

Supporting the Supporter: Social Support, Stress, and Well-being among Caregivers of Children
with Severe Disabilities

Meara Helen Faw

A dissertation
submitted in partial fulfillment of the
requirement for the degree of

Doctor of Philosophy
University of Washington
2014

Reading Committee:

Malcolm R. Parks, Chair

Valerie Manusov

Kathleen O'Connor

Hendrika Meischke

Program Authorized to Offer Degree:

Communication

©Copyright 2014
Meara H. Faw



This work is licensed by the author under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License <http://creativecommons.org/licenses/by-nc-sa/4.0/>

University of Washington

Abstract

Supporting the Supporter: Social Support, Stress, and Well-being among Caregivers of Children
with Severe Disabilities

Meara H. Faw

Chair of Supervisory Committee:

Dr. Malcolm R. Parks

Department of Communication

The social, economic, and physical costs associated with providing long-term care for a person with disabilities can be debilitating. Caregivers frequently experience burnout, emotional distress, and significant health ailments as a result of their caregiving duties. Social support can be a key resource to combat these negative effects. Despite extensive research underscoring the importance of perceived support on health and well-being, however, scholars continue to explore the specific physiological mechanisms for how support influences health. In addition, much of support research focuses on perceived support rather than actual supportive interactions and ignores the fact that support varies greatly in its quality and appropriateness. Much also remains unknown about the short-term effects of providing support for the friends and family members who support caregivers. This study addresses these questions in a specific context by looking at the effects of supportive interactions between parents of children with

disabilities and a member of their supportive network. This study explores how support and its quality influence the physiological stress responses of both the support receiver (a caregiving parent of a child with disabilities) and the support provider (a network member of the parent). It also outlines the literature surrounding social support and its connections with health and well-being generally before exploring several hypotheses and research questions investigating how supportive interactions affect relational and physiological health outcomes for both interactants in this context. The results and implications of this study are then discussed, outlining specific recommendations for future research.

Keywords: social support, caregiving, stress, cortisol, verbal person-centeredness, health, well-being, children with disabilities

TABLE OF CONTENTS

	Page
List of Figures	ii
List of Tables	iii
Acknowledgments	iv
Chapter I	1
Disabilities in the United States	2
The Community Cost of Disability	3
Social Support and its Importance	6
Defining Social Support	6
Social Support, Stress, and Health	7
Social Support and Physiological Measures	10
Communicated Social Support and Support Quality	15
Social Support and the Support Provider	18
Chapter II	24
Participants	24
Exclusion Criteria	25
Appointment Procedures	26
Measurements	29
Saliva Assay	29
Survey Scales for Parents	30
Survey Scales for Parents and Conversation Partners	33
Coding Interactions	37
Chapter III	46
Analysis involving Parents of Children with Disabilities	48
Perceived Support and Health Outcomes	48
Received Support and Relational and Health Outcomes	52
Analysis involving Conversation Partners	60
Providing Support and Relational and Health Outcomes	60
Providing Support, Support Quality, and Its Effects	61
Chapter IV	63
Support and Support Recipients	67
The Stress Buffering Hypothesis	67
Support Quality and Stress	68
Support and Support Providers	77
Study Limitations	80
Conclusion	85
References	102
Appendix A	110
Appendix B	118
Appendix C	117

LIST OF FIGURES

Figure Number	Page
1. Mediation model between perceived social support, perceived stress, and depression and anxiety	52
2. Changes in cortisol during appointment	54
3. Changes in cortisol by support quality	58

LIST OF TABLES

Table Number	Page
1. Timeline for Appointment Procedures	28
2. Examples of Interaction Messages and their Variations in VPC	40
3. Descriptive Statistics for the Primary Variables of Analysis for Parents of Children with Disabilities	47
4. Descriptive Statistics for the Primary Variables of Analysis for Conversation Partners	48
5. Predicting Perceived Stress by Caregiver Burden and Perceived Global Support	50
6. Repeated Measures ANCOVA Summary Table for Changes in Cortisol	54
7. Repeated Measures ANCOVA Summary Table for Changes in Cortisol by Quality of Support Provided	57
8. Summary of Results for All Hypotheses and Research Questions	64

ACKNOWLEDGEMENTS

This dissertation would not have been possible without the efforts of many individuals.

First, I thank my advisor, committee members, and colleagues at the University of Washington. Without Dr. Malcolm Parks' guidance and mentorship, this dissertation (and my future as an academic) would be nothing but a thought bubble of half-formulated ideas. I am so grateful for his time and efforts over the past five years. Likewise, much appreciation is due to Dr. Valerie Manusov, Dr. Hendrika Meischke, and, especially, Dr. Kathleen O'Connor. Thank you for your assistance throughout this project and, in Kathy's case, for the hours spent analyzing dozens of microtiter plates with me. I also thank my UW support team—Jacquelyn Harvey-Knowles, Dr. Lauren Kolodziejcki, and Elizabeth Parks. Thank you for your commiseration and camaraderie. I am truly blessed to have mentors and colleagues such as these.

Second, I thank my lifelong “fab five” friends—Dr. Paige Flett, Laura Nelson, Katie Baranco, and Laura Seals. Without you, dear friends, my life would be so boring. Thank you for encouraging me to press on and, above all, for making me laugh always. Thanks also to the wonderful Lindsay Tabaka, whose belief in me is unrivaled. I'm grateful for these friends and for how much they mean to me. To both sets of parents, Tim and Jhon Hall and Russ and Cathy Faw, and the rest of my family: Thank you, thank you, thank you, and thank you one more time!

Third, I thank the single most important person and source of support in my life, Kevin Faw. Thank you for your love and patience, for celebrating my victories and lifting me up in my moments of doubt and insecurity. I couldn't have done any of this without you.

Finally, I thank my gracious God, for his words are true: “I can do all things through Christ who strengthens me” (Philippians 4:13).

Supporting the Supporter:

Social Support, Stress, and Well-being among Caregivers of Children with Severe Disabilities

Chapter 1

Mental and physical disabilities afflict millions of people in the United States, and disability prevalence rates have risen during the past decade (CDC, 2012b). Treating disabilities is associated with significant economic and social costs, and the costs incurred specifically by long-term, informal family caregivers are significant (CDC, 2011). Family caregivers often dedicate their own financial resources to care for loved ones, and they frequently experience negative health outcomes as a result of the strain associated with their caregiving role (CDC, 2010). To help them manage these demands, caregivers may rely on social support from friends and family (Lovell, Moss, & Wetherell, 2012). Previous social support research has demonstrated the links between support, stress, and overall health and well-being (Berkman & Syme, 1979; Cohen & Willis, 1985; Lovell, et al., 2012), but there is much still unknown about how support ultimately influences well-being and when it works best.

The goals of this study are threefold. First, it explores how interactants dealing with a particular set of challenges (i.e., caring for a child with disabilities and providing support for that caregiver) in a single supportive conversation experience physiological changes as a result of their encounter and how these interactions affect the pre-existing relationship between the two of them as well as their perceived well-being. Second, this study examines one potential biological mechanism explaining the connection between social support and health by assessing the physiological stress responses of both interactants to a supportive interaction. Third, this

project focuses on how communicated support and support quality influence short-term reactions to stress, two critical areas of support research.

Before exploring these goals, the literature behind them, and the specific hypotheses and research questions proposed for this study, I outline some of the economic and physical costs associated with caregiving in the United States. I then summarize much of the research underscoring social support's role in alleviating caregiver burden before discussing the importance of assessing communicated support and its quality for both interactants in this specific context. Next, I review the existing literature on support and physiological measures, culminating in an outline of the research methods used to explore these hypotheses and research questions. Finally, I explore the results of this investigation before ending with a discussion of the implications of this research and its potential to inform future research.

Disabilities in the United States

According to the Centers for Disease Control and Prevention (CDC; 2012b), nearly one in six children in the United States experience developmental disabilities. Over the past decade, the prevalence of disabilities in the United States has grown 17.1%, resulting in an additional 1.8 million diagnoses of disabilities compared to years past (CDC, 2012b). These disabilities range greatly from mild conditions, such as speech impediments, to more serious disabilities, including autism and cerebral palsy. Classifying the severity of a disability is complicated, as disabilities can affect a range of functions from motor skills to cognitive development (Brault, 2008; Wolfe, Tarnal, & Ostry, 2009). The U.S. Census Bureau classifies individuals as experiencing *severe* disabilities if they encounter any of the following conditions: an inability to perform functional activities (such as walking, seeing, or hearing) or instrumental daily activities

(such as toileting or eating); a mental or emotional condition that significantly interferes with their ability to participate in everyday activities; or any condition that limits a person's ability to work around the house or maintain employment. Certain conditions, such as mental retardation, autism, cerebral palsy, and other developmental disabilities, are automatically classified as severe disabilities (Brault, 2008).

The Community Costs of Disability

Economic costs. There are numerous significant challenges linked to having a family member with a disability. First, disabilities are frequently tied to substantial medical costs. The CDC estimates that disability-associated healthcare spending accounted for nearly 27% of all healthcare expenditures in the United States, totaling approximately \$398 billion (CDC, 2011). Across all 50 states, annual spending estimates range from \$7833 to \$22,494 per disabled person (CDC, 2012a). Approximately 70% of these costs are paid for by public sources (such as Medicare and Medicaid), with the remaining 30% being covered by other sources (CDC, 2011).

The economic costs extend beyond public spending. Evidence suggests that families with a child with disabilities have lower aggregate household incomes than families without a disabled child, and these families are significantly more likely to fall below the poverty level (Emerson, 2003). One study found that families spent between 5%-12% of their annual income on treatment and care for the individual with disabilities. Most of these families spent in excess of \$8000 per year (Anderson, Dumont, Jacobs, & Azzaria, 2007). While staggering, this figure does not account for the costs associated with missed or scaled-back work due to caregiving responsibilities (Family Caregiver Alliance, 2012), making the actual cost even greater.

Burden on caregivers. Individuals with disabilities are often dependent upon others to complete many basic day-to-day activities successfully. According to National Dissemination Center for Children with Disabilities (NICHCY; 2013), “[o]ften, individuals with a severe disability require ongoing, extensive support in more than one major life activity in order to enjoy the quality of life available to people with fewer or no disabilities.” As such, the stress and burden experienced by those who physically care for and support individuals with disabilities represents a second and equally important community cost (CDC, 2010).

Long-term caregiving has been associated with a host of negative health outcomes, including increased risk of depression and anxiety, reduced immune functioning, a higher incidence of physical health complaints, and increased risk for all-cause mortality (Kiecolt-Glaser & Glaser, 2001; Lovell, et al., 2012; Rohleder, Marin, Ma, & Miller, 2009; Schulz & Beach, 1999; Schulz, O’Brien, Bookwala, & Fleissner, 1995). A study by the National Alliance for Caregiving (NAC; 2006) found that all of the 528 caregivers surveyed reported that their health had declined as a result of caregiving activities. Caregivers also indicated experiencing significant increases in stress (NAC, 2006). Stress, in turn, has been associated with a host of negative health outcomes (Cohen & Willis, 1985; Skinner et al., 2011), further complicating the health risks for long-term care providers.

Caregiving parents face unique challenges that potentially exacerbate these negative outcomes. Children with severe disabilities often engage in problematic behavior that can overwhelm or embarrass parents, creating feelings of social isolation and limiting their ability to cope (De Andrés-García, Moya-Albiol, & González-Bono, 2012; Ha, Hong, Mailick Seltzer, & Greenberg, 2008). These problems can also disrupt family functioning, creating strain between

parents, siblings, and members of the extended family (Raina et al., 2005). Similarly, parents must navigate social stigma associated with disabilities and the emotional grief that comes with realizing a child will never achieve certain life milestones (Ha et al., 2008). This grief is often compounded with anxiety about the child's future and concerns about whom will assume the child's care when the parents are no longer able (De Andrés-García et al., 2012).

In addition, caregiving is often associated with decreased efforts to maintain caregivers' own health, compromising their well-being in other ways. A study by the National Alliance for Caregiving (NAC; 2006) found that family member caregivers were less likely than individuals without any caregiving duties to receive health care for themselves, citing reasons such as a lack of time, energy, or alternative care options for the individual with disabilities. Caregivers also cited deficits in time and energy as key reasons for engaging in poorer eating and exercise habits, contributing to weight gain and the potential negative outcomes associated with being overweight or obese (NAC, 2006).

Caregiving costs also have significant implications for the child's health, as research has demonstrated that caregivers' health quality is tied directly to the quality of care they can provide (Carretero, Garcés, Ródenas, & Sanjosé, 2009; CDC, 2010). In fact, declining caregiver health is associated with pre-mature institutionalization of the individual with disabilities and, in extreme cases, maltreatment or abuse (Carretero et al., 2009). In one study, more than half of caregivers surveyed indicated that declines in their own health influenced their ability to provide quality care, with those experiencing the greatest health declines also reporting the most significant declines in the provision of quality care (NAC, 2006). Some caregivers even indicated that their health declines increased their concerns that they could no longer provide a

safe environment for the care recipient (NAC, 2004). As such, a vicious circle may be created whereby caregivers experience poorer health as a result of their caregiving responsibilities. This, in turn, results in decreased well-being for the care recipient, increasing their caregiving needs and adding additional burden to the caregiver, further impairing the caregivers' health. Thus, promoting caregiver well-being has a trickle-down effect, resulting in better care and health not just for the caregiver him/herself but also for the individual with disabilities.

Social Support and Its Importance

Defining Social Support

Because caregiver health and care recipient health are strongly interwoven, scholars and practitioners have sought to identify factors that might ameliorate the stress resulting from a caregiving role. Some strategies focus on providing respite care for the child with disabilities or creating opportunities for the caregiver to have personal time. Other strategies focus on enhancing caregiver coping mechanisms through educational interventions, group therapy, or other opportunities to air their emotions (Carretero et al., 2008).

Social support is one key resource for alleviating caregiver stress (Rodakowski, Skidmore, Rogers, & Schulz, 2012; Tsai & Wang, 2009). It is defined as "verbal and nonverbal communication between recipients and providers that reduces uncertainty about the situation, the self, the other, or the relationship, and functions to enhance a perception of personal control in one's life experience" (Albrecht & Adelman, 1987, p. 19). According to this definition, individuals encountering uncertainty often struggle to explain the causes and consequences of the events around them. This lack of confidence results in reduced perceptions of control,

creating distress. Social support, however, functions to reframe these situations and, in doing so, decreases the resulting anxiety (Albrecht & Adelman, 1987).

Five different types of social support have been identified in the literature: network, esteem, informational, tangible, and emotional support (Cutrona & Russell, 1990). *Network support* is characterized by actions that help a person feel connected to a larger social group. *Esteem support* focuses on sharing feelings that validate the other person and boost their self-concept. *Informational support* involves offering information about a topic of concern with the intention of providing assistance. *Tangible support* occurs when someone provides material goods or assistance to aid another. Finally, *emotional support*, the form that receives the most empirical attention, occurs when an individual receives expressions of caring, love, and concern (Cutrona, 1996). Parents of children with disabilities may receive several of these different types of support from their larger network, though research suggests that emotional support in particular is associated with beneficial health outcomes for caregivers, including enhanced subjective well-being and psychological adjustment (White & Hastings, 2004). This falls in line with the larger body of research seeking to investigate the connections between support and health. This extensive body of work also focuses on emotional support, as evidence shows distinct connections between emotional support and well-being more generally (House, 1981; Ikeda & Kawachi, 2010). These studies have attempted to outline specific mechanisms linking emotional support to enhanced health. One such explanation is the stress-buffering hypothesis.

Social Support, Stress, and Health

Ample empirical evidence suggests that adequate support is essential to mental, physical, and social well-being (Berkman & Syme, 1979; Cohen & Willis, 1985; Goldsmith, 2004).

In their seminal study examining a nationally representative sample in the United States, Berkman and Syme (1979) concluded that a lack of social support (as defined by the number of social network ties an individual had) was significantly associated with an increased risk of all-cause mortality. This reduced risk of mortality remained even after controlling for factors well-documented to influence mortality risk, such as socioeconomic standing, smoking, obesity, and alcohol consumption (Berkman & Syme, 1979). Though Berkman and Syme's operationalization of support differs from later research, their study was one of the first to link social connectedness with health outcomes. Since this study, numerous others have documented similar results in populations across the globe (e.g., Bøen, Dalgard, & Bjertness, 2012; Orth-Gomér & Johnson, 1987; Welin et al. 1985).

With the well-established associations between support and health, scholars have sought to investigate the specific mechanisms linking the two. One proposed mechanism explores how social support affects experiences of stress that, in turn, broadly affects health. Medical researchers and practitioners have long documented the negative effects of chronic stress on health and well-being. Allostasis theory (McEwan, 1998) argues that, as people experience ongoing stress, their biological stress response systems adapt to enhance their likelihood of survival. Whereas these adaptations serve to encourage survival in the present moment, they ultimately cause wear and tear on the body (known as allostatic load) that leads to long-term health deficits and an increased risk for early mortality. Thus, one way that support could enhance health is by reducing stress or enhancing an individual's ability to cope with stressors so as to limit his/her allostatic load.

Within the larger area of stress theory, the *stress-buffering hypothesis* proposes a specific relationship between support and stress (Cohen & Willis, 1985). It hypothesizes that support serves a protective function by helping distressed individuals cope with their problems. This enhanced coping ability ultimately limits their experiences of stress and, therefore, its negative effects on health and well-being. According to this hypothesis, support is most essential when people experience particularly difficult times, as this is when stress is likely to increase, leading to a higher allostatic load. To test the stress-buffering hypothesis, researchers have most commonly examined how perceptions of access to support as well as subjective perceptions of stress result in differing health outcomes.

Studies using these theoretical starting points have shown that positive health outcomes result from experiencing heightened levels of perceived support, including lower levels of psychological distress, fewer health complaints, lower levels of perceived stress, and better overall mental health (including lower risk of depression and anxiety) (Cohen & Willis, 1985; Lovell, et al. 2012; Stephens, Alpass, Towers, & Stevenson 2011). One study found that, among parents providing care for a child with autism or ADHD, those with greater perceptions of support experienced lower levels of psychological distress and fewer physical health complaints than caregivers experiencing lower levels of perceived support (Lovell et al., 2012). Another study involving mothers of adult children with intellectual disabilities found that increases in perceived emotional support were significantly associated with psychological well-being (Hong, Seltzer, & Krauss, 2001). Based on the history of evidence supporting a relationship between higher levels of perceived support and positive health outcomes broadly as well as among parent caregivers, I hypothesize that *perceived support will predict the*

physical health complaints (H1), level of depression (H2), level of anxiety (H3), and level of perceived stress (H4) among parents caring for a child with disabilities.

Social Support and Physiological Measures

Whereas substantial evidence supports the stress-buffering hypothesis, this body of research often operationalizes support based on individuals' reports of perceived support, not the support they actually receive (MacGeorge, Feng, & Burleson, 2011). In doing so, these studies implicitly acknowledge the role that communication plays in the supportive process without actually studying the communication itself. In response, scholars have argued that, "Social support should be studied as communication because it is ultimately conveyed through messages directed by one individual to another in the context of a relationship that is created and sustained through interaction" (Burleson, Albrecht, Goldsmith, & Samter, 1994, p. xviii). In addition to its emphasis on support as a perception, the majority of these studies frequently rely on subjective self-reports of stress (the degree to which individuals appraise life events as stressful) to understand participant stress (Cohen, Karmarck, & Mermelstein, 1983). While valuable, evidence suggests that people often experience difficulty trying to define and articulate in their own lives (Cacioppo, Marshal-Goodell, & Germenzano, 1983), underscoring the need for additional measures to assess experiences of stress as they relate to social phenomena.

In addition to these critiques, researchers have yet to establish a mediating relationship between psychological mechanisms, the effects of perceived support, and health (Uchino et al., 2012). That is, while studies using self-report data to measure stress and support have consistently noted that higher levels of support lead to reduced stress and, in turn, better

health, scholars are still investigating what might be happening biologically to account for the relationship between social support and stress. Within the past decade, scholars have examined several physiological processes that might explain the connections between support and stress. For example, research by Gallagher and colleagues (2009a, 2009b) focused on immune responses in caregivers. Their research found that parent caregivers for children with disabilities experienced a less robust antibody response to various vaccinations when compared with non-caregiving counterparts. These findings suggest that exposure to the demands of caregiving and the resulting heightened stress impairs immune functioning, making caregivers more susceptible to communicable diseases.

Scholars have also used the hormone cortisol to understand how social phenomena affect well-being, both in contexts involving parent caregivers and others (Afifi et al., 2011; Floyd et al., 2007; Lovell et al., 2012). Cortisol is a glucocorticoid hormone with many biological functions, including digestion, metabolism maintenance, and stress response (Levine et al., 2006). Its myriad functions make it an interesting yet complicated hormone to study, and researchers must be careful when studying cortisol to ensure that steps are taken to limit potential confounds. When an individual is exposed to stressors, cortisol is secreted by the adrenal glands through a series of chain reactions that begin in the hypothalamus and move to the pituitary gland. From there, cortisol moves through the blood stream to the adrenal glands. This regulatory system, known as the hypothalamic-pituitary-adrenal (HPA) axis, represents a slower, longer-lasting response to stressors, compared with the faster-acting, “fight or flight” sympathetic nervous system response to stress (Levine et al., 2006). Cortisol is secreted in a diurnal pattern, with levels peaking in the morning approximately 30 to 45 minutes after

waking and decreasing throughout the course of the day until they reach their lowest point in the evening. After stressor exposure, cortisol is secreted into the blood stream and passively diffuses into saliva and urine (Hellhammer, 2009).

Cortisol can be measured in several different biological matrices (Gatti et al., 2009; Levine et al., 2006). Though serum cortisol measures are considered the research gold standard, they are often not practical or feasible to administer in a study design. Especially when examining the short-term effects of stress, the act of venipuncture (a stressful event in and of itself) could result in a confounding cortisol response, making observations about the effects of the social phenomenon of interest impossible (Levine et al., 2006). It is, therefore, common practice to assess changes in salivary cortisol, as it is a less invasive way to observe cortisol changes and also less likely to result in a confounding stress response. Salivary cortisol's correlation with blood cortisol levels has been well established, underscoring its acceptability for use in research settings (Hellhammer et al., 2009). When exposed to stressors, increases in salivary cortisol begin after approximately 10 minutes and are expected to begin returning to their basal levels after about 30 minutes (Afifi et al., 2011; Chong et al., 2008; Floyd et al., 2007).

