

The Relationship Between Perceived Self-Efficacy, Social Network Composition, and
Individual Aphasia Group Participation Among Persons with Aphasia

By

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This study investigates the relationship between individual social networks, perceived self-efficacy, and individual aphasia group participation among five community-dwelling persons with aphasia. Standardized self-efficacy measures were completed, aphasia group participation was described, and social network analysis was conducted using the social network convoy model (Antonucci & Akiyama, 1987; Cruice, et al., 2006). Bivariate analysis using non-parametric measures revealed no association among variables. Despite self-efficacy scores that were within normal limits for a sample, non-aphasic population, participants in this study reported fewer members in their social networks in comparison to previously published social network data for those without aphasia. Interestingly, despite robust participation in aphasia group networks, social network membership comprised of others with aphasia represented a scant, and in some participants an absent, representation.

Keywords: aphasia, social networks, self-efficacy, aphasia group

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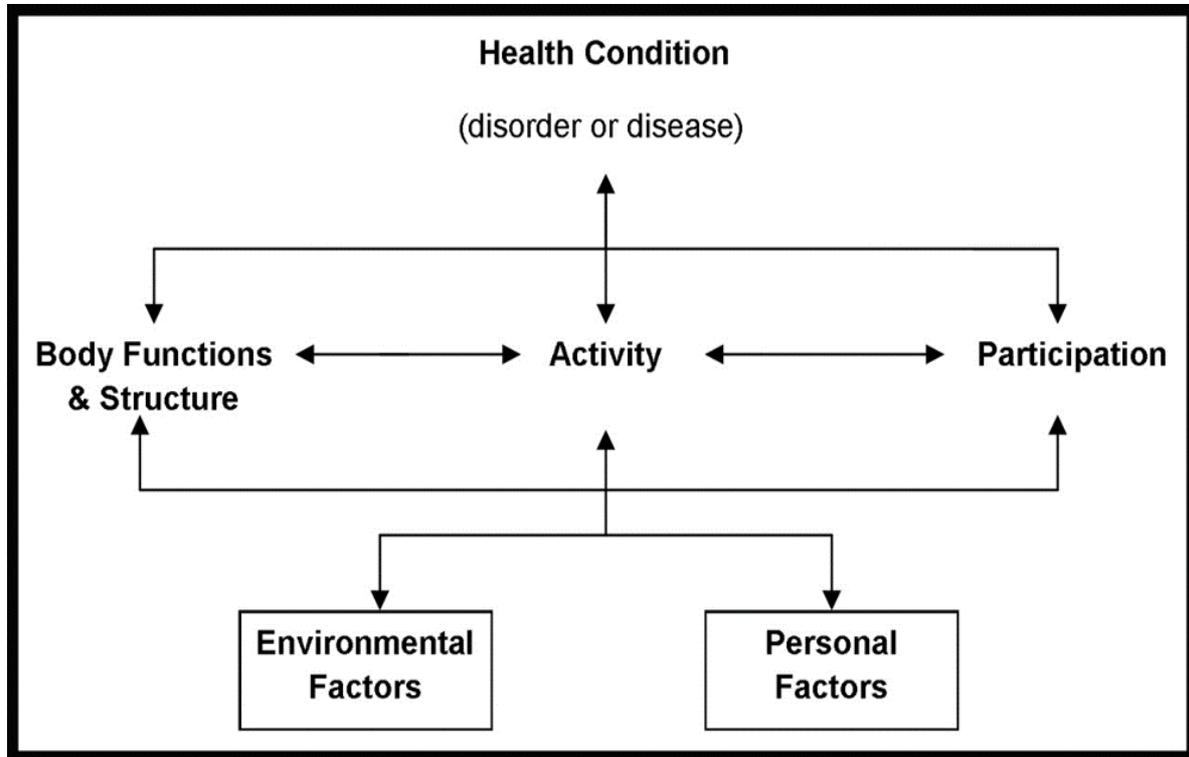
Literature Review

Aphasia occurs due to trauma to a portion of the brain responsible for language. Aphasia impacts an individual's ability to understand (receptive language) and/or produce language (expressive language) in oral, written, and reading modalities. Aphasia can develop insidiously through infection, dementia, or tumor, or suddenly through traumatic brain injury or stroke. It primarily impacts men and women of middle age or older, although it can affect persons of any age. Most recent estimates indicate that between 2.4 – 4.1 million people are currently living with aphasia in the United States (Simmons-Mackie, 2018). Due to the reductions in language ability, PWA may withdraw from social engagements, which effectively, reduces their social networks. In addition to impacting language, aphasia also impacts social interactions and people with aphasia tend to have less diverse social networks (Northcott et al., 2016). On average, compared to healthy older adults age-matched to persons with aphasia, people PWA have nine fewer social contacts (primarily friends) and are engaged in three fewer social leisure activities (Cruice et al., 2006).

