

Examining the impact of resilience on communicative participation in individuals with
Parkinson's Disease

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Abstract

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Communicative participation is defined as taking part in life situations where knowledge, information, ideas, and feelings are exchanged. Communicative participation has been shown to be impacted by various psychosocial variables. One construct of interest is resilience, which is the ability to bounce back from a traumatic event or hardship. The purpose of this study was to examine the impact of resilience, among other psychosocial factors such as perceived social support, self-efficacy, and depression, on communicative participation in individuals with Parkinson's disease (PD). As part of a larger study, 38 individuals with PD completed the Communicative Participation Item Bank-General Short Form, the Connor-Davidson Resilience Scale, the Patient Health Questionnaire-9, the Communicative Activities Checklist- modified, and the Multidimensional Scale of Perceived Social Support. The results revealed that self-efficacy was a significant predictor of communicative participation however, there were no significant results related to resilience as a significant predictor of communicative participation, or that indicated a significant change in resilience either in participants who underwent speech

therapy during the course of the study or those who did not. The results of this study suggest that self-efficacy may have more clinical relevance to speech-language pathology treatment and potentially provides insight into the complex psychosocial construct of resilience.

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Introduction

Communicative participation is defined as “taking part in life situations where knowledge, information, ideas, and feelings are exchanged.” (Eadie, Yorkston, Klasner, Dudgeon, Deitz, Baylor, & Amtmann, 2006). There is evidence that communicative participation is shaped by a variety of psychosocial factors. One that is receiving attention in the literature is resilience. An understanding of resilience and how it contributes to communicative participation has many implications, including informing treatment outcomes. The following literature review includes an introduction to resilience, its suggested role in impacting health outcomes, and the relationship between resilience and general health outcomes in people with Parkinson’s disease (PD), the population of interest for this study. Then, the literature review will focus more specifically on emerging evidence about the role of resilience in living with communication disorders, and potential relationships with other psychosocial factors.

Introduction to resilience

Resilience is generally defined as the ability to “bounce back” from a traumatic event or hardship (Southwick & Charney, 2012). Many of the early studies in resilience were longitudinal studies that followed children who suffered from traumatic events in their childhood. For example, Werner & Smith (1992) conducted a study with 200 children who experienced environmental risk factors such as poverty, parental mental health problems, and daily instability. Despite these risk factors 72 of 200 children were doing very well at the end of a thirty-year time period. The study concluded that personal characteristics such as being female, socially responsible, achievement oriented, and having good self-esteem were predictive of more resilient individuals, in spite of early trauma. The study also reported that a caregiving

environment inside and outside the family contributed to young people thriving in the face of adversity (Richardson, 2002; Smith & Werner, 1992).

As research into the construct of resilience has continued over the decades, one key question has been whether resilience is best defined as an innate, stable trait which does not change over time, or a process that is subject to change. This question has important clinical implications for healthcare-related fields not only for understanding how different people might respond to various health and life challenges, but also for indicating if targeting resilience in treatments can help individuals weather serious or chronic illnesses.

In combination with various identified protective factors, such as psychological, neurobiological, and social (e.g. family cohesion, parental support, etc.), resilience has been suggested to be an innate trait that is stable over time. For example, Fletcher & Sarkar (2013) described resilience as a stable trait and a collection of characteristics that enable an individual to adapt to challenging circumstances. The stability of resilience has been measured in a variety of populations to in an effort to discern whether resilience is a trait or a process. Rainey & colleagues (2014) examined baseline resilience scores of individuals admitted in a level 1 trauma center and concluded that resilience was stable across 12 months regardless of injury, severity, or etiology. Other researchers have also found that resilience, when not targeted for intervention, was stable over time in individuals with spinal cord injury (White, Driver & Warren, 2010).

Conversely, The American Psychological Association recognizes resilience as a dynamic process that develops in the face of adversity such as relationship problems, financial stressors, or threats (Windle, 2011). Fletcher and Sarkar (2013) explained this opposite viewpoint in their systematic review and defined resilience as an evolving characteristic that varies from situation to situation and develops across the lifespan. In another systematic review, Windle (2011)

concluded that within the lifespan, resilience is dynamic in nature and will fluctuate over time as new adversities arise in changing life circumstances. Additionally, studies rooted in childhood trauma suggest that resilience develops across the lifespan (Richardson, 2002).

More research is needed to assess the possibility of resilience as a dynamic process rather than an innate human trait. There are differing opinions as to whether resilience is best described as a trait or a process. However, resilience as a trait has been described to be stable over time periods of six months to one year (Rainey et al., 2014; White et al., 2010). Conversely, resilience as a process has been argued to develop over the span of individual's lifespan (Richardson, 2002). Perhaps the argument is not whether resilience is a state or a process, but a question of how rapidly resilience may change. Regardless of how rapidly resilience may or may not change, evidence is emerging that resilience can be a significant contributor to health outcomes, which will be reviewed below.

Resilience and healthcare outcomes

Resilience has been studied in a variety of contexts due to its implications in quality of life, overall well-being of an individual, and other various health outcomes (Windle, 2011).

Resilience has been examined in relation to healthcare outcomes using The Health and Retirement Study, in which 4562 adults aged 50-70 years old participated (Ezeamama, Elkins, Simpson, Smith, Allegra, & Miles, 2016). The study revealed that higher resilience predicted lower healthcare utilization and improved perceived health. This study provided evidence that resilience is not only an important factor in the presence of a health crisis, but also offers protective factors in for the general health of older adults.

One of the most heavily studied relationships in resilience and healthcare is that between resilience and psychosocial health, specifically resilience as a protective factor against

depression. The relationship between resilience and depression has been examined across several populations, including individuals with head and neck cancer, spinal cord injury, and a normal aging population (Jeste, Savla, Thompson Vahia, Glorioso, Martin...Depp, 2013; Eadie, Faust, Bolt, Kapsner-Smith, Hunting Pompon, Baylor, Futran, & Menez, 2018; White et al., 2010). Higher levels of resilience were associated with lower levels of depression in individuals with head and neck cancer (Eadie et al., 2018), served as a possible predictor of lower depression in spinal cord injury (Shin, Jung-In, Chae, Heong-Ho, Min, Jung_Ah...Cha-Yeon, 2012; White et al., 2010), and acted as a protective factor to positive outcomes in healthy aging population (MacLeod, Musich, Hawkins, Alsgaard, & Wicker, 2015). Rainey and colleagues (2014) concluded that individuals with low resilience scores upon admittance to a level 1 trauma center were more likely to report depressive-like symptoms 12 months later. Battalio, Silverman, Ehde, Amtmann, Edwards, & Jensen (2017) suggested that resilience was significantly associated with satisfaction in social roles and quality of life in individuals with multiple sclerosis, muscular dystrophy, spinal cord injury, and post poliomyelitis syndrome. Additionally, in a meta-analysis done by Hu and colleagues (2014), resilience was negatively correlated with negative indicators of mental health and positively correlated with positive indicators of mental health. Emerging evidence of the relationship between resilience and healthcare outcomes suggests that resilience is an important factor to consider in healthcare, due to its protective factor against negative psychosocial outcomes, overall improved health outcomes, and positive indications for increased quality of life and intervention outcomes.