Recently, salivary cortisol has been used to explore the connections between social support and stress among parents of children with disabilities. In a 2012 study, Lovell and colleagues examined the diurnal pattern of salivary cortisol and, specifically, the cortisol awakening response (CAR). The CAR examines the rise in cortisol occurring approximately 30-45 minutes after waking in the morning. Lovell and colleagues found that caregivers who reported higher levels of esteem support experienced a steeper CAR. They argued that this increase in CAR is indicative of enhanced well-being, as previous research on CAR has implicated a blunted

CAR in negative health outcomes like burnout and chronic fatigue syndrome (Heim, Ehlert, & Hellhammer, 2000; Van Houdenhove, Van Den Eede, & Luyten, 2009). Put differently, the researchers concluded that caregivers who perceived greater access to support that encouraged a positive self-concept experienced enhanced well-being when compared to those experiencing lower levels of perceived support (Lovell et al., 2012). This evidence suggests a promising connection between cortisol response, stress, and social support specifically among caregiving parents.

What remains to be explored, however, is how quickly physiological reactions occur in response to social support. The study by Lovell and colleagues (2012) using cortisol and those by Gallagher and colleagues (2009a, 2009b) examining the immune system, for example, focused on physiological responses over a time period of at least 24 hours. Studies like these that take place over 24-hours or longer are limited in that they can only present aggregate information about many supportive encounters with several different people. They cannot speak to the specific communication that took place and its immediate effects on the well-being of the interactants (Priem & Solomon, 2014). Investigating responses to an actual supportive encounter provides an opportunity for discovering which characteristics of support make it more or less successful in this context including parent caregivers and what might, in turn, make support more beneficial in general. Understanding how short-term interactions might influence physiological changes to stress and enhanced well-being is valuable. These interactions can take place at any point in time and with a number of different individuals, and knowledge about the short-term effects of support provides one potential avenue for offering a

form of low-cost care to parents of children with disabilities in informal settings without creating any extra costs or burdens on the larger health care system.

Because studies examining the effects of support over longer periods do not have specific information about the supportive communication that occurred during the study period, the resulting recommendations from these studies are that participants benefit from more support generally without exploring or understanding the nuances of specific supportive encounters. It is possible that the short-term effects of receiving support also influence well-being and can illuminate specific qualities about support that are meaningful both in the present moment as well as over time. Thus, this question remains: What physiological response occurs in the body during a short-term supportive interaction or shortly after a supportive encounter occurs? Few studies have sought to examine this question, though one project by Priem and Solomon (2011) sheds light on this question.

In this study, the researchers found that participants who received support from a romantic partner after engaging in a stressful task experienced decreases in salivary cortisol levels. This was, however, not true for individuals who engaged in a stressful task and then received a hurtful message (Priem & Solomon, 2011). Their study suggests that, immediately following a supportive interaction, individuals experienced lower levels of stress. Based on this evidence, I hypothesize that *parents of children with disabilities will experience a decrease in their stress levels (as evidenced by reductions in their salivary cortisol levels) in response to a brief supportive interaction with a network member (H5).*

Communicated Social Support and Support Quality

As noted, most studies examining the relationship between support and health look at participants' perceptions of support, and the current study also inquires about this form of support. Perceived support is important, but it is not the only way to study support. Moreover, critics of studies using perceived support argue that these measures imply that more support is always better (MacGeorge et al., 2011), whereas evidence exists to contrary (Croezen et al., 2012; Goldsmith, 1992, 2004). Some supportive attempts can actually result in interactions that are unhelpful or even harmful. Recent studies by Byrd-Craven and colleagues (2008, 2010), for example, demonstrate that when attempts at support result in co-rumination (interactions featuring excessive problem talk coupled with negative affect), the end result is experiencing sustained stress, not less stress. Offers of unwanted or unhelpful support can also lead to strained relationships and awkward interactions (Braithwaite & Eckstein, 2003; Faw, 2014).

It is important to consider not just perceptions of support but also the communication of support and its quality, because it is ultimately through the messages shared that participants feel supported or not (MacGeorge et al., 2011). One way to measure the quality of support is by assessing it in terms of its *verbal person-centeredness* (VPC; Burleson, 1982, 2003; MacGeorge et al., 2011). VPC is defined as "the extent to which messages explicitly acknowledge, legitimize, and contextualize the feelings and perspectives of a distressed other" (Bodie, Burleson, Holmstrom et al., 2011, p. 231). Numerous studies have explored the effects of person-centered supportive messages on relational outcomes, and results from a recent meta-analysis indicate a strong, positive relationship ($r = .61$) between VPC and the perceived effectiveness of supportive messages (High & Dillard, 2012).

Not all supportive messages have the same level of VPC. Low person-centered (LPC) “support” ignores or denies the distressed individual’s feelings. Often, these messages veer towards criticism, challenging the legitimacy of the distressed individual’s emotions. Other times, LPC messages focus on telling the distressed person how he/she *should* feel. Moderate person-centered (MPC) support recognizes the other person’s feelings implicitly without fully legitimizing them or elaborating upon them. These messages are characterized by expressions of sympathy or attempts to distract the individuals from their distress. MPC messages might also explain the distressed person’s situation in ways intended to reduce his/her stress without ever fully legitimizing or elaborating on his/her feelings.

In contrast to LPC and MPC messages, high person-centered (HPC) messages fully acknowledge the distressed other’s feelings and legitimize them. HPC messages help distressed individuals articulate and elaborate on their feelings while simultaneously providing a broader context for the situation and the emotions involved (Applegate, 1980a, 1980b). Ultimately, HPC messages help distressed people gain insight into the situation and equip them with the enhanced feelings of efficacy needed to negotiate the challenges they face (Bodie, Burleson, Gill-Rosier et al., 2011; Bodie, Burleson, Holmstrom et al., 2011; Burleson, 1994; Burleson et al., 2005).

Researchers have consistently found HPC messages to be more positive, sensitive, comforting, and helpful than either MPC or HPC messages (High & Dillard, 2012; Jones & Guerrero, 2001). HPC message recipients also report feeling better as a result of the support received than those who receive LPC or MPC messages (Jones & Burleson, 2003). Similarly, HPC support has been associated with increased relationship satisfaction and stability among long-

term romantic or married couples (Brock & Lawrence, 2008; Samter, 1994), and effective social support has been cited as a key component of close interpersonal relationships among friends (Parks & Floyd, 1996). HPC support has also been associated with improved affect, in part, because it encourages support recipients to engage in cognitive reappraisals that are directly associated with enhancements to their emotional states (Burleson, 1994; Jones & Burleson, 2003; Jones & Wirtz, 2006). In general and across a number of studies, effective communication and effective support are central concepts in several models predicting relationship well-being, stability, and satisfaction (MacGeorge et al., 2011). With this in mind, I pose several hypotheses to test the effects of supportive messages that vary in VPC on the relational outcomes between a parent of a child with disabilities and their conversation partner. I hypothesize that *parents who receive supportive messages higher in VPC will report greater relationship satisfaction (H6) and feelings of closeness (H7) with their conversation partner when compared with parents who receive messages lower in VPC*. I also hypothesize that *parents who receive supportive messages higher in VPC will report higher levels of perceived support (H8) than parents who receive supportive messages lower in VPC*.

Despite the positive associations related to receiving HPC support, little research has examined the physiological outcomes that result from receiving different quality support. In one study by Priem and Solomon (2009), participants with high levels of communication apprehension were offered comforting messages before they had to give a public speech. The researchers found that distracting messages (messages likely classified as MPC messages had VPC been used to measure support quality) produced significant reductions in physiological stress as measured by salivary cortisol. This is interesting, as VPC research in general would

suggest that HPC messages, not MPC, should produce the strongest positive outcome as the form of support most consistently rated as helpful and effective (High & Dillard, 2012).

When interpreting the results of this study, it is important to note that it was conducted in a specific context. Participants were exposed to an acute stressor and received comfort from someone with whom they did not have a particularly close relationship. These conditions are different from the average supportive interaction experienced in day-to-day lives. This study's context also provides limited information to explain what might happen when someone experiencing chronic stress, like a caregiver, receives LPC, MPC, or HPC support. One study examining parents of children with intellectual disabilities found that parents' ratings of the helpfulness of the support received from their friends and family was the most consistent predictor of enhanced well-being when compared with support received from formal sources as well as the total volume of support perceived to be available (White & Hastings, 2004). Based on the evidence linking HPC messages to better outcomes, including perceptions of message helpfulness, and the evidence that the helpfulness of the support is significant for the parents of children with disabilities, I hypothesize that *parents who receive of HPC supportive messages during their interaction with their conversation partner will experience greater reductions of physiological stress as evidenced by decreases in levels of salivary cortisol than parents receiving MPC or LPC messages (H9)*. Similarly, I predict that *parents who receive MPC messages will experience greater reductions in physiological stress than parents receiving LPC messages (H10)*.

Social Support and the Support Provider

A supportive interaction, by its very nature of being an *interaction*, must involve at least two people in communication with one another (Albrecht & Adelman, 1987; Goldsmith, 2004).

Thus, it is important to consider the support recipient *and* the support provider when assessing the outcomes of supportive interactions as both people are key to the overall interaction. Providing support can result in both positive and negative outcomes for the provider (Liang, Krause, & Bennet, 2001). In some cases, those providing support may experience negative feelings toward the recipient or their relationship with the recipient (La Giappa, 1990; Lu & Stanton, 1992). Support provision can also result in emotional contagion, whereby the provider's emotional state deteriorates as they assume some of the negative emotions experienced by the recipient while expressing empathy for their distress (Coyne, 1976; Wortman & Dunkel-Schetter, 1979).

Providing support also carries risk even when it is not associated with long-term stressors such as those resulting from a caregiving role. Individuals sought for support by friends or family may feel their autonomy is threatened (Goldsmith, 1992), resulting in feelings of obligation or resentment that lead to relational hardship (Lu, 1997). Likewise, concerns about providing an inappropriate response or fears of appearing incapable can produce anxiety for support providers (Goldsmith, 1992; Wortman & Lehman, 1985). Providing support can also result in emotional and physical strain. In fact, it is the demands associated with providing constant and extensive support that result in the negative outcomes associated with caring for a child with disabilities (Carretero et al., 2009; Gallagher & Whiteley, 2013; Lach et al., 2009)

On the other hand, there are potential benefits to providing support, including increased positive affect and the feelings of satisfaction that can result from aiding a loved one (Cialdini, Darby, & Vincent, 1973; Cialdini & Kenrick, 1976; Lu & Argyle, 1992). Several studies examining older adults have found that support provision is associated with enhanced feelings

of trust, intimacy, and a greater sense of purpose as well as decreases in psychological distress (Krause, Herzog, & Baker; 1992; Liang et al. 2001). In another study, Brown and colleagues (2003) concluded that providing tangible and emotional support resulted in reduced mortality among older adults. Even among parents of children with disabilities, they often perceive benefits in providing support and care for their child (Green, 2007). These studies highlight the potential benefits of support provision. Many of these studies also note, however, that, in certain circumstances, offering support can ultimately be harmful for the provider. For example, if individuals are called upon to provide excessive support, the benefits of support provision evaporate and negative outcomes begin to occur (Brown et al., 2003; Silverstein, Chen, & Holler, 1996).

It is not difficult to imagine that people called upon to support caregivers of children with disabilities might experience some of the benefits generally associated with support provision because of their opportunity to assist a friend or family member. Aside from research examining the effects of support provision among elderly adults or individuals in a caregiving situation, little research has examined the outcomes that come from supporting the supporter. Understanding the consequences of providing support to chronically stressed individuals including parents of children with disabilities is important, as this support is crucial to minimizing potential burnout and declines in their well-being (Carretero et al., 2009; Lovell, et al., 2012). Thus, I hypothesize that *conversation partners providing support to parents of children with disabilities will experience short-term decreases in physiological stress as evidenced by changes in salivary cortisol as a result of supporting the parent caregiver* (H11).

Just as with support recipients, it is likely that support quality matters for the support provider. Researchers have posited that matching the support offered to the needs that support seekers communicate is essential to creating a successful interaction for both support providers and recipients (Cutrona & Russell, 1990). Similarly, scholars examining VPC have concluded that providing HPC messages requires higher levels of cognitive complexity and social engagement than is required to produce LPC or MPC messages (Samter, 2002). Aside from these conclusions, very little research has investigated what effects the creation of supportive messages might have on the support provider. As such, an additional goal of this study is to explore the outcomes experienced by support providers when they create support messages of differing quality.

One potential benefit of providing support is improved affect (i.e., increases in positive affect and reductions in negative affect) (Cialdini & Kenrick, 1976; Lu & Argyle, 1992). Little is known, however, about whether providing support of differing quality might influence an individual's positive and negative affect differently. That is, we do not know if providing high-quality support results in more significant enhancements to improve affect than providing lower quality support. In one study examining the effects of support provision on affect, Knoll et al. (2014) found that engaging in different types of support (e.g., emotional versus tangible) produced distinct changes in affect that differed among men and women. In their study, providing instrumental support (information and tangible assistance) was associated with enhanced positive affect among men, whereas providing emotional support was associated with better outcomes for women. Additional research has shown that successfully helping someone in need can result in bolstered self-esteem (Batson, 1998) and enhanced mood

(Gleason, Iida, Bolger & Shrout, 2003; Williamson & Clark, 1989) in the helper more generally. Because HPC support should be more effective and produce better outcomes for the support recipient than either MPC or LPC support, it is likely that support providers will be aware of their success (or failure) as they provide these different types of support, with perceived shortcomings from providing LPC or MPC support leading to corresponding changes in affect. With this in mind, I hypothesize that *providing HPC support will be associated with providers' lower levels of negative affect (H12) and higher levels of positive affect (H13) when compared with individuals providing support lower in VPC*. Finally, I pose the following research questions to further explore the associations of support quality with other relational and health outcomes: *Does the quality of the support provided affect the physiological stress response of the support provider during the supportive interaction (RQ1)? Does the quality of support provided influence the support provider's perceptions of relationship satisfaction (RQ2) and closeness (RQ3)?*

Chapter 1 Summary

Because of the significant costs associated with caring for children with disabilities, it is important to understand how support might ameliorate the stress associated with long-term caregiving duties in this context. This study's goal, to explore the associations between a short-term supportive interaction and relational and health outcomes among parents of children with disabilities and a member of their supportive network, is accomplished by testing three sets of predictions. The first concern outcomes experienced by the support recipient (the parent caregiver), including how their general perceptions of support affect their perceptions of their relationship and their stress levels as well as their physiological manifestations of stress. The

second set of hypotheses tests how examining variations in message quality affect these same outcomes among parent caregivers, using verbal person-centeredness as the metric of support quality. The final set of predictions explores how giving support affects the support provider (the conversation partner in this study). These hypotheses and research questions examine the relational and physical outcomes of support provision and include investigations into the effects of offering different quality support on well-being. Next, I outline the research methods employed to test these hypotheses.

Chapter II: Methods

Participants

Participants were recruited through a handful of strategies. First, I contacted several organizations that provide resources for parents of children with disabilities. In this initial contact, I explained the study and its procedures and asked if the organizational contact would be willing to promote the study. Second, after identifying a handful of participants through this strategy, I began data collection and engaged in snowball sampling. During data collection appointments, I talked with participants about their knowledge of others who might be eligible and interested in participating in this study. If they knew others whom they thought might be interested, they then directed these people to contact me about becoming involved. Finally, in addition to these methods, I posted study announcements on online message boards or in support groups for parents and families of individuals with disabilities. Ultimately, participants were recruited across three states in the northwestern United States.

The final sample included 40 dyads with each dyad consisting of at least one parent of a child with disabilities and one conversation partner. These partners were someone with whom the parent had a pre-existing relationship and whom the parents identified as someone they had previously turned to for support. Parents were almost exclusively mothers (female: 97.5%) and ranged from 25 to 77 years old ($M = 48.65$, $SD = 10.62$), whereas conversation partners (female: 40%) ranged from 27 to 80 years old ($M = 49.30$, $SD = 10.04$). Participants predominately identified themselves as White (93.8%), with the remaining identifying themselves as Native American (3.8%) or other (2.5%). Conversation partners consisted of spouses or romantic partners (60%), friends (17.5%), parents (12.5%), or adult children of the parent participant (10%). These dyads had usually known one another for more than 7 years

(90% of dyads), though two dyads had known each other for approximately 5 years, one for 2 years, and one had known each other for one year. The majority of parents were currently married (82.5%), though some had either never been married (5%) or were divorced (12.5%).

Exclusion Criteria

Interested parents were first directed to complete an online screening questionnaire to determine their eligibility or, in cases where online access was limited or non-preferred, participants were screened over the phone. To be eligible, each dyad had to include at least one parent of a child with disabilities and one conversation partner. Though generally accepted as a reliable physiological measure of stress, cortisol's many biological functions demand that researchers take care to address potential behaviors and participant characteristics that might influence its secretion and confound results. For this reason, all participants could not currently use any form of steroids, prescription hormones (excluding contraceptives), or thyroid medication, nor could they currently use tobacco (including smoking or chewing tobacco) (Afifi et al., 2011; Floyd et al., 2007). Finally, pregnant or breastfeeding participants were excluded from the study as the biological changes associated with pregnancy and breastfeeding are known to alter an individual's cortisol levels (Floyd et al., 2007).

During screening, parents nominated up to three different people whom they considered important supportive contacts. In selecting these contacts, parents were asked to think about an adult whom they had previously turned to for support that also lived in the same geographical region. These partners could be of any relationship to the parent. Upon completing the screening questionnaire successfully, parents were asked to share the questionnaire's website link with their potential conversation partners. By asking more than

one conversation partner to take the screening questionnaire, I tried to ensure that parents could maximize their ability to participate in the study in case conversation partners did not qualify or did not want to participate. Nonetheless, a majority of participants chose to only nominate one person for participation in the study.

Appointment Procedures

Appointments were scheduled throughout the day to accommodate participants' schedules. Participants were asked to choose a two-hour block of time when both the parent and his or her conversation partner could meet to participate in the study. The majority of appointments took place in participants' homes, with a few taking place at other locations when participants indicated they would feel more comfortable meeting elsewhere. These locations included a conference room in the researcher's university and classrooms in two public elementary schools not currently in session. All participants were asked to refrain from eating anything, drinking anything but water, or exercising vigorously for at least two hours prior to their appointment start time as these activities are known to cause short-term increases in cortisol that could confound the results of the study (Gordis et al., 2006). They were also asked to refrain from brushing their teeth or chewing gum for at least 30 minutes prior to their appointment start time in order to ensure that the saliva samples obtained were untainted (Gordis et al., 2006). All participants received confirmation of their appointment the night before. This confirmation was communicated by phone, email, or text message and contained an appointment reminder and instructions for pre-appointment procedures.

At the beginning of the appointment, each set of participants received a thorough explanation of the study procedures and completed the informed consent process (for a study

timeline, please Table 1). They also affirmed their adherence to all pre-study measures. If participants had not complied with pre-study procedures, the appointment was rescheduled. No participants indicated a lack of adherence to pre-study procedures. After consenting, participants provided a baseline saliva specimen using the passive drool method (Granger et al., 2007). Under this method, participants were instructed to rinse their mouths out with water. They then provided approximately two milliliters of saliva in a polypropylene centrifuge tube by drooling or spitting into the tube.

Next, participants received instructions for the conversation portion of the study. The conversation lasted 10 minutes and was video recorded with their permission. During the conversation, the video camera was placed on a tripod usually eight to ten feet away from the participants and remained in the same position for the duration of the conversation. The camera was angled to capture the bodies and faces of both participants as fully as possible. In the conversation, the parent of the child with disabilities (or the primary caretaking parent in the case that both parents participated together) was instructed to share some of the challenges or difficulties he or she experienced as a result of caring for a child with disabilities. Participants could talk about this topic broadly (i.e., general fears of their child growing old, sadness about milestones their child will never achieve) or more specifically (i.e., discussion of difficult behavior the day of the appointment, challenges with attempting new medications). In response, conversation partners were instructed to respond in ways that they thought would be helpful and appropriate. Both participants were told that there was no set structure for the

Table 1.

Timeline for study appointment procedures.

Arrival	Baseline Saliva Sample (T1)	Conversation Task	Saliva Sample 1 (T2)	Saliva Sample 2 (T3)	Follow-up Questionnaire	Saliva Sample 3 (T4)
Arrive for appointment; informed consent process	Baseline saliva specimen	Participants engage in 10 minute conversation	Specimen 10 minutes post-conversation task	Specimen sample 30 minutes post-conversation	Participants begin working on the follow-up questionnaire	Specimen 50 minutes post-conversation task

conversation and that the goal was to have the conversation feel as normal as possible. To give participants additional privacy, the researcher left the room during the conversation.

After the interaction, participants engaged in a 10-minute rest period. During all rest periods, participants were asked not to talk with one another or use their cell phones or computers. Instead, they were provided with a selection of magazines that they could read during this time. At the end of the first rest period, participants provided another saliva specimen. They then completed a 20-minute rest period followed by a third saliva specimen. Participants were then given access to an online or pen-and-paper questionnaire (depending on participants' preferences and internet accessibility). Twenty minutes after the completion of their third saliva specimen, participants provided a final saliva specimen. Participants remained in the same room with one another during the procedures, and the researcher was also present with them for all portions of the study except for the conversation. Upon completion of the appointment, participants were debriefed as to the goals of the research study. Each person was also provided with \$25. They were then encouraged to ask any remaining questions about the research procedures and offered a copy of the consent form complete with the researcher's contact information.