The World Health Organization International Classification of Functioning, Disability and Health (WHO-ICF; 2002) Model (Figure 1) can be used to develop a comprehensive perspective of how to address and provide appropriate intervention to people with aphasia (PWA). The implementation of the WHO-ICF model has assisted in shifting from the medical model, which has a deficit perspective, to seeking to identify the PWA in terms of their condition and activities, participation, environmental and personal factors. As social networks and interactions tend to decline post aphasia diagnosis, an emphasis toward creating goals to facilitate functional improvements in overall daily participation in activities and life has been made paramount (Vickers, 2010).

Figure 1

WHO-ICF Model (WHO, 2002)

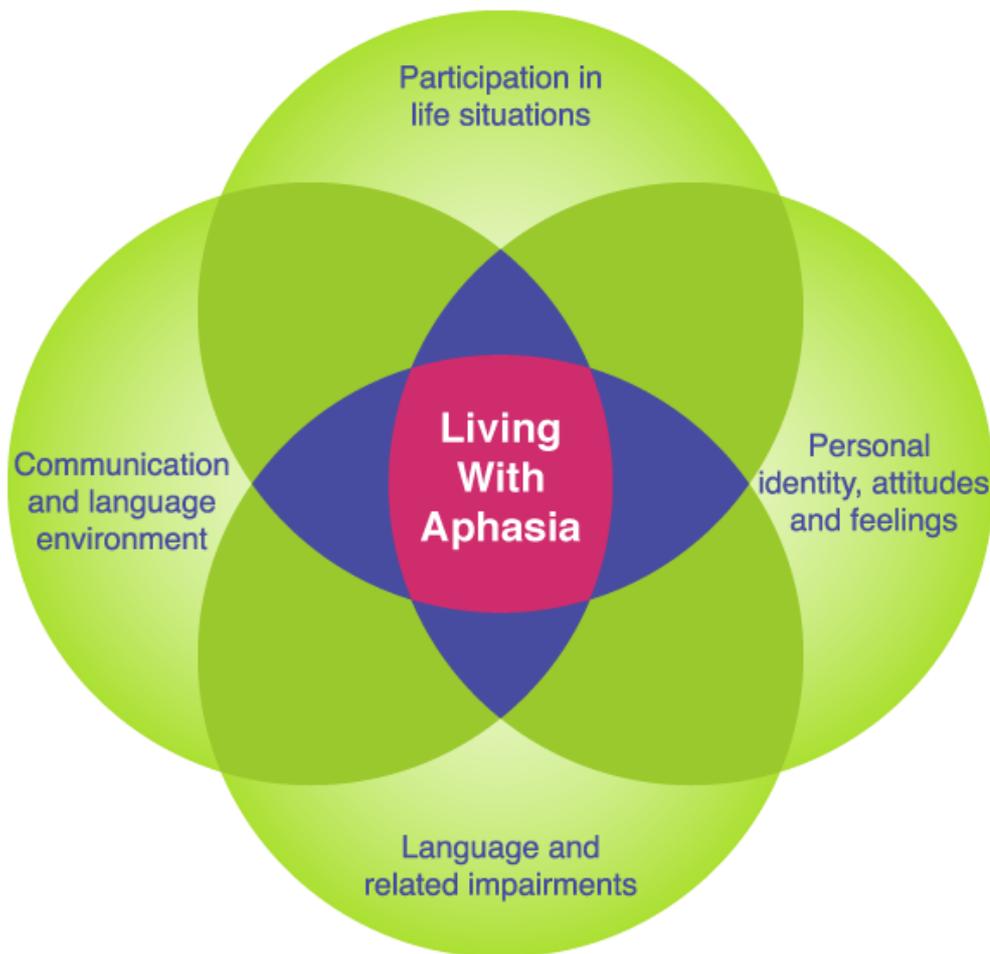


The Life Participation Approach to Aphasia (LPAA; Chapey et al., 2000) is a service delivery model centralized around providing assessment and treatment that is functional and individualized to the client. The LPAA includes consideration into the PWA's life activities, emotional well-being, and social connections and attempts to enhance quality of life through meaningful, real life outcomes (ASHA, 2019). One framework that conceptualizes core components of the LPAA is the Aphasia: Framework for Outcome Measurement (A-FROM; Kagan et al., 2011; Figure 2). The A-FROM is an adapted version of the WHO-ICF model for individuals with aphasia. The A-FROM considers participation in life situations, communication and language environment, language and related impairments, and personal, identity, attitudes, and feelings (Kagan et al., 2011). Essentially, a variety of factors impact communication for those with aphasia, including the traditional impairment itself in a

multiple modalities, environmental barriers or facilitators to communicative interactions, participation in social opportunities of everyday life, and personal feelings, emotions, and perception of self (Kagan, 2011).