Resilience and Parkinson's disease

According to the Parkinson's Foundation, by 2020, one million people in the United States will be living with PD (Parkinson.org). PD is a progressive neurological disorder that

impacts the production of dopamine in the basal ganglion structures of the subcortical system. It is thought to be a result of the interaction between genetic predisposition and environmental factors (Kalia & Lang, 2015). The hallmark features of PD are motor symptoms that include bradykinesia, resting tremor, muscular rigidity, and postural and gait abnormalities. Typically, before the onset of motor features, nonmotor features such as cognitive impairment, autonomic dysfunction, fatigue, and olfactory dysfunction are also common.

Communication difficulties stem from both motor speech and cognitive impairment associated with the disorder. Smith & Caplan (2018) identified common changes in communication experienced by individuals with PD. Changes in speech acoustics include decreased pitch variation, decreased loudness, imprecise articulation, and difficulty coordinating sensory feedback which result in short rushes of speech. Language deficits are also present, including word finding difficulty and deficits in processing and comprehension of complex grammar and syntax. Individuals with PD also experience cognitive difficulties that manifest in communication including decreased topic maintenance and speed of processing. Other indirect impacts on communication include decreased comprehension of nonverbal acts of communication, flat affect, and changes in mood (Smith & Caplan, 2018).

In order to understand the lived experiences of the communication challenges associated with PD, McAuliffe, Baylor, & Yorkston (2017) utilized self-report data to examine the relationship between communicative participation and health-related quality of life. The study found that self-rated severity of speech, lower levels of speech usage, and the presence of fatigue, cognitive, emotional, and swallowing difficulties were associated with lower levels of communicative participation. Additionally, other demographic variables such as age, sex, and speech usage impacted communicative participation. To further examine the lived experiences of

managing communication and PD, Yorkston, Baylor, and Britton (2017) explored the experiences of everyday communication situations of individuals with PD. One theme that emerged from that qualitative study was about the experience of speaking, and included several subthemes related to effort of speaking, feelings associated with speaking, and the environment in which the individual is speaking. For many participants, speaking was considered an effortful process, in which they had to think about the cognitive demands associated with speaking and the act of speaking simultaneously. Participants also reported that rapidly moving conversations are particularly challenging. One participant described their communication as their identity, and with the change in communication due to the presence of PD, they feel as though they cannot express who they are to unfamiliar communication partners. Similarly, Miller, Noble, Jones, & Burn (2006) concluded that the main concern of individuals with PD was how the changes in their speech and voice impacted their self-concept and participation inside and outside of their family.

In a study with individuals with PD, higher resilience scores measured by the Resilience Scale (R-15) were correlated with less disability and better mental and physical quality of life. Additionally, resilience was associated with less apathy and depression, and a more optimistic personality (Robottom, Gruber-Baldini, Anderson, Reich, Fishman, Weiner, & Shulman, 2012). In another study with individuals with PD, higher resilience was significantly associated with more favorable outcomes in depression, functional status, apathy, life satisfaction, and quality of life (Shamaskin-Garroway, Lageman, & Rybarczyk, 2016). Similarly, Robottom and colleagues (2012) found that resilience was highly associated with other factors such as less severe nonmotor symptoms and more optimistic personality. Resilience appears to not only play a key role in adapting to medical conditions such as spinal cord injury and head and neck cancer, but

also in aiding individuals with PD to adapt to their condition. (Eadie et al., 2018; Robottom et al., 2012, Shamaskin-Garroway et al., 2016; White et al., 2010).

Resilience and communication disorders

At the time of the current literature search, the topic of resilience can be found as being mentioned in literature related to communication disorders, but largely in a theoretical sense or in qualitative studies describing people's lived experiences (Craig, Blumgart, & Tran, 2011; Cyr, 2010). Other limited examples of resilience in the communicative disorder literature consisted of unpublished theses, as well as examples of resilience mentioned vaguely as a possible element in living with communication disorders without being specifically studied or measured. No studies were found examining the relationship between resilience and communication challenges in people with PD. At this time, there was little evidence of quantitative investigations of resilience and its role in living with communication disorders. One study has specifically examined resilience among the factors that offered protective functions against chronic stuttering (Craig et al., 2011). Two-hundred adults who lived with chronic stuttering were divided into a resilient and non-resilient group, based on self-report measures. One measure was the Symptom Checklist-Revised (Derogatis, 1994), a measure that assessed symptoms for nine psychopathology domains. Another measure was the Global Severity Index (GSI), a measure of distress which was adopted as a measure of resilience for the purpose of the study. The assumption was that a high GSI score suggested poor resilience and low or normal GSI scores suggested higher resilience (Sexton, Byrd, & von Kluge, 2010). Craig and colleagues (2011) found that participants in the more resilient groups differed significantly from the less resilient group in the following ways: the more resilient group demonstrated lower levels of health risk, greater sense of self-mastery (self-efficacy) over stress in their lives, fewer physical role

limitations, fewer obstacles in mixing socially, stronger vitality, and greater perceived social support. Results indicated that these factors were associated with the coping process when faced with the adversity of chronic stuttering, thus contributing to resilience.

Communication-related quality of life and other psychosocial aspects

While the current study will focus primarily on the relationship between communicative participation and resilience, other psychosocial factors likely interact with both of these constructs. In order to better understand the constellation of psychosocial factors that may relate to communicative participation, this study will also explore how the constructs of perceived social support, self-efficacy, and depression relate to resilience and communicative participation. The following paragraphs will provide an overview of these constructs and what is currently known about how they relate to communication disorders.

Perceived Social Support

Social support is defined as the experience of being loved, cared about, valued, and respected by others present in one's life and can be demonstrated by a variety of people in an individual's life (Roohafza, Afshar, Keshteli, Mohammadi, Feizi, Taslimi, & Adibi, 2014). Social support has been conceptualized in many different ways. Functional social support includes informational support (e.g. information given to cope with stress), emotional support (e.g. expressing comfort or caring), tangible support (e.g. providing physical materials such as finances) and belonging support (e.g. others engaging in social activities). Functional support can be received, meaning that it is experienced by the individual; or perceived, meaning that the individual believes that others will provide support when needed. (Glanz, Rimer, & Viswananth, 2015). Perceived social support has therapeutic value, in that it can facilitate coping mechanisms

in a multitude of ways (Pearson, 1986). For the purpose of the current study, perceived social support and its impact on communication disorders will be examined.