Measurements

Salivary cortisol assay. Saliva samples were kept on ice when transported from the appointment and then frozen in a home freezer at -5°C . Samples were then transferred to a -20°C freezer in the laboratory. Specimens remained frozen until analysis, when they were thawed in the lab and then centrifuged at 2800 RPM for 20 minutes. The aqueous layer of the saliva was separated into aliquots and stored in a -20°C freezer until ready for assay. Upon the

first run of the cortisol specimens, all specimens had gone through two freeze-thaw cycles. Specimens were assayed using a competitive microtiter plate enzyme immunoassay (EIA) designed to measure salivary cortisol. The assay protocol had been previously validated (Munro & Stabenfeldt, 1985) and used for measuring cortisol in a variety of matrices, including saliva (Skinner et al., 2011) and urine (Trumble, Brindle, Kupsik, & O'Connor, 2010) as well as both serum and dried blood spots specimens (Konishi, Guyton, & O'Connor, 2012). The assay used cortisol reference calibrators (Steraloids, cat. no. Q3880) and a purified polyclonal-anti-cortisol antibody, R4886, provided by C. Munro (University of California, Davis) (Munro & Stabenfeldt, 1985). All specimens were run in duplicate, with each participant's specimens run on the same microtiter plate to minimize any potential bias resulting from variations across plates (Trumble et al., 2012). Specimens were run at a variety of dilutions (ranging from 1:1 to 1:10) in order to accommodate the different collection times across the day. Specimens that fell outside the assay limits of detection or had unacceptable coefficients of variation (CV's) were re-assayed. Ultimately, all samples fell within the limits of detection of the assay, and none were excluded from analysis. The intra-assay CV's for the specimens ($n = 14$ plates) ranged from 9% to 15% for the three in-house controls. Inter-assay CV's ranged from 8% to 14% across the three controls.

Survey scales for parents. Because each appointment involved two people, each participant received a slightly different questionnaire depending on whether he or she was the parent/primary caregiver of the child with disabilities or the conversation partner. The following scales were included in the questionnaire for the primary parent only (see Appendix A for complete parent scale information). For all scales where reliability was acceptable ($\alpha = .70$ or greater), a single mean score was computed and used in the subsequent analyses.

Caregiver burden. Parents completed Zarit and colleague's (1980) Caregiver Burden Scale. Though originally designed to assess burdens associated with caring for the elderly, it has since been tested and successfully applied to a variety of caregiving situations including situations involving children with disabilities (Deeken et al., 2003). Respondents indicated on a "never" (0) to "nearly always" (4) scale how often they experience different emotions and situations as a result of their caregiving duties, including questions such as "How often do you feel that your relationship with the relative for whom you are caring negatively impacts your social life?" and "How much does your relative depend on you as the caregiver?". This scale consisted of 22 different items to assess a caregiver's overall burden. Reliability for the scale (as assessed using Chronbach's α) was robust ($\alpha = .89$; $M = 2.13$, $SD = .71$).

Functioning of the child with disabilities. The Functional Independences Measure for Children (WeeFIM; Ottenbacher et al., 1999) was used to measure the functioning of the child with special needs. In cases where the parents had more than one child with disabilities, they chose the child whom they identified as having the most significant and severe needs and completed the scale with that child in mind. The WeeFIM outlines several day-to-day activities (e.g., toileting, dressing, communicating, eating, etc.) and asks the caregiver to rate the child's ability to perform the activity with or without assistant. Parents rate their child on a "total assistance required (child at 0%)" (1) to a "complete independence (child completes task timely and safely)" (7). Higher scores on the WeeFIM represent children experiencing milder disabilities and greater independence, though it is important to note that higher scores do not indicate that the child is free from disabilities or even free from severe disabilities. The reliability of this scale was strong ($\alpha = .97$; $M = 4.45$, $SD = 1.94$).

Perceived stress. Parents' perceived stress was measured using the Global Perceived Stress Scale (GPSS; Cohen, Karmarck, & Mermelstein, 1983). This 14-item scale asked participants to indicate how often they perceived events in their life to be overwhelming or unpredictable on a "never/almost never" (0) to "more than once per week" (4) scale. Sample items included, "In the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you been angered because of things that happened that were outside of your control?". Six scale items were reverse coded so that higher scores represented higher levels of perceived stress ($\alpha = .86$; $M = 1.95$, $SD = .63$).

Physical health symptoms. To assess caregivers' experiences of physical health ailments, parents completed a shortened version of Pennebaker's Inventory of Limbic Languidness, a scale commonly used to assess individual's overall experiences of common physical health complaints and general physical health (Pennebaker, 1982). First, participants were asked to indicate the frequency with which they experienced common health complaints (e.g., headaches, stomach pain, chest pain, faintness or dizziness, etc.) on a "have never or almost never experienced this symptom" (0) to a "more than once very week" (4) scale (range: 4-22). Second, they responded to three general questions about their health: In the past month, how many visits have you made to the physician for illness (range: 0-5); how many days have you been sick (range: 0-30); and how many days has your activity been restricted due to illness (range: 0-30). These items were combined with the responses to common health complaints questions to create a single measure of physical health symptoms ($\alpha = .72$; $M = 17.31$, $SD = 13.80$).

Mental health symptoms. Parents also responded to a scale assessing their experiences of mental health ailments. Using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), participants responded to seven items assessing anxiety and seven assessing depression. For both subscales, all items were coded using a 1 to 4 scale, with higher scores indicating greater levels of depression or anxiety. On the depression subscale, one item (“I feel cheerful”) was removed to achieve acceptable scale reliability ($\alpha = .73$; $M = 3.04$, $SD = .53$). On the anxiety subscale, one item (“I get a sort of frightened feeling, like ‘butterflies’ in the stomach”) was removed to enhance scale reliability ($\alpha = .84$; $M = 2.59$, $SD = .62$).

Survey scales for parents and conversation partners. In addition to these scales, both the parent/caregivers and their conversation partners responded to several items designed to assess their relationship status in general. The following scales were administered to both participants during their appointment. For all scales where reliability was acceptable ($\alpha = .70$ or greater), a single mean score was computed from the scale responses for both parents and participants (for complete scale information, see Appendix B).

Perceived relationship support. A modified version of Xu and Burleson’s (2001) Desired and Experienced Social Support Scale (DESS) assessed participants’ perceptions of the support they actually receive from their conversation partner on a day-to-day basis. This scale consists of five items each addressing one of the five different types of support (emotional, tangible, esteem, network, and informational). Sample items include asking participants to indicate how often their partner “expresses willingness to help you when you are in need of help”; “providing you with hope or confidence”; and “assuring you that you are worthwhile person”. Respondents indicated on a “do not receive at all” (1) to a “receive a great deal” (5) scale their

perceptions of support, with higher scores indicate receiving more support. For both parents and conversation partners, the scale was reliable (parents: $\alpha = .94$; $M = 3.46$, $SD = .77$; partners: $\alpha = .92$; $M = 3.68$, $SD = .62$).

Global perceived support. Participants completed the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) to measure their perceived support more generally. This scale consists of 12 questions assessing perceptions of support available from friends, family, and significant others. Participants used a “strongly disagree” (1) to “strongly agree” (5) scale to indicate their agreement with statements such as, “there is a special person who is around when I am in need,” or “I can talk about my problems with my family.” Higher scores on the MSPSS indicated greater perceptions of support. For parents and partners alike, the overall scale reliability was robust (parents: $\alpha = .92$; $M = 3.88$, $SD = .81$; partners: $\alpha = .92$ $M = 3.94$, $SD = .78$).

Positive and negative affect. The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess participants’ general levels of positive and negative affect. This scale was originally developed to assess individual’s general reactivity and has shown acceptable reliability and validity when used as a general measure of reactivity as well as a measure of emotional reactivity to specific events (Watson & Clark, 1984; Watson et al., 1988). This scale consists of 20 words (10 positive and 10 negative), and participants were asked to indicate the extent to which they felt each emotion in their daily life on a “not at all” (1) to “extremely” (5) scale, with higher scores reflecting greater experiences of positive or negative affect on a day-to-day basis. The positive affect and negative affect subscales were reliable for parents (positive affect: $\alpha = .89$; $M = 3.41$, $SD = .73$; negative affect: $\alpha = .91$; $M =$

2.29, $SD = .82$) as well as conversation partners (positive affect: $\alpha = .88$; $M = 3.52$, $SD = .69$; negative affect: $\alpha = .90$; $M = 2.09$, $SD = .73$).

Relationship satisfaction. Both individuals responded to Hendrick's (1988) Relationship Assessment Scale to measure relationship satisfaction. This seven-item scale is designed to measure general relationship satisfaction. Participants respond on a "strongly disagree" (1) to "strongly agree" (5) scale how well the partner meets his/her needs, with higher scores indicated greater levels of relationship satisfaction. Sample items include, "my conversation partner meets my needs"; "I often wish that I had not gotten into this relationship"; and "I care about my conversation partner very much." Higher scores on this scale indicate greater levels of relationship satisfaction. For both parents and partners, the scale was reliable (parents: $\alpha = .91$; $M = 4.27$, $SD = .81$; partners: $\alpha = .89$; $M = 4.31$, $SD = .69$).

Relationship closeness. Relationship closeness among dyads was assessed using two separate scales. The first scale was the Inclusion of the Other in the Self Scale (IOSS; Aron, Aron, & Smollan, 1992), which measures the degree that a person perceives him or herself to be interdependent with another person. This single-item scale shows participants seven different diagrams. Each diagram consists of two separate circles that overlap to varying degrees. On the low end of the scale, the circles do not overlap at all, whereas the high end of the scale shows two circles overlapping substantially. Participants are asked to choose whichever diagram best represents the degree of interdependence between him/herself and his/her conversation partner. Their choice was then coded into a 1 to 7 score, with higher scores representing the diagram showing higher degrees of overlap between the two circles and, thus, higher levels of closeness (parent: $M = 4.35$, $SD = 1.67$; partner: $M = 4.85$, $SD = 1.53$).

Participants also completed Rubin's (1970) Measurement of Liking. This scale was altered to ask questions about a conversation partner (instead of a romantic partner). The scale includes 13 statements, such as "my conversation partner is one of the most likeable people I know" and "in my opinion, my conversation partner is an exceptionally mature person". Participants indicated their agreement with these statements on a "completely disagree" (1) to "completely agree" (5) scale. Higher scores on this scale indicate greater levels of closeness, and the scale was reliable for both interactants (parents: $\alpha = .92$; $M = 3.88$, $SD = .75$; partners: $\alpha = .92$; $M = 4.04$, $SD = .65$).

Perceptions of the interaction messages. In addition to assessing the general nature of the relationship, two different scales assessed participants' perceptions of the interaction that took place during the appointment. The first scale asked participants to indicate on a "strongly disagree" (1) to "strongly agree" (5) scale how much they agreed that certain adjectives described the conversation they had during the appointment (Bodie, Burleson, Holmstrom et al., 2011). A total of nine adjectives were listed, including "responsive," "thoughtful," and "unsympathetic," among others. For primary parents, they were asked to indicate how much these nine adjectives described their conversation partner's behavior during the interaction. Items indicating a negative perception of the conversation partner's behavior were reverse-coded so that a higher total score represented feelings that partner had provided good, sensitive support ($\alpha = .91$; $M = 4.49$, $SD = .58$). For conversation partners, instead of rating the parent's behavior during the interaction, they were asked to rate their own performance using the same scale. Again, items were reverse-coded so that higher scores represented partners' belief that their own support had been more sensitive ($\alpha = .91$; $M = 4.05$, $SD = .71$).

The next scale used to measure interactants' perceptions of the conversation consisted of 13 items and was designed to assess the perceived appropriateness of the conversation (Bodie, Burleson, Holmstrom et al., 2011). As with the first scale, primary parents indicated on a "strongly disagree" (1) to "strongly agree" (5) scale how much they agreed with statements about their partner's behavior. Sample statements included, "my conversation partner behaved correctly" and "my feelings toward my conversation partner became more positive a result of this conversation". Items indicating negative interaction perceptions were again reverse-coded so that high scores represented more appropriate conversations from the parent's perspective ($\alpha = .76$; $M = 4.32$, $SD = .43$). As with the previous scale, partners were asked to respond to these questions reflecting on their own behavior, with higher scores indicating partners' belief they behaved more appropriately ($\alpha = .78$; $M = 4.16$, $SD = .45$).

Coding Interactions

In addition to the survey measures, the conversations between each dyad were coded to examine the quality of support provided during the interaction. First, all conversations were transcribed by a transcriber blind to participant information. Second, two coders blind to participant information analyzed the conversation using the transcripts. Coders rated the interaction's overall quality of support using verbal person-centeredness (VPC) as the metric for support quality. Coders used Burleson's (1982) coding scheme, which classified messages on a 1 to 9 scale, with higher scores indicating support messages higher in VPC and, thus, of better quality (for a more detailed description of this scale, see High & Dillard, 2012). These scores were then used to classify the support provided as low person-centered (LPC) support, moderate person-centered (MPC) support, or high person-centered (HPC) support.

Conversations that were coded with a score of 1 to 3 were also coded as LPC messages; conversations with scores of 4 to 6 were labeled as MPC messages; and conversations with scores from 7 to 9 as HPC messages.

Before coding began, the coders engaged in three hours of training to familiarize themselves with the coding scheme and the codebook instructions. To complete the coding, coders were instructed to first read through the transcript in its entirety. Then, during a second reading of the transcript, coders were asked to assess the quality of support provided during the interaction. For a complete description of criteria used to differentiate between the different levels of support as well as examples of the different levels of support from the coded interactions, see Table 2 and Appendix C.

Intercoder reliability was tested at several points during the coding analysis. Both coders first independently coded five transcripts using the 1 to 9 VPC scale. From this information, each conversation was coded as LPC (1), MPC (2), or HPC (3). Both the 1 to 9 coding score and the LPC/MPC/HPC coding scores were then compared, and intercoder reliability was assessed using Scott's pi. After the initial five test cases, the coders came together and reconciled their differences and clarified the coding scheme as necessary. They then coded an additional five cases, assessed the reliability, and reconciled their differences in coding. At this point in time, coders had engaged in approximately 10 hours of training, coding, and reconciling. With these ten cases, the coders had established acceptable intercoder reliability as evidenced by an intercoder reliability coefficient greater than .70 (reliability on the 1 to 9 VPC coding scheme: Scott's pi = .74; 84.6% agreement; reliability on the 1 to 3 VPC coding scheme: Scott's pi = 1.0; 100% agreement). The remaining cases were then randomly divided amongst the two coders

and coded for VPC using both scales. Among study participants, there were 11 cases of LPC support, 14 cases of MPC support, and 15 cases of HPC support.

Table 2.

Examples of Interaction Messages and their Variations in VPC.

<u>Code Level</u>	<u>Definition</u>	<u>Example</u>
Level 1	The speaker condemns or rejects the other's feelings.	<p>Dyad 39</p> <p>Parent: But I wouldn't necessarily say that's a difficulty, because we have a solution.</p> <p>Partner: It's still difficult. It's more difficult than if it wasn't the case and you could just take both boys out and ride the motorcycles. You don't have to defend them. It's just the reality of the life. They're just trying to figure out what things would be difficult. That would be some stuff, that's not normal. That you have to consider.</p> <p>Parent: I guess it's stuff we have to think about, that other families don't have to think about. But I...</p> <p>Partner: Yeah. I think you're taking it too personal. You're worried about like protecting them, like. That's okay. Going grocery shopping.</p> <p>Parent: [...] Oh! How 'bout, his wheelchair? Ordering it, and it taking 10 weeks to get here, and we still don't have all the parts.</p> <p>Partner: Nah. Lots of people deal with that stuff.</p> <p>Parent: It's still...inconvenient.</p> <p>Partner: Yeah, but that's - that's common. Cause. Somebody orders parts for their...entertainment center, and if they don't - like that's</p> <p>Parent: Yeah, but the difference is that there's a need - and then, and then, a want or desire.</p>
Level 2	Speaker challenges the legitimacy of the other's	<p>Dyad 23</p> <p>Parent: Or will she be increasingly isolated in so many things because of the way kids see her. I don't think she'll be</p>

feeling or actions following from those feelings.

isolated because she's extremely social but...

Partner: <raises eyebrows>

Parent: In the sense of her social intelligence is really high. But she's becoming more sensitive [...]

Partner: Well, I think her social intelligence is going to count against her because she senses that people find her strange and that causes her to withdraw [...]

Parent: Yeah. Well. Thank you for increasing my stress a little further [...]

Partner: I think we need to find a way for her to play to her own strengths. For instance, she's really good with young kids. I think she'd make a great nursery school worker. Somebody who can connect with younger kids, who's got the patience to help them with things.

Parent: Sure. But she also - for her happiness, she needs to be able to connect with her peer group and I think that she will.

Partner: I kind of - I kind of doubt that.

Parent: It will be. It will be a fairly, sort of, iconoclast. It will be a - a - it will be the oddballs, or it will be... I think she'll connect in some fashion. And I don't know. I don't want to be a - I know what you're saying - but I don't want to push her into, um, something like being a day care worker. Number 1, I don't want to push her into that and because it's really hard to be independent and a day care worker.

Partner: I don't think she'll ever be able to independent.

Level 3

The speaker ignores the other's feelings.

Dyad 2

Parent: Right. You know, as far as him and I and this support, I mean, we have each other although, you know, there's frustration between us too because a lot of times... I'm always looking for solutions and, and a lot of times I may not get that from him because he doesn't really know where to go so...

Partner: Who? Me, or A?

Parent: So...You.

		<p>Partner: Oh.</p> <p>Parent: It seems like a lot of it... falls on me to figure out what to do and... you know, that can get really frustrating because I'm okay if I have options but when I run out of options which, we kind of went through that last summer with our support system falling apart with him, um...[...] um... So that's also creating a lot of, um, stress right now and so... you know... um... locating the appropriate support is not easy.</p> <p>Partner: Well, at least we, he's, that... he's doing well at the University of Washington. He's a student here, and he's a jun - well, he's going to be a junior. And...</p>
Level 4	<p>Speaker attempts to reframe the situation in a positive way by diverting the other's attention away from the event, "smoothing over" the negative feelings, offering some sort of compensation, or suggesting a method of repair.</p>	<p>Dyad 14:</p> <p>Parent: And some other... you know, bad - kind of bad side-effects - in some ways.</p> <p>Partner: Well, I don't know if you'd call them bad. I mean, they could be worse. They could be...</p> <p>Parent: Yeah. Well, they're not...</p> <p>Partner: He could be self-abusive.</p> <p>Parent: Right. They're not bad.</p> <p>Partner: He's not in pain... They're not - he's not behavioral - but he interrupts us, ya know. So we've just...</p>
Level 5	<p>At this level, the speaker does (implicitly or explicitly) acknowledge the other's feelings but fails to assist the other in understanding why they are experiencing those feelings or how best to cope with their emotions.</p>	<p>Dyad 25</p> <p>Parent: Okay. Oh...lately, you know, um, an issue for me is the whole, what's going to happen next year. Already, she's been telling me - "I'd like to know what I'm going to be doing in September. I want to go to college." And, um, I feel frustrated right now [...] and so I can't answer any of her questions and I feel very frustrated with her right now.</p> <p>Partner: Well, it's hard to hear her desires to go to college and stuff - you know, in light of her sisters and everything. I don't understand how it's going to work. How it works for someone like her.</p> <p>Parent: Going to college? Or?</p>

Partner: Yep.

Parent: I feel like in the couple of meetings that I've been to, um, they don't see how it's going to work for her either [...] that kind of takes my time and my effort, you know. How am I going to get her there? You know. Do I sit there with her in class? You know if she audits class so that she can see what college is like, you know, and - and I know that the school programs that they have for A are not going to be like filling her days Monday through Friday. It - it's going to be...part of the day and then she's going to have the rest of the day that's totally open, um, with, you know, either nothing to do or what can I fill in the gaps with. That's what I - that's what I see coming up.

Partner: She's already got that now.

Parent: Yeah [...] Do you have any thoughts?

Partner: No. It's the whole school process has been frustrating for me because I can't really see the value that she gets out of it. She sits in class and goes to class. It's amazing the amount of homework that she does and the things that she does, but, beyond that I don't know what she gets out of it.

Parent: How it's going to help her and her future? Yeah.

Level 6

Speaker acknowledges the feelings of the distressed other and attempts to provide some explanation for the feeling without fully legitimizing or elaborating upon the emotions in the situation.

Dyad 7

Parent: Definitely. What do you see as challenges of M?

Partner: I don't really look at things that way.

Parent: Well, I know you don't.

Partner: You know I don't look at life that way. You take it in stride.

Parent: Yeah. Exactly. Exactly.

Partner: It just depends on the day, and on the moment.

Parent: Yeah.

Partner: Cross it as you go. Sometimes the biggest challenge is finding the movie he wants.

Level 7	Speaker explicitly recognizes and acknowledges the other's feelings but does not provide an elaborated explanation of these feelings.	<p>Dyad 29:</p> <p>Parent: Not knowing, did he - did he do something - you know - that - you know - that has put him at risk, or that has... or are we gonna meet some new woman that we don't want to meet.</p> <p>Partner: Yeah.</p> <p>Parent: Or whatever [...] A mix of things I guess.</p> <p>Partner: Or what he does when he's at Special Olympics and we're not there [...]</p> <p>Parent: Yeah that's hard too...</p> <p>Partner: [...] The - the reality is that nothing awful has happened! Uh, most of what happened we've intervened for it got out of hand.</p> <p>Parent: Well it worked out okay so far. It's just [...] There's just always the fear.</p> <p>Partner: Yeah, I understand there's always the fear. But it's been successful.</p> <p>Parent: Like him riding his bike home from work. I don't think I would have let him do that if I would have known [...] But it turned out okay.</p> <p>Partner: It did.</p>
Level 8	Speaker provides an elaborated acknowledgement and explanation of the other's feelings	<p>Dyad 36:</p> <p>Parent: Because I was like, "No I'm going to do this! I'm going to just take care of him." And that's where I probably made most of my mistakes, was, not having anyone there[...] I mean...but...<crying></p> <p>Partner: Well, it's a learning process. And, you know, you do want to try to do it all yourself. And that's not a, necessarily, a bad thing. But it is a learning thing.</p> <p>Parent: Well, and what I have learned through the years, when I did finally get the help, and let people be supportive, is that these kids are not raised alone.</p>

Partner: No [...] Well, I think I told you when I first, or shortly after I first met you. It was in 3rd grade. And I worked with him. And, I said - the one thing I respect the most is how much you fight for him. And how much you are there. And that it wasn't just a babysitting job, you know. A way for me to just get him out of your hair. You didn't need him out of your hair. You needed somebody to do something with him, to help him. And, that is something I always respected. Then and now. That, it's not just, "here hang out with my son so, you know, I could - it's easier on me." It's not about being easier for you. It's about - what can be done to help him. And it's always been that way. It's always been him first. And, I've always respected that.

Parent: Well, and I appreciate that. And that's just that, you know, I was told very early on that he wouldn't be anything. That he wouldn't walk. He wouldn't talk. He wouldn't do anything. And the doctor pretty much told me to put him in a home. And I said, that's not going to happen.

Partner: I remember you saying that. Right.

