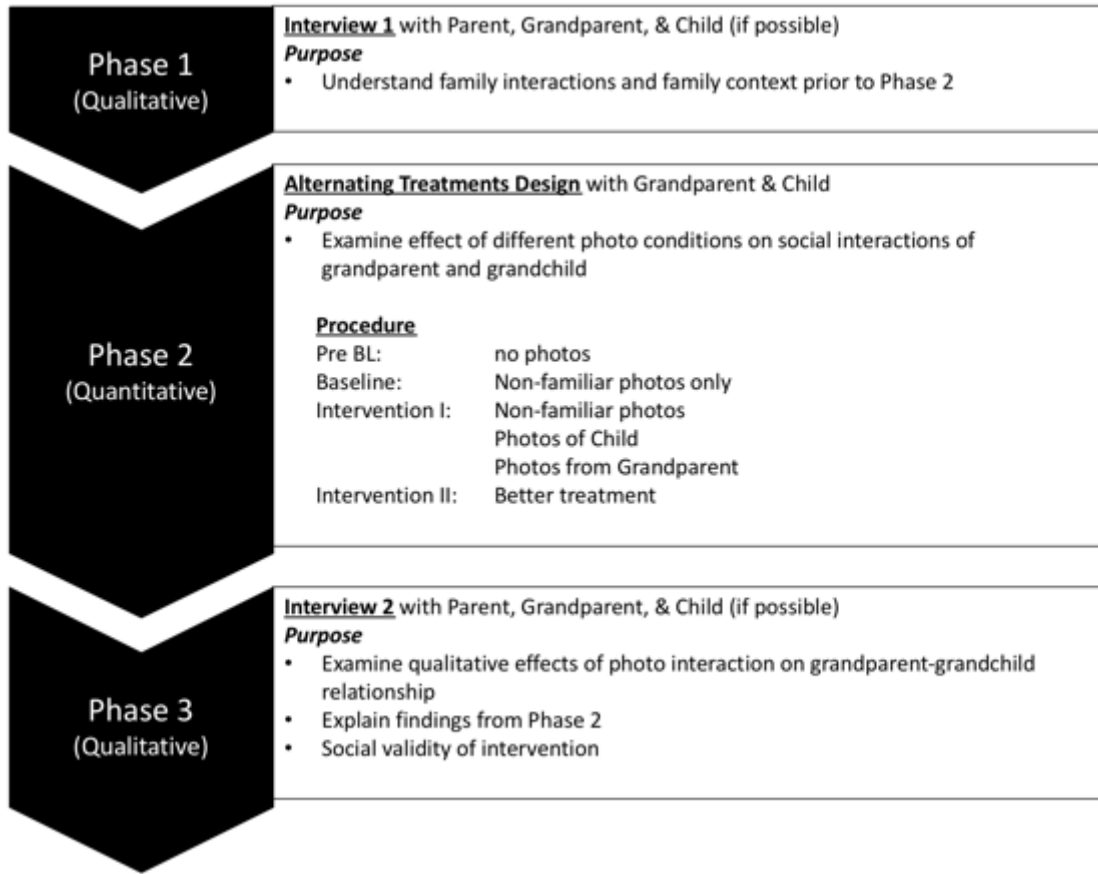


Figure 3. Study phases associated components.

**Directions (researcher says to grandparent)**

**Pre-baseline:** *“Let’s talk about [animal, place, activity].”*

Prompts for grandparent, if needed:

Specific prompts

- *What do you like about XX?*
- *When was the last time you did/saw/went to XX?*
- *What was happening?*
- *How did you feel then?*

To extend the conversation:

- *Tell me more.*
- *Say more about that.*

**Baseline/Intervention:** *“Here’s a photo of [animal/place/activity]. Talk about what you see in this photo.”*

Prompts for grandparent, if needed:

Specific prompts

- *Who is in the photo? Who was at this place?*
- *When did this activity occur? When did you go there?*
- *Where was this place?*
- *What was happening here? What was going on?*
- *Why did xx happen? | Why did you take that photo?*
- *How did you feel when you were there?*

To extend the conversation:

- *Tell me more.*
- *Say more about that.*

Figure 4. List of prompts.