Perceived social support has been demonstrated to be positively related to communication outcomes. In a systematic review by Eadie, Kapsner-Smith, Bolt, Sauder, Yorkston, & Baylor (2018), both qualitative and quantitative studies were found to demonstrate the association between perceived social support and quality of life in people with a range of communication disorders. The review revealed two major findings: social support acts as a facilitator of communication outcomes and failed and/or absent social support acts as a barrier to communication outcomes. As examples of how social support can facilitate communication outcomes, Natturlund (2010) reported that perceived social support facilitated communication in individuals with aphasia when participants ask their partners to support them in communication interactions. Similarly, Dalemans and colleagues (2010) identified other methods of demonstrating perceived social support including familiar communication partners giving tips to unfamiliar communication partners to facilitate successful communication in people with aphasia. Expressions of caring, engaging in social activities, and providing advice, guidance, and a partner to practice speech activities with were all facilitators of increased communication quality of life in people across communication disorders including aphasia, dysarthria, and communication difficulties associated with multiple sclerosis (Bringfelt, Hartelius, & Runmaker, 2006; Dalemans, Dewitte, Wade, & Van Den Heuvel, 2010, Swore-Fletcher et al., 2012).

The second emerging theme from the review by Eadie and colleagues (2018) was that failed and/or absent social support acted as a barrier to communication. As examples, Dalemans and colleagues (2010) reported caregivers of individuals with aphasia tended to take over the conversation which in turn, minimized their opportunities to communicate. Participants with

aphasia reported that they understood the intention of caregivers to be well-meaning, but at the cost of eliminating communication opportunities. Other studies revealed perceived lack of social support, reported by people across communication disorders, from families, friends, and healthcare providers, which also limited communication opportunities and overall communicative quality of life (Natturlund, 2010; Swore Fletcher et al., 2012;).

Self-efficacy

Self-efficacy refers to the extent to which an individual believes that they have the ability to demonstrate a particular behavior or complete a certain task (Bandura, 1986). Self-efficacy is different than self-esteem in that self-efficacy refers to the individual's confidence in themselves as opposed to their sense of self-worth (Carter, Breen, Beliby, 2019).

The impact of self-efficacy has been studied in communication disorders, specifically with adults who stutter. Boyle (2015) demonstrated that self-efficacy was positively associated with increased quality of life. Another study by Boyle and colleagues (2018) demonstrated that stronger self-efficacy predicted more favorable communicative participation, among other psychosocial factors. In a separate study, higher self-efficacy was also related to higher perception of control of stuttering moments (Boyle, 2016). Additionally, higher levels of self-efficacy for verbal communication are associated with lower levels of stuttered speech frequency (Carter, Breen, & Beilby, 2019). In another study with individuals with aphasia, high communication self-efficacy was significantly related with low burden of communication and good mental health status (Tatsumi, Nakaaki, Satoh, Yamamoto, Chino, & Hadano, 2016). This study utilized the Communication Self-Efficacy Scale, a measure developed to examine communication self-efficacy in individuals with aphasia (Tatsumi, Hiroshi, Yamamoto, Masahiko..., Hadano, Kazuo, 2012). Another measure that has been developed to assess self-

efficacy in individuals with communication disorders is the Communication Confidence Rating Scale for Aphasia (Babbitt, Heinemann, Semik, and Cherney, 2011). This 10-item questionnaire was designed to utilize a self-rating system to understand levels of communication confidence in individuals with aphasia. Communication confidence was defined by Babbitt and colleagues (2011) as a feeling of one's ability to participate in a communication situation and one's sense of the skills they have to understand conversation and express themselves.

Depression

The final variable of interest in this study due to its association with resilience and communicative participation is depression. Depression is defined as feelings of sadness, helplessness, worthlessness, and loss of interest in activities that once brought enjoyment to an individual (Ainsworth, 2000). The symptoms fall into four categories: mood, behaviors, cognitive, and physical. According to Ainsworth (2000), people may experience symptoms in all categories, or just one depending on the severity of depression and personal characteristics of the individual.

Several studies have suggested connections between depression and communicative participation. Two studies by Baylor and colleagues included depression, as measured by the PHQ-9 (Kroenke, Spitzer, & Williams, 2001), as an independent variable in exploring predictors of communicative participation in people with multiple sclerosis. The results indicated that fatigue, slurred speech, depression, problems thinking, employment status, and social support were significantly associated with communicative participation, accounting for 48.7% of the variance (Baylor, Yorkston, Bamer, Britton, & Amtmann, 2010). In the other study, individuals were followed for two years and grouped into three latent classes: high, middle, and low

participation. The majority of the sample fell in the high-participation group and reported lower levels of depression, slurred speech, and fatigue (Baylor, Amtmann, & Yorkston, 2012).

Eadie and colleagues (2018) explored the relationships among communicative participation, social support, resilience, and depression in people with head and neck cancer. Adults who were at on average 12.2 years posttreatment for head and neck cancer participated in the study. Two blocks of variables were entered into a multiple regression in order to predict communicative participation. The first block included demographic and disorder information such as self-rated speech severity, cognitive function, laryngectomy status, and time since diagnosis. The results from the first block of the study concluded that self-rated speech severity, perceived cognitive function, time since diagnosis, and laryngectomy status accounted for 46.1% of variance in communicative participation. Speech severity was the highest significant predictor and accounted for 27.7% of variance in communicative participation.

The second block included the following psychosocial factors: Perceived social support, measured using the Multidimensional Scale of Perceived Social Support (Zimet et al., 1986), resilience, measured by the Connor-Davidson Resilience Scale-Short form (Connor & Davidson (2003), and depression, measured by the Hospital Anxiety and Depression scale (Kroenke et al., 2001). These three variables accounted for 12.1% of the variance in communicative participation in individuals with head and neck cancer. Of the three psychosocial factors examined, perceived depression was the strongest. Individuals with higher levels of depression consistently reported less favorable communicative participation. Overall, the study by Eadie & colleagues (2018) concluded that the impact of head and neck cancer extends beyond the impairment level (e.g. impaired speech, presence of laryngectomy) to include the psychosocial impact a change in communication may have on an individual.

At the time of this study, there is emerging evidence about the role of resilience and other psychosocial factors in shaping communication outcomes such as communicative participation. However, this literature does not provide a tremendous amount of guidance as to whether these psychosocial factors have clinical implications. The current study is designed to provide a better understanding of these psychosocial factors to provide a guidance as to where clinicians can direct their efforts during treatment in individuals with PD.