Parent: That's not. I don't believe in that. I didn't know that he would be where he is today. I mean, I couldn't - I don't have foresight like that. But, I knew that if I could fight for him that he would be as good as he's meant to be.

Partner: [...] Yeah, he's just kind of - I love to see the growth in him. Like every day. Every time. He says something different. Every time he repeats something we say. And, it's just, so exciting to see - to still see the growth. When people say, they reach a certain age and there's no more changing... I still see so much change in him. In every way! You know. In physical things he could do.

Level 9

Speaker helps the other to gain a perspective on her own feelings (feelings are explicitly elaborated and legitimized) and attempts to help the other see feelings in relation to a broader context of the feelings of others in the situation.

Dyad 30:

Parent: Um, the hardest thing about the kids is, um, people not understanding, from looking at the outside in, because there are not, um, physical... um, viewpoints, or uh, physical, um, things physically that they can see on the outside that it's mental, um, people don't understand and they, uh, judge very quickly. And, there isn't support from friends, um. There's not support from, uh, psychiatrists or counselors because of the unique situation that we're in [...] you know there's nobody to talk about that with. And, there're no resources out there because it's so rare, and it's a lonely place to be.

Partner: I've sensed your loneliness, um. For quite a while. Not just since the diagnosis. Um. And I know that you've, like, shared taking the kids shopping and the meltdowns and, um. The, um, odd behavior for their age. And how you feel everybody's looking at you and thinking, "why doesn't that mom do something about them?"

Chapter III: Results

The first step of analysis was to examine the cortisol specimens for deviations from normality. None of the specimens from parents or conversation partners fell outside of the assay limits of detection, so no specimens were excluded from the final analyses. Because the cortisol data were not normally distributed, however, a natural log transformation was used to address the moderate skew of the data (average skew: 1.04, $SE = .37$; post-transformation skew: $-.17$, $SE = .37$; Keene, 1995).

At the second step, the correlations between relevant variables were examined in two sets. The first set examined the correlations among variables for analyses involving the parents of children with disabilities (see Table 3). The second correlation matrix examined relevant variables for analyses involving conversation partners (see Table 4).

Finally, all hypotheses and research questions were examined using appropriate statistical analyses. The results for these hypotheses and research questions are grouped together based on the variables included in the analyses. The first set of analyses include two sets of hypotheses and address two major topics of concern: The first set of hypotheses (hypotheses 1 through 4) explores the effects of parents' perceived support on their subjective health and well-being, with the second set of hypotheses (hypotheses 5 through 10) investigating the effects of support quality on parents' relational and physiological outcomes. Next, all hypotheses and research questions involving data from the conversation partner will be examined. These analyses, again, are broken down into two groups: The first set of hypotheses (hypotheses 11 through 13) examines the effects of providing support generally on the physiological and relational outcomes experienced by the conversation partners.

Table 3.

Descriptive Statistics for the Primary Variables of Analysis for Parents of Children with Disabilities.

	<i>M</i>	<i>(SD)</i>	<i>n</i>	1	2	3	4	5	6	7	8	9	10
1. Age	48.65	2.13	40	--									
2. Burden	2.13	.71	40	-.15	--								
3. Physical Symptoms	12.10	4.13	39	-.42**	.45**	--							
4. Perceived Stress	1.95	.63	40	-.07	.70**	.44**	--						
5. Depression	1.96	.53	40	-.13	.57**	.54**	.69**	--					
6. Anxiety	2.41	.62	40	-.40*	.61**	.48**	.65**	.66**	--				
7. Satisfaction	4.27	.81	40	.28	-.23	-.30	-.24	-.16	-.34*	--			
8. IOS Closeness	4.35	1.67	40	.15	-.38	-.34	-.44**	-.47**	-.40*	.60**	--		
9. Liking	3.88	.75	40	.18	-.26	-.24	-.18	-.11	-.33*	.82**	.65**	--	
10. Perceived Support	3.88	.81	40	-.06	-.52**	-.19	-.60**	-.54**	-.45**	.44**	.54**	.47**	--

Note. Analysis represents values for parents of children with disabilities only. * $p < .05$, ** $p < .01$

Table 4.

Descriptive Statistics for the Primary Variables of Analysis for Conversation Partners.

	<i>M</i>	<i>(SD)</i>	<i>n</i>	1	2	3	4	5
1. Negative Affect	2.09	.73	40	--				
2. Positive Affect	3.52	.69	40	-.55**	--			
3. Liking	4.04	.65	40	.05	.26	--		
4. Satisfaction	4.31	.69	40	-.21	.33*	.60**	--	
5. Closeness	4.85	1.53	40	-.15	.11	.30	.29	--

Note. Analysis represents values for interaction partners only. * $p < .05$, ** $p < .01$

Finally, the second set of analyses (research questions 1 through 3) more carefully examines the relationship between the quality of support provided and relational and health outcomes for conversation partners.

Analysis involving Parents of Children with Disabilities

Perceived support and health outcomes. The first four hypotheses in this study examined the relationships among parents of children with disabilities' perceived support, perceived stress, and subjective mental and physical well-being. Hypothesis 1 stated that perceived support would predict parents' reports of physical health complaints. To test this hypothesis, a hierarchical linear regression was used. In the first block, caregiver burden, perceived stress, and the participant's age were entered as control variables, as these are known to associate with physical health issues (Schulz & Beach, 1999; Schulz et al., 1995). In the second block, parents' perceived global support (as measured by the MSPSS) was entered.

Results indicated that the model was significant, $F(4, 35) = 3.78, p < .05$, adjusted $R^2 = .22$.

Further analysis indicated that perceived stress was the only significant predictor of subjective physical health symptoms ($\beta = .51, p < .05$). Thus, hypothesis 1 was not supported.

Hypothesis 2 stated that perceived support would predict parents' reports of depressive symptoms. Again, a hierarchical linear regression was used to test this hypothesis. Caregiver burden and perceived stress were included as control variables in the first block, with parent's perceived global support as the predictor variable in the second block. The results again indicated that the overall model was significant, $F(3, 36) = 12.524, p < 0.01$, adjusted $R^2 = .47$. Parents' perceived stress, however, was the only significant predictor of depression ($\beta = .48, p < .05$). Thus, hypothesis 2 was not supported.

Hypothesis 3 stated that parents' perceived support would predict their reports of anxiety. As with the previous model, caregiver burden and perceived stress were included as control variables in the first block with perceived global support as the predictor variable in the second block. The overall model was significant, $F(3, 36) = 10.53, p < .01$, adjusted $R^2 = .42$. Perceived global support was not a significant predictor of parents' reported anxiety, however. Instead, perceived stress significantly predicted anxiety ($\beta = .42, p < .05$), and there was a trend of caregiver burden as a marginally significant predictor ($\beta = .29, p < .10$). Thus, hypothesis 3 was not supported.

Hypothesis 4 stated that parents' perceived support would successfully predict their levels of perceived stress. Regression analysis was used to test this hypothesis, with caregiver burden entered in the first block as a control variable and perceived global support entered in the second block as the predictor variable. The overall model was significant, $F(2, 37) = 24.09, p$

< .01, adjusted $R^2 = .54$ (see Table 5). Both caregiver burden ($\beta = .53, p < .01$) and perceived global support ($\beta = -.33, p < .05$) were significant predictors of perceived stress. These results indicate support for hypothesis 4, that the perceived stress experienced by parents of children with disabilities is negatively predicted by their perceived support, with parents experiencing higher levels of perceived support indicating lower levels of stress.

Table 5.

Predicting Perceived Stress by Caregiver Burden and Perceived Global Support

	Model One**	Model Two**
Caregiver burden	.70**	.53**
<i>Incremental R² (%)</i>		47.1%
Perceived support		-.33**
<i>Incremental R² (%)</i>		7.1%
<i>Total R² (%)</i>		54.2%

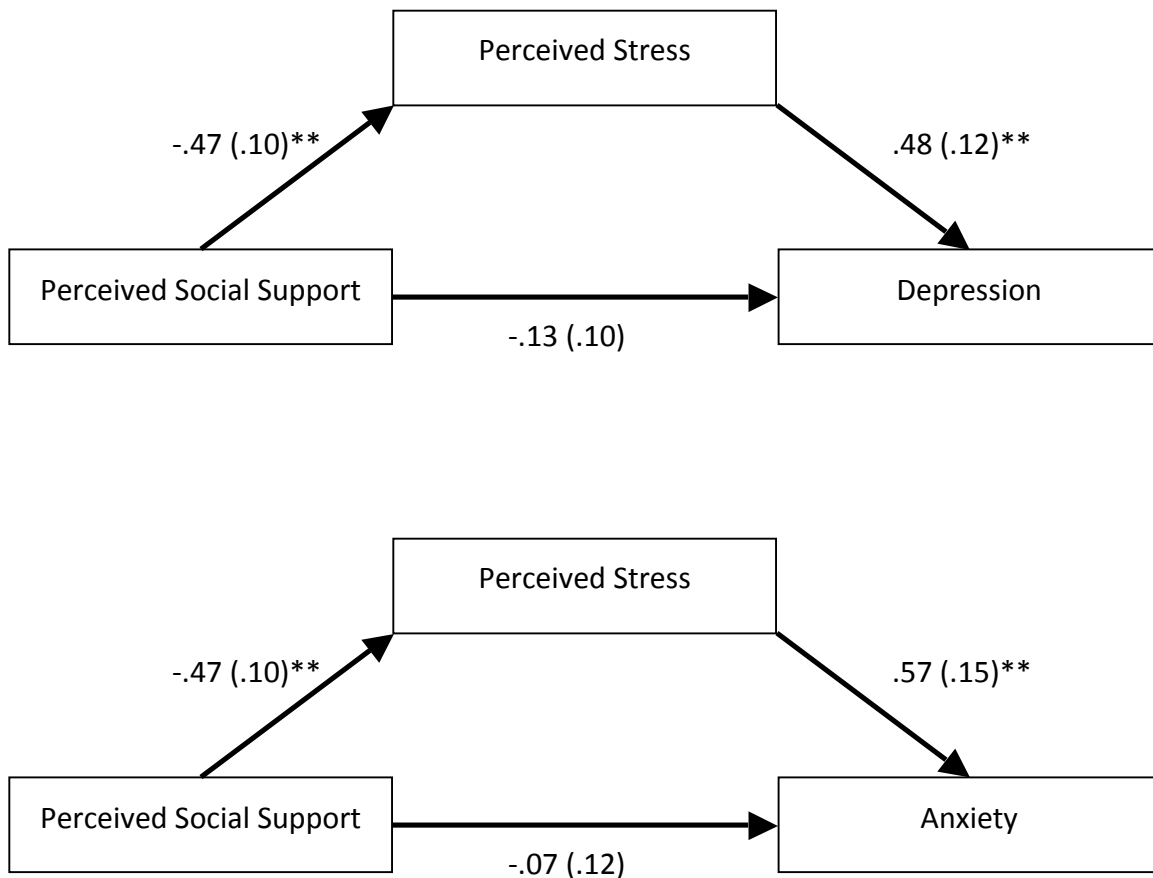
Note. Numbers indicated standardized regression coefficients; $n = 40$; * $p < .05$, ** $p < .01$

These results indicated a significant relationship between perceived support and perceived stress and also between perceived stress and subjective reports of depression and anxiety, but no significant relationship was found between perceived social support and subjective levels of depression and anxiety. Thus, post hoc analyses were used to test whether perceived stress mediated the effects of perceived support on subjective reports of depression and anxiety. In examining this potential mediation relationship, I tested for an indirect effect of

perceived support (Hayes, 2009; Preacher & Hayes, 2008). Research has shown the indirect effects test to be superior to the more commonly-used Sobel's test as well as the Baron and Kenny (1986) method, because its analysis does not assume large, normally distributed sample sizes (Preacher & Hayes, 2004). The indirect effects test also adjusts for the possible influence of covariates and other variables not proposed to be mediating variables in the specific model (Preacher & Hayes, 2008).

Results indicated that the relationship between perceived support and reports of depression were mediated by perceived stress (indirect effect = $-.36$, $SE = .09$, $p < .01$). The significance of this indirect effect was tested using bootstrapping procedures, with indirect effects calculated for each of 5000 bootstrapped samples. The unstandardized indirect effect was $-.23$ (95% confidence interval $[-.38, -.12]$; see Figure 1). A similar method was used to test for mediation between perceived support and subjective reports of anxiety with similar results (indirect effect = $-.35$, $SE = .11$, $p < .01$). The significance of the indirect effect was again tested using bootstrapping procedures. The unstandardized indirect effect was $-.27$ (95% CI $[-.51, -.10]$; see Figure 1), indicating that perceived stress significantly mediated the relationship between perceived support and subjective anxiety levels. Thus, these analyses suggest that the relationship between perceived support and subjective reports of anxiety and depression is mediated entirely by perceived stress.

Figure 1. Mediation model between perceived social support, perceived stress, and depression and anxiety.



Note. All coefficients represent unstandardized coefficients with (SE). $p < .05$, ** $p < .01$

Received support and relational and health outcomes. The next set of hypotheses was designed to explore the relationship between the enacted support provided during the conversation that took place during the data collection appointment and parents' relational and physiological outcomes. The interactions between the parents and their conversation partners were coded using Burlinson's (1982) verbal-person centeredness (VPC) coding scheme, with

messages showing the lowest levels of VPC receiving a score of 1 and messages demonstrating the highest levels of VPC receiving a score of 9 ($M = 5.43$, $SD = 2.40$). Each conversation was also coded as a low person-centered (LPC) message (conversations scored 1 through 3; $n = 11$), moderate person-centered (MPC) message (conversations scored 4 through 6, $n = 14$), or high person-centered (HPC) message (conversations scored 7 through 9, $n = 15$). These categorical measures were then used in analysis to explore group-level differences between the quality of support received and parents' physiological and relational outcomes in this context.

Before beginning analyses, steps were taken to assess whether the participants in these groups (LPC, MPC, or HPC) were significantly different from one other in ways that would account for changes in their salivary cortisol levels and potentially confound the results. Using one-way ANOVAs, I first assessed if participants in these groups differed in their experiences of caregiver burden or in the functioning of their child with disabilities. Neither of these variables was statistically significant (caregiver burden: $F(2, 37) = 2.52$, ns ; child functioning: $F(2, 37) = .50$, ns). Next, I assessed whether participants' experiences of stress in the day leading up to the appointment differed and found no statistically significant results, $F(2, 37) = .11$, ns , indicating that these potential confounders were not significantly different between the three groups.

Hypothesis 5 stated that parents would experience reductions in their salivary cortisol levels as a result of the supportive conversation regardless of the quality of support provided during that conversation. To test this hypothesis, a repeated measures analysis of covariance (ANCOVA) was used. The four transformed cortisol measures (baseline as well as samples taken at 10, 30, and 50 minutes post-interaction) were used as the within-subject variables, and time of waking, sleep quality the night before the data collection appointment, level of stress

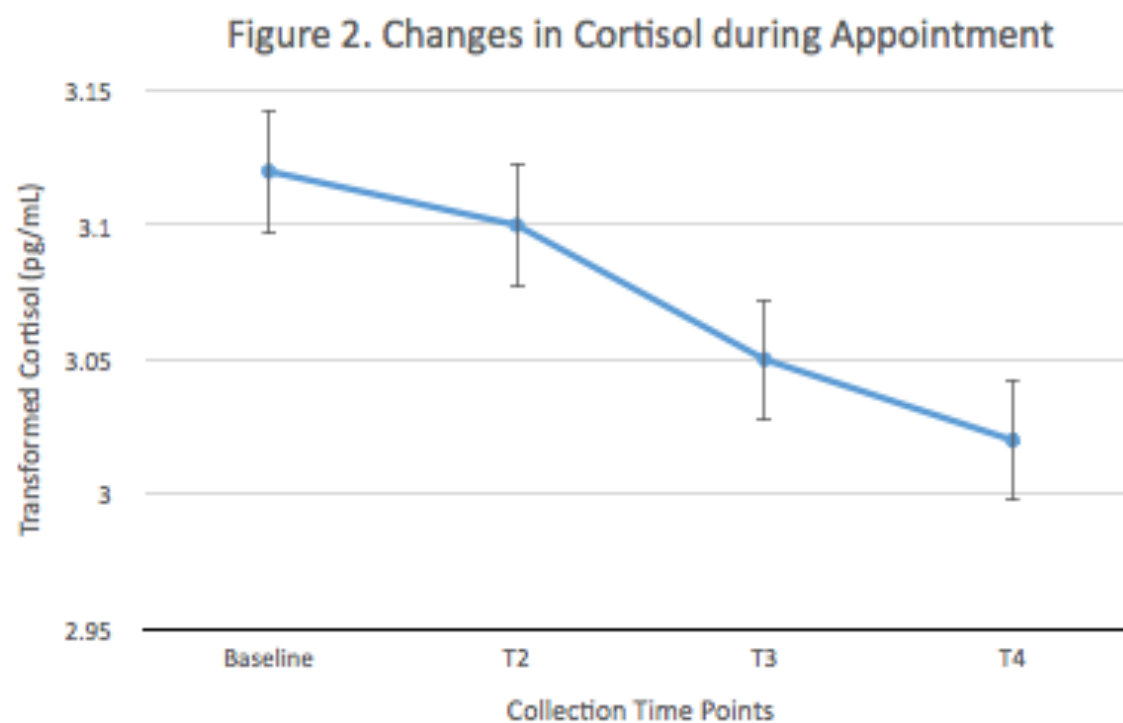
parents experienced leading up to the appointment, and the start time of the appointment were included as covariates, because cortisol levels fluctuate on a diurnal pattern contingent upon the time of waking and are sensitive to differences in sleep quality. Results indicated that cortisol levels changed significantly from baseline to the end of the appointment, $F(3, 105) = 3.66, p < .05$, partial $\eta^2 = .10$. There was no significant effect of any of the covariates on cortisol (see Table 6 for complete data). Post-hoc analysis using Bonferroni's correction revealed that cortisol levels were significantly lower at collection Time 4 ($M = 3.02, SE = .03$) when compared with baseline ($M = 3.12, SE = .38, p < .05$) and collection Time 2 ($M = 3.10, SE = .38, p < .05$; see Figure 2). These results provide confirmation for hypothesis 5.

Table 6.

Repeated Measures ANCOVA Summary Table for Changes in Cortisol.

Source	SS	df	MS	F	p	η^2
Cortisol	.14	3	.05	3.66	.02	.10
Cortisol * Apt. Time	.04	3	.01	1.13	ns	.03
Cortisol * Stress	.03	3	.01	.69	ns	.02
Cortisol * Wake	.08	3	.03	1.96	ns	.05
Cortisol * Sleep	.05	3	.02	1.37	ns	.04
Error	1.33	105	.01			

Note. $n = 40$



Hypothesis 6 predicted that parents who received messages higher in VPC would report greater feelings of relationship satisfaction with their conversation partner. To test this hypothesis, a one-way analysis of variance (ANOVA) was used with relationship satisfaction as the dependent variable and the quality of support received (LPC, MPC, or HPC) as the independent variable. Results indicated no statistically significant differences between the groups and how satisfied they felt with their relationship, $F(2, 37) = 1.95, ns$. This evidence provided no support for hypothesis 6. A similar method was used to test hypothesis 7, which stated that participants would report greater feelings of closeness with their conversation partner as a result of the type of support received during the interaction. Two one-way ANOVAs were used to test this hypothesis, one using the Aron and colleagues' (1992) Inclusion of the Other in the Self scale (IOSS) for closeness as the dependent variable, and one using Rubin's

(1970) liking scale as the dependent variable. Both the IOSS test, $F(2, 37) = .77, ns$, and the liking test, $F(2, 37) = 1.96, ns$, were not significant, indicating that parents who received support of differing quality during this interaction did not experience significant differences in their feelings of closeness with their conversation partners. Thus, hypothesis 7 was not supported.

Hypothesis 8 predicted that parents who received messages higher in VPC would also report higher levels of perceived support. This hypothesis was tested in two ways. First, a one-way ANOVA was used, with parents' perceived global support (as measured by the MSPSS) as the dependent variable and the type of support received during the conversation (LPC, MPC, or HPC) as the independent variable. Results indicated no significant differences in perceived global support as a result of receiving different quality support during the appointment interaction, $F(2, 37) = .90, ns$. Next, a one-way ANOVA was used with the perceived support parents experienced specifically within their relationship with the conversation partner (as measured by the DESS scale) as the dependent variable and the quality of support received as the independent variable. Results indicated a significant effect for the quality of support received on parents' perceptions of support in their relationship with their conversation partner, $F(2, 37) = 3.19, p < .05$, partial $\eta^2 = .15$. Thus, hypothesis 8 received partial support.

Hypotheses 9 and 10 predicted that parents who received an HPC supportive message would experience greater reductions in their physiological stress levels when compared with parents who received LPC or MPC messages (H9), and that parents who received MPC supportive messages would experience greater reductions in their physiological stress when compared with parents who received LPC messages (H10). To test these hypotheses, a one-way repeated measures ANCOVA was used. The four transformed cortisol values were entered

as the within-subject variables, and the quality of support received were entered as the between-subject variable. Once again, time of waking, quality of sleep, stress experienced before the appointment, and the appointment start time were included as covariates in the model. Results indicated that cortisol levels significantly changed over the course of the data collection appointment, $F(3, 99) = 3.64, p < .05$, partial $\eta^2 = .10$. Analysis also revealed a significant effect of the quality of support received on cortisol levels after controlling for the four covariates, $F(6, 99) = 5.59, p < .01$, partial $\eta^2 = .25$ (see Table 7 and Figure 3).