Noah's Behavior Data

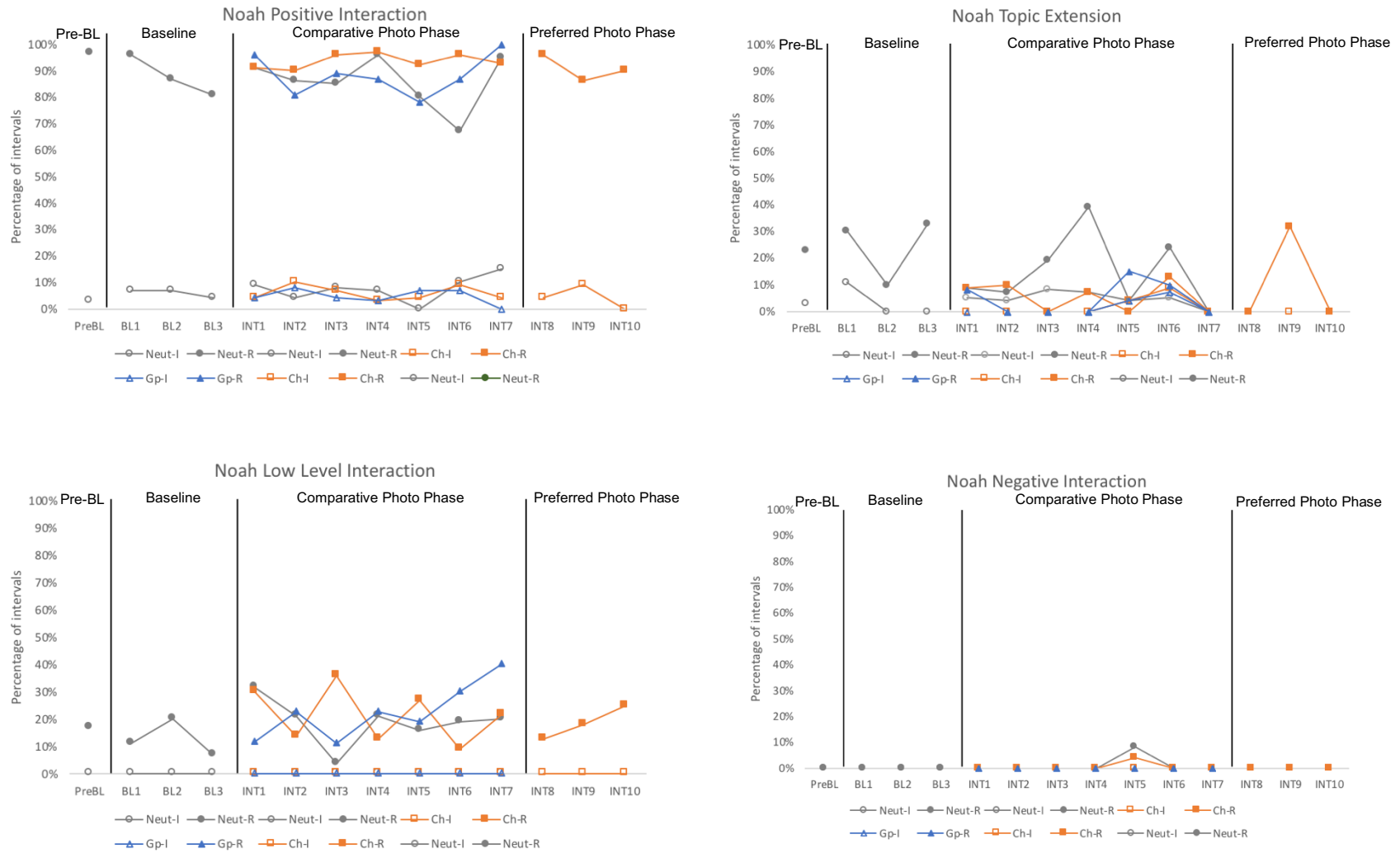
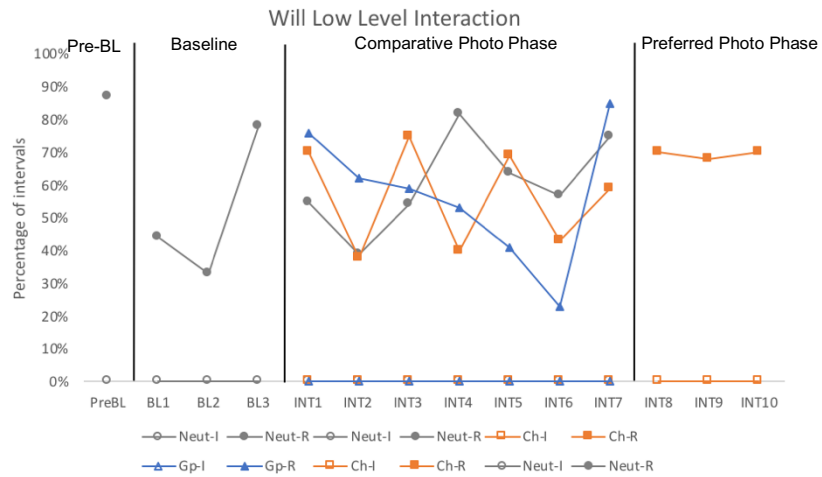
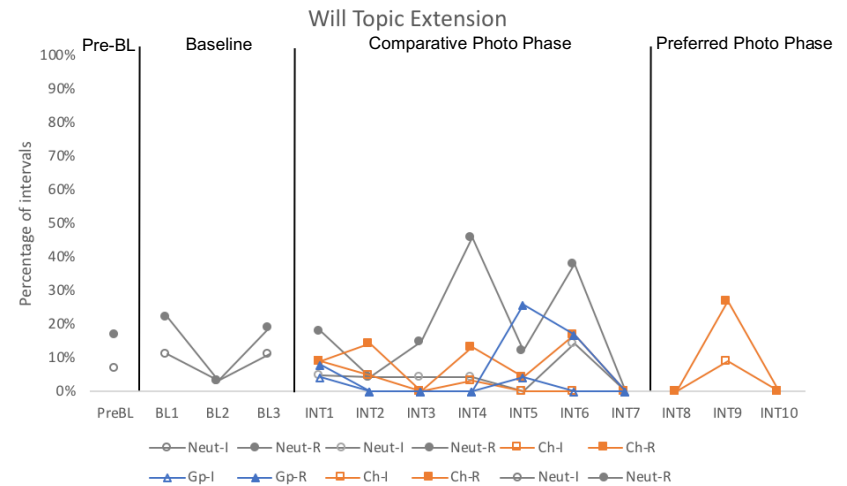
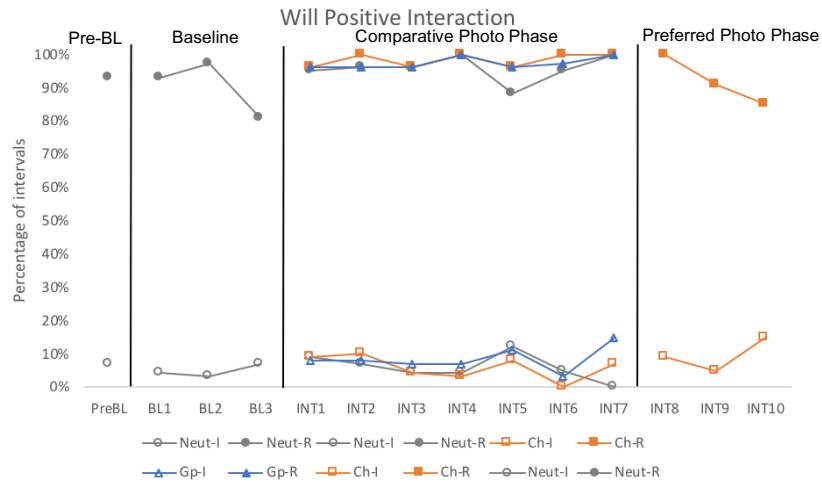
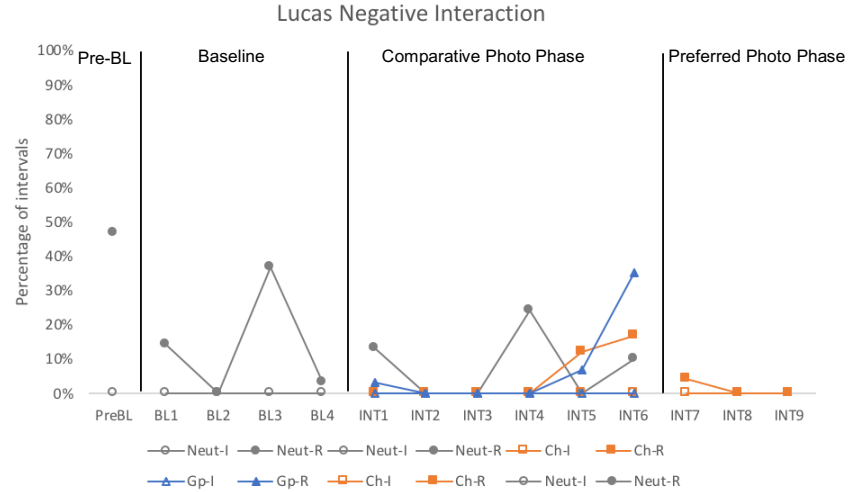
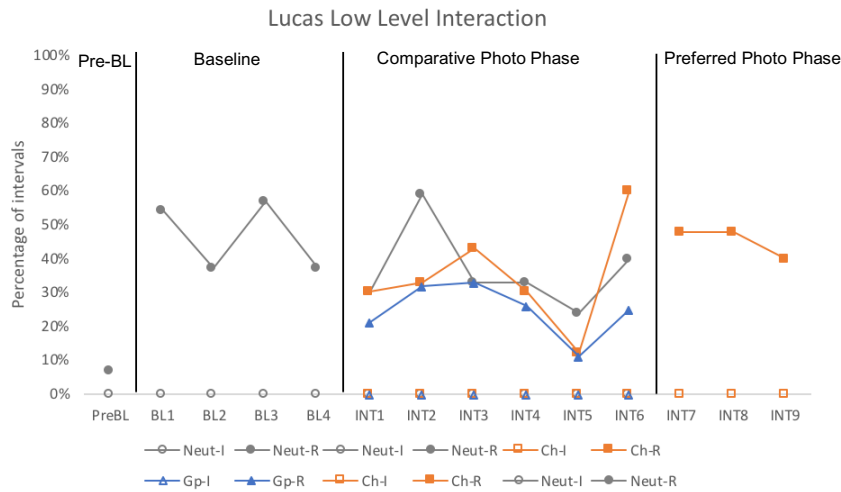
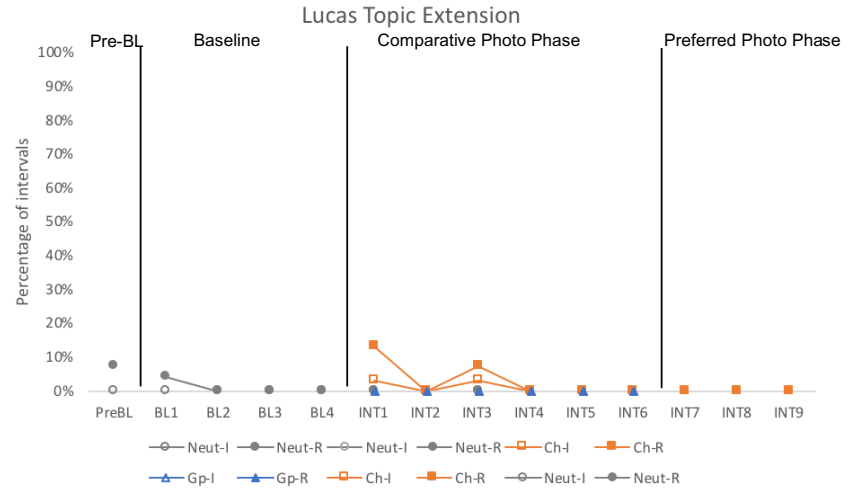
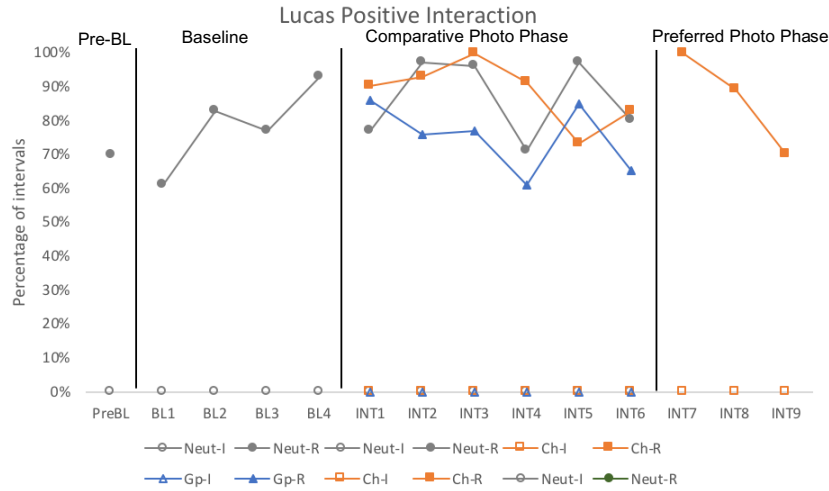


Figure 5. Behavior data for Noah, Will, Lucas, and Beth (continued on next page)

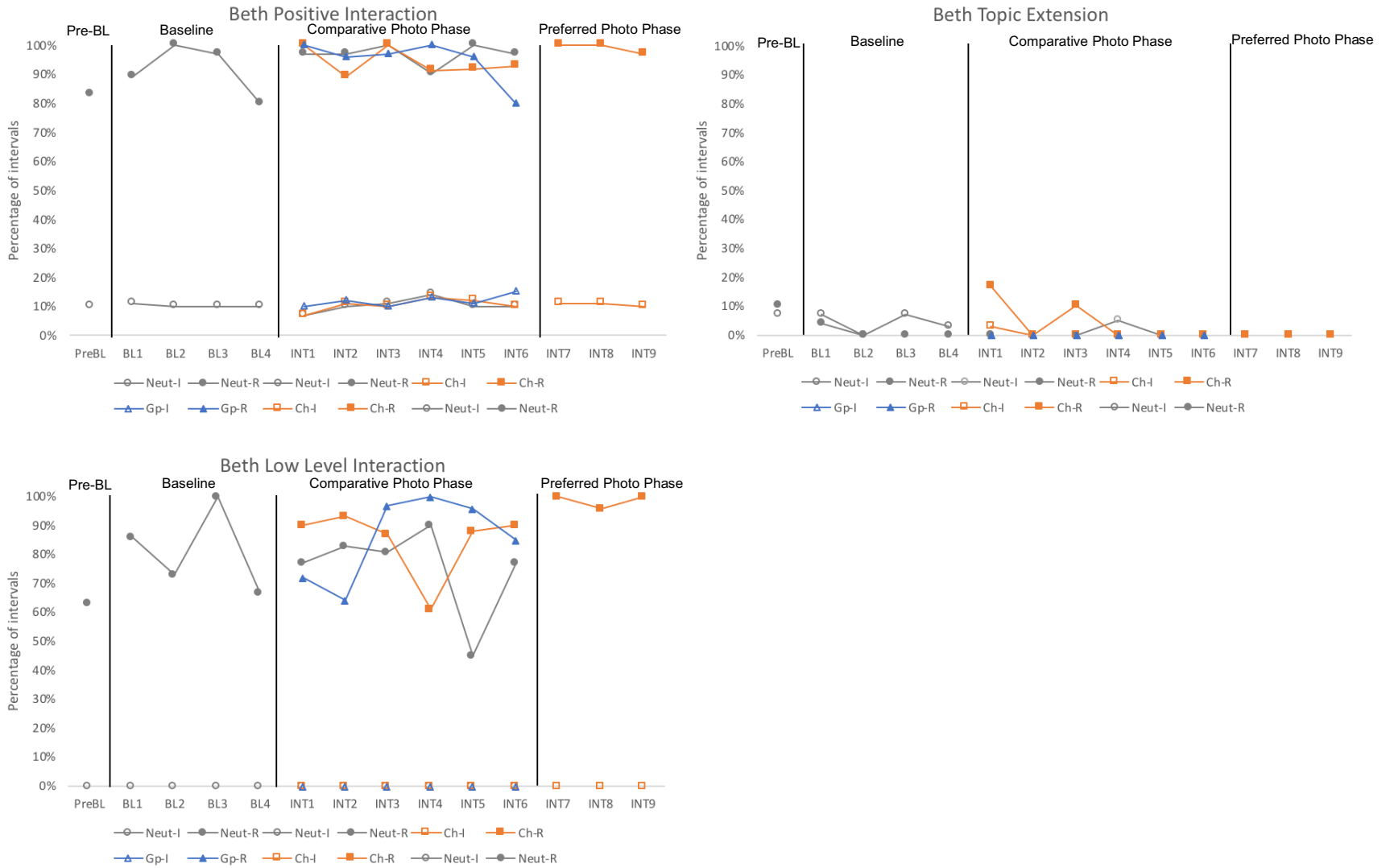
**Will's Behavior Data**



Lucas' Behavior Data



**Beth's Behavior Data**



**Appendix A**  
**Phase 1**  
**Interview Protocol with Parents**

*Thanks for meeting with me today! As you know, I'm interested in the interactions between grandparents and grandchildren with disabilities and how to support the grandparent-grandchild relationship. So I'm going to ask you some questions to help me better understand this relationship and the factors that influence it.*