Purpose

The purpose of this study is to examine the contribution of resilience to communicative participation and how resilience compares to other psychosocial factors such as social support, self-efficacy, and depression. Furthermore, this study is designed to examine if resilience changed over the course of speech therapy. The study builds more closely on the work of Eadie & colleagues (2018), who found that resilience, perceived social support, and depression were significant predictors of communication participation in individuals with head and neck cancer. The current study is a preliminary exploratory study looking at similar relationships in individuals with PD. The findings of the proposed study may contribute to identifying variables that should be included in future experimental designs and clinical work to improve communicative participation outcomes in people with PD. The specific research questions this study addresses are as follows:

Research Questions

1. What are the relative contributions of resilience, social support, self-efficacy, and depression to the variance in communicative participation in people with PD?
- 2a. Does resilience differ between treatment and observation groups over time?

2b. In anticipation of describing any change in resilience over time, does self-rated speech severity differ between treatment and observation groups over time?

Method

The current study is a retrospective secondary analysis examining the contribution of resilience to communicative participation in individuals with communication disorders associated with PD. The study also examined if resilience changed over the course of speech therapy in individuals with PD. The data come from a larger observational study examining the impact of specific interventions on the communicative participation of individuals living with a variety of medical impairments/ communication disorders (e.g. spasmodic dysphonia, vocal fold immobility, multiple sclerosis, PD, etc.). The larger study was approved by the University of Washington Institutional Review Board. The larger study was a repeated measures design in that participants were seen at two time points six months apart.

Participants

Participants were recruited using a variety of methods, including through the University of Washington speech and hearing clinics and their neighborhood partners in the Puget Sound area, as well as through the University of Washington Parkinson's Disease Registry. Inclusion for participation in the larger study included the following: report of communication changes related to PD for at least 2 years, and a passing score on the Blessed Cognitive Screening, which could be administered via telephone (Kawas, Karagiozis, Resau, Corrada, & Brokmeyer, 1995). Inclusion criteria also included community-dwelling adults (i.e., not residing in a skilled nursing facility) and fluent in English. Participants were not excluded due to prior treatment experiences, thus displayed a wide variety of treatment histories.

The participants in this study were a convenience sample recruited from the community. In the larger study, participants were placed in groups according to their treatment status when they enrolled. Individuals who were planning on starting intervention were assigned to the treatment group, and data were collected before they started intervention and six months later (i.e., after intervention). Individuals who expressed no plans for beginning intervention in the next six months were assigned to the observation group and data were collected at the time they entered the study and six months later. Treatment was not controlled in the larger study, and participants receiving treatment received standard of care intervention at a clinic of their choice in the community. Forty-six individuals with PD completed data collection in the larger study. The treatment group consisted of 20 participants while the observation group consisted of 26 participants.

Data Collection

Data collection for the larger study included participating in a semi-structured qualitative interview, completing a variety of surveys about their experience living with a communication disorder, and recording a speech sample for later analysis. For the purpose of the current study, which focused on survey results, the *Communicative Participation Item Bank-General Short Form* (2013) the *Connor-Davidson Resilience Scale* (2003), the *Patient Health Questionnaire-9* (2001), the *Communicative Activities Checklist- modified* (2015), and the *Multidimensional Scale of Perceived Social Support* (1986) were used in the analysis. Please see below for detail regarding these measures and see appendices A-F for complete item sets. The measures included as part of this study measured the general impact of psychosocial constructs in the participants' lives. The only measures that were specifically related to communication were the COMACT-modified (2015) and the CPIB (2013). Participants were mailed paper questionnaires and

instructed to complete the questionnaires before coming to their in-person research session for the interview and speech recordings. The surveys were checked during the in-person session, and participants were asked about any missing responses in an effort to reduce missing data. Data were later double-entered into Redcap data management software for storage by two research assistants.

Communicative Participation Item Bank (2013)

The Communicative Participation Item Bank (CPIB) is a self-report measure developed by Baylor and colleagues (2013) to measure the impact a communication disorder has on an individual's communicative participation. The General Short Form of the CPIB was used in the data collection in the current study. The short form was extracted from the original 46-item bank and includes 10 items with response categories ranging from *Not at all*= 3 to *Very much* = 0 (Baylor et al., 2013). Sample items included, "*Does your condition interfere with talking with people you do NOT know?*" and "*Does your condition interfere with giving someone DETAILED information?*" Higher scores indicate less interference of the communication disorder with participation and thus, are more favorable.

Connor-Davidson Resilience Scale (2003)

To measure resilience, the 10-item version of the Connor-Davidson Resilience Scale (CD-RISC) was utilized. The items in the CD-RISC are rated on a 5-point scale (0-4) with higher scores indicating higher levels of resilience. Sample items included, "*I tend to bounce back after illness, injury, or other hardships.*" Connor & Davidson (2003) concluded that the measure demonstrated sound psychometric properties, including internal consistency reliability (alpha=.85) and convergent validity. The CD-RISC also demonstrated the ability to differentiate between different levels of resilience.

The Patient Health Questionnaire (2001)

The Patient Health Questionnaire nine-item version (PHQ-9) is a self-administered tool used to measure depression. This questionnaire scores the nine symptoms (e.g., diminished interest or pleasure in activities, fatigue or loss of energy, recurrent thoughts of death, etc.) included in the DSM-IV criteria of depression in terms of frequency of symptoms from 0 (not at all) to 3 (nearly every day), hence higher scores are less favorable. Major depressive disorder can be considered if five or more of the 9 items on the PHQ are reported to be either a score of “2” (more than half the days) or “3” (nearly every day). The PHQ was found to be a valid and reliable measure of depression severity (Kroenke et al., 2001).

Communication Activities Checklist-Modified (2015)

To measure self-efficacy, an adapted version of the Communicative Activities Checklist was used. The COMACT, in its original form, is a checklist on which participants are asked to rate the frequency with which they participate in various communication activities (Aujla, Botting, Worrall, Hickson, and Cruice, 2015). The measure was deemed to be a reliable and valid construct in measuring communication activity. For the larger study from which the data for this project were extracted, the self-efficacy ratings, based on Oreinstein & Manning (1985), were added to the COMACT items in order to encompass the construct of self-efficacy in everyday communication activities. Thus, example items from the COMACT include *Talk to family, Talk to friends, and Talk to pets*. Participants were asked to indicate how often they participate in the communicative activity (e.g., daily, weekly, every other week, monthly, rarely, or never). In addition, for each item, participants were presented with a one-hundred-millimeter VAS line with anchors of *Not at all confident* and *Very Confident* to measure self-efficacy. A score closer to “0” indicated a less favorable outcome and a score closer to “100” indicated a

more favorable outcome (Oreinstein & Manning, 1985). For this study, only the self-efficacy ratings were used.