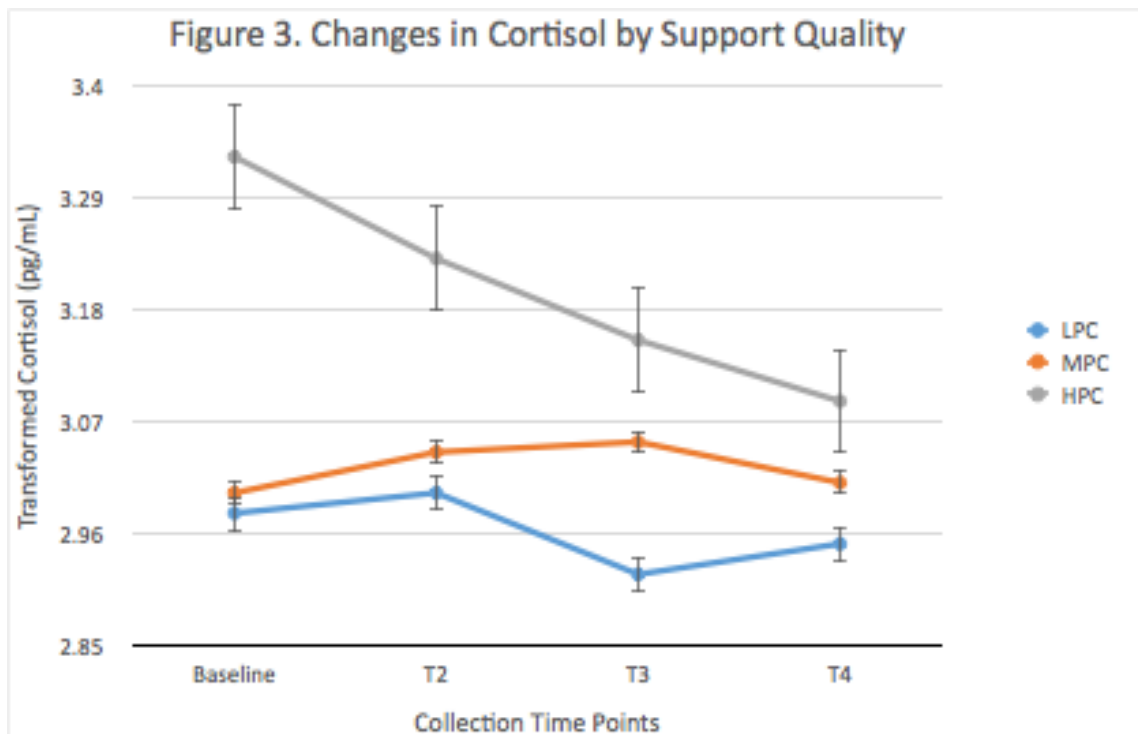
To further explore these differences, change scores were computed by subtracting each of the transformed cortisol measures from the baseline cortisol measure, resulting in three scores representing the change in salivary cortisol levels from baseline to Time 2 (10 minutes

Table 7.

Repeated Measures ANCOVA Summary Table for Changes in Cortisol by Quality of Support Provided

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Cortisol	.11	3	.037	3.64	.02	.10
Cortisol * Apt. Time	.05	3	.02	1.56	<i>ns</i>	.05
Cortisol * Stress	.05	3	.02	1.64	<i>ns</i>	.05
Cortisol * Wake	.07	3	.02	2.43	.07	.07
Cortisol * Sleep	.06	3	.02	2.07	<i>ns</i>	.06
Cortisol * Support Quality	.34	6	.06	5.59	.001	.25
Error	.996	99	.01			

Note. $n = 40$



post interaction), baseline to Time 3 (30 minutes post-interaction), and baseline to Time 4 (50 minutes post-interaction). One-way ANCOVAs were then used to test for differences between each support type on changes in cortisol at each time point. The first one-way ANCOVA revealed statistically significant differences in the changes of participants' salivary cortisol levels from baseline to Time 2, $F(2, 33) = 4.52, p < .05$, partial $\eta^2 = .22$. Pairwise comparisons using Bonferroni's correction revealed that participants who received HPC support experienced reductions in their cortisol levels (average reduction = .11, $SE = .04$) that were significantly greater than those experienced by participants who received MPC support ($M = -.05, SE = .04, p < .05$). The difference in cortisol changes between those who received HPC support and LPC support was marginally significant ($M = -.03, SE = .04, p < .10$).

The second ANCOVA tested if groups experienced different changes in their cortisol levels from baseline to Time 3 and was also significant, $F(2, 33) = 10.28, p < .01, \text{partial } \eta^2 = .38$. Again, pairwise comparisons using Bonferroni's correction indicated that participants who received HPC messages ($M = .20, SE = .04$) experienced a greater reduction in their salivary cortisol levels than those who received MPC messages ($M = -.06, SE = .04, p < .01$). A third and final ANCOVA revealed a statistically significant effect for support message type on changes in cortisol levels between baseline and Time 4, $F(2, 33) = 11.42, p < .01, \text{partial } \eta^2 = .41$. Pairwise comparisons using Bonferroni's correction demonstrated that recipients of HPC messages ($M = .25, SE = .04$) experienced significantly larger reductions in their salivary cortisol levels when compared with participants who received MPC messages ($M = -.02, SE = .04, p < .01$) and participants who received LPC messages ($M = .03, SE = .05, p < .01$).

As these results and Figure 3 illustrate, recipients of HPC messages were the only participants to experience reductions in their salivary cortisol levels at all three post-baseline collection time points. These reductions were significantly greater than those experienced by MPC message recipients at all three time points and than those experienced by LPC message recipients at Time 4 (with marginally significant differences at Time 2). Thus, hypothesis 9, which stated that parents who received HPC support would experience the greatest declines in their salivary cortisol levels, was supported. However, hypothesis 10 was not supported, as participants who received MPC messages did not experience sharper declines in their physiological stress when compared with parents who received LPC messages. In fact, parents who received MPC support actually experienced *increases*, rather than decreases, in their

physiological stress levels, though these changes were not statistically significant when compared with the LPC message recipient group.

Analysis involving Conversation Partners

Providing support and relational and health outcomes. In addition to exploring how a supportive interaction would affect the relational and physiological outcomes experienced by support recipients, a primary goal of this study was to explore how support provision might affect the individual offering support. Hypothesis 11 predicted that conversation partners would experience a decrease in their salivary cortisol levels as a result of their participation in the supportive interaction. To test this hypothesis, a repeated measures ANCOVA was used. The transformed cortisol measures at all four collection time points were used as the within-subjects variables. Time of waking, quality of sleep the night before the appointment, amount of stress experienced before the appointment, and the appointment start time were included as covariates. Results indicated that conversation partners' salivary cortisol levels did not significantly change over the course of the data collection appointment, $F(3, 105) = .19, ns$. Thus, hypothesis 11 was not supported.

The next hypotheses stated that the quality of support provided by conversation partners would be associated with their experiences of negative affect (H12) and positive affect (H13), so that providing higher quality support would be associated with lower levels of negative and higher levels of positive affect. To test hypothesis 12, a one-way ANOVA was used with negative affect as the dependent variable and the quality of support provided (LPC, MPC, or HPC) as the between-subjects variable. Results indicated that negative affect did not differ significantly as a result of the quality of support provided, $F(2, 37) = .14, ns$, resulting in no

support for hypothesis 12. Next, a one-way ANOVA was used to test hypothesis 13. This ANOVA had positive affect as the dependent variable with the quality of support provided as the between-subjects variable. Again, results indicated that positive affect did not differ significantly as a result of the quality of support provided, $F(2, 37) = 1.93, ns$. Thus, neither hypothesis 12 nor hypothesis 13 received empirical support.

Providing support, support quality, and its effects. Because the body of work examining the effects of support provision on support providers is small, this study explored several research questions regarding the effects of giving support in a short-term interaction. The first research question asked whether providers would experience differences in their physiological stress as a result of the quality of support provided (RQ1). To answer this question, a repeated measures ANCOVA was used with the four transformed cortisol variables representing each collection time point as the within-subjects measures and the quality of support provided (LPC, MPC, or HPC) as the between-subjects variable. Time of waking, the day's stress, quality of sleep, and the appointment start time were also included as covariates. Results indicated no significant effect of the quality of support provided on the stress levels experienced by conversation partners, $F(2, 33) = .61, ns$.

The next research question asked whether the quality of support provided would influence conversation partners' perceptions of relationship satisfaction (RQ2) and closeness (RQ3) experienced in their relationship with the parent. For these questions, one-way ANOVAs were used. The first one-way ANOVA included relationship satisfaction as the dependent variable and the quality of support provided as the between-subjects variable. Results indicated no difference in relationship satisfaction between conversation partners who provided different

types of support, $F(2, 37) = 1.27, ns$. The next one-way ANOVA used conversation partner's level of liking as the dependent variable and the quality of support provided as the between-subjects variable. Again, no statistically significant differences emerged between the groups, $F(2, 37) = .41, ns$. The final one-way ANOVA used conversation partners' scores on the Inclusion of the Other in the Self Scale as the dependent variable with support quality as the between-subjects variable. This one-way ANOVA revealed no statistically significant differences between groups, $F(2, 37) = .05, ns$. Thus, evidence suggests that the quality of support provided by conversation partners in the context of this study did not significantly influence their experiences of satisfaction or closeness in their relationship with the parent of a child with disabilities.

Chapter IV: Discussion

Previous research has established connections between social support and positive relational and health outcomes, leading scholars to pinpoint adequate support as a key resource for people facing chronic stressors like those experienced when providing care for a child with disabilities (Berkman & Syme, 1979; Cohen & Willis, 1985; Lovell, et al., 2012). The current study explored whether short-term supportive interactions between parents of children with disabilities and members of their supportive network affected the relationship between the two interactants as well as both individuals' reported and actual physiological health. Results indicated that both perceived support and enacted support significantly affect the health of the support recipient as measured through self-reports and physiological data examining participant experiences of stress. Specifically, global perceived support was found to affect participants' reports of depression and anxiety by influencing their self-reported perceptions of stress. Similarly, results from the supportive interaction indicated that receiving support can result in positive changes to physiological stress (as indicated in salivary cortisol measures) as well, though the quality of support provided played an important role in determining how beneficial the interaction is in this context. This study also explored how support providers experienced outcomes resulting from their engagement in the supportive process. Analyses indicated that support provision in this context did not result in significant outcomes for their relationships nor providers' experiences of stress as measured by salivary cortisol. These findings will now be discussed in greater detail (for a summary of findings, see Table 8).

Table 8.*Summary of Results for All Hypotheses and Research Questions*

	<u>Control Variable(s)</u>	<u>Independent Variable(s)</u>	<u>Dependent Variable(s)</u>	<u>Results</u>
H1. Perceived support will significantly predict parents' reports of health complaints.	Caregiver Burden Perceived Stress Age	Perceived Support (measured by MSPSS)	Physical Health Complaints (measured by PILL)	Not significant
H2. Perceived support will significantly predict parents' reports of depression.	Caregiver Burden Perceived Stress	Perceived Support (measured by MSPSS)	Depressive Symptoms (measured by HADS)	Not significant
H3. Perceived support will significantly predict parents' reports of anxiety.	Caregiver Burden Perceived Stress	Perceived Support (measured by MSPSS)	Anxiety Symptoms (measured by HADS)	Not significant
H4. Perceived support will significantly predict parents' levels of perceived stress.	Caregiver Burden	Perceived Support (measured by MSPSS)	Perceived Stress (measured by GPSS)	Significant: Perceived support predicted lower levels of perceived stress
H5. Parents will experience decreases in their stress during the supportive interaction.	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Change over Time (as measured by repeated measures ANCOVA)	Salivary Cortisol levels at baseline, T1, T2, and T3	Significant: Parents salivary cortisol levels decreased over the course of the interaction

H6. Parents experiencing higher quality support will report higher levels of relationship satisfaction.		Support Quality (LPC, MPC, or HPC)	Relationship Satisfaction	Not significant
H7. Parents experiencing higher quality support will report higher levels of relationship satisfaction.		Support Quality (LPC, MPC, or HPC)	Closeness (as measured by the IOSS and Rubin's Liking Scale)	Not significant
H8. Parents experiencing higher quality support will report higher levels of perceived support.		Support Quality (LPC, MPC, or HPC)	Perceived support (as measured by the MSPSS and the DESS)	Partial support: No significant differences on the MSPSS (global perceived support), but significantly different on the DESS (perceived support from the conversation partner)
H9. Parents receiving HPC support will experience the greatest decreases in their stress levels when compared with parents who receive LPC or MPC support.	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Support Quality (LPC, MPC, or HPC)	Salivary Cortisol levels at baseline, T1, T2, and T3	Significant: HPC recipients did experiences significantly greater decreases in stress than MPC recipients and LPC recipients at some time points
H10. Parents receiving MPC support will experience greater decreases in their stress levels when compared with parents who receive LPC support.	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Support Quality (LPC, MPC, or HPC)	Salivary Cortisol levels at baseline, T1, T2, and T3	Not Significant: MPC recipients did not experience lower stress levels that LPC recipients

H11. Conversation partners will experience decreases in their stress levels during the supportive interaction.	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Change over Time (as measured by repeated measures ANCOVA)	Salivary Cortisol levels at baseline, T1, T2, and T3	Not Significant
H12. Conversation partners who provide higher quality support will experience decreases in their negative affect when compared with partners who provide lower quality support.		Support Quality (LPC, MPC, or HPC)	Negative Affect (as measured by the PANAS)	Not significant
H13. Conversation partners who provide higher quality support will experience increases in their positive affect when compared with partners who provide lower quality support.		Support Quality (LPC, MPC, or HPC)	Positive Affect (as measured by the PANAS)	Not significant
RQ1. How does the quality of support provided influence conversation partners' stress levels?	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Support Quality (LPC, MPC, or HPC)	Salivary Cortisol levels at baseline, T1, T2, and T3	Not significant
RQ2. How does the quality of support provided influence conversation partners' feelings of relationship satisfaction?	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Support Quality (LPC, MPC, or HPC)	Closeness (as measured by the IOSS and Rubin's Liking Scale)	Not significant
RQ3. How does the quality of support provided influence conversation partners' feelings of closeness?	Time of Waking Sleep Quality Pre-Appointment Stress Appointment Start Time	Support Quality (LPC, MPC, or HPC)	Relationship Satisfaction (as measured by Hendrick's scale)	Not significant

Support and Support Recipients

The stress buffering hypothesis. Results from the first set of hypotheses explored how parents' perceptions of support influenced their levels of perceived stress, subjective mental health, physical health complaints, and relationship outcomes with their conversation partners demonstrated that the relationship between perceived support and self-reported mental health was mediated by perceived stress. These findings support the stress buffering hypothesis (Cohen & Willis, 1985), which states that social support positively influences well-being by protecting distressed individuals from experiencing heightened levels of stress. The hypothesis was expanded by looking at this relationship during a short, 10-minute interaction rather than over time, finding significant reductions to stress levels (as measured by changes in salivary cortisol) for parents of children with disabilities. Other researchers examining communication phenomena and cortisol levels likewise have argued that short-term reductions in cortisol indicate a health benefit by signifying decreases in stress (see Afifi et al., 2011; Crowley, 2014; Floyd et al., 2007). Taken together, the findings from this study support the stress buffering hypothesis, indicating that social support serves an important protective function for parents of children with disabilities by guarding them against some of the negative effects of stress.

Though this research is promising, additional research should seek to connect these reductions in perceived and physiological stress with physical health outcomes. In the current study, perceived support was not associated with physical health complaints, a finding that runs contrary to the stress buffering hypothesis. It should be noted that, due to meeting exclusion criteria to participate in this study, participants were generally healthy individuals. In fact, the majority of participants indicated experiencing few to no physical health complaints during the

month prior to their appointment as measured by a shortened version of Pennebaker's Inventory of Limbic Languidness (PILL; 1982). Approximately 70% of participants indicated that they had not visited the doctor during the past month, and 80% of participants reported being sick for two days or less during the previous month. The fact that study participants were, in general, quite healthy could possibly have limited the ability to detect a relationship between social support perceived stress, and physical health symptoms. It is also possible that participants underreported or underestimated their own health ailments, as the instrument used to measure physical symptoms relied upon self-report data.

Another possible explanation for this lack of findings is the fact that participants reported relatively high levels of perceived support ($M = 3.88$ on a five-point scale measure, the MSPSS). It is possible that participants in this study already have sufficient support to enhance their coping abilities, thereby limiting their experiences of physical health complaints. If this were the case, the stress buffering hypothesis would already be in effect. Future research should continue to explore the connections between perceptions of support, perceived stress, and health in general, examining short-term cortisol reaction profiles (such as those identified in this study) with long-term cortisol information to create a more complete picture of how support influences stress. This, in turn, might lead to greater insight and illumination regarding the relationship between perceived support, actual and perceived stress, and physical health outcomes.

Support quality and stress. In addition to examining the connections between receiving support and stress, this study also explored how enacted support of differing quality affects physiological health. Analyses revealed that participants receiving high-quality supportive

messages (HPC messages) experienced the most pronounced reductions in their salivary cortisol levels. In fact, participants who received HPC support were the only ones to experience salivary cortisol reductions at all collection time points relative to their baseline cortisol levels. As HPC messages have been deemed the best and most successful form of supportive message (High & Dillard, 2012; Jones & Guerrero, 2001), this finding falls in line with previous research.

One possible explanation for the success of HPC messages in reducing physiological stress may be their ability to induce cognitive reappraisals in the message recipient. Burleson and Goldsmith's (1989) model of comforting communication hypothesized that the best comfort would result in improved emotional states by causing the distressed individual to reappraise his/her situation. This hypothesis was confirmed in later research, which found that HPC messages had a direct effect on emotional improvement while also encouraging people to verbalize their emotions and thoughts more throughout the interaction, resulting in further reappraisals and enhanced emotional states (Jones & Wirtz, 2006). Though the present study did not test for cognitive reappraisals among support recipients, future research should investigate the role that reappraisals might play in not only improving the emotional states of distressed individuals but also in enhancing their physiological stress recovery.

It is interesting to note that participants in the HPC condition experienced higher stress levels at the onset of the appointment when compared with MPC or LPC support recipients. Analysis revealed that participants who received HPC support did not differ significantly in their overall caregiver burden, the functioning of their child with disabilities, or their self-reported levels of stress leading up to the appointment itself. It is possible, however, that something about how these individuals behaved in the supportive interaction as a result of their higher

baseline stress levels incited their conversation partner to respond with higher quality support. That is, it is possible that the higher stress levels experienced by the caregiving parents somehow primed and motivated their conversation partners to provide better support. For example, if the conversation partner was aware that the parent usually experiences high levels of stress (even when the parent him/herself is less aware of his/her own stress), the conversation might approach the interaction differently and provide better support with the parent's needs in mind. Future research should seek to examine if these types of behavioral antecedents exist and, if so, how they work to signal an increased need for support.

Unlike this study's results for HPC messages, the results for recipients of MPC and LPC messages contradict previous VPC research. Participants receiving LPC messages in this study experienced positive changes in their salivary cortisol levels (that is, they experienced an overall reduction in their cortisol levels from baseline to the end of the appointment). These changes, however, were not always significantly different from the changes experienced by individuals in the HPC message condition, and they were never significantly different from participants who received MPC messages. This would suggest that participants receiving LPC support experienced benefits that were, in some instances, not significantly different from those participants who received HPC or MPC messages. This contradicts the theoretical model of VPC support, which argues that the benefits associated with receiving LPC support should be minimal and certainly less than either MPC or HPC support.

One possible explanation for participants' positive physiological reactions to receiving LPC support might be illuminated in exploring the relationship dynamics that existed between dyad partners. It is possible that these partners are accustomed to giving and receiving LPC

support. Previous research has shown that individuals are often attracted to and satisfied with relationship partners who have similar communication skills as their own, even when these skills are poor (Burlleson, 1998; Burlleson & Denton, 1992; Burlleson & Samter, 1996). Burlleson (1998) proposed the possibility that individuals with low communication skills might not realize that the skills they possess (and the skills their partner possesses) are poor, ultimately leading them to evaluate their partner's communication behaviors positively. Similarly, it is possible that participants in this study were accustomed to receiving LPC messages and thus interpreted these messages positively, causing these participants to feel supported even though the support they received was of low quality according to VPC evaluations of support.

It is also possible that LPC support recipients simply benefitted from having the opportunity to express their emotions regardless of the response received from their conversation partner. A significant body of research has shown that emotional expression through writing (see Frattaroli, 2006; Pennebaker, 2003) can positively impact health and well-being. According to this research, this enhanced well-being is especially pronounced when individuals are able to air negative emotions that they might not get to express otherwise (Pennebaker & Beall, 1986). If LPC support recipients find themselves in relationships where they frequently do not have the chance to share and discuss their troubles, then having the freedom to express their emotions during this interaction might have resulted in positive physiological outcomes unhampered by their conversation partners' responses. Future research should explore these possibilities in attempts to understand when and why lower quality support might enhance well-being and result in reductions to physiological stress.

As with the LPC support recipients, participants receiving MPC support did not experience the hypothesized changes to their physiological stress outcomes. In fact, participants receiving MPC support actually experienced *increases* in their salivary cortisol levels from baseline to collection Time 2 and Time 3. It is also interesting to note that MPC recipients are the only participants in this study whose cortisol levels never dropped below their original baseline levels, suggesting a trend that MPC message recipients experienced higher stress levels at the end of the appointment than when the appointment started. This not only contradicts what VPC research would expect to happen (High & Dillard, 2012) but is also the opposite finding of previous studies. In their 2009 study, Priem and Solomon found that participants who received distracting messages (MPC support) in anticipation of a public speaking task actually experienced lower levels of salivary cortisol than those individuals who received messages fostering reappraisals (HPC support). They argued that one possible explanation for this finding might be the fact that a teacher (rather than a close friend or relationship partner) provided the support in both experimental groups, when previous research has acknowledged that receiving emotional support (and HPC support, in particular) from someone when familiarity or trust are lacking can produce negative or awkward supportive encounters (Burleson, 2003; Goldsmith & Parks, 1990). In the present study, however, support recipients participated with someone they knew and to whom they felt close, minimizing the possibility that HPC support might be seen as inappropriate or unsuccessful due to a lack of trust and closeness between interaction partners. The findings in this study, taken with previous findings, suggest that MPC support functions differently depending on the

relationship between the interaction partners and the situational context, with MPC support exchanged in close relationships potentially proving more ineffectual than even LPC support.

It is possible that MPC support recipients in this study already experienced a variety of supportive messages within their day-to-day interactions. If these participants have received HPC support in the past, then receiving MPC support might fail to meet their expectations, resulting in frustration and a heightened awareness that their supportive needs are not being met. Previous research has shown that, when support fails to meet expectations, the physiological health benefits experienced by the support recipient disappear (Priem & Solomon, 2014). It is also possible that MPC support, which often serves to distract the distressed individual from his/her feelings, are particularly ineffective for parents dealing with children who have disabilities, as they are constantly surrounded by and reminded of the challenges associated with caring for their child. These attempts at distraction might actually serve to underscore some of the negative emotions, such as feelings of guilt or loneliness, associated with providing long-term care for someone. For example, if a parent is feeling guilty for not being able to provide the best care for her son, attempts at distraction or encouragement to push these guilty feelings aside might make those guilty feelings more salient, as any attempt to forget the guilt might be perceived, in the parent's mind, as further evidence of their failure to be a good parent.