*I'm interested in grandparent and grandchild relationship because I know that grandparents are often involved in supporting the grandchild and family, but they're not really prominent in research and we don't know how we can better support them. I've seen families with a child with disabilities where grandparents are highly involved and I myself had a grandmother who lived with us and helped raised me while my parents were working.*

*Before we begin, I want to remind you that participation is voluntary. If at any point in time you would like me to turn off the recorder, let me know. You will also have an opportunity to review the transcript and can also let me know then if there is anything you would like me to remove before I begin my analysis of the data. Any questions?*

#	Interview questions for parent	Goal of question
1	Please tell me about your child.	<input type="checkbox"/> Child characteristics
2	What are some of his/her strengths?	
3	What are some challenges he/she has?	
4	Can you tell me what your child's social interaction is like, with adults, and with other children?	<input type="checkbox"/> Current level of social interaction
5	How frequently does your child interact with other adults? With other children? What does that look like?	
6	Please describe your child's disability briefly	<input type="checkbox"/> Understanding about disability
7	How did you share the news about your child's disability with the members of your family?	<input type="checkbox"/> How did P and GDP initially interact around disability <input type="checkbox"/> Cultural perceptions about disability
8	What were some of the initial responses? Have there been any changes?	
9	How was disability talked about when you were growing up? Can you give an example?	<input type="checkbox"/> Culture: beliefs/understanding about disability
10	What was <i>your</i> understanding about disability when you were growing up?	
11	How has that influenced your current perception of disability?	
12	Has having a grandchild with a disability changed your perception of disability? How so?	
13	What are your goals/dreams/hopes for your child?	<input type="checkbox"/> Goals/dreams/hopes for child <input type="checkbox"/> What is success in
14	What would you consider to be a <b>fulfilled life</b> for your child? What is your <b>definition of success</b> ?	

15	<p>What are some goals for your child’s relationship with other people in his/her life? (e.g., with other family members, peers, etc.)                  More specifically, what are your hopes for your grandchild’s <b>social interactions</b> with other people in his/her life?                  ▪ Please describe what that would look like.</p>	<p>life  <input type="checkbox"/> Cultural definition of success</p>
16	<p>Who is usually involved in supporting the child and family?                  How are roles usually distributed in the family?                  ▪ Can you give an example?</p>	<p><input type="checkbox"/> Family roles /  <input type="checkbox"/> Caregiving responsibility /  <input type="checkbox"/> Supporting family</p>
17	<p>Think of a recent time you observed your child and the grandparent interacting. What was that like?                  ▪ Can you provide examples?</p>	<p><input type="checkbox"/> Grandparent-grandchild relationship</p>
18	<p>How does grandparent support your family?                  ▪ What roles does he/she play?                  ▪ What types of support does grandparent provide?</p>	<p><input type="checkbox"/> Grandparent role  <input type="checkbox"/> Grandparent as support  <input type="checkbox"/> Type of support</p>
19	<p>What role does grandparent play with regards to the grandchild with disability?</p>	
20	<p>How would you describe your relationship with the grandparent?</p>	<p><input type="checkbox"/> Grandparent-parent relationship</p>
21	<p>How frequently do you see or contact grandparent? (e.g., seeing each other, contacting via phone, text etc.)</p>	<p><input type="checkbox"/> Family relations and dynamics</p>
22	<p>Have there been differences in opinion about caregiving, or ways to support the child? How do you negotiate that?</p>	<p><input type="checkbox"/> Parent-grandparent collaboration</p>
23	<p>What are some favorite memories you have with your own grandparent?</p>	<p><input type="checkbox"/> Culture: Grandparent role &amp; background</p>
24	<p>How do you perceive the grandparent's role?</p>	
25	<p>What are some hopes you have for the grandparent's role in the child's life?</p>	
26	<p>What are some family traditions and rituals in your family that are important to you? (e.g., meals, holidays, sports...)                  ▪ Can you give an example?</p>	<p><input type="checkbox"/> Culture: Family traditions, rituals, special occasions, celebrations...</p>
27	<p>What are some routines in your family as a child that you've seen being passed on to your grandchild? (e.g., bedtime routines, meal times, celebrations, special events)                  ▪ Can you give an example?</p>	
28	<p>What are some traditions that fit with or don't fit with having a disability in the family?                  ▪ Can you give an example?</p>	
29	<p>Does your family use visual images? How often is that?</p>	<p><input type="checkbox"/> Pre-intervention questions</p>
30	<p>Does your family take photos often? (e.g., just for fun, special occasions)                  ▪ How often is that?</p>	
31	<p>How frequently do you talk about or share photos with your child?                  What is his/her response usually like?</p>	

We’ve come to the end of our interview. Thank you so much for your time!

**Phase 3**  
**Interview Protocol with Parents**

*Thanks for meeting with me today! We've come to the end of the study and I'd like to gather some thoughts from you about the photo intervention project.*

*Before we begin, I want to remind you that participation is voluntary. If at any point in time you would like me to turn off the recorder, let me know. You will also have an opportunity to review the transcript and can also let me know then if there is anything you would like me to remove before I begin my analysis of the data. Any questions?*

#	Interview question for parent	Theme
1	What were your thoughts or feelings about the intervention?	<input type="checkbox"/> Intervention initial thoughts
2	What did you like or dislike about the intervention?	<input type="checkbox"/> Intervention improvement
3	How easy was it for you to take photos of your child? Was this more frequently or less frequently than before this study?	<input type="checkbox"/> Ease of photo-taking for parent
4	Was there anything you would want to improve about the intervention, or how it took place?	<input type="checkbox"/> Intervention improvement
5	Did you see more connection between the grandparent and grandchild? Can you say more about that? Can you describe a recent time you observed their interaction?	<input type="checkbox"/> Changes in grandparent-grandchild relationship
6	Have you had any conversations about visual images in the last week with your child (that was outside of the study)? (e.g., around routine times, more aware of traditions, special events...?) <ul style="list-style-type: none"> <li>▪ Was this more often than previously?</li> </ul>	<input type="checkbox"/> Change: Photos, culture <input type="checkbox"/> Parent-child relationship <input type="checkbox"/> Generalization
7	Did you find yourself talking more about visual images with the grandparent?	<input type="checkbox"/> Change: parent-grandparent relationship <input type="checkbox"/> Culture? <input type="checkbox"/> Generalization
8	We found that XX condition led to higher rates of communication between the grandparent and your child. <ul style="list-style-type: none"> <li>▪ What are your thoughts about that?</li> <li>▪ Were you surprised by this?</li> </ul>	<input type="checkbox"/> Reaction to intervention outcomes
9	What do you think might have contributed to the results from this photo intervention?	<input type="checkbox"/> Potential factors leading to results e.g., Cultural ways of talking/interacting?
10	We found an unexpected outcome XXX. What are your thoughts about this?	<input type="checkbox"/> Intervention unexpected findings?
11	TBD	<input type="checkbox"/> Phase 1 follow up: Points of clarification
12	TBD	<input type="checkbox"/> Phase 1 follow up: unexpected comments?

*We've come to the end of our interview. Thank you so much for your time! [Remember gift card]*

**Phase 1**  
**Interview Protocol with Grandparents**

*Thanks for meeting with me today! As you know, I'm interested in the interactions between grandparents and grandchildren with disabilities and how to support the grandparent-grandchild relationship. So I'm going to ask you some questions to help me better understand this relationship and the factors that influence it.*

*I'm interested in grandparent and grandchild relationship because I know that grandparents are often involved in supporting the grandchild and family, but they're not really prominent in research and we don't know how we can better support them. I've seen families with a child with disabilities where grandparents are highly involved and I myself had a grandmother who lived with us and helped raised me while my parents were working.*

*Before we begin, I want to remind you that participation is voluntary. If at any point in time you would like me to turn off the recorder, let me know. You will also have an opportunity to review the transcript and can also let me know then if there is anything you would like me to remove before I begin my analysis of the data. Any questions?*

#	Interview questions for grandparent	Goal of question
1	Please tell me about your grandchild.	<input type="checkbox"/> Child characteristics
2	What are some of his/her strengths?	
3	What are some challenges he/she has?	
4	Can you tell me what your grandchild's social interaction is like, with adults, and with other children?	<input type="checkbox"/> Current level of social interaction <input type="checkbox"/> With adults <input type="checkbox"/> With children
5	How frequently does your grandchild interact with other adults? With other children? What does that look like?	
6	Please describe your grandchild's disability briefly	<input type="checkbox"/> Understanding about disability
7	How did you learn about your grandchild's disability?	<input type="checkbox"/> How did parent and grandparent initially interact around disability <input type="checkbox"/> Cultural perceptions about disability
8	What were your initial responses and emotions? Has that changed over time?	
9	How was disability talked about when you were growing up? Can you give an example?	<input type="checkbox"/> Culture: beliefs/understanding about disability
10	What was <i>your</i> understanding about disability when you were growing up?	
11	How has that influenced your current perception of disability?	
12	Has having a grandchild with a disability changed your perception of disability? How so?	
13	What are your goals/dreams/hopes for your grandchild?	<input type="checkbox"/> Goals/dreams/hopes for child <input type="checkbox"/> What is success in life
14	What would you consider to be a <b>fulfilled life</b> for your grandchild? What is your <b>definition of success</b> ?	