The Multidimensional Scale of Perceived Social Support (1988)

The Multidimensional Scale of Perceived Social Support (MSPSS) is a twelve-item self-report measure that includes three subscales (e.g. Friends, Family, and Others), with each representing a different source of support. Items include scenarios in which an individual feels they are supported by someone special in their life. Sample items include, “*There is a special person who is around when I am in need*” and “*I can talk about my problems with my family.*” Each item is scored from 1= *Very Strongly Disagree* to 7= *Very Strongly Agree*. Higher scores indicate perception of social support is greater and thus, are more favorable. Zimet and colleagues (1988) concluded the psychometric properties of this measure were sound, including test-retest reliability for Significant Other, Family, and Friend subscales. Additionally, concurrent validity was judged to be good due to the significant correlation of all three subscales of the MSPSS and the Parenting Stress Index- Short Form (Solis & Abidin, 1991).

Self-Reported Severity

As part of the data collection during the larger study, participants were asked to rate the severity of their speech on a typical day. A one-hundred-millimeter visual analogue scale (VAS) with anchors of normal (before the onset of PD) and severe was used to measure self-reported severity. The score is calculated by measuring the distance from the ‘normal’ end of the scale in millimeters, with 0 = “normal” and 100 = “severe problem.”

Analysis

All data were examined using SPSS Version 26 (IBM, Chicago, Illinois). A significance level of $\alpha < .05$ was used for all statistical analyses. The following sections describe the analysis process for each question:

Research Question 1

For research question 1, Pearson correlations among all included variables were examined followed by conducting a multiple linear regression analysis, with all variables entered simultaneously. The model that was tested consisted of four independent variables (e.g. social support, resilience, depression, and self-efficacy) with communicative participation as the dependent variable.

Research Question 2 and 3

For research questions 2 and 3, two mixed analyses of variance (ANOVA) were conducted. A separate mixed ANOVA was conducted for each variable of resilience and severity. For both mixed ANOVAs, the within-group variable of time (i.e., initial session and six months later) was utilized. The between group variable of group identity (i.e., treatment or observation) was utilized. A Bonferroni adjustment was planned for any post-hoc analyses necessary.

Results

Participants

Due to missing data points for any of the variables included in the study (e.g., communicative participation, social support, self-efficacy, resilience, or depression), the sample size was reduced to 38 participants. The mean age of the 38 participants across treatment and observation groups was 67.76 years (SD= 9.2 years) with a range from 49-84 years. Of all

participants, 36.8% were female and 63.2% were male. The majority of the sample self-identified as white or Caucasian (90.4%). All participants (100%) self-identified their primary language as English and had some level of experience in college (e.g., some college, graduated college, graduate level education, etc.). The average time since onset of Parkinson’s disease was 13.89 years (SD= 5.78 years) with a range of 4-31 years. Please refer to Table 1 for additional participant demographic variables separated into the treatment and observation groups.

Table 1: Participant Demographic Data

Variable	Treatment Group n= 17	Observation Group n=21	Total n= 38
Age (years)	68.59 (SD= 8.60)	67.05 (SD= 10.03)	67.76 (SD= 9.2)
Sex	5/17 female 12/17 male	9/21 female 12/21 male	14/38 female 24/38 male
Racial/ ethnic group	17/17 Caucasian	19/21 Caucasian 2/21 Asian	36/38 Caucasian 2/38 Asian
Highest education completed	4/17 Some college 5/17 College graduate 8/17 Postgraduate	1/21 Some college 7/21 College graduate 13/21 Postgraduate	5/38 Some college 13/38 College graduate 21/38 Postgraduate
Employment status	15/17 retired or retired early due to medical condition	13/21 retired or retired early due to medical condition	28/38 retired or retired early due to medical condition
Time since diagnosis (years)	11.78 (SD= 4.24)	15.89 (SD= 6.42)	13.89 (SD= 5.78)

Research Question 1: Does resilience predict communicative participation

Descriptive results for all variables are presented in Table 2. Table 3 presents the correlations among all variables included in this study. Examination of this table revealed that resilience was moderately correlated with social support ($r= .571$) and depression ($r= -.455$).

However, resilience was weakly correlated with self-efficacy and communicative participation. The multiple linear regression revealed that the model consisting of the four variables of resilience, social support, self-efficacy, and depression significantly predicted communicative participation ($p = .000$) and accounted for 47.3% of the variance in the CPIB. However, close examination of the contribution of each predictor variable revealed that self-efficacy was the only significant predictor of CPIB scores. See Table 4 for detailed results of the model consisting of all four variables.

Examination of Table 3 also revealed a Pearson correlation value of $r > 0.7$ between the CPIB and self-efficacy, raising questions about multicollinearity. According to Hair, Anderson, Tatham, & Black (1995), an analysis of multiple linear regression that raises questions of multicollinearity can be continued if variance inflation factor (VIF) is less than 10. For the purpose of this study, the VIF measure between communicative participation and self-efficacy was 1.11, suggesting that the original model could be used. However, given the exploratory nature of the study, and out of concern for the high correlation between self-efficacy and CPIB scores, the multiple linear regression that included self-efficacy in the model. In this analysis, the model was not significant ($p = .247$) and none of the remaining variables of social support, resilience, or depression demonstrated a significant contribution to the variance in communicative participation. See Table 5 for detailed results of the model consisting of all variables but self-efficacy.

Considering resilience was the variable of interest, a linear regression was conducted to examine the amount of variance it accounted for in communicative participation on its own. The results, again, were not significant, $p = .113$. Resilience accounted for roughly 4% of the variance in communicative participation. See table 6 for detailed results of this model.

Table 2: Descriptive statistics, Mean (standard deviation)

Variable	Treatment n= 17	Observation n= 21	Combined n= 38
CPIB	49.04 (5.59)	43.26 (10.40)	47.44 (8.74)
Resilience time point 1	29.96 (5.67)	28.56 (6.17)	28.92 (5.89)
Resilience time point 2	29.53 (5.94)	28.58 (5.61)	28.96 (5.69)
Social Support	71.86 (8.56)	64.42 (20.04)	67.58 (16.51)
Self-efficacy	57.32 (27.98)	57.32 (27.98)	56.94 (25.50)
Depression	4.25 (2.94)	7.11 (4.57)	5.89 (4.18)
Severity time point 1	51.7 (24.59)	45.7 (21.97)	48.49 (23.14)
Severity time point 2	49.5 (24.75)	48.8 (29.74)	49.11 (27.17)

Table 3: Pearson Correlations

	1	2	3	4
1. CPIB (primary outcome)				
2. Self-efficacy	.716			
3. Resilience	.262	.288		
4. Social Support	.294	.252	.571	
5. Depression	-.053	-.080	-.455	-.423

Table 4: Linear regression results for the model including self-efficacy variable

	<i>B</i>	Coefficients std. error	<i>t</i>	Sig.
Self-efficacy	.205	.038	5.405	.000
Resilience	.021	.217	.096	.924
Social support	.074	.078	.955	.347
Depression	.132	.266	.498	.622

Note: Dependent variable: CPIB T-score

Table 5: Linear regression results for the model excluding self-efficacy variable