The findings in this study related to VPC and changes in stress among support recipients emphasize the need for future research on support quality in real interactions and its effects on health and well-being. Though researchers have consistently found HPC support to be most effective at reducing distress, followed by MPC and then LPC support, nearly every study

examining the effects of support quality on relational outcomes and well-being have used contrived interactions. That is, these studies have relied on trained confederates to provide specific types of support to a research participant in a laboratory setting, asked participants to respond to hypothetical scenarios whereby they imagine themselves in an interaction with a friend or loved one and receive varying types of support from that person, or required participants to read and rate researcher-created supportive messages (High & Dillard, 2012). Very few studies have sought to apply VPC and VPC coding schemes to more naturally occurring supportive interactions between two people who have a pre-existing relationship.

The results of this study also suggest that applications of VPC support coding schemes are not as clear-cut in real conversations as they appear to be in research using controlled supportive messages. In research using either hypothetical scenarios or researcher-crafted supportive messages, participants are often successful at imagining a loved one giving them the support outlined in the research design (High & Dillard, 2012). However, these messages are fixed and lack nonverbal comforting cues, so though they are able to mitigate the potential downsides of involving a confederate (where a lack of closeness and trust can alter perceptions of the interaction), they ultimately present a narrow, static, and context-free version of the supportive process. These “conversations” do not allow for feedback from the support provider or the typical give-and-take characteristic of supportive interactions (Goldsmith, 2004). On the other hand, using confederates to provide support, while allowing for greater fluidity in the supportive conversation and the inclusion of nonverbal cues, also has significant downsides, including a lack of trust, closeness, and shared relationship history that make the interaction uncomfortable while also increasing the potential for face threats and image management

concerns for the support recipient (Burlison, 2003; High & Dillard, 2012). Even employing close relationship partners to serve as confederates in a study can have its downsides, as asking individuals to behave in ways atypical to their normal behavior might cause confounding reactions to the interaction and perceptions of the support provided (Priem & Solomon, 2011).

In more naturally occurring interactions (such as those in the current study), the outcomes of supportive communication appear to be contingent upon factors aside from just the VPC of the supportive messages. In this study, participants chose to invite someone whom they identified as a key source of support in their day-to-day lives. Thus, it is reasonable to assume that these participants had a set of expectations and norms for the type of support they would receive from their conversation partners and how the supportive conversation would proceed. These expectations probably look quite different from those experienced by an individual entering a contrived supportive interaction, especially when that interaction involves a relative stranger (as in Priem & Solomon, 2009) or even those held by a person entering into a supportive conversation without the same stressors as those experienced by parents of children with disabilities. Future research should seek to explore the role that expectations play when engaging in a supportive conversation, as this might account for some of the instances where VPC coding schemes result in findings that differ from what researchers would suspect.

In addition to the expectations, it is important to note that when receiving contrived support, participants are often aware that when their participation in the research process ends, the support and its implications also terminate. That is, the ramifications of the conversation experienced during the research process, be it with a confederate or in a hypothetical scenario, tend not to extend beyond the research setting and into participants'

real lives. This could potentially influence their interpretations of supportive messages. In more naturally occurring interactions, any conversational antecedents, consequences, and evaluations can carry important relational information for the interactants that does not cease when their study participation stops. Thus, in some ways, the relational stakes might be higher in supportive interactions that occur between existing relationship partners, as the things said and done during the study could trickle into future conversations and establish future expectations. This awareness of the greater conversational and supportive trajectory for the dyad could result in interactants evaluating messages of varying VPC differently and in more complex ways than contrived research designs can accurately measure.

It is also likely that other relationship characteristics present in more naturally occurring support influence how recipients perceive different quality supportive messages. For example, a study by Priem and Solomon (2011) asked pre-existing relationship partners to engage in hurtful and supportive conversations, and then the authors measured message recipients' stress responses. They found that message recipients with higher levels of uncertainty about their partners' involvement in the relationship experienced fewer health benefits as a result of the supportive interaction. Though this study did not explore differences in support quality, its results indicate that relationship factors present in more naturalistic supportive interactions, such as relational uncertainty, influence the outcomes of that support. It is possible, therefore, that relational uncertainty might also influence support recipients' interpretations of messages that vary in their VPC.

With this in mind, future research should seek to explore how differences in expectations and norms for support as well as how anticipation of future interaction and other

qualities unique to interaction partners (such as the uncertainty present in the relationship) ultimately influence perceptions of supportive interactions. In doing so, researchers can begin to tease apart the situations where MPC supportive communication can actually be more effective in reducing stress (as in Priem & Solomon, 2009) versus the situations where it is the *least* effective form of comforting communication (as in the results of this study). This research should also seek to identify times when LPC support might be most effective in enhancing relational and health outcomes, as it is possible that these situations exist and have yet to be acknowledged.

Support and Support Providers

Another goal of this study was to explore how offering support to a person likely experiencing chronic stress might influence the relational and health outcomes for support providers. Results from this study did not illuminate any significant connections between expressed support and support quality on providers' physiological health or relational outcomes. This runs contrary to previous research, which has found that providing support can have negative and/or positive outcomes for providers. It is possible that participant characteristics for the people in this study may have limited the ability to detect changes in provider outcomes. For example, all but one support recipient in this study was female, whereas approximately 60% of support providers in the study were male. Researchers have previously established that men are less likely to provide highly sensitive emotional support than women, and they also tend to feel less comfortable providing this type of support (Burlison et al., 2005; MacGeorge et al., 2003).

These studies, though very different from the current study, argued that the sex of both interactants in a supportive encounter can influence various outcomes when it comes to giving and receiving emotional support. In the present study, men and women were not significantly different in their likelihood to provide high VPC support, $\chi^2 (df = 2) = 1.33, ns$. Analyses did show, however, that parents were more likely to report the support received by female conversation partners as more sensitive ($M = 4.54, SD = .29$) compared to male conversation partners ($M = 4.18, SD = .44$), $t(38) = 2.85, p < .01$. Female conversation partners' support ($M = 4.77, SD = .46$) was also rated as more appropriate by parents when compared with male conversation partners ($M = 4.31, SD = .59$), $t(38) = 2.60, p < .05$. As such, it is possible that male conversation partners experienced more discomfort in providing emotional support as part of the study. This discomfort could have been compounded by an awareness that their support was perceived as less effective by the people they are trying to help, causing them to experience changes in their physiological stress that looked different from the changes experienced by female providers and essentially canceling out any changes in cortisol that might have been detected had the sample of providers consisted purely of men or of women.

It is also important to note that male conversation partners were significantly more likely to be the spouse or romantic partner ($n = 23$) of the parent, whereas female conversation partners were more likely to be their friend, parent, or adult child ($n = 15$), $\chi^2 (df = 5) = 32.54, p < .01$. As such, it is also possible that the discussion for male-female conversation dyads looked and felt different from female-female conversation dyads, as the problems discussed by the parent in the cross-sex conversation dyads were, for the most part, problems that directly affected the conversation partner's life as well. Thus, by engaging in the supportive interaction

with the parent, male conversation partners were also forced to discuss the challenges present in their own family life, potentially limiting the positive experience of providing support by stirring negative feelings. Future research might investigate if the differences in providing emotional support between men and women translate to changes in their physiological experiences of the support provision process and if other relationship characteristics, such as whether the dyad are married and share a home life together, influence these changes differently for male and female support providers.

Another possible explanation for the lack of evidence linking support provision to various outcomes is the amount of time participants engaged in the interaction. Because support providers are, by the very nature of being targeted to offer support, not experiencing the levels of emotional distress that support recipients are, they might be less susceptible to experiencing short-term changes in their stress levels as a result of a single supportive interaction. This might be especially true for providers who are responding to the supportive needs of parents who have children with disabilities, as the challenges and emotions expressed by these parents are most likely ongoing and, therefore, familiar to the support provider. On the other hand, it is possible that providing support to a distressed other over long periods of time might result in significant relational and physiological health outcomes. In fact, most research exploring the costs and rewards of support provision take a broad, long-term approach to support provision (for examples, see Brown et al., 2003; Silverstein et al., 1996). In future research, scholars should examine the long-term physiological outcomes associated with supporting a chronically-stressed individual, as this might better illuminate the relationship between support provision and health. Additionally, scholars might also explore characteristics

of the supportive interaction itself, such as how the degree of upset experienced by the distressed individual and the novelty of the situation being discussed influence outcomes for the support provider.

Study Limitations

Though this study's findings point to interesting conclusions, it is not without limitations. To begin, the parents who participated in this study are not representative of the greater population of parents who care for children with disabilities. The majority of parents in this study were currently married (82.5%) and white (97.5%), and approximately 50% of the parents in this study reported household annual incomes greater than \$60,000. All of these rates are higher than the national average, indicating that this study population is non-representative. Additionally, research suggests that the financial and relational burdens associated with caring for a disabled child result in higher divorce rates (Mauldon, 1992) and lower economic standing (Emerson, 2003) among parents of children with disabilities above and beyond the national averages. Thus, it is likely that the parents in this study experience less stress and fewer financial difficulties than other parents of children with disabilities.

Additionally, the research study design required that parents participate in the study with someone that they knew and felt they could turn to for support. Through the outreach and screening efforts, several parents indicated an interest in being a part of the study. Upon learning that full participation required that they invite another person to be in the study with them, however, these parents withdrew their names from consideration, explicitly stating that they did not have another person whom they could invite to participate. This would imply that parents participating in this study actually had more robust social support networks than some

who did not participate. This probability is underscored by the fact that parents who participated in this study reported fairly high levels of global perceived support ($M = 3.88$ on a 1-5 scale) as well as high levels of relationship satisfaction ($M = 4.27$ on a 1-5 scale). These scores, in combination with the higher household income and percentage of married participants, suggests that the individuals in this study most likely have better support networks and, thus, experience lower stress than parents without these qualities.

It is possible that parents experiencing lower access to support, lower socioeconomic standing, or a combination of the two could respond to and benefit from supportive attempts differently than people without these challenges. Future research should attempt to include a more diversified study sample, seeking out participants who are divorced or single parents of children with disabilities and/or experiencing lower socioeconomic standing. By including more of these participants, results may more closely resemble what researchers would expect to see among the general population of parents of children with disabilities across the United States. Seeking out these groups also serves to benefit those individuals likely experiencing even higher levels of stress and, thus, more severe supportive needs.

Another limitation of this study was the limited control over the interaction between participants. This openness was intentional and designed to examine how supportive interactions that, as much as possible within the constraints of the study, mirrored naturally occurring conversations would affect the outcomes for interactants. It became clear in analysis, however, that not providing more specific instructions for the conversation resulted in a wide variety of topics that ranged greatly in their severity and emotional intensity. For example, one participant became visibly distressed and began crying when discussing the sadness she felt

knowing that her daughter would never be able to get married or have her own family. This looked very different from the interaction of another participant, who spent much of the interaction joking with her conversation partner about her son's fascination with a new toy and how his playing late at night prevents her from sleeping. The wide range of interactions might account for some of the physiological reactions seen among parents receiving support as well as the nature of the support supplied by the provider. Those engaged in more light-hearted conversations might not have experienced the same benefits as those who were able to express their deep troubles and then receive assistance in coping with them. In the future, allowing participants to interact in a natural way while also utilizing a more specific conversation prompt would provide more balance between the need for control in the research design and the desire to analyze communication that more closely mirrors day-to-day interactions.

Finally, one shortcoming of this piece is the small sample size of 40 dyads. Previous research using biological markers have demonstrated that small sample sizes can be sufficient in identifying meaningful differences among participants (for examples, see Crowley, 2014, and Floyd et al., 2007). In fact, the results of this study (specifically with regards to parents' experiences of physiological stress) would also support this argument. It is possible, however, that the sample size was insufficient to detect small but meaningful changes in physiological stress among the conversation partners. Increasing the sample size could create greater sensitivity in illuminating differences in how supportive interactions of differing quality affect physiological health outcomes. Future efforts to increase study sample size would serve to not only enhance statistical sensitivity but could also help create a more representative sample.

Conclusion

This study takes an initial step in exploring the effects of short-term supportive interactions on the well-being of both support recipients and support providers by examining supportive interactions between parents of children with disabilities and a member of their support network. It also makes strides in examining how differences in the quality of the support provided might influence the relational and health benefits associated with receiving support. Ultimately, this study provides some limited empirical evidence for the benefits of receiving support for parents of children with disabilities. However, questions remain about the outcomes associated with support provision in this context.

For scholars, the findings of this study carry important implications. First, it underscores the contention that social support is an important communication process associated with individual health and well-being. Second, it provides empirical evidence to support the argument that not all social support is “created equal” and that variations in the quality of support received can result in significantly different outcomes for recipients who are experiencing long-term stressors, such as parents caring for children with disabilities. Third, it raises important questions about our understanding of how support quality is enacted in conversation and where existing tools to quantify and assess support quality appear to fall short. The results of this study did not cleanly map onto the suggested hierarchy of support quality as proposed by verbal person-centered message research. This is significant, as much of the current literature surrounding questions of support quality and outcomes rely on a traditional, three-tiered model of support with each increasing level of verbal person-centeredness proving more helpful and effective than the last within the confines of support

provided in close relationships. If this way of “grading” support quality does not function as expected in semi-natural interactions, scholars must pause to consider what else might account for differences in support quality and how these ideas could be tested and applied to future research exploring the effects of support.

The results of this study also carry implications for support recipients and providers, and especially for those dealing with long-term, chronic stressors. This study found that something as small as a 10-minute conversation has the ability to affect the stress experienced by parents of children with disabilities. As these individuals may be busy, overwhelmed, and incredibly stressed, parents might be encouraged to more frequently engage in brief supportive interactions knowing that these conversations can make a difference for their well-being. Organizations seeking to promote the health and wellness of these parents might use this information to encourage parental involvement in support groups or other forms of supportive encounters, stressing that interactions do not have to be lengthy to achieve some short-term benefit. Similarly, practitioners and counselors could use the knowledge that higher person-centered messages caused the most significant reductions in stress to train peer mentors or spouses and family members to provide the best quality support possible, resulting in the greatest chance for enhanced well-being among caregivers. This study is the first step in understanding how supportive interactions affect well-being among long-term caregivers, opening avenues for greater exploration and the potential to help people achieve enhanced relational and physical well-being through their day-to-day interactions with others.

References

- Afifi, T. D., Granger, D. A., Denes, A., Joseph, A., & Aldeis, D. (2011). Parents' communication skills and adolescents' salivary a-amylase and cortisol response patterns. *Communication Monographs, 78*(3), 273-295. doi: 10.1080/03637751.2011.589460
- Albrecht, T. L., & Adelman, M. B. (1987). *Communicating social support*. Newbury Park, CA: Sage Publications.
- Anderson, D., Dumont, S., Jacobs, P., & Azzaria, L. (2007). The personal costs of caring for a child with a disability: A review of the literature. *Public Health Reports, 122*, 3-16.
- Applegate, J. L. (1980a). Adaptive communication in educational contexts: A study of teachers' communication strategies. *Communication Education, 29*, 158-170.
- Applegate, J. L. (1980b). Person- and position-centered communication in a day-care center. In N. K. Denzin (Ed.), *Studies in symbolic interaction* (pp. 59-96). Greenwich, CT: JAI Press.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*, 596-612.
- Baron, R. M., & Kenny, D. A. (1986). The moderator/mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Batson, C. D. (1998). Altruism and prosocial behavior. In T. D. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 282-316). New York, NY: McGraw-Hill.
- Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine, 51* 843-857.

- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology*, *109*(2), 186-204.
- Bodie, G. D., Burleson, B. R., Gill-Rosier, J., McCullough, J. D., Holmstrom, A. J., Rack, J. J., et al. (2011). Examining the impact of attachment style on evaluations of supportive messages: A dual-process framework. *Communication Research*, *38*, 228-247. doi: 10.1177/0093650210362678
- Bodie, G. D., Burleson, B. R., Holmstrom, A. J., McCullough, J. D., Rack, J. J., Hanasono, L. K., et al. (2011). Effects of cognitive complexity and emotional upset on processing supportive messages: Two tests of a dual-process theory of supportive communication outcomes. *Human Communication Research*, *37*, 350-376.
- Bøen, H., Dalgard, O. S., & Bjertness, E. (2012). The importance of social support in the associations between psychological distress and somatic health problems and socio-economic factors among older adults living at home: A cross-sectional study. *BMC Geriatrics*, *12*, 27-39.
- Braithwaite, D. O., & Eckstein, N. J. (2003). How people with disabilities communicatively manage assistance: Helping as instrumental social support. *Journal of Applied Communication Research*, *31*, 1-26.
- Brault, M. W. (2008). *Americans with disabilities: 2005. Household economic studies*. Retrieved from: <https://www.census.gov/prod/2008pubs/p70-117.pdf>

- Brock, R. L., & Lawrence, E. (2008). A longitudinal investigation of stress spillover in marriage: Does spousal support adequacy buffer the effects? *Journal of Family Psychology, 22*, 11-20.
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. *Psychological Science, 14*, 320-327. doi: 10.1111/1467-9280.14461
- Burleson, B. R. (1982). The development of comforting communication skills in childhood and adolescents. *Child Development, 53*, 1578-1588.
- Burleson, B. R. (1994). Comforting messages: Features, functions, and outcomes. In J. A. Daly & J. M. Wiemann (Eds.), *Strategic interpersonal communication* (pp. 135-161). Hillsdale, NJ: Erlbaum.
- Burleson, B. R. (1998). Similarities in social skills, interpersonal attraction, and the development of personal relationships. In H. Sypher & J. L. Applegate (Eds.), *Communication by children and adults* (pp. 63-104). Beverly Hills, CA: Sage.
- Burleson, B. R. (2003). Emotional support skill. In J. O. Greene & B. R. Burleson (Eds.), *Handbook of communication and social interaction skills* (pp. 551-594). Mahwah, NJ: Erlbaum.
- Burleson, B., Albrecht, T., Goldsmith, D. & Sarason, I. (1994). Introduction. In B. R. Burleson, T. L. Albrecht, & I. Sarason (Eds.), *The communication of support: Messages, interactions, relationships, and community* (pp. xi-xix). Newbury Park, CA: Sage.
- Burleson, B. R., & Denton, W. H. (1992). A new look at similarity and attraction in marriage: Similarities in social-cognitive and communication skills as predictors of attraction and satisfaction. *Communication Monographs, 59*, 268-287.

- Burleson, B. R., & Goldsmith, D. J. (1998). How the comforting process works: Alleviating emotional distress through conversationally induced reappraisals. In P. A. Andersen & L. K. Guerrero (Eds.), *Communication and emotion* (pp. 246-275). Orlando, FL: Academic Press.
- Burleson, B. R., Holmstrom, A. J., & Gilstrap, C. M. (2005). "Guys can't say *that* to guys": Four experiments assessing the normative motivation account for deficiencies in the emotional support provided by men. *Communication Monographs*, *72*, 468-501.
- Burleson, B. R., & Samter, W. (1996). Similarity in the communication skills of young adults: Foundations of attraction, friendship, and relationship satisfaction. *Communication Reports*, *9*, 127-139.
- Byrd-Craven, J., Geary, D. C., Rose, A. J., & Ponzi, D. (2008) Co-ruminating increases stress hormone levels in women. *Hormones and Behavior*, *53*, 489-492.
- Byrd-Craven, J., Granger, D. A., & Auer, B. J. (2010). Stress reactivity to co-rumination in young women's friendships: Cortisol, alpha-amylase, and negative affect focus. *Journal of Social and Personal Relationships*, *28*(4), 469-487. doi: 10.1177/0265407510382319
- Cacioppo, J. T., Marshall-Goodell, B. S., & Gormenzano, I. (1983). Social psychophysiology: Bio-electrical measurement, experimental control, and analog-to-digital data acquisition. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 666-690). New York, NY: Guilford Press.
- Carretero, S., Garcés, J., Ródenas, R., & Sanjosé, V. (2009). The informal caregiver's burden of dependent people: Theory and empirical review. *Archives of Gerontology and Geriatrics*, *49*, 74-79. doi: 10.1016/j.archger.2008.05.004

Centers for Disease Control and Prevention. (2010). *Caregiving: A public health priority*.

Retrieved from: <http://www.cdc.gov/aging/caregiving/index.html>

Centers for Disease Control and Prevention. (2011). *Disability and health: Health care data and statistics*. Retrieved from: <http://www.cdc.gov/ncbddd/disabilityandhealth/healthcare-data.html>

Centers for Disease Control and Prevention. (2012a). *Disability and health: Data and statistics*.

Retrieved from: <http://www.cdc.gov/ncbddd/disabilityandhealth/economic-data.html>

Centers for Disease Control and Prevention. (2012b). *Key findings: Trends in the prevalence of developmental disabilities in U.S. children, 1997-2008*. Retrieved from:

<http://www.cdc.gov/ncbddd/features/birthdefects-dd-keyfindings.html>

Chong, R. Y., Uhart, M., McCaul, M. E., Johnson, E., & Wand, G. S. (2008). Whites have a more robust hypothalamic-pituitary-adrenal axis response to a psychological stressor than blacks. *Psychoneuroendocrinology*, *33*, 246-254. doi: 10.1016/j.psyneuen.2007.10.014

Cialdini, R. B., Darby, B. K., & Vincent, J. E. (1973). Transgression and altruism: A case for hedonism. *Journal of Experimental Social Psychology*, *9*, 502-526.

Cialdini, R. B., & Kenrick, D. T. (1976). Altruism as hedonism: A social development perspective on the relationship of negative mood state and helping. *Journal of Personality and Social Psychology*, *34*, 907-914.

Cohen, S., Karmarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 385-396.

Cohen, S., & Willis, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*, 310-357.