15	<p>What are some goals for your grandchild’s relationship with other people in his/her life? (e.g., with other family members, peers, etc.)                  More specifically, what are your hopes for your grandchild’s <b>social interactions</b> with other people in his/her life?                  ▪ Please describe what that would look like.</p>	<input type="checkbox"/> Cultural definition of success
16	<p>Who is usually involved in supporting the child and family? How are roles usually distributed in the family?                  ▪ Can you give an example?</p>	<input type="checkbox"/> Family roles / <input type="checkbox"/> Caregiving responsibility / <input type="checkbox"/> Supporting family
17	<p>How would you describe your relationship with the parent?                  Please describe a recent example/incident.</p>	<input type="checkbox"/> Grandparent-parent relationship <input type="checkbox"/> Family relations and dynamics
18	<p>How frequently do you see or contact grandparent?                  (e.g., seeing each other, contacting via phone, text etc.)</p>	
19	<p>Have there been differences in opinion about caregiving, or ways to support the child? How do you negotiate/work around that?                  ▪ Has that been different at the start (when grandchild was first diagnosed) till now?</p>	<input type="checkbox"/> Parent-grandparent collaboration <input type="checkbox"/> Family relations and dynamics
20	<p>Please tell me about yourself. How do you view your role in this family, and with regard to this grandchild?</p>	<input type="checkbox"/> Grandparent role <input type="checkbox"/> Grandparent as support <input type="checkbox"/> Type of support
21	<p>How are you usually involved in this family? What are the ways you help with the family?</p>	
22	<p>What do you typically do with all your grandchildren in general (if any)?                  ▪ Please provide some examples.</p>	
23	<p>What do you typically do with the grandchild in this study? Have there been any differences or ways that you have had to adapt your activities?                  ▪ Can you give an example?</p>	<input type="checkbox"/> Grandparent-grandchild relationship <input type="checkbox"/> Type of support <input type="checkbox"/> Culture: Family traditions
24	<p>What do you enjoy doing with your grandchild? Can you tell me a time when you did xx activity?</p>	
25	<p>What are some family traditions and rituals in your family that are important to you? (e.g., meals, holidays, sports...)                  ▪ Can you give an example?</p>	
26	<p>What are some routines in your family as a child that you've seen being passed on to your grandchild? (e.g., bedtime routines, meal times, celebrations, special events)                  ▪ Can you give an example?</p>	<input type="checkbox"/> Culture: Family traditions, rituals, special occasions, celebrations
27	<p>What are some traditions that fit with or don't fit with having a disability in the family?                  ▪ Can you give an example?</p>	<input type="checkbox"/> Culture: beliefs/ understanding about disability <input type="checkbox"/> Adaptation
28	<p>What are some favorite memories you have with your own grandparent?</p>	<input type="checkbox"/> Culture: Grandparent role and background

29	How do you think that may have influenced how you view your role as a grandparent?	
30	What are some hopes/goals you have for your role as the grandparent in the child's life?	
31	What do you usually talk to the grandchild about? What are some favorite topics? (e.g., school, fun activities)	<input type="checkbox"/> Pre-intervention questions
32	Have you had any conversation about visual images or photos in the last week?	
33	Does your family take photos often? (e.g., just for fun, special occasions) <ul style="list-style-type: none"> <li>▪ How often is that?</li> </ul>	
34	How frequently do you talk about or share photos with your grandchild? What is his/her response usually like?	

*We've come to the end of our interview. Thank you so much for your time!*  
*[Remember gift card]*

**Phase 3**  
**Interview Protocol with Grandparents**

*Thanks for meeting with me today! We've come to the end of the study and I'd like to gather some thoughts from you about the photo intervention project.*

*Before we begin, I want to remind you that participation is voluntary. If at any point in time you would like me to turn off the recorder, let me know. You will also have an opportunity to review the transcript and can also let me know then if there is anything you would like me to remove before I begin my analysis of the data. Any questions?*

#	Interview questions for grandparent	Goal of question
1	What were your thoughts or feelings about the intervention?	<input type="checkbox"/> Intervention initial thoughts
2	What did you like or dislike about the intervention?	<input type="checkbox"/> Intervention improvement
3	How easy was it for you to find photos to share with your grandchild? Was this more frequently or less frequently than before this study?	<input type="checkbox"/> Ease of photos for gdp
4	Did it become easier for you to ask questions and maintain the conversation over time? (can you give an example?)	<input type="checkbox"/> Specific interaction
5	Was there anything that you would want to improve about the photos or the prompts or how the intervention took place?	<input type="checkbox"/> Intervention improvement
6	Was there a particular kind of photo you preferred interacting with or talking with your grandchild about? Which kinds of photos did you enjoy talking to your grandchild about most?	<input type="checkbox"/> Photo preference
7	Which kind of photo did you find most challenging to talk about? Can you give an example?	
8	What was your favorite memory of the sessions?	
9	Do you use photos outside of the intervention to interact with your grandchild? Has that been different (increased/decreased) since this study?	<input type="checkbox"/> Generalization
10	When we first started the study, you mentioned that your conversation with the grandchild was often about _____. Did the subject of your conversation change since the intervention?	<input type="checkbox"/> Change: conversation topics
11	Describe a subject/topic you talked about with your grandchild in the last two weeks (outside of the study).	<input type="checkbox"/> Change: conversation topics

12	Have you had any conversations about visual images in the last week (that was outside of the study)? (e.g., around routine times, more aware of traditions, special events...?)	<input type="checkbox"/> Change: Photos, culture <input type="checkbox"/> Parent-child relationship <input type="checkbox"/> Generalization
13	Do you think your grandchild had a greater preference for one type of photo over another?	<input type="checkbox"/> Photo preference
14	Previously you mentioned that your family took photos XX times a week. Do you take more family photos now?	<input type="checkbox"/> Change: Photos <input type="checkbox"/> Generalization
15	We found that XX condition led to higher rates of communication between you and your grandchild. <ul style="list-style-type: none"> <li>▪ What are your thoughts about that?</li> <li>▪ Were you surprised by this?</li> </ul>	<input type="checkbox"/> Reaction to intervention outcomes
16	What do you think might have contributed to the results from this photo intervention?	<input type="checkbox"/> Potential factors leading to results <input type="checkbox"/> Cultural ways of talking/interacting
17	What kind of impact did the intervention have on the quality of your interactions with your grandchild? <ul style="list-style-type: none"> <li>▪ Was it helpful or meaningful for you?</li> <li>▪ How was it helpful/meaningful?</li> </ul>	<input type="checkbox"/> Changes in grandparent-grandchild relationship <input type="checkbox"/> Changes in grandparent-grandchild relationship
18	Did you feel more connection between yourself and your grandchild? <ul style="list-style-type: none"> <li>▪ Can you say more? Can you describe a recent example?</li> </ul>	
19	Has the intervention influenced the way you interact with your grandchild (if any)? Can you give an example?	<input type="checkbox"/> Grandparent style
20	TBD	<input type="checkbox"/> Phase 1 follow up: Points of clarification
21	TBD	<input type="checkbox"/> Phase 1 follow up: unexpected comments?

*We've come to the end of our interview. Thank you so much for your time!  
 [Remember gift card]*

**Phase 1**  
**Interview Protocol with Child**

*Hello, thanks for meeting with me today! I'm interested in learning about your relationship with your grandparent and I'd like to learn about yourself and your grandparent.*

*Before we begin, I want to let you know that you can choose to stop any time. If you want me to stop the audio recorder at any time, just let me know. Any questions?*

*Great let's begin!*

#	Interview questions for child	Goal of question
1	What do you enjoy doing? / What are some favorite activities you like doing?	<input type="checkbox"/> Grandchild personality/characteristics
2	What do you enjoy doing with your grandparent?	<input type="checkbox"/> Grandchild-grandparent relationship
3	What is your favorite thing to do with your grandparent? Can you give one example?	
4	What was fun about it?	
5	Do you like looking pictures?	<input type="checkbox"/> Pre-intervention questions
6	What kind of pictures do you like to look at? (e.g., drawings, photographs...)	
7	What are some of your favorite pictures?	

*Thank you for chatting with me! You'll be talking about some pretty cool photos next time. So stay tuned!*

**Phase 3**  
**Interview Protocol with Child**

*Hello, thanks for meeting with me today! We've finished this whole photo project with you and your grandparent. And I'd like to ask you some thoughts about this project!*

*Before we begin, I want to let you know that you can choose to stop any time. If you want me to stop the audio recorder at any time, just let me know. Any questions?*

*Great let's begin!*

#	Interview questions	Goal of question
1	Did you enjoy talking with your grandparent during the sessions we had?	<input type="checkbox"/> Chatting with grandparent
2	What did you like about it? ( <i>e.g., spending time, talking about photos, learning about gdp...?</i> )	
3	There were three different kinds of photos you talked about with your grandparent: photos taken by other people, photos of yourself, and photos that your grandparent brought. <b>Which kind of photos did you like?</b> Why?	<input type="checkbox"/> About the intervention
4	Which was your <b>most favorite</b> photo that you talked about?	
5	Were there any photos you <b>didn't enjoy</b> as much? Why?	
6	Would you want to see <b>more photos</b> from your grandparent?	
7	What kind of photos would you like to <b>show</b> your grandparent?	

*Thank you so much for your time! I hope you enjoyed this session. Did you have any questions you would like to ask me?*

*Thank you!*

**Appendix B**

Order of photo condition presented at each session

**Random Assignment of Conditions***Family 1*

Day	Session 1	Session 2	Session 3
Int1	Ch	NF	Gp
Int2	Gp	Ch	NF
Int3	NF	Ch	Gp
Int4	Ch	Gp	NF
Int5	Ch	NF	Gp
Int6	NF	Gp	Ch
Int7	Gp	NF	Ch

*Family 2*

Day	Session 1	Session 2	Session 3
Int1	NF	Gp	Ch
Int2	Gp	Ch	NF
Int3	NF	Ch	Gp
Int4	Gp	NF	Ch
Int5	Ch	NF	Gp
Int6	Gp	NF	Ch

*NOTE: NF=non-familiar condition; Ch=photo with grandchild condition; Gp=photo selected by grandparent condition*