	<i>B</i>	Coefficients std. error	<i>t</i>	Sig.
Resilience	.254	.288	.880	.385
Social support	.128	.104	1.227	.228
Depression	.257	.358	.718	.478

Note: Dependent variable: CPIB T-score

Table 6: Linear regression results for the model with resilience only

	Adjusted r^2	Std. error of the estimate	<i>df</i>	Sig.
Resilience	.043	8.0083	36	.113

Note: Dependent variable: CPIB T-score

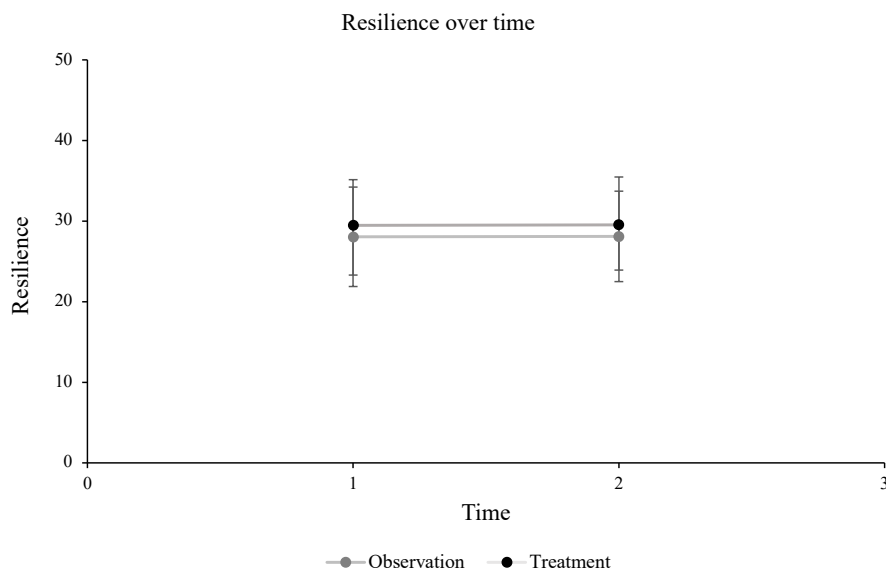
Research Question 2: Did resilience change over time

To answer research question two, a mixed ANOVA was conducted to compare levels of resilience between the treatment and observation groups over the two time points. Two additional participants were removed due to missing responses on items related to resilience administered during time point two of the study, resulting in a sample size of 36 for this analysis. Results indicated that the effect of time on resilience was not significant within groups, $F(1, 34)$

= .039, $p = .845$. The between group effect was also not significant, $F(1, 34) = 1.03, p = .318$.

See Figure 1 for a graph of results.

Figure 1: *Resilience over time*

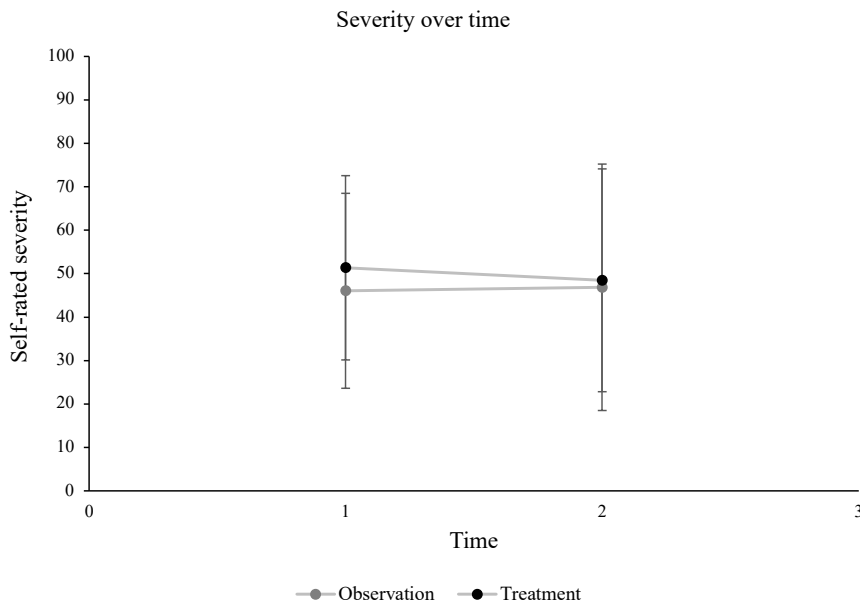


Self-rated severity over time

To provide context for research question 2, a mixed ANOVA was conducted to compare the impact of treatment on self-rated speech severity scores between the treatment and observation groups. One participant was not included due to missing responses on items related to self-rated severity. This participant was different than participants removed for research question 2a, as these missing responses were specific to severity-related items in the study. Thus, the sample size for this analysis was 37 participants. Results indicated that the effect of the time on self-rated severity was not significant within groups, $F(1, 35) = .196, p = .661$. The between

group effect was also not significant, $F(1, 35) = .282, p = .599$. See Figure 2 for a graph of results.

Figure 2: *Severity over time*



Although significance for the group level analyses of severity and resilience was not demonstrated in this study, visual examination of individual participant responses in the treatment group revealed considerable changes for some participants. For example, one participant reported a severity score of “72/100” before treatment and “47/100” following treatment—a decrease of 25% in self-rated severity. Another participant reported a severity score of “51/100” before treatment and “9/100” following treatment, a 42% decrease in severity. In these same participants, resilience scores slightly worsened (e.g. reported less favorable outcomes in resilience). While one participant reported a 25% decrease in self-rated severity,

they also reported a 10% decrease in levels of resilience. The other participant, who reported a 42% decrease in severity, reported a slight decrease of 2.5% in level of resilience over the course of treatment.

Conversely, notable changes in self-reported severity changed in the opposite direction following treatment. One participant reported a severity score of “50/100” before treatment and “82/100” following treatment, an increase of 32% in severity. Another participant reported a severity score of “39/100” before treatment and “76/100” following treatment, an increase of 37% in severity. In these participants, resilience scores were slightly higher than scores collected at time point one. The participant who experienced an increase of 32% in severity experienced a 5% increase in resilience levels, in spite of their increase in severity. The other participant, who experienced a 37% increase in severity, reported a 2.5% decrease in resilience.

The visual examination of changes in resilience tells a different story. Among individual participants, there was only one notable increase in resilience in the treatment group. This participant reported a score of 28/40 at time point one and reported a score of 37/40 at time point two, an increase of 22.5% in resilience. However, this same participant reported an increase of 19% in severity, thus reporting that they perceived their condition as more severe following treatment. There were two considerable decreases in resilience in the treatment group. One participant reported a score of 35/40 at time point one and a score of 29/40 at time point two, a 15% change in resilience. This participant also reported an increase of 8% in their perceived severity levels. The last notable change in resilience was a reported score of 28/40 at time point one and a score of 21/40 at time point two, a 17.5% decrease in resilience. This same participant reported a decrease in severity of 12%. When comparing the two largest changes in severity on each end of the spectrum, it is evident that resilience did not change in the context of notable

changes in severity in either direction. Conversely, the same is true for dramatic changes in resilience and their respective severity scores. It is also evident that resilience and self-rated severity can change a considerable amount for some individuals, and that this is not necessarily reflected in group level-results.