- Conover, W. J., & Iman, R. L. (1981). Rank transformations as a bridge between parametric and nonparametric statistics. *The American Statistician*, *35*, 124-129. doi: 10.1080/00031305.1981.10479327
- Coyne, J. L. (1976). Depression and response of others. *Journal of Abnormal Psychology*, *85*, 186-193.
- Croezen, S., Picavet, H. S. J., Haverman-Niles, A., Verschuren, W. M. M., de Groot, L. C. P. G. M., & van't Veer, P. (2012). Do positive or negative experiences of social support relate to current and future health? Results from the Doetinchem cohort study. *BMC Public Health*, *12*, 65-73.
- Crowley, J. P. (2014). Expressive writing to cope with hate speech: Assessing psychobiological stress recovery and forgiveness promotion for lesbian, gay, bisexual, or queer victims of hate speech. *Human Communication Research*, *40*, 238-261. doi: 10.1111/hcre.12020
- Cutrona, C. E. (1996) *Social support in couples*. Thousand Oaks, CA: Sage.
- Cutrona, C. E., & Russell, D. A. (1990). Types of social support and specific stress: Toward a theory of optimal matching. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 319-366). New York: Wiley.
- De Andrés-García, S., Moya-Albiol, L., & González-Bono, E. (2012). Salivary cortisol and immunoglobulin A: Responses to stress as predictors of health complaints reported by caregivers of offspring with autistic spectrum disorder. *Hormones and Behavior*, *62*, 464-474. doi: 10.1016/j.yhbeh.2012.08.003
- Deeken, J. F., Taylor, K. L., Mangan, P., Yabroff, K. R., & Ingham, J. M. (2003). Care for the caregivers: A review of self-report instruments developed to measure the burden, needs, and quality of life of informal caregivers. *Journal of Pain and Symptom Management*, *26*, 922-953. doi: 10.1016/S0885-3924(03)00327-0

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The adaptive calibration model of stress responsivity. *Neuroscience and Biobehavioral Reviews*, *35*, 1562-1592. doi: 10.1016/j.neubiorev.2010.11.007

Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: Social and economic situation, mental health status, and the self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability Research*, *47*, 385-399.

Family Caregiver Alliance. (2012). *Selective caregiver statistics*. Retrieved from: http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=439

Faw, M. H. (2014). Young adults' strategies for managing social support during weight loss attempts. *Qualitative Health Research*, *24*, 267-278. doi: 10.1177/1049732313520079

Floyd, K., Mikkelson, A. C., Tafoya, M. A., Farinelli, L., La Valley, A. G., & Wilson, J. (2007). Human affection exchange theory: XIII. Affectionate communication accelerates neuroendocrine stress recovery. *Health Communication*, *22*, 123-132.

Fratraroli, J. (2006). Experimental disclosure and its moderators: A meta-analysis. *Psychological Bulletin*, *132*, 823-865. doi: 10.1037/0033-2909.132.6.823

Gallagher, S., Phillips, A. C., Drayson, M. T., & Carroll, D. (2009a). Caregiving for children with development disabilities is associated with a poor antibody response to influenza vaccination. *Psychosomatic Medicine*, *71*, 341-344.

Gallagher, S., Phillips, A. C., Drayson, M. T., & Carroll, D. (2009b). Parental caregivers of children with developmental disabilities mount a poor antibody response to pneumococcal vaccination. *Brain, Behavior & Immunity*, *23*, 338-246.

- Gallagher, S., & Whiteley, J. (2012). Social support is associated with blood pressure responses in parents caring for children with developmental disabilities. *Research in Developmental Disabilities, 33*, 2099-2105. doi: 10.1016/j.ridd.2012.06.007
- Gatti, R., Antonelli, G., Prearo, M., Spinella, P., Cappellin, E., & De Palo, E. F. (2009). Cortisol assay and diagnostic laboratory procedures in human biological fluids. *Clinical Biochemistry, 42*, 1205-1217. doi: 10.1016/j.clinbiochem.2009.04.011
- Gleason, M. E. J., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality and Social Psychology Bulletin, 29*, 1036-1045.
- Gordis, E. B., Granger, D. A., Susman, E. J., & Trickett, P. K. (2006). Asymmetry between salivary cortisol and α -amylase reactivity to stress: Relation to aggressive behavior in adolescents. *Psychoneuroendocrinology, 31*, 976-987.
- Goldsmith, D. J. (1992). Managing conflicting goals in supportive interactions: An integrative theoretical framework. *Communication Research, 19*, 264-286.
- Goldsmith, D. J. (2004). *Communication social support*. New York: Cambridge University Press.
- Goldsmith, D. J., & Parks, M. R. (1990). Communicative strategies for managing the risks of seeking social support. In S. Duck & R. C. Silver (Eds.), *Personal relationships and social support*, 104-121. Newbury Park: Sage.
- Green, S. E. (2007). "We're tired, not sad": Benefits and burdens of mothering a child with a disability. *Social Science & Medicine, 64*, 150-163. doi: 10.1016/j.socscimed.2006.08.025
- Ha, J-H., Hong, J., Mailick Seltzer, M., & Greenberg, J. S. (2008). Age and gender differences in the well-being of midlife and aging parents with children with mental health or

- developmental problems: Report of a national study. *Journal of Health and Social Behavior*, 49, 301-316.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis for the new millennium. *Communication Monographs*, 76, 408-420. doi: 10.1080/03637750903310360
- Heim, C., Ehlert, U., & Hellhammer, D. H. (2000). The potential role of hypocortisolism in the pathophysiology of stress-related bodily disorders. *Psychoneuroendocrinology*, 25, 1-35.
- Hellhammer, D. H., Wust, S., & Kudielka, B. M. (2009). Salivary cortisol as a biomarker in stress research. *Psychoneuroendocrinology*, 34, 163-171. doi: 10.1016/j.psyneuen.2008.10.026
- Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family*, 50, 93-98.
- High, A. C., & Dillard, J. P. (2012). A review of meta-analysis of person-centered messages and social support outcomes. *Communication Studies*, 63, 99-118. doi: 10.1080/10510974.2011.598208
- Hong, J., Seltzer, M. M., & Krauss, M. W. (2001). Change in social support and psychological well-being: A longitudinal study of aging mothers of adults with mental retardation. *Family Relations*, 50, 154-163.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241(4865), 540-545.
- Ikeda, A., & Kawachi, I. (2010). Social networks and health. In A. Steptoe (Ed.), *Handbook of behavioral medicine* (pp. 237-261). New York, NY: Springer.
- Jones, S. M., & Burleson, B. R. (2003). Effects of helper and recipient sex on the experience and

- outcomes of comforting messages: An experimental investigation. *Sex Roles*, 48, 1-19.
- Jones, S. M., & Guerrero, L. K. (2001). The effects of nonverbal immediacy and verbal person centered support process. *Human Communication Research*, 27, 567-596.
- Jones, S. M., & Wirtz, J. G. (2006). How does the comforting process work? An empirical test of an appraisal-based model of comforting. *Human Communication Research*, 32, 217-243. doi: 10.1111/j.1468-2958.2006.00274.x
- Keene, O. N. (1995). The log transformation is special. *Statistics in Medicine*, 14, 811-819. doi: 10.1002/sim.4780140810
- Kiecolt-Glaser, J. K., & Glaser, R. (2011). Stress and immunity: Age enhances the risk. *Current Directions in Psychological Science*, 10, 18-21.
- Knobloch, L. K., & Solomon, D. H. (1999). Measuring the sources and content of relational uncertainty. *Communication Studies*, 50, 261-278. doi: 10.1080/10510979909388499
- Knoll, N., Kienle, R., Bauer, K., Pfuller, B., Luszczynska, A. (2014). Affect and enacted support in couples undergoing in-vitro fertilization: When providing is better than receiving. *Social Science & Medicine*, 64, 1789-1801. Doi: 10.1016/j.socscimed.2007.01.004
- Konishi, S. B. E., Guyton, A., & O'Connor, K. (2012). Salivary excretion of progesterone and cortisol significantly differs between individuals after correcting for blood hormone values. *American Journal of Physical Anthropology*, 149, 231-241.
- Krause, N, Herzog, R. A., & Baker, E. (1992). Providing support to others and well-being in later life. *Journals of Gerontology: Psychological Science*, 47. 300-311.
- La Giappa, J. J. (1990). The negative effects of informal support. In S. Duck (Ed.), *Personal relationships and social support* (pp. 122-139). London, UK: Sage Publications.

- Lach, L. M., Kohen, D. E., Garner, R. E., Behaut, J. C., Miller, A. R., Klassen, A. F., & Rosenbaum, P. L. (2009). The health and psychosocial functioning of caregiving of children with neurodevelopmental disorders. *Disability & Rehabilitation, 31*, 741-742.
- Levine, A., Zagoory-Sharon, O., Feldman, R., Lewis, J. G., & Weller, A. (2007). Measuring cortisol in human psychobiological studies. *Physiology & Behavior, 90*, 43-53. doi: 10.1016/j.physbeh.2006.08.025
- Liang, J., Krause, N. M., & Bennet, J. M. (2001). Social exchange and well-being: Is giving better than receiving? *Psychology & Aging, 16*, 511-523. doi: 10.1037//0882-7974.16.3.511
- Lovell, B., Moss, M., & Wetherell, M. A. (2012). With a little help from my friends: Psychological, endocrine and health corollaries of social support in parental caregivers of children with autism or ADHD. *Research in Developmental Disabilities, 33*, 682-687. doi: 10.1016/j.ridd.2011.11.014
- Lu, L. (1997). Social support, reciprocity, and well-being. *The Journal of Social Psychology, 137*, 618-628.
- Lu, L., & Argyle, M. (1992). Receiving and giving support: Effects on relationships and well-being. *Counseling Psychology Quarterly, 5*, 123-134.
- MacGeorge, E. L., Feng, B., & Burlison, B. R. (2011). Supportive communication. In M. L. Knapp & J. A. Daly (Eds.), *The Sage handbook of interpersonal communication* (pp. 317-354). Thousand Oaks, CA: Sage.
- MacGeroge, E. L., Gillihan, S. J., Samter, W., & Clark, R. A. (2003). Skill deficit or differential motivation? Accounting for sex differences in the provision of emotional support. *Communication Research, 30*, 272-303. doi: 10.1177/0093650203030003002

- Mauldon, J. (1992). Children's risks of experiencing divorce and remarriage: Do disabled children destabilize marriages? *Population Studies: A Journal of Demography*, 46, 349-362. doi: 10.1080/0032472031000146276
- McEwan, B. S. (1998). Stress, adaptation, and disease. *Annals New York Academy of Sciences*, 840, 33-44.
- Munro, C., & Stabenfeldt, G. (1985). Development of a cortisol enzyme-immunoassay in plasma. *Clinical Chemistry*, 31, 956-956.
- National Alliance for Caregiving. (2004). *Caregiving in the U.S.: An executive summary*. Retrieved from: http://assets.aarp.org/rgcenter/il/us_caregiving_1.pdf
- National Alliance for Caregiving. (2006). *Evercare study of caregivers in decline: Findings from a national survey*. Retrieved from: <http://www.caregiving.org/data/Caregivers%20in%20Decline%20Study-FINAL-lowres.pdf>
- National Dissemination Center for Children with Disabilities (2013). *Severe and/or multiple disabilities*. Retrieved from: <http://nichcy.org/disability/specific/multiple>
- Nordstokke, D. W., Zumbo B. D., Cairns, S. L., & Saklofske, D. H. (2011). The operating characteristics of the nonparametric Levene test for equal variances with assessment and evaluation data. *Practical Assessment, Research, & Evaluation*, 16, 1-8.
- Orth-Gomér, K., & Johnson, J. V. (1987). Social network interaction and mortality: A six year follow-up study of a random sample of the Swedish population. *Journal of Chronic Disease*, 40, 949-957.

- Ottenbacher, K. J., Msal, M. E., Lyon, N., Duffy, L. C., Granger, C. V., & Braun, S. (1999). Measuring developmental and functional status in children with disabilities. *Developmental Medicine & Child Neurology, 41*, 186-194.
- Parks, M. R., & Floyd, K. (1996). Meanings for closeness and intimacy in friendship. *Journal of Social and Personal Relationships, 13*, 85-107. doi: 10.1177/0265407596131005
- Pennebaker, J. W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.
- Pennebaker, J. W. (2003). Putting stress into words: Health, linguistics, and therapeutic implications. *Behaviour Research and Therapy, 31*, 539-548. doi: 10.1016/00057967(93)90105-4
- Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95* 274-281. doi: 10.1037//0021-843X.95.3.274
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computes, 36*, 717-731.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891. doi: 10.3758/BRM.40.879
- Priem, J. S., & Solomon, D. H. (2009). Comforting apprehensive communicators: The effects of reappraisal and distraction on cortisol levels among students in a public speaking class. *Communication Quarterly, 57*, 259-281. doi: 10.1080/01463370903107253
- Priem, J. S., & Solomon, D. H. (2011). Relational uncertainty and cortisol responses to hurtful

and supportive messages from a dating partner. *Personal Relationships*, 18, 198-223.

doi: 10.1111/j.1475-6811.2011.01353.x

Priem, J. S., & Solomon, D. H. (In press). Emotional support and physiological stress recovery:

The role of support matching, adequacy, and invisibility. *Communication Monographs*.

Raina, P., O'Donnell, M., Rosenbaum, P., Brehaut, J., Walter, S. D., Russell, D., Swinton, M., Zhu,

B., & Wood, E. (2005). The health and well-being of caregivers of children with cerebral

palsy. *Pediatrics*, 115, e626-e636. doi: 10.1542/peds.2004-1689

Rodakowski, J., Skidmore, E. R., Rogers, J. C., & Schulz, R. (2012). Role of social support in

predicting caregiver burden. *Archives of Physical and Medical Rehabilitation*, 93, 2229-

2234. doi: 10.1016/j.apmr.2012.07.004

Rohleder, N., Marin, T. J., Ma, R., & Miller, G. E. (2009). Biological cost of caring for a cancer

patient: Dysregulation of pro- and anti-inflammatory signaling pathways. *Journal of*

Clinical Oncology, 27, 2909-2914.

Rubin, Z. (1970). Measurement of romantic love. *Journal of Personality and Social Psychology*,

16, 265-273.

Samter, W. (1994). Unsupportive relationships: Deficiencies in the support-giving skills of the

lonely person's friends. In B. R. Burleson, T. L. Albrecht, & I. G. Sarason (Eds.), *The*

communication of social support: Messages, interactions, relationships, and community

(pp. 195-214). Thousand Oaks, CA: Sage.

Samter, W. (2002). How gender and cognitive complexity influence the provision of emotional

support: A study of indirect effects. *Communication Reports*, 15, 5-16.

- Schulz, R., & Beach, S. R. (1999). Caregiving as a risk factor for mortality: The Caregiver Health Effects Study. *JAMA*, *282*, 2215-2219.
- Schulz, R., O'Brien, A. T., Bookwala, J., & Fleissner, K. (1995). Psychiatric and physical morbidity effects of dementia caregiving: prevalence, correlates, and causes. *Gerontologist*, *35*, 771-791.
- Silverstein, M., Chen, X., & Heller, K. (1996). Too much of a good thing? Intergenerational social support and the psychology of older parents. *Journal of Marriage and Family*, *58*, 970-982.
- Skinner, M. L., Shirtcliff, E. A., Haggerty, K. P., Coe, C. L., & Catalano, R. F. (2011). Allostasis model facilitates understanding race differences in the diurnal cortisol rhythm. *Development and Psychopathology*, *23*, 1167-1186. doi: 10.1017/S095457941100054X
- Stephens, C., Alpass, F., Towers, A., & Stevenson, B. (2011). The effects of types of social networks, perceived social support, and loneliness on the health of older people: Accounting for the social context. *Journal of Aging and Health*, *23*(6), 887-911. doi: 10.1177/0898264311400189
- Thoits, P. A. (1986). Social support as coping assistance. *Journal of Counseling and Clinical Psychology*, *54*, 416-423.
- Trumble, B. C., Brindle, E., Kupsik, M., & O'Connor, K. A. (2010). Responsiveness of the reproductive axis to a single missed evening meal in young adult males. *American Journal of Human Biology*, *22*, 775-781.
- Trumble, B. C., Cummings, D., von Rueden, C., O'Connor, K. A., Smith, E. A., Gurven, M., & Kaplan, H. (2012). Physical competition increases testosterone among Amazonian

- forager-horticulturalists: A test of the 'challenge hypothesis.' *Proceedings of the Royal Society B*, 279, 2907-2912. doi: 10.1098/rspb.2012.0455
- Tsai, S-M., & Wang, H-H. (2008). The relationship between caregiver's strain and mothers with intellectually disable children. *Journal of Clinical Nursing*, 18, 539-548. doi: 10.1111/j.1365-2702.2008.02524.x
- Uchino, B. N., Bowen, K., Carlisle, M., & Birmingham, W. (2012). Psychological pathways linking social support to health outcomes: A visit with the "ghosts" of research past, present, and future. *Social Science & Medicine*, 74, 949-957. doi: 10.1016/j.socscimed.2011.11.023
- Van Houdenhove, B., Van Den Eede, F., & Luyten, P. (2009). Does hypothalamic-pituitary-adrenal axis hypofunction in chronic fatigue syndrome reflect a 'crash' in the stress system? *Medical Hypothesis*, 72, 701-705.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, 90, 465-490.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
- Williamson, G. M., & Clark, M. S. (1989). Providing help and desired relationship type as determinants of change in moods and self-evaluations. *Journal of Personality and Social Psychology*, 56, 722-734.
- Wortman, C. B., & Dunkel-Schetter, C. (1979). Interpersonal relationships and cancer. *Journal of Social Issues*, 35, 120-155.

- Wortman, C. B., & Lehman, D. R. (1985). Reactions to victims of life crisis: Support attempts that fail. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research, and applications* (pp. 463-489). Dordrecht, The Netherlands: Marinus Nijhoff.
- Welin, L., Tibblin, G., Svardsudd, K., Tibblin, B., Ander-Peciva, S., Larsson, B., & Wilhelmsen, L. (1985). Prospective study of social influences on mortality: The study of men born in 1913 and 1923. *Lancet*, *1*, 915-918.
- White, N., & Hastings, R. P. (2004). Social and professional support for parents of adolescents with severe intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *17*, 181-190.
- Wolfe, P. S., Tanai, B., & Ostry, C. (2009). Defining severe disabilities: Implications for research and practice. *International Journal of Special Education*, *24*, 19-28.
- Xu, Y., & Burleson, B. R. (2001). Effects of sex, culture, and support type of perceptions of spousal social support: An assessment of the "support gap" hypothesis in early marriage. *Human Communication Research*, *27*, 535-566.
- Zarit, S.H., Reever, K.E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *Gerontologist*, *20*(6), 649-655.
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, *67*(6), 361-370.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, *52*, 30-41.

Appendix A: Survey scales for parents of children with disabilities

Caregiver Burden Scale

Zarit, S.H., Reever, K.E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *Gerontologist*, 20(6), 649–655.

Instructions: Read each statement carefully. Rate each statement on a 0 (never) to 4 (nearly always) scale.

1. In general, how often do you feel:

There is not enough time for yourself	0	1	2	3	4
Overtaxed with responsibilities	0	1	2	3	4
Like you've lost control over your life	0	1	2	3	4

2. In regard to the relative for whom you are caring, how often do you feel:

Uncertain about what to do for your relative	0	1	2	3	4
Like you should do more for your relative	0	1	2	3	4
Like you could do a better job of caring	0	1	2	3	4

3. When you are with the relative for whom you are caring, how often do you feel:

A sense of strain	0	1	2	3	4
Anger	0	1	2	3	4
Embarrassment	0	1	2	3	4
Uncomfortable about having friends over	0	1	2	3	4

4. How often do you feel that your relationship with the relative for whom you are caring negatively impacts:

Your social life	0	1	2	3	4
Other relationships with family and friends	0	1	2	3	4
Your health	0	1	2	3	4
Your privacy	0	1	2	3	4

5. How often do you:

Feel you receive excessive help requests	0	1	2	3	4
Feel all the responsibility falls on one caregiver	0	1	2	3	4
Fear the future regarding your relative	0	1	2	3	4
Fear not having enough money to care for your relative	0	1	2	3	4
Fear not being able to continue caring for your relative	0	1	2	3	4
Wish to leave the care of your relative to someone else	0	1	2	3	4

6. How much does your relative depend on you as the caregiver? 0 1 2 3 4

7. Please rate your overall level of burden in caring for your relative:

- 0 – No burden at all
- 1 – Mild burden

- 2 – Moderate burden
- 3 – Severe burden
- 4 – Extreme burden

Adapted Functional Independence Measure for Children (WeeFIM)

Ottenbacher, K. J., Msall, M. E., Lyon, N., Duffy, L. C., Granger, C. V., & Braun, S. (1999).
Measuring developmental and functional status in children with disabilities.
Developmental Medicine & Child Neurology, 41, 186-194.

Instructions: Please rate your child's ability to perform the following activities using the following scale:

- 7 Complete independence (Timely, Safely)
- 6 Modified independence (Device)
- 5 Supervision
- 4 Minimal assistance (Subject=75%+)
- 3 Moderate assistance (Subject=50%+)
- 2 Maximal assistance (Subject=25%+)
- 1 Total assistance (Subject=0%+)

Self-care

- 1. Eating
- 2. Grooming
- 3. Bathing
- 4. Dressing – upper body
- 5. Dressing – lower body
- 6. Toileting

Sphincter control

- 1. Bladder management
- 2. Bowel management

Transfers from

- 1. Chair/wheelchair
- 2. Toilet
- 3. Tub/shower

Locomotion

- 1. Walk/wheelchair/crawl
- 2. Stairs

Communication

- 1. Comprehension
- 2. Expression

Social cognition

- 1. Social interaction
- 2. Problem solving
- 3. Memory

Global Perceived Stress Scale

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385-396.

Instructions: The questions in this section will ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you have felt or thought a certain way. Although some of these questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count the number of times you felt a particular way, but rather indicate the answer that seems like a reasonable estimate.

Responses are on a 0 (never) to 4 (very often) scale.

In the last month, how often have you:

1. Been upset because of something that happened unexpectedly?
2. Felt that you were unable to control the important things in your life?
3. Felt nervous and "stressed"?
4. Dealt successfully with irritating life hassles?
5. Felt that you were effectively coping with important changes that were occurring in your life?
6. Felt confident about your ability to handle your personal problems?
7. Felt that things were going your way?
8. Found that you could not cope with all the things you had to do?
9. Been able to control irritations in your life?
10. Felt that you were on top of things?
11. Been angered because of things that happened that were outside of your control?
12. Found yourself thinking about things that you have to accomplish?
13. Been able to control the way you spend your time?
14. Felt difficulties were piling up so high that you could not overcome them?

Modified Pennebaker Inventory of Limbic Languidness

Pennebaker, J. W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.