**Appendix C**

**Description of Photos in Each Condition Per Session**

Family	Session	Condition				
		Non-familiar Condition	Child Condition	Grandparent Condition		
Family 1	<b>BL1</b>	a) girl holding hawk with glove b) boardwalk path in forest c) collection of pumpkins on a table				
	<b>BL2</b>	a) vegetables in a basket on a table b) boy playing in the surf c) girl looking at lamas				
	<b>BL3</b>	a) two girls playing on a playground b) koala eating a leaf c) girl eating a slice of watermelon				
	<b>INT1</b>	a) bowl of pasta b) water flowing through a creek c) boy feeding hay to sheep			a) Noah dressed as Harry Potter for Halloween b) Noah in snow with ski goggles c) Noah wearing yellow sunglasses	a) Will and Noah at the Mariner game b) Noah wearin headphones, glasses, and black tee shirt c) Will with baby at the beach
	<b>INT2</b>	a) waterslides b) boy eating corn on the cobb c) close up of green and red lizard			a) Noah giving two thumbs up b) Noah unwrapping lego present c) Noah standing on driftwood at the beach	a) Noah standing between two palm trees b) Noah driving a tractor c) Noah and family swing at the lakeshore
	<b>INT3</b>	a) Two park swings b) boy eating hot dog c) boy with parrot on shoulder			a) Noah giving thumbs up with picachu sunglasses b) Noha giving thumbs up with red tee shirt holding light post c) Noah on bed with stuffed monkey and towel monkey	a) Will in uniform shaking hands b) Will as a young man with necktie c) Will in uniform with local children (DARE Campaign)
	<b>INT4</b>	a) four penguins b) boy looking at camera eating spaghetti c) two girls playing in the sand			a) Noah at Mariners day game wearing hat and jersey b) Noah on cruise ship with snorkel mask c) Noah fishing with green tee shirt and cap	a) Will in uniform hands at sides b) Mom at recital "pink elf ears" c) Will and grandma
	<b>INT5</b>	a) adult and child holding hands on nature path b) hummingbird at rest c) fruit assortment			a) Noah giving thumbs up with white hat and black tee shirt b) Noah giving thumbs up wearing read hat, jacket, and tee shirt c) Noah with white tee shirt and mirrored aviator sunglasses	a) baby picture of mother with raggedy ann doll b) baby picture of Noah dressed as Santa Clause c) Will in uniform holding baby Noah
	<b>INT6</b>	a) panda eating bamboo b) girl eating cheese platter c) two boys playing in water fountain			a) Noah asleep in hospital bed b) Noah in backseat dressed as lego ninja c) Noah in kitchen making gingerbread houses	a) Noah with mom: "long haired hippie" b) Great Grandpa Carl receiving Silver Star award c) young mom and aunt against snow bank
	<b>INT7</b>	a) duck floating in water b) girl outside eating rasberries c) trampoline with side guards			a) Noah with binder collection of magic game cards b) Noah with jacket and green necklace	a) family dog b) baby Noah in tuxedo c) mom wearing pink and purple tee shirt

	<b>INT8</b>		c) Noah placing ornament on Christmas tree a) Noah wearing yellow sunglasses and hand covering mouth b) Noah with cousin at wedding wearing black bow tie c) Noah in front of aquarium glass with plain white tee shirt	
	<b>INT9</b>		a) Noah and cousin in hot tub b) Noah next to model of the solar system c) Noah with blue vest in front of Christmas tree	
	<b>INT10</b>		a) Noah and cousin carving a pumpkin b) Noah smiling with green tee shirt c) Noah at a table eating pizza	
Family 2	<b>BL1</b>	a) Koala eating leaf; b) Child eating watermelon; c) Creek		
	<b>BL2</b>	a) hummingbird at rest b) two girls playing on playground c) boy eating hot dog		
	<b>BL3</b>	a) waterslides b) finger sandwiches on plate c) boy with giant tortoise		
	<b>BL4</b>	a) girl looking at llamas b) boy eating apple c) trampoline with side guards		
	<b>INT1</b>	a) two empty swings b) girl outside eating raspberries c) giraffe with lounge out	a) Lucas receiving a haircut b) Lucas inspecting toys at the toystore c) Lucas with armsling drinking from cup with straw	a) Lucas with orange Halloween costume b) Lucas and cousins on water rafts c) Lucas and others inspecting lizard
	<b>INT2</b>	a) fruit assortment b) close up of red and green lizard c) two boys playing in water fountain	a) Lucas tucked in with head on pillow (blue) b) Lucas looking out the window of charter bus wearing orange tee shirt c) Lucas standing in front of television wearing arm sling	a) Lucas wearing suit and purple tie with family b) Large family photo with Lucas' great grandfather c) Younger Lucas with older brother wearing white shirts
	<b>INT3</b>	a) boy playing in surf b) assortment of pumpkins on table c) panda eating a leaf	a) Lucas with dad on couch b) Lucas with leg crossed on couch c) Lucas dancing in driveway with backpack and Buddy	a) Lucas in garage with classic red convertible b) Family 2's large family gathering c) Lucas as a toddler sitting on couch with family
	<b>INT4</b>	a) beach coastline b) boy eating corn on the cobb c) young child with goat	a) Lucas in the pool with purple noodle floater b) Lucas at wedding with cousins wearing necktie and black shirt c) Lucas in kitchen making pizza	a) Lucas as a toddler playing with train on patio b) Ruth with baby Lucas and older brother c) Lucas dressed as Batman
	<b>INT5</b>	a) four penguins b) bowl of pasta c) two girls playing in sand	a) Lucas in front of house holding a leaf b) Lucas with mom and dad on couch	a) Magic Schoolbus with mom, dad, and brother b) Dad being interviewed in studio with Buddy in the

		c) Lucas eating cake batter in bedroom	background c) baby Lucas with Trailblazers headband
<b>INT6</b>	a) girl reaching out for sea bird b) vegetable in a basket on a table c) adult and child holding hands on nature trail	a) Lucas sitting with cousins at an outdoor table b) Lucas and brother sitting on couch playing video games c) Lucas wearing orange tee shirt looking into a jar	a) Lucas as a toddler wearing a backpack holding hands with dad b) Ruth with Lucas as a toddler eating c) Lucas as a toddler sitting at a table with mom
<b>INT7</b>		a) Lucas sitting on a lawn chair eating spaghetti b) Lucas holding water gun c) Lucas with smartphone in backseat of car	
<b>INT8</b>		a) Lucas and dad sitting on the couch b) Lucas smiling for the camera wearing a blue tee shirt and backpack c) Lucas in restaurant looking at smart phone	
<b>INT9</b>		a) Lucas sitting on the couch with dad b) Lucas with badminton racket on porch with Buddy c) Lucas on nature trail wearing blue shirt	

## Appendix D

### Coding Manual of Social Interaction Behaviors

#### Coding Protocol v.2.2

##### Important documents to have when coding

- Coding Protocol
- Definitions of Social Behaviors (at the end of this document)
- Coding sheet for child/grandparent
- Photos used in the session

##### Where to code

- To protect confidentiality, please code the videos in a location where no other people can view the videos.
- Wear earphones/headphones for clearer audio

##### CODING RULES

- Code each video twice.
  - First, code for **child** behaviors
  - Then, code for **grandparent** behaviors
- Partial Interval Coding:
  - 10-second partial interval coding system. If a behavior is observed at any point in a 10 second interval (1-10s, 11-20s, etc.), circle "I", "R", or "+". If the behavior does not occur at all in the interval, circle the "-".
- Key:
  - "I": Initiation
  - "R": Response
  - "+": indicates behavior was observed
  - "-": indicates behavior was not observed
- Note that "I" is coded differently from "R" and "+":
  - **"I": only coded in the interval it begins**
  - "R": coded for intervals that it occurs in (i.e., can carry over)
  - "+": coded for intervals that it occurs in (i.e., can carry over)
- Notes:
  - If behavior cannot be observed because child/grandparent are out of frame (e.g., eye contact), code as "-".
  - Only behaviors directed at grandparent/child should be coded. Do not code behaviors directed at researcher.
  - Note any technical difficulties on coding sheet.

##### STARTING CODING

- Fill in information at top of sheet: Child/Grandparent ID, Phase, Date of Session as indicated on video title, Coder initials, Circle primary or secondary.
- Primary coder establishes Coding Start and End Times
- Coding Start time begins right after researcher offers the first prompt "Talk about XXX."
- To code: Note start time and do 10 second intervals from thereon.

- Tip: might be helpful to write out the start or end times of each interval
- Coding should end once researcher states “Thank you for chatting” or when 5 minutes are up.

### **DURING CODING**

- Refer to operational definitions as needed.
- You may pause the video or replay video as needed.
- Indicate the intervals in which a photo change takes place.

### **FINISHING CODING**

- Fill out totals at bottom of coding sheets
- Calculate Overall Total for the session.
- Scan and upload the sheet to appropriate folder
- Name the sheet FileTitlecoderinitials (e.g., Fam1BL1\_180628xy)
- Pass hard copies of data sheets to Xueyan

### **Technology Issues**

- If picture freezes or slows, you can still hear the video and you can discriminate what is going on, continue coding.
- If picture freezes or slows and you can't discriminate, but it lasts less than 5 sec, just continue (don't need to record under tech issues)
- If picture freezes or slows and you can't discriminate, and it lasts more than 5 sec, indicate in the interval with a “T”.

***\* At any point in time, if you have any questions, please do not hesitate to email Xueyan.***

**Operational Definitions of Social Interaction Behaviors  
(adapted from Bauminger, 2002, and Hauck et al., 1995)**

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*NOTE: All behaviors below pertain to child and grandparent behaviors except for idiosyncratic language, repetitive behavior, physical/verbal aggression, and avoidance.*

### **SOCIAL INITIATION**

Child/Grandparent begins a new social interaction directed at grandparent/child through a verbal utterance (e.g., asking a question or making a comment), touching or gesturing toward the grandparent to gain attention, or touching the photo and looking at the grandparent/child (for shared interest/joint attention), not contingent on the other person's prior utterance.

A new interaction is defined as a change in object (photo), or discontinuation of previous social interaction for at least 5 seconds.

- Examples include: asking a question after 5 seconds of non-interaction, touching grandparent to gain attention after 5 seconds of non-interaction, making a comment upon first looking at photo.
- Non-examples include: child responding to a prior grandparent utterance within 5 seconds, child exhibits behavior without social intention (e.g., tapping on photo without orientation or gesturing toward grandparent, or as stimming behavior)

*NOTE: Initiation for "Extension of Topic" is only coded when the content is not directly about the photo. See notes under "Extension of Topic".*

### **SOCIAL RESPONSE**

Child/grandparent responds verbally and/or nonverbally to social stimuli directed toward him/her by grandparent/child.

A social interaction is coded as a response if it begins within 5 seconds of the grandparent/child's social initiation.

- Examples include: child nodding head or vocalizing in response to a comment or question by grandparent.
  - Non-examples include: child talks about something completely unrelated to topic.
-

## POSITIVE SOCIAL INTERACTION

Child/grandparent exhibits verbal or nonverbal social behaviors that lead to effective social process with grandparent/child. These behaviors serve to start or maintain social interaction.