Discussion

The purpose of this preliminary study was to examine the contribution of resilience and other psychosocial factors, including self-efficacy, perceived social support, and depression, in predicting communicative participation in people with PD. Resilience did not significantly predict communicative participation, however self-efficacy did significantly predict communicative participation, as measure by the CPIB. This study also examined if levels of resilience changed over a six-month period both in individuals who had received speech therapy during that interval and those who had not. The study demonstrated no significant changes in levels of resilience in either treatment or observation groups, and there was no difference in resilience between those two groups. The final objective of this study, in anticipation of interpreting any possible change in resilience, was to examine if self-rated speech severity changed following six months of speech therapy. There was no significant change in self-rated speech severity following speech therapy in the treatment, nor in the observation group, and again no significant differences between those two groups.

While the topic of resilience is receiving increasing attention in the field of speech-language pathology, the current study does not provide strong quantitative evidence that resilience is a major contributor to communicative participation outcomes. These results are similar to the study by Eadie and colleagues (2018), in which resilience was examined alongside other psychosocial variables (e.g., social support and depression) and communicative

participation. Resilience was included in a block of variables that predicted 12.1% of the variance of CPIB scores, along with social support, depressions, and the interactions. However, it was not the strongest predictor in the study. On its own, resilience accounted for approximately 1% of the variance in the study (Eadie et al., 2018). These results are similar to this study in that on its own, resilience accounted for 4% of the variance in communicative participation, as measured by the CPIB scores. These combined results demonstrate that in individuals with chronic diseases such as head and neck cancer and PD, levels of resilience alone do not appear to predict levels of communicative participation.

The results of the current study also support the view that if resilience changes, it does so at a slow rate. Previous studies that reported no changes in levels of resilience following a traumatic experience utilized time periods of 6 months- 2 years (Rainey et al., 2016; White et al., 2010). In studies that claim resilience is a dynamic process that can be changed, participants were followed for up to 30 years (Rutter, 1985; Werner & Smith, 1992). When comparing shorter time periods to periods of time that stretch across the lifespan, it is difficult to make a claim that resilience is an innate state or a dynamic process. Instead of the state versus trait argument that has been proposed, the rate in which resilience changes should be considered. The lack of change over time that was demonstrated by this study should not argue that resilience is a state, rather that if resilience does change, it changes at a slow rate and potentially at times throughout one's life that cannot be identified in the six-month window of this study.

Not only do the results of this study suggest that a change in resilience may not be identifiable in a six-month window, it also suggests that levels of resilience are highly variable from person to person. In the review by Richardson (2002), which ultimately argued that resilience changes across the lifespan, it was mentioned that resilience can take anywhere from

seconds to years to develop in the face of adversity. While group level results in the current study did not show significant changes in resilience, some participants in this study made notable progress towards higher levels of resilience suggesting some individual variability. Overall, the results of the study suggest that resilience is a complex construct that is highly specific to an individual and that if it changes, it does so slowly and over the lifespan.

Though the aim of this study was to delve deeper into how resilience impacts communicative participation, the results of the study provided insight into a different psychosocial construct. The results of the study, instead, indicated that self-efficacy, as it relates to communication, had a significant impact on communicative participation. The significance of self-efficacy in this study draws comparisons to previous studies conducted with individuals with other communication disorders. In studies done with adults who stutter, self-efficacy predicted increased quality of life and more favorable communicative participation (Boyle, 2015; Boyle et al., 2018). Another study with individuals with aphasia indicated that higher self-efficacy was significantly associated with low burden of communication and good mental health status (Tatsumi et al., 2016).

At first glance, these findings regarding self-efficacy are seemingly unrelated to the construct of resilience; however, a look into previous studies indicates that self-efficacy and resilience may be related. Wheatley (2013) claimed that building self-efficacy is the key to developing resilience. Previous longitudinal studies with children who were labeled as resilient in spite of early childhood trauma indicated that one of the protective factors that contributed to resilience was self-efficacy, or the belief that one can successfully accomplish a task (Bandura, 1977; Rutter, 1985; Werner & Smith, 1992). The significance of self-efficacy in this study provides information regarding how speech pathologists can harness the belief that one can

accomplish a task to possibly contribute to resilience across the lifespan. Williams and Williams (2010) described self-efficacy as a loop, and that a mastery in one task leads to the belief that one can accomplish other tasks in the future. This description of self-efficacy encompasses the definition of resilience, the ability to bounce back after a traumatic event or hardship (Southwick & Charney, 2012). If an individual has been successful at a task that has been difficult, such as communicating in the context of a communication disorder, theoretically they will be more likely to have the belief that they can master a different task.

In terms of clinical implications, speech pathologists have the ability to instill the belief that individuals with communication disorders can accomplish a task through evidence-based treatments and opportunities to generalize these skills in everyday life. As clinicians, perhaps the importance of resilience is to be sensitive to the construct in patients and strive to manipulate self-efficacy levels in an effort to build higher self-efficacy for other adversities that our patients will experience (Richardson, 2002). By being sensitive to self-efficacy and how it theoretically impacts resilience, clinicians can potentially be a piece to the puzzle of building the complex construct of resilience over the lifespan.

Limitations

The results of this study provide information regarding psychosocial factors that contribute to communicative participation outcomes with people with PD. However, the results of the study should be considered with the following limitations. The design of the study was a retrospective analysis of existing data from a larger study. This was a convenience sample, with no randomization to groups. Though fairly representative of the population of individuals with PD, the sample for this study consisted predominately of white males over the age of 65 with college experience. The results of this study indicated that if resilience does change, it

is a slowly changing construct. Therefore, the time period of 6-months that was used in this study would be difficult to capture a change, if any, in resilience. Finally, PD is a neurodegenerative disease with known decline in cognition over time. Though cognition was screened during initial recruitment phases, the screen used only looked at lower level cognitive skills (e.g., attention, orientation). Recent literature reflects that individuals with PD have more difficulty with higher level cognitive skills that may be necessary to report items that accurately reflect current levels of functioning (Smith & Caplan, 2018).