Instructions: Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. We are currently interested in finding out how prevalent each symptom is among various groups of people. On the page below, write how frequently you experience each symptom. For all items, use the following scale:

0	1	2	3	4
Have never or almost never experienced the symptom	Less than 3 or 4 times per year	Every month or so	Every week or so	More than once every week

For example, if your eyes tend to water once every week or two, you would answer "3" next to question #1.

- ___ 1. Headaches
- ___ 2. Stomach ache or pain
- ___ 3. Chest pain
- ___ 4. Runny or congested noses
- ___ 5. Coughing or sore throat
- ___ 6. Faintness or dizziness
- ___ 7. Out of breath
- ___ 8. Acne or pimples
- ___ 9. Stiff or sore muscles

Since the beginning of the month, how many:

- _____ Visits have you made to the doctor for illness
- _____ Days have you been sick
- _____ Days your activity has been restricted due to illness

Hospital Anxiety and Depression Scale

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67(6), 361–370.

Instructions: For the following questions, please indicate your response by circling the appropriate phrase.

1. I feel tense or 'wound up':
 - a. Most of the time
 - b. A lot of the time
 - c. From time to time, occasionally
 - d. Not at all

2. I still enjoy the things I used to enjoy:
 - a. Definitely as much
 - b. Not quite so much
 - c. Only a little
 - d. Hardly at all

3. I get a sort of frightened feeling as if something awful is about to happen:
 - a. Very definitely and quite badly
 - b. Yes, but not too badly
 - c. A little, but it doesn't worry me
 - d. Not at all

4. I can laugh and see the funny side of things:
 - a. As much as I always could
 - b. Not quite so much now
 - c. Definitely not so much now
 - d. Not at all

5. Worrying thoughts go through my mind:
 - a. A great deal of the time
 - b. A lot of the time
 - c. From time to time but not too often
 - d. Only occasionally

6. I feel cheerful:
 - a. Not at all
 - b. Not often
 - c. Sometimes
 - d. Most of the time

7. I can sit at ease and feel relaxed:
 - a. Definitely
 - b. Usually
 - c. Not often
 - d. Not at all

8. I feel as if I am slowed down:
 - a. Nearly all the time
 - b. Very often
 - c. Sometimes
 - d. Not at all

9. I get a sort of frightened feeling like 'butterflies' in the stomach:
 - a. Not at all
 - b. Occasionally
 - c. Quite often
 - d. Very often

10. I have lost interest in my appearance:
 - a. Definitely
 - b. I don't take so much care as I should
 - c. I may not take quite as much care
 - d. I take just as much care as ever

11. I feel restless as if I have to be on the move:
 - a. Very much indeed
 - b. Quite a lot
 - c. Not very much
 - d. Not at all

12. I look forward with enjoyment to things:
 - a. As much as ever I did
 - b. Rather less than I used to
 - c. Definitely less than I used to
 - d. Hardly at all

13. I get sudden feelings of panic
 - a. Very often indeed
 - b. Quite often
 - c. Not very often
 - d. Not at all

14. I can enjoy a good book or radio or TV program
 - a. Often

- b. Sometimes
- c. Not often
- d. Very seldom

Appendix B: Survey scales administered to both participants.

Desired and Experienced Social Support Scale

Xu, Y., & Burleson, B. R. (2001). Effects of sex, culture, and support type of perceptions of spousal social support: An assessment of the “support gap” hypothesis in early marriage. *Human Communication Research*, 27, 535-566.

Instructions: In the context of your relationship, your conversation partner may do all kinds of different things for you when you need support, but they probably do so to a greater or lesser extent. Here, I am interested in how much of each behavior you actually receive from your conversation partner. For each of the items below, please indicate how much of each behavior you actually receive from your conversation partner.

Responses are on a 1 (do not receive at all) to 5 (receive a great deal) scale.

1. Telling you that he/she loves you and feels close to you
2. Expressing understanding of a situation that is bothering you, or disclosing a similar situation that he/she experienced before
3. Promising to keep problems you discuss in confidence
4. Providing you with hope or confidence
5. Expressing sorrow or regret for your situation or distress
6. Expressing esteem or respect for a competency or personal quality of yours
7. Telling you that you are still a good person even when you have a problem
8. Trying to reduce your feelings of guilt about a problem situation
9. Expressing agreement with your perspective on various situations
10. Assuring you that you are a worthwhile person
11. Offering to do things with you and have a good time together
12. Connecting you with people whom you may turn to for help
13. Connecting you with people whom you can confide in
14. Offering to spend time with you to get your mind off something (chatting, having dinner together, going to a concert, etc.)
15. Helping you find the people who can assist you with things
16. Giving you advice about what to do
17. Analyzing a situation with you and telling you about available choices and options
18. Helping you understand why you did not do something well
19. Telling you whom to talk to for help
20. Giving you reasons why you should or should not do something
21. Offering to lend you something (including money)
22. Taking you to see a doctor when you don't feel well
23. Joining you in some activity in order to alleviate stress
24. Expressing willingness to help you when you are in need of help
25. Offering to help you do something that needs to be done

Relationship Assessment Scale

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family*, 50, 93–98.

Instructions: For the following questions, please indicate how much you agree or disagree with the following statements.

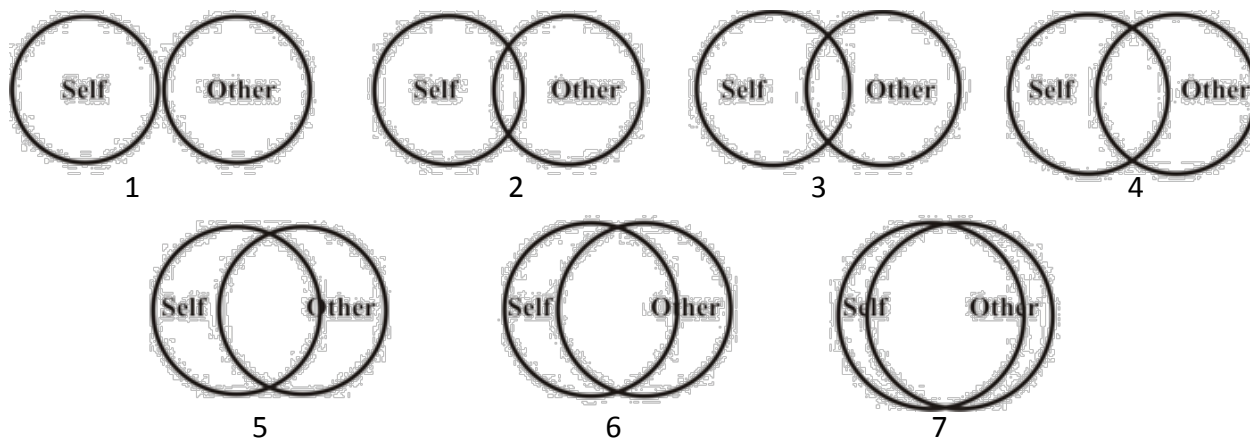
Responses are on a 1 (strongly disagree) to 5 (strong agree) scale.

1. My partner meets my needs.
2. In general, I am very satisfied with my relationship.
3. My relationship is better compared to most.
4. I often wish that I had not gotten into this relationship.
5. My relationship has exceeded my original expectations.
6. I care about my relationship partner very much.
7. My relationship has more problems than most.

Inclusion of the Other in the Self Scale

Aron, A., Aron, E. N., Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63, 596-612.

Instructions: Please circle the picture below that best describes your current relationship with your conversation partner.



Measurement of Liking

Rubin, Z. (1970). Measurement of romantic love. *Journal of Personality and Social Psychology*, 16, 265-273.

Instructions: Please indicate how true the following statements are for your relationship with your conversation partner.

Responses are on a 1 (not at all true/completely disagree) to 5 (completely true/definitely agree).

1. When I am with my conversation partner, we are almost always in the same mood.
2. I think that my conversation partner is unusually well-adjusted.
3. I would highly recommend my conversation partner for a responsible job.
4. In my opinion, my conversation partner is an exceptionally mature person.
5. I have great confidence in my conversation partner's good judgment.
6. Most people would react very favorably to my conversation partner after a brief acquaintance.
7. I think that my conversation partner and I are quite similar to each other.
8. I would vote for my conversation partner in a group election.
9. I think that my conversation partner is one of those people who quickly wins respect.
10. I feel that my conversation partner is an extremely intelligent person.
11. My conversation partner is one of the most likable people I know.
12. My conversation partner is the sort of person whom I myself would like to be.
13. It seems to me that it is very easy for my conversation partner to gain admiration.

Multidimensional Scale of Perceived Social Support

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52, 30-41.

Instructions: Please indicate how much you agree or disagree with the following statements:

Responses are on a 1 (strongly disagree) to 5 (strongly agree) scale.

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share my joys and my sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person in my life who cares about my feelings.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and my sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Positive and Negative Affect Scale

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.

Instructions: This scale consists of a number of words that describe different feelings and emotions you may have. Read each item and then choose the appropriate answer from the menu. Please indicate to what extent you feel this way in your daily life. Use the following scale to record your answers.

Responses are on a 1 (very slightly or not at all) to 5 (extremely) scale.

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

Message Characteristic Scales

Bodie, G. D., Burlison, B. R., Holmstrom, A. J., McCullough, J. D., Rack, J. J., Hanasono, L. K., et al. (2011). Effects of cognitive complexity and emotional upset on processing supportive messages: Two tests of a dual-process theory of supportive communication outcomes. *Human Communication Research, 37*, 350-376.

Caregiver questions:

Instructions: Please indicate how much you agree/disagree that the following word describes your conversation partner and how you felt about them during the conversation.

1. Responsive
2. Thoughtful
3. Unsympathetic
4. Compassionate
5. Competent
6. Not understanding
7. Caring
8. Warm
9. Friendly

Instructions: Please indicate how much you agree or disagree with the following statements:

Responses are on a 1 (strongly disagree) to 5 (strongly agree) scale.

1. My conversation partner behaved correctly.
2. My feelings toward my conversation partner became more positive as a result of this conversation
3. My conversation partner behaved like I would expect him/her to behave in this kind of situation.
4. My liking for my conversation partner decreased substantially as a result of this conversation.
5. My conversation partner's behavior was pretty typical behavior.
6. My feelings toward my conversation partner became more negative as a result of this conversation.
7. My conversation partner behaved very appropriately.
8. My conversation partner behaved as he/she should have in this situation.
9. My liking for my conversation partner increased as a result of this conversation.
10. Most people I know would act like my conversation partner did in this situation.
11. This conversation with my conversation partner was typical of our interactions.
12. During this interaction, my conversation partner behaved as he/she normally does.

13. This conversation with my conversation partner was unusual or different than our normal interactions.

Conversation Partner questions:

Instructions: Please indicate how much you agree/disagree that the following word describe the support you provided to your conversation partner and how you felt you behaved during the conversation.

1. Responsive
2. Thoughtful
3. Unsympathetic
4. Compassionate
5. Competent
6. Not understanding
7. Caring
8. Warm
9. Friendly

Instructions: Please indicate how much you agree or disagree with the following statements:

Responses are on a 1 (strongly disagree) to 5 (strongly agree) scale.

1. I behaved correctly.
2. My feelings toward my conversation partner became more positive as a result of this conversation
3. I behaved like I normally would in this kind of situation.
4. My liking for my conversation partner decreased substantially as a result of this conversation.
5. My behavior was pretty typical.
6. My feelings toward my conversation partner became more negative as a result of this conversation.
7. I behaved very appropriately.
8. I behaved as I should have in this situation.
9. My liking for my conversation partner increased as a result of this conversation.
10. Most of the people in my life would act like I did in this situation.
11. This conversation with my conversation partner was typical of our interactions.
12. During this interaction, I behaved as I normally do.
13. This conversation with my conversation partner was unusual or different than our normal interactions.

Appendix C: “Support the Supporter” Conversation Coding Scheme

Purpose: The purpose of this coding scheme is to quantify the quality of the support provided in a natural supportive interaction between two individuals with a previously-existing relationship. To quantify the quality of support, we will be using the *person-centeredness* of the supportive messages provided.

Coding for verbal person-centeredness:

When evaluating the messages, it is essential to pay attention to the *person-centeredness* of the message. Person-centered is defined as: *the extent to which messages explicitly acknowledge, legitimize, and contextualize the feelings and perspectives of a distressed other* (Bodie, Burleson, Holmstrom et al., 2011, p. 231).

VPC can be thought of as existing in a hierarchy from low verbal person-centeredness (LPC) to high verbal person-centeredness (HPC), with moderately person-centered messages falling between these two ends of the spectrum. While several studies have clumped messages into these three categories, this study will use Burleson’s (1982) traditional 9-level coding scheme. The text below describes these levels (High & Dillard, 2012).

Level one: Low person-centered messages (LPC)

These messages explicitly or implicitly deny the feelings of the person in distress. These messages also might dismiss the feelings of the other or imply that these feelings are somehow not legitimate or valid.

1.1 LPC messages can explicitly condemn the feelings of the other:

- Ex. “You shouldn’t feel that way.”
- Ex. “That’s stupid—you shouldn’t feel bad about the situation.”
- Ex. “I don’t think that’s what’s happening at all.”

1.2 LPC messages can also challenge the legitimacy of the other’s feelings:

- Ex. “It’s not such a big deal. You can figure something out.”
- Ex. “This isn’t the end of the world.”
- Ex. “Don’t worry about it. You’ll find a way—you always do.”

1.3 Finally, LPC messages can ignore the feelings of the other:

- Ex. “If you worked or paid more attention harder, than this wouldn’t happen.”
- Ex. “Maybe if you’d followed up with the provider paperwork you wouldn’t be in this mess now.”
- Ex. When asked to address a certain concern, the participant changes the subject.

Level 2: Moderate person-centered messages (MPC)

These messages implicitly recognize the feelings of the other without elaborating or helping the person understand other perspectives or their own feelings. These are more sensitive than LPC messages, but do not spend any time or effort elaborating on the feelings or helping the person to understand why they feel the way they do.

2.1 Some MPC messages attempt to distract the other from the immediate situation and the feelings being experienced.

- Ex. "Well, aren't there good things that happen, too?"
- Ex. "You just need a night off. Then things will feel better."

2.2 MPC messages can also acknowledge the other's feelings, but do not attempt to help the other understand why those feelings are present or how to deal with them.

- Ex. "I'm sorry you feel that way."
- Ex. "I'm sorry you had this terrible experience."
- Ex. "Ugh, that's really rough."
- Ex. "I totally get where you're coming from."

2.3 Finally, MPC messages can also attempt to "explain away" the other's feelings by citing mitigating circumstance or by elaborating other nonfeeling-centered accounts of the situation and its emotions.

- Ex. "Oh no! Maybe you need to think about this differently."
- Ex. "Maybe you need to have a conversation with your doctor to make sure he understands."
- Ex. "Maybe your paperwork just got lost in the mail and you can talk to them about it."

Level 3: High person-centered messages (HPC)

These messages explicitly acknowledge and attempt to deal with the feelings the distress individual is feeling. They also involve elaboration of the person's feelings; they might also involve providing the distress with new perspectives on the situation or encourage the distress to adopt a new perspective.

3.1 At the lowest end of HPC messages, the participant explicitly acknowledges the others feelings but does not provide an elaborated explanation of these feelings. These are often accompanied by an attempt to "remedy" the problem at hand.

- Ex. "I understand how you feel. It's really hard dealing with a child with autism. Have you talked to her teacher about this?"
- Ex. "Ugh, that's so frustrating! What else can we do to make this better?"

3.2 HPC messages can also provide an elaborated acknowledgement and explanation of the others' feelings while occasionally including references to the feelings of other parties involved.

- Ex. "It's really hard. We're both really tired and there doesn't seem to be an end, but at least we're in it together."

- Ex. "I know. You feel so guilty, like you can't possibly do enough. I feel that way too."

3.3 Finally, HPC messages that are highest in person-centeredness explicitly elaborate and legitimize the feelings of the other and also help the other to gain a perspective on his/her feelings by placing them in perspective with the broader context or the feelings of other involved parties.

- Ex. "I understand how you feel. I've had similar struggles with my child. It's important to remember that no parent is perfect, no matter how hard we try. What matters most is that we try and we love our kids."
- Ex. "I'm so sorry that happened. It feels awful to feel like your child is unreachable or unmanageable. I understand how terrible it feels, and I'm here for you."

CODEBOOK FOR “SUPPORTING THE SUPPORTER”

Instructions:

1. Before beginning the coding, please read through the transcript in its entirety. This should give you an overview of the topics of conversation and provide context for how the conversation changes during its duration.
2. Once you’ve finished reading the transcript, read through it again. This time, focus specifically on what the support provider is saying in response to the support recipient. Note key moments or phrases when the provider indicates support or sympathy (see VPC message descriptions above for examples of what key phrases might be).
3. Begin completing the code sheet below. Each interview should have its own code sheet. Begin by noting the **conversation ID** number. Then, provide a brief description of the topics of conversation and the progression of the interaction.
4. Next, please indicate which type of support was provided using the 1-9 VPC scale. If you experience trouble pinpointing whether the message is LPC, MPC, or HPC, please see the following pages, which provide some troubleshooting for support coding.
5. Finally, please provide an explanation for why you coded the message as you did. Here, list key phrases or signal words that helped shaped your perception.

Conversation ID:

Brief description of the conversation topics:

Verbal Person-Centeredness:

1 2 3 4 5 6 7 8 9

Explanation for why you coded the support at this level of VPC:

TROUBLESHOOTING CODING:

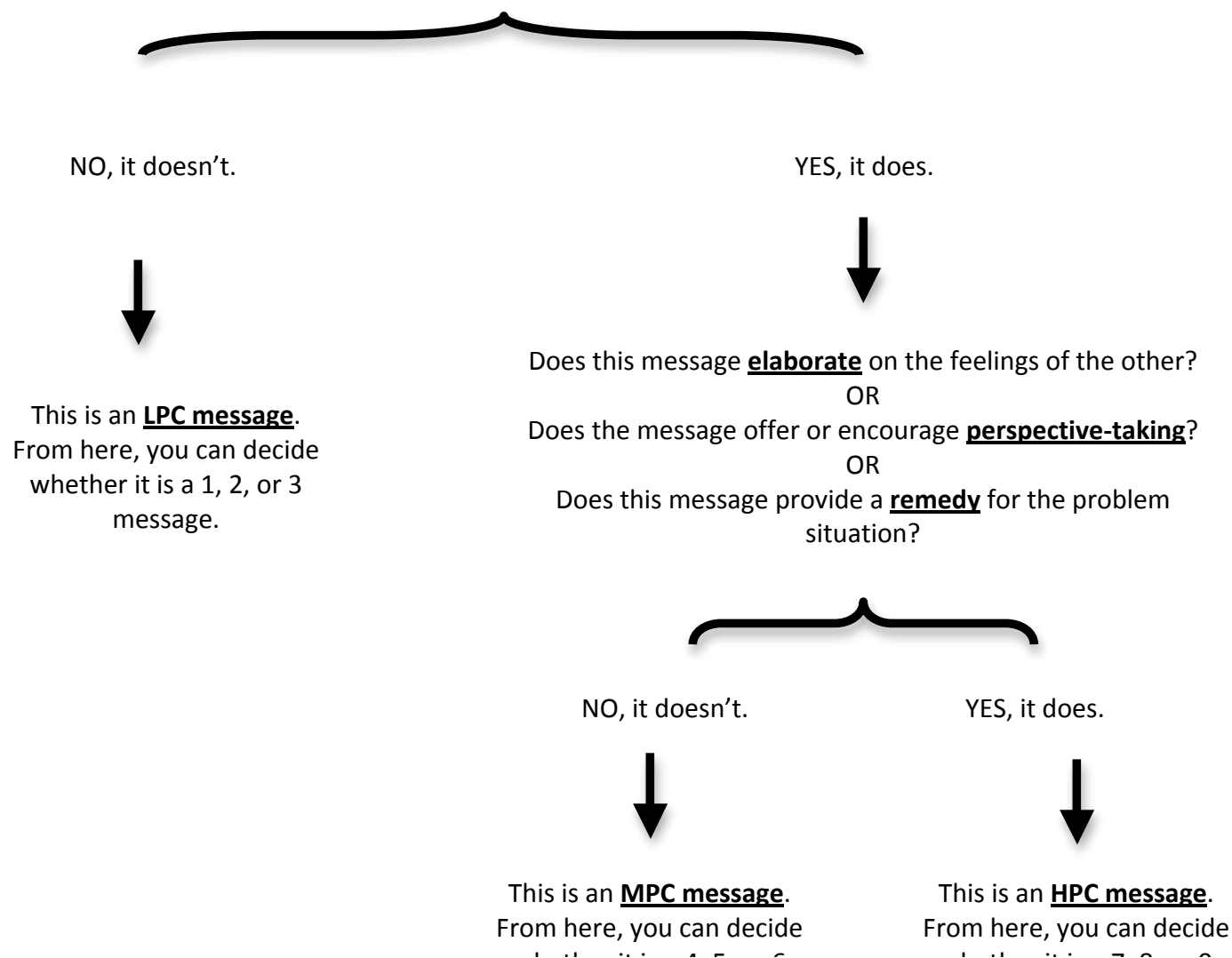
- After reading the supportive messages provided by the partner in the conversation, determine whether it is LPC, MPC, or HPC.
- After determining if the message is LPC, MPC, or HPC, you can read through the examples to decide which subtype of message it is.
- The following flowchart includes some questions that you can ask yourself if you are having doubts about whether the message is LPC, MPC, or HPC.
- In situations where you are torn between sublevels of messages, round to the higher level of support. That is, if you are on the fence about whether the message is a 5 or a 6, round up to 6.

Coding Flow Chart:

STEP ONE:

Do the messages acknowledge the other's feelings?

Acknowledgment is more than just saying "yeah" or "uh huh". It needs to be clear that the supporter is recognizing the others feelings, and not just providing a cue that the speaker has been heard.



References

- Burleson, B. R. (1982). The development of comforting communication skills in childhood and adolescents. *Child Development, 53*, 1578-1588.
- Bodie, G. D., Burleson, B. R., Holmstrom, A. J., McCullough, J. D., Rack, J. J., Hanasono, L. K., et al. (2011). Effects of cognitive complexity and emotional upset on processing supportive messages: Two tests of a dual-process theory of supportive communication outcomes. *Human Communication Research, 37*, 350-376.
- High, A. C., & Dillard, J. P. (2012). A review and meta-analysis of person-centered messages and social support outcomes. *Communication Studies, 63*, 99-118.