- **Eye contact:** Child looks into eyes of grandparent (eye contact is only coded if both parties are looking at each other).
  - Example:
    - Child looks at grandparent's eyes (grandparent should also be looking back).
    - Child looks at grandparent when grandparent is not looking at him, but grandparent makes eye contact 3 seconds later. (Code only as eye contact and not "looking").
  - Non-example:
    - Child looks toward grandparent, but faces grandparent's neck and not his/her eyes.
    - Either child or grandparent's faces are out of video frame.
    - Child smiles when making eye contact with grandparent (Code as "Eye contact with smile")
  - Coding notes:
    - Code only if child is clearly looking at eyes of grandparent (approximate eye area of grandparent).
    - If grandparent and grandchild are not both present in video, do not code.
    - NOTE: If child looks at grandparent (no eye contact) but grandparent makes eye contact afterward (e.g., 5 sec later), code as eye contact, not "looking". i.e., **if eye contact is established during the duration of the behavior, code as eye contact.**
  
- **Eye contact with smile:** Child/grandparent looks at and smiles/laughs toward grandparent/child (both parties should be looking at each other)
  - Similar to "Eye contact", but code only if child visibly smiles.
  - NOTE: *If unsure about smile, do not code.*
  
- **Smile with no eye contact:** Child/grandparent smiles/laughs but does not look into the other person's eyes
  - Similar to "Eye contact with smile", but code only if child visibly smiles/laughs but does not look at grandparent or does not look at grandparent's eyes.
    - Example:
      - Child smiles/laughs while looking at and/or talking about photo.
      - Child smiles/laughs toward grandparent, but faces grandparent's body without making eye contact.
      - Child smiles/laughs (in response to photo or topic conversation) while looking away.
    - Non-example: Child looks down (mouth is hidden and smile is unclear)
  - NOTE: *If unsure about smile, do not code.*
  
- **Affection:** Child/grandparent expresses affection toward grandparent/child either verbally (e.g., "I like you") or nonverbally (e.g., hug, touch, high-fives, playful gestures)
  - Examples:

- Child/grandparent expresses a declarative statement of affection toward grandparent/child (e.g., “I love spending time with you”, “you’re awesome”)
  - Child gives grandparent a side-hug
  - Child clearly leans into grandparent’s side.
  - Child/grandparent perform some kind of gesture with playful intent (e.g., “chomping” on grandpa’s hand”)
  - Non-examples:
    - Child expresses declarative statement of enjoyment, but not toward grandparent (e.g., “I love reading”)
    - Child lies on grandparent’s lap to ‘rest’.
    - Do not include smiling/laughing.
  - **Social communication/talk:** Child/grandparent approaches or responds to the other person with social (rather than functional) intention (e.g., “look at that xx in the photo”). This includes verbal and nonverbal forms of communication.
    - Examples:
      - Child’s talk or **gestures** reflects an interest in the grandparent or content of the photo (e.g., “What do you think?”, “that animal looks funny”, **points** to object to direct attention),
      - Child leans to look at photo more closely / picks photo up to look closer.
      - Child responds to a prompt/question from grandparent. (Code “R”)
      - Child says, “Can you bring it closer? I can’t see it clearly.”
      - Child offers object (photo) to grandparent or points at something in photo.
      - Child makes verbal utterance/sound (e.g., “tsk”, “uh huh”, “whha!” etc.) in response to grandparent.
    - Non-examples:
      - Child/grandparent directs communication to researcher.
    - **NOTE: “Social communication” should be coded as I or R if “Extension of topic” occurs**
-

## EXTENSION OF TOPIC

- Conversation topic is extended from photo but not directly related to photo
    - Example:
      - Child talks about related event that is not depicted in the photo. If photo shows a park, child talks about a specific event/incident when he went to the park. Or child says "Let's plan for a future hike in the summer". Or Gdp says, "Would you like to visit.../let's go visit..."
      - Conversation on a hiking topic goes on to another outdoor activity – a fishing outing with grandparent
      - If photo shows a ship the family went on, and they start talking about a related event but not directly related to the trip itself or the specific ship in the photo.
    - Non-example:
      - Child describes feelings about photo: "I don't like [animal in photo]"
      - Child describes what he/she sees in the photo.
      - Child talks about events directly related to what's in the photo. E.g., photo is of child with a special hat, and child talks about why he got it and the circumstances around how he got it.
  - NOTE:
    - *This should only be coded if "Social communication/talk" was coded as I or R.*
    - ***"I" is coded when the child initiates the conversation about related event not directly depicted in the photo. Check photos of session if needed.***
    - ***"R" is coded when the extension of topic is in response to grandparent's initiation.***
- 

## LOW LEVEL INTERACTION

Child/grandparent exhibits behaviors that indicate social intention but with minimal social enactment.

- **Looking:** Child/grandparent looks at the other's face or body, or action, without establishing eye contact (when one party looks at the other, but the other is not looking.)
  - Example:
    - Child looks at grandparent's face but not the eyes.
    - Child responds to grandparent's question by looking toward grandparent, but not making eye contact.
    - Child laughs and looks at grandparent, but grandparent does not look back (no eye contact established) (Code as "smiles without eye contact" and "looking")
  - Nonexample:
    - Child orients face toward grandparent, but does not look at grandparent at all (e.g., eyes are looking anywhere but grandparent)
- **Functional communication:** Child initiates/responds (*verbal or nonverbal*) to grandparent with intention to fulfill his/her own needs, and with no social intention, unrelated to photo or content of conversation. Or, if Grandparent responds to child's

negative behaviors as a way of managing negative social behaviors (*verbal or nonverbal*)

- Example:
  - Child requests for water: “I want water”
  - Grandparent corrects child’s negative social behaviors: “Was that an okay thing to do?” “Please pick that up”. Etc.
- Nonexample
  - Child responds to grandparent’s social interaction with a related question. E.g., if the topic is about the park and child says, “Can we go to the park? I would like to go to the park!”
  - When will this be over – Code as negative social interaction
- **Neutral physical contact:** Child/grandparent makes physical contact with the other person which is not overtly aggressive, affectionate, ritualistic, or provocative.
  - Example:
    - Child physically leans on grandparent to look closer at photo (and not to gain attention from grandparent)
    - Child lies on grandparent’s lap. **NOTE:** *This is coded only at the first interval if child lies on grandparent lap for long periods.*
    - Grandparent brushes lint off child’s head.
  - Nonexample:
    - Child hugs grandparent (Code as “affection”)
    - Child hits grandparent (Code as “aggression”)
- **“Yes” and “no” ONLY:** Child says “yes” or “no” OR nods their head for yes and shakes it for no, without extending the conversation (verbally or non-verbally) within 3 seconds.
  - Example:
    - Child says yes in response to grandparent without further vocalizing within 3 seconds.
    - Child only nods in response to grandparent’s social initiation/response and does not vocalize further.
    - Child shrugs shoulders without further responding for 3 seconds.
  - Nonexample:
    - Child says “yes” (or nods) AND continues conversation within 3 seconds. This should be coded as “social communication” (R).
    - If child indicates “no” AND continues communication with a nonverbal gesture. Code as “social communication” (R).
  - **NOTE:** *If child says “no” as an act of avoidance (i.e., “No” and pushes photos away indicating a desire to stop session or avoid photo, code as avoidance and not “yes” and “no”. This code should only be for yes-no, factual type of questions, in response to the photo or photo content.*
- **Imitation:** Child/grandparent imitates the other person’s utterance, talk or actions
  - Example:
    - Child mimics grandparent’s words or actions.
  - Nonexample:
    - Child says same words as grandparents at almost the same time.
- **Idiosyncratic language:** Child uses utterances with no clear meaning [**child only**]
  - Example:

- Child utters words/phrases that appear to have no clear meaning.
    - Child displays echolalic behaviors
  - Nonexample:
    - Child's utterances are unclear to coder, but appear to be meaningful to grandparent (i.e., grandparent responds). If it is a case that utterances are unclear to coder due to unfamiliarity with child's language, do not code as idiosyncratic language.
- **Repetitive behavior:** Child behaves in repetitive manner with no clear communication intent (i.e., *stimming behaviors*) [**child only**]
  - Example:
    - Child flaps hands or shakes legs
    - Child displays stimming behavior
  - Nonexample:
    - Child stutters
    - Child taps photo repeatedly in an attempt to get grandparent's attention (e.g., taps photo and looks at grandparent).

### **NEGATIVE SOCIAL INTERACTION [*child only*]**

Child exhibits unpleasant social behaviors that operate to stop or decrease the likelihood of the development of an adequate social interaction.

- **Physical or verbal aggressiveness:** Child behaves in malicious intrusive ways toward grandparent, or *child destroys property.*
  - Example:
    - Child yells, screams, hits, pushes, pinches, slaps, etc.
    - Child throw a book
    - Child throws photo away, or gestures to throw photo away.
  - Nonexample:
    - Child talks loudly (louder than usual voice) due to excitement about topic.
    - Child taps hard on grandparent's shoulder to get social attention
  - NOTE: if child has a tantrum or meltdown for prolonged period, video should not be continued. If session is less than 3 minutes, do not code.
- **Avoidance:** Child avoids social overtures made toward him by grandparent
  - Example:
    - Looking away: Child looks away from grandparent in order to avoid social contact.
    - Moving away (more than 3 ft): Child physically moves more than 3 feet away from grandparent in order to avoid social contact.
    - Agitation: Child displays signs of agitation, beginning signs of meltdown. (e.g., whimpering, crying, makes sounds of frustration, etc.)
  - Nonexample:
    - Child moves chair away but continues to talk about photo or topic at hand.

*Additional coding notes:*

*For behaviors occurring at the same time (in seconds), if child displays positive social interaction behaviors, no negative social interaction should be coded [mutually exclusive codes]. However, if child displays positive social interaction behaviors at the start of the interval, and then displays a negative social interaction at the end of the interval, code both.*

**Appendix E: Child Rating Scale**

CHILD ID: \_\_\_\_\_ Session Date: \_\_\_\_\_ Session Number: \_\_\_\_\_  
 Phase: PreBL / BL / Int I / Int II  
 Condition: Non-familiar / Grandchild / Grandparent selected

*Please circle the picture that best describes how you are feeling.*

1. **How did you feel about chatting with your grandparent just now?**  
*[Prompt: How much did you like talking to your grandparent just now? / How much fun did you have talking to grandparent just now?]*



2. **How did you feel about the photos you just talked about?**  
*[Prompt: How much did you like the photos you just saw?]*

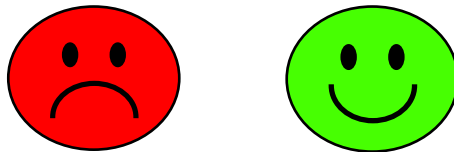


**Child Rating Scale [adapted]**

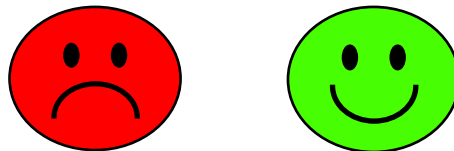
CHILD ID: \_\_\_\_\_ Session Date: \_\_\_\_\_ Session Number: \_\_\_\_\_  
 Phase: PreBL / BL / Int I / Int II Condition: Non-familiar / Grandchild / Grandparent selected

*Please point to the picture that best describes how you are feeling.*

3. **How did you feel about chatting with your grandparent just now?**  
*[Prompt: How much did you like talking to your grandparent just now? / How much fun did you have talking to grandparent just now?]*



4. **How did you feel about the photos you just talked about?**  
*[Prompt: How much did you like the photos you just saw?]*



**Child Rating Scale**

*[last round of three sessions]*

CHILD ID: \_\_\_\_\_ Session Date: \_\_\_\_\_ Session Number: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II

Condition: Non-familiar / Grandchild / Grandparent selected

***Please circle the picture that best describes how you are feeling.***

5. **How did you feel about chatting with your grandparent just now?**  
*[Prompt: How much did you like talking to your grandparent just now? / How much fun did you have talking to grandparent just now?]*



6. **How did you feel about the photos you just talked about?**  
*[Prompt: How much did you like the photos you just saw?]*



7. **Please rank the photos you enjoyed chatting about the most today?**  
*(1 being the most enjoyed)*

	Rank
First set of photos	
Second set of photos	
Third set of photos	

8. **What photo did you enjoy chatting most about today? Why?**

- End of survey -  
 Thank you for your time!