Future Directions

Future research should incorporate a prospective design using the variables included in this study. Additionally, information about how resilience changes over time may be more useful at the acute phase of diagnosis of PD. The experience of receiving a diagnosis could be potentially more adverse and represent a time when resilience might be more likely to change, as opposed to a time period in which individuals have been living with the disease for years. One potential reason as to why self-efficacy, as it relates to communication, was significant and resilience was not is that the items that were used to measure self-efficacy were specifically related to communication. The COMACT (2015) was the only measure of psychosocial factors related to communication utilized by this study. Items related to resilience, depression, and social support all related to general domains in an individual's life as opposed to self-efficacy as it relates to communication that was related specifically to confidence in communicative activities. Future research should utilize different measures to separate psychosocial factors as they relate to communication versus psychosocial factors as they relate to one's life in general.

Finally, future research should also examine the impact of resilience in other communicative diagnoses such as motor speech disorders, neurogenic language disorders, voice disorders, or swallowing disorders. Finally, future research should incorporate results of this study and other emerging literature to develop a framework that speech language pathologists can utilize during treatment to describe the benefits of developing and discussing psychosocial constructs such as self-efficacy and resilience in treatment with individuals with PD and other communication disorders.

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Appendix A

The Communicative Participation Item Bank – General Short Form

Instructions:

The following questions describe a variety of situations in which you might need to speak to others. For each question, please mark how much your condition interferes with your participation in that situation. By “condition” we mean ALL issues that may affect how you communicate in these situations including speech conditions, any other health conditions, or features of the environment. If your speech varies, think about an AVERAGE day for your speech – not your best or your worst days.

	Not at all	A little	Quite a bit	Very much
1. Does your condition interfere with... ...talking with people you know?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.	Does your condition interfere with... ...communicating when you need to say something quickly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Does your condition interfere with... ...talking with people you do NOT know?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Does your condition interfere with... ...communicating when you are out in your community (e.g. errands; appointments)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Does your condition interfere with... ...asking questions in a conversation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Does your condition interfere with... ...communicating in a small group of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Does your condition interfere with... ...having a long conversation with someone you know about a book, movie, show or sports event?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Does your condition interfere with... ... giving someone DETAILED information?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Does your condition interfere with... ...getting your turn in a fast-moving conversation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Does your condition interfere with... ...trying to persuade a friend or family member to see a different point of view?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix B

Connor Davidson Resilience Scale

Section 9

For each item, please mark the box that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

		Not at all true	Rarely true	Sometimes true	Often true	True nearly all the time
1.	I am able to adapt when changes occur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	I can deal with whatever comes my way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	I try to see the humorous side of things when I am faced with problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.	Having to cope with stress can make me stronger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	I tend to bounce back after illness, injury, or other hardships.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	I believe I can achieve my goals, even if there are obstacles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Under pressure, I stay focused and think clearly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	I am not easily discouraged by failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	I think of myself as a strong person when dealing with life's challenges and difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Not at all true	Rarely true	Sometimes true	Often true	True nearly all the time

Appendix C

Multidimensional Scale of Perceived Social Support

Section 10

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement on a scale of 1 – 7:

- 1 = Very strongly disagree
- 2 = Strongly disagree
- 3 = Mildly disagree
- 4 = Neutral
- 5 = Mildly agree
- 6 = Strongly agree
- 7 = Very strongly agree

		Very strongly Nisannan			Neutral		Very strongly Aagree	
		1	2	3	4	5	6	7
1.	There is a special person who is around when I am in need.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	There is a special person with whom I can share my joys and sorrows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	My family really tries to help me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	I get the emotional help and support I need from my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	I have a special person who is a real source of comfort to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	My friends really try to help me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	I can count on my friends when things go wrong.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	I can talk about my problems with my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	I have friends with whom I can share my joys and sorrows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	There is a special person in my life who cares about my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	My family is willing to help me make decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	I can talk about my problems with my friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Appendix D

Patient Health Questionnaire-9

Section 11

Instructions: Over the last two weeks, how often have you been bothered by any of the following problems?

		Not at all	Several days	More than half the days	Nearly every day
1.	Little interest or pleasure in doing things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Feeling down, depressed or hopeless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Trouble falling or staying asleep, or sleeping too much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.	Feeling tired or having little energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Poor appetite or overeating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Feeling bad about yourself – or that you are a failure or have let yourself or your family down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Trouble concentrating on things such as reading the newspaper or watching television	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Thoughts that you would be better off dead or of hurting yourself in some way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you checked off *any* problems, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult

Appendix E

Communicative Activities Checklist- Modified

Section 2

Instructions: For each situation below, mark how often you are typically in that situation. Then, on the line below the situation, mark *how confident you are in your ability to communicate*. Refer to the box below for an example of how to mark the line.

EXAMPLE:

Not at all confident	_____ / _____	Very confident
----------------------	---------------	----------------

- 1. Talk to family**

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident Very confident

2. Talk to friends

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident Very confident

3. Talk to neighbors

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident Very confident

4. Talk to store clerks

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident _____ Very confident

5. Talk to pets

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident _____ Very confident

6. Talk on the phone

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident _____ Very confident

7. Talk in a small group of people

How often do you do this?

Daily Weekly Every other
 week Monthly Rarely Never

How confident are you in your ability to communicate in this situation?

Not at all confident _____ Very confident

8. Talk in a large group of people

How often do you do this?

Appendix F

Self-Reported Severity

On this page we would like you to rate your voice/speech. Please refer to the box below for an example of how to mark the line to indicate your response for each of the items:

EXAMPLE:

None _____ / _____ Extreme

Effort

By effort, we mean how much you have to push, force, or work to talk. The “No effort” end of the line represents speech that is completely comfortable and easy. The

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“Extreme effort” end of the line represents speech that requires you to really push and force to get it out.

Please **mark anywhere along the line** that best fits how much effort you used **during the speech recording** you just did:

No effort _____ Extreme effort

Now, please **mark anywhere along the line** that best fits how much effort you use **on a typical day** – when your speech is about average (not your best or your worst days):

No effort _____ Extreme effort

Fatigue

By fatigue, we mean how tired your voice gets as you talk, or how much your speech/voice “wears out” as you talk. You can mark anywhere on the line that best represents what you experienced from “No fatigue” to “Extreme fatigue.”

Please **mark anywhere along the line** that best fits how much fatigue you experienced **during the speech recording** you just did:

No fatigue _____ Extreme fatigue

Now, please **mark anywhere along the line** that best fits how much fatigue you experience **on a typical day** – when your speech is about average (not your best or your worst days):

No fatigue _____ Extreme fatigue

Speech / Voice Quality

By speech / voice quality, we mean how much does your speech sound like that of a typical adult (without speech/voice problems). The “Normal” end of the line represents that you think your voice sounds like that of a typical adult without speech/voice problems. The “Severe problem” end of the line represents that you think your voice sounds like someone with a severe speech/voice problem.

Please **mark anywhere on the line** that best fits your speech/voice **during the speech recording you just did**:

Normal _____ Severe
problem

Now, please **mark anywhere on the line** that best fits your speech/voice **on a typical day** (not your best or your worst days):

Normal _____ Severe
problem

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