**Appendix F: Grandparent Rating Scale**

Grandparent ID: \_\_\_\_\_ Session Date: \_\_\_\_\_ Session Number: \_\_\_\_\_  
 Phase: PreBL / BL / Int I / Int II  
 Condition: Non-familiar / Grandchild / Grandparent selected

Please circle the picture that best describes how you are feeling.

- How did you feel about chatting with your grandchild just now?



- How did you feel about the photos you just talked about?



Please rate the following:

- How easy did you find it to **initiate** your conversation with your grandchild around the photos in this session?

1	2	3	4	5
Very difficult	Difficult	Neither easy nor difficult	Easy	Very easy

Why was this so? Any other comments?

---

- How easy did you find it to **maintain** your conversation with your grandchild around the photos in this session?

1	2	3	4	5
Very difficult	Difficult	Neither easy nor difficult	Easy	Very easy

Why was this so? Any other comments?

---

**Grandparent Rating Scale**  
*[last round of three sessions]*

Grandparent ID: \_\_\_\_\_ Session Date: \_\_\_\_\_ Session Number: \_\_\_\_\_  
 Phase: PreBL / BL / Int I / Int II Condition: Non-familiar / Grandchild / Grandparent selected

**Please circle the picture that best describes how you are feeling.**

5. How did you feel about chatting with your grandchild just now?



6. How did you feel about the photos you just talked about?



7. How easy did you find it to **initiate** your conversation with your grandchild around the photos in this session?

- |                |           |                               |      |           |
|----------------|-----------|-------------------------------|------|-----------|
| 1              | 2         | 3                             | 4    | 5         |
| Very difficult | Difficult | Neither easy nor<br>difficult | Easy | Very easy |

Why was this so? Any other comments?

---

8. How easy did you find it to **maintain** your conversation with your grandchild around the photos in this session?

- |                |           |                               |      |           |
|----------------|-----------|-------------------------------|------|-----------|
| 1              | 2         | 3                             | 4    | 5         |
| Very difficult | Difficult | Neither easy nor<br>difficult | Easy | Very easy |

Why was this so? Any other comments?

---

*[Cont. on next page]*

9. Please rank the photos you enjoyed chatting about the most today? (*1 being the most enjoyed*)

	<b>Rank</b>
<b>First set of photos</b>	
<b>Second set of photos</b>	
<b>Third set of photos</b>	

10. What photo did you enjoy chatting most about today? Why?

*- End of survey -*

*Thank you for your time!*

**Appendix G**

**Procedural Fidelity Checklist  
(for Pre-Baseline, Baseline, Intervention I, and Intervention II)**

Phase: **Pre-Baseline** | Participant ID: \_\_\_\_\_ | Session No: \_\_\_\_\_ | Date: \_\_\_\_\_

Check (✓) if implemented			Tasks
<b>Before Session</b>			
Y	N		<i>Child Rating Scale is printed in color</i>
Y	N		<i>Grandparent Rating Scale is printed in color</i>
<b>During Session</b>		<b>Pre-Baseline Condition</b>	
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		<i>Researcher starts Session with statement: "Let's talk about [animal/place/activity]."</i>
Y	N		<i>Pre-Baseline session is at least 3 minutes in length and no longer than 5 minutes in length.</i>
Y	N		<i>At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session.</i>
Y	N	N/A	<i>If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the topic until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.</i>
Y	N	N/A	<i>Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.</i>
Y	N	N/A	<i>Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.</i>
<b>Immediately after Session</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
<b>After Session</b>			
Y	N		Thank you email is sent to parent/grandparent. • Include next meeting date & time.
<i>Key: White boxes = Researcher complete; Grey boxes = Coder complete</i>			
<u>Notes for Sessions</u>			

Phase: **Baseline** | Participant ID: \_\_\_\_\_ | Session No: \_\_\_\_\_ | Date: \_\_\_\_\_

Check (✓) if implemented			Tasks
<b>Before Session</b>			
Y	N		Researcher checks with parent that non-familiar photos are not familiar to child (via email or in person)
Y	N		3 photos for <b>Non-familiar</b> condition are printed in color
Y	N		<i>Child Rating Scale</i> is printed in color
Y	N		<i>Grandparent Rating Scale</i> is printed in color
<b>During Session   Baseline Condition: ■ Non-familiar Photos</b>			
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		<i>Researcher places photo between grandparent and grandchild or hands photo to grandparent.</i>
Y	N		<i>Researcher starts Session with statement: "Here's a photo of [animal/place/activity]. Talk about what you see in this photo".</i>
Y	N		<i>Intervention session is at least 3 minutes in length and no longer than 5 minutes in length.</i>
Y	N		<i>At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session, and removes photos.</i>
Y	N	N/A	<i>If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the photos until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.</i>
Y	N		<i>Researcher only shows photos related to this session.</i>
Y	N	N/A	<i>Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.</i>
Y	N	N/A	<i>Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.</i>
<b>Immediately after Session</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
<b>After Session</b>			
Y	N		Thank you email is sent to parent/grandparent. <ul style="list-style-type: none"> <li>• Include next meeting date &amp; time.</li> <li>• Request for photos for specific conditions as needed.</li> </ul>
Y	N	N/A	If photos are not received, send a second email/phone call/text.
<i>Key: White boxes = Researcher complete; Grey boxes = Coder complete</i>			
<u>Notes for Sessions</u>			

Phase: **Intervention I** | Participant ID: \_\_\_\_\_ | Session No: \_\_\_\_\_ | Date: \_\_\_\_\_

Check (✓) if implemented			Tasks
<b>Before Sessions</b>			
Y	N		3 photos for Non-familiar condition are printed in color
Y	N		3 photos for Photo with Child condition are printed in color
Y	N		3 photos for Grandparent-selected condition are printed in color
Y	N		<i>Child Rating Scale</i> is printed in color
Y	N		<i>Grandparent Rating Scale</i> is printed in color
<b>During Session 1 selected</b>			<b>Condition: ■ Non-familiar / ■ Photo w Child / ■ Gdp</b>
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		<i>Researcher places photo between grandparent and grandchild or hands photo to grandparent.</i>
Y	N		<i>Researcher starts Session with statement: "Here's a photo of [animal/place/activity]. Talk about what you see in this photo".</i>
Y	N		<i>Intervention session is at least 3 minutes in length and no longer than 5 minutes in length.</i>
Y	N		<i>At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session, and removes photos.</i>
Y	N	N/A	<i>If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the photos until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.</i>
Y	N		<i>Researcher only shows photos related to this session.</i>
Y	N	N/A	<i>Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.</i>
Y	N	N/A	<i>Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.</i>
<b>Immediately after Session 1</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
Y	N		Confirm time for Session 2.
<b>During Session 2 selected</b>			<b>Condition: ■ Non-familiar / ■ Photo w Child / ■ Gdp</b>
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		Researcher places photo between grandparent and grandchild or hands photo to grandparent.
Y	N		Researcher starts Session with statement: "Here's a photo of [animal/place/activity]. Talk about what you see in this photo".
Y	N		Intervention session is at least 3 minutes in length and no longer than 5 minutes in length.
Y	N		At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session, and removes photos.

Y	N	N/A	If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the photos until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.
Y	N		Researcher only shows photos related to this session.
Y	N	N/A	Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.
Y	N	N/A	Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.
<b>Immediately after Session 2</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
Y	N		Confirm time for Session 2.
<b>During Session 3   Condition: ■ Non-familiar / ■ Photo w Child / ■ Gdp selected</b>			
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		Researcher places photo between grandparent and grandchild or hands photo to grandparent.
Y	N		Researcher starts Session with statement: "Here's a photo of [animal/place/activity]. Talk about what you see in this photo".
Y	N		Intervention session is at least 3 minutes in length and no longer than 5 minutes in length.
Y	N		At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session, and removes photos.
Y	N	N/A	If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the photos until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.
Y	N		Researcher only shows photos related to this session.
Y	N	N/A	Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.
Y	N	N/A	Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.
<b>Immediately after Session 3</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
<b>After Sessions</b>			
Y	N		Thank you email is sent to parent/grandparent. <ul style="list-style-type: none"> <li>• Include next meeting date &amp; time.</li> <li>• Request for photos for specific conditions as needed.</li> </ul>
Y	N	N/A	If photos are not received, send a second email/phone call/text.
Key: White boxes = Researcher complete; Grey boxes = Coder complete			
<u>Notes for Sessions</u>			

Phase: **Intervention II** | Participant ID: \_\_\_\_\_ | Session No: \_\_\_\_\_ | Date: \_\_\_\_\_

Check (✓) if implemented			Tasks
<b>Before Sessions</b>			
Y	N		3 photos for Photo with Child OR Grandparent-selected condition are printed in color
Y	N		<i>Child Rating Scale</i> is printed in color
Y	N		<i>Grandparent Rating Scale</i> is printed in color
<b>During Session   Condition: ■ Photo w Child / ■ Gdp selected</b>			
Y	N		2 Video cameras are set up so that grandparent and grandchild faces are captured.
Y	N		1 Audio recorder set up between grandparent and grandchild
Y	N		Only consented grandparent and grandchild (and researcher) are present in the filming area.
Y	N		<i>Researcher places photo between grandparent and grandchild or hands photo to grandparent.</i>
Y	N		<i>Researcher starts Session with statement: "Here's a photo [of you/your grandparent chose]. Talk about what you see in this photo".</i>
Y	N		<i>Intervention session is at least 3 minutes in length and no longer than 5 minutes in length.</i>
Y	N		<i>At 5 minutes (or when grandparent/grandchild indicates they are finished after the 3 min mark), researcher states, "Thank you for chatting" to end the session, and removes photos.</i>
Y	N	N/A	<i>If session takes less than 3 minutes, researcher will ask the grandparent and grandchild to talk about the photos until 3 minutes have been reached. If child clearly declines to participate, the session will end and this session will NOT be coded.</i>
Y	N		<i>Researcher only shows photos related to this session.</i>
Y	N	N/A	<i>Researcher provides prompts to grandparent ONLY after 5 seconds of pause in conversation.</i>
Y	N	N/A	<i>Researcher uses only the specific prompts and extending prompts listed in Procedure Manual.</i>
<b>Immediately after Session</b>			
Y	N		Child Rating Scale is offered to child
Y	N		Grandparent Rating Scale is offered to grandparent
<b>After Sessions</b>			
Y	N		Thank you email is sent to parent/grandparent. <ul style="list-style-type: none"> <li>• Include next meeting date &amp; time.</li> <li>• Request for photos for specific conditions as needed.</li> </ul>
Y	N	N/A	If photos are not received, send a second email/phone call/text.
Key: White boxes = Researcher complete; Grey boxes = Coder complete			
<u>Notes for Sessions</u>			

**Appendix H: Data coding sheets (Child and Grandparent behaviors)**

Child Behavior - Coding Data Sheet

p. 1

CHILD ID: \_\_\_\_\_  
Coding Start Time: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II  
Coding End Time: \_\_\_\_\_

Session Date: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
Coding date: \_\_\_\_\_

Child Behavior	Intervals (seconds)											
	1 0:01-0:10	2 0:11-0:20	3 0:21-0:30	4 0:31-0:40	5 0:41-0:50	6 0:51-1:00	7 1:01-1:10	8 1:11-1:20	9 1:21-1:30	10 1:31-1:40	11 1:41-1:50	12 1:51-2:00
<i>Indicate interval start time:</i>												
<b>Positive interaction</b>												
eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Topic content</b>												
extension	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>												
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
idiosyncratic language	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
repetitive behavior	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
Totals	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+
<b>Negative interaction</b>												
physical/verbal aggression	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
avoidance	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
Totals	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; /=Not applicable | Indicate change in photos using Δ symbol

Totals (this page)	
Positive interaction	I = _____ / 12 intervals R = _____ / 12 intervals
Topic content	I = _____ / 12 intervals R = _____ / 12 intervals
Low level interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals
Negative interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals

NOTE: (Note any unusual behavior or technical difficulties here)

Child Behavior - Coding Data Sheet

p. 2

CHILD ID: \_\_\_\_\_  
Coding Start Time: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II      Session Date: \_\_\_\_\_  
Coding End Time: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
Coding date: \_\_\_\_\_

Child Behavior	Intervals (seconds)											
	13 2:01-2:10	14 2:11-2:20	15 2:21-2:30	16 2:31-2:40	17 2:41-2:50	18 2:51-3:00	19 3:01-3:10	20 3:11-3:20	21 3:21-3:30	22 3:31-3:40	23 3:41-3:50	24 3:51-4:00
<i>Indicate interval start time:</i>												
<b>Positive interaction</b>												
eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Topic content</b>												
extension	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>												
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
idiosyncratic language	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
repetitive behavior	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
<b>Totals</b>	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+
<b>Negative interaction</b>												
physical/verbal aggression	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
avoidance	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
<b>Totals</b>	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; /=Not applicable | Indicate change in photos using Δ symbol

Totals (this page)	
Positive interaction	I = _____ / 12 intervals R = _____ / 12 intervals
Topic content	I = _____ / 12 intervals R = _____ / 12 intervals
Low level interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals
Negative interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals

NOTE: (Note any unusual behavior or technical difficulties here)

Child Behavior - Coding Data Sheet

p. 3

CHILD ID: \_\_\_\_\_ Phase: PreBL / BL / Int I / Int II Session Date: \_\_\_\_\_  
 Coding Start Time: \_\_\_\_\_ Coding End Time: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
 Coding date: \_\_\_\_\_

Child Behavior	Intervals (seconds)					
	25 4:01-4:10	26 4:11-4:20	27 4:21-4:30	28 4:31-4:40	29 4:41-4:50	30 4:51-5:00
<i>Indicate interval start time:</i>						
<b>Positive interaction</b>						
eye contact	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R
<b>Topic content</b>						
extension	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>						
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -
idiosyncratic language	+ -	+ -	+ -	+ -	+ -	+ -
repetitive behavior	+ -	+ -	+ -	+ -	+ -	+ -
<b>Totals</b>	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+
<b>Negative interaction</b>						
physical/verbal aggression	I R -	I R -	I R -	I R -	I R -	I R -
avoidance	+ -	+ -	+ -	+ -	+ -	+ -
<b>Totals</b>	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; /=Not applicable | Indicate change in photos using Δ symbol

Overall Totals		
Positive interaction	I = _____ / 30 intervals = _____ %	R = _____ / 30 intervals = _____ %
Topic content	I = _____ / 30 intervals = _____ %	R = _____ / 30 intervals = _____ %
Low level interaction	I = _____ / 30 intervals = _____ %	R/+ = _____ / 30 intervals = _____ %
Negative interaction	I = _____ / 30 intervals = _____ %	R/+ = _____ / 30 intervals = _____ %

Totals (this page)	
Positive interaction	I = _____ / 6 intervals R = _____ / 6 intervals
Topic content	I = _____ / 6 intervals R = _____ / 6 intervals
Low level interaction	I = _____ / 6 intervals R/+ = _____ / 6 intervals
Negative interaction	I = _____ / 6 intervals R/+ = _____ / 6 intervals

NOTE: (Note any unusual behavior or technical difficulties here)

Grandparent Behavior - Coding Data Sheet

p. 1

GRANDPARENT ID: \_\_\_\_\_  
Coding Start Time: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II      Session Date: \_\_\_\_\_  
Coding End Time: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
Coding date: \_\_\_\_\_

Grandparent Behavior	Intervals (seconds)											
	1 0:01-0:10	2 0:11-0:20	3 0:21-0:30	4 0:31-0:40	5 0:41-0:50	6 0:51-1:00	7 1:01-1:10	8 1:11-1:20	9 1:21-1:30	10 1:31-1:40	11 1:41-1:50	12 1:51-2:00
Indicate interval start time:												
<b>Positive interaction</b>												
eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Topic content</b>												
extension	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>												
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
Totals	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; /=Not applicable | Indicate change in photos using Δ symbol

Totals (this page)	
Positive interaction	I = _____ / 12 intervals R = _____ / 12 intervals
Topic content	I = _____ / 12 intervals R = _____ / 12 intervals
Low level interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals

NOTE: (Note any unusual behavior or technical difficulties here)

Grandparent Behavior - Coding Data Sheet

p. 2

GRANDPARENT ID: \_\_\_\_\_  
Coding Start Time: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II      Session Date: \_\_\_\_\_  
Coding End Time: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
Coding date: \_\_\_\_\_

Grandparent Behavior	Intervals (seconds)											
	13 2:01-2:10	14 2:11-2:20	15 2:21-2:30	16 2:31-2:40	17 2:41-2:50	18 2:51-3:00	19 3:01-3:10	20 3:11-3:20	21 3:21-3:30	22 3:31-3:40	23 3:41-3:50	24 3:51-4:00
<i>Indicate interval start time:</i>												
<b>Positive interaction</b>												
eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Topic content</b>												
extension	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
Totals	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>												
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -	+ -
Totals	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; /=Not applicable | Indicate change in photos using Δ symbol

Totals (this page)	
Positive interaction	I = _____ / 12 intervals R = _____ / 12 intervals
Topic content	I = _____ / 12 intervals R = _____ / 12 intervals
Low level interaction	I = _____ / 12 intervals R/+ = _____ / 12 intervals

NOTE: (Note any unusual behavior or technical difficulties here)

Grandparent Behavior - Coding Data Sheet

p. 3

GRANDPARENT ID: \_\_\_\_\_  
Coding Start Time: \_\_\_\_\_

Phase: PreBL / BL / Int I / Int II      Session Date: \_\_\_\_\_  
Coding End Time: \_\_\_\_\_

Coder Initials: \_\_\_\_\_ (Primary / Secondary Coder)  
Coding date: \_\_\_\_\_

Grandparent Behavior	Intervals (seconds)					
	25 4:01-4:10	26 4:11-4:20	27 4:21-4:30	28 4:31-4:40	29 4:41-4:50	30 4:51-5:00
<i>Indicate interval start time:</i>						
<b>Positive interaction</b>						
eye contact	I R -	I R -	I R -	I R -	I R -	I R -
eye contact w smile	I R -	I R -	I R -	I R -	I R -	I R -
smile w no eye contact	I R -	I R -	I R -	I R -	I R -	I R -
affection	I R -	I R -	I R -	I R -	I R -	I R -
social communication/talk	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R
<b>Topic content</b>						
extension	I R -	I R -	I R -	I R -	I R -	I R -
<b>Totals</b>	I R	I R	I R	I R	I R	I R
<b>Low level interaction</b>						
looking (no eye contact)	I R -	I R -	I R -	I R -	I R -	I R -
functional communication	I R -	I R -	I R -	I R -	I R -	I R -
neutral physical contact	I R -	I R -	I R -	I R -	I R -	I R -
yes/no only	+ -	+ -	+ -	+ -	+ -	+ -
imitation	+ -	+ -	+ -	+ -	+ -	+ -
<b>Totals</b>	I R/+	I R/+	I R/+	I R/+	I R/+	I R/+

KEY: I=Initiation; R=Response; / = Not applicable | Indicate change in photos using Δ symbol

Overall Totals	
Positive interaction I =	_____ / 30 intervals = ____%
Positive interaction R =	_____ / 30 intervals = ____%
Topic content I =	_____ / 30 intervals = ____%
Topic content R =	_____ / 30 intervals = ____%
Low level interaction I =	_____ / 30 intervals = ____%
Low level interaction R/+ =	_____ / 30 intervals = ____%

Totals (this page)	
Positive interaction I =	_____ / 6 intervals
Positive interaction R =	_____ / 6 intervals
Topic content I =	_____ / 6 intervals
Topic content R =	_____ / 6 intervals
Low level interaction I =	_____ / 6 intervals
Low level interaction R/+ =	_____ / 6 intervals

NOTE: (Note any unusual behavior or technical difficulties here)