Figure 2

LPAA Framework for Outcome Measurement (A-FROM), adapted from Kagan et al., 2011 & Copyright Aphasia Institute



The social network, or the social sphere surrounding an individual (e.g., family, friends, community, etc.) is significantly reduced post aphasia diagnosis (Northcott et al., 2016). Spouses and family members commonly become the most stable provider of support while the number and quality of friendships decline (Northcott & Hilari, 2018). With a

reduction in the quantity and quality of social network connections, psychosocial well-being of PWA can be negatively affected (Brown, Worrall, Davidson & Howe, 2012). Aphasia groups are a community of PWA, family, friends, and caregivers who come together to share experiences, interact, and practice communication techniques. Intervention that addresses functional targets and promotes social interaction and meaningful relationships, such as aphasia groups, have been increasingly valuable and popular to address the reduction of social relationships (Vickers, 2010).

Self-efficacy can be described as one's own belief that they have control over their environment and situation (Bandura, 1994). Having a strong sense of self-efficacy can counteract and assist in managing trials, maximizing positive behavior, as well as psychological, and psychosocial outcomes (Bandura, 1994). This study seeks to analyze the connection between social network, self-efficacy, and individual aphasia group participation in people with aphasia.

Literature Review

Social Networks

Social networks refer to the composition of a person's social relationships among family, friends, neighbors, and coworkers within their community, region, and beyond (Bandyopadhyay et al., 2011). It is a multidisciplinary area of study used throughout social, mathematical, statistical, and computer science fields to examine the relationship that exists between units. Graphing systems have been created to visually express the presence or absence, direction, and strength of these tied units. Social network analysis (SNA) is used to measure and describe relational ties. SNA is deeply rooted in the perspective that social ties are not independent or static but interdependent and flexible. This is a powerful tool to analyze both changes in the patterning of group structure and personal social networks.

Research in social networks has led to discoveries in the fields of healthcare, disabilities, and psychological well-being (Bandyopadhyay et al., 2011).

DuBois (2016), in a longitudinal study, described the connection between disability, health, social networks, and social support, and identified the strong relationship between health outcomes and social supports and social networks. . People with disabilities, specifically those with autism spectrum disorder, experience poorer social well-being and increased adverse health outcomes, especially depression, when compared to those typically developing. Depression generally increases in severity across the lifespan and can be partially mediated through peer relationships. In those with autism spectrum disorder, the inclusion of social networks and social skill interventions can potentially have a large impact on minimizing adverse health outcomes (DuBois, 2016).

Smith et al. (2012) conducted a study evaluating social supports and well-being amongst mothers of adolescents and adults with autism spectrum disorders, measuring the social support of mothers of adolescents and adults with autism spectrum disorder (n=269) using a modified convoy model from Antonucci and Akiyama (1987). They determined that a larger social network results in improvements in maternal well-being over an 18-month period, and higher levels of negative support results in an increase in depressive symptoms and negative affect.

Social network analysis has also been used to identify patterns of behavior among other groups. Addiction is partially driven by individual social network ties. Meisel et al. (2012) sought to determine the connection between pathological gamblers and non-pathological gamblers and their relationship with their social networks. After interviewing 40 frequent gamblers (n=22 non-pathological, n=18 pathological), they discovered pathological gamblers had an increased amount of social connections with individuals who frequently gambled, smoked, and drank when compared to non-pathological gamblers. They concluded

that addictive behavior is most likely encouraged and reinforced in those with unhealthier persons in one's social network. Social network ties, when engaging in similar behaviors, have also been found to encourage male and female adolescent smoking (Mercken et al., 2010), as well as alcohol and marijuana use (Coronges et al., 2011). Social networks can have positive and/or negative influence on individuals. Simply because one has a large number of contacts or high amount of perceived positivity toward those relationships, does not mean the relationships or contacts have a positive impact on the individual (Antonucci et al., 2013).

Patient interactions with physicians are found to be largely associated with information patients obtain through social networks (Griffiths et al., 2012). When social networks are used in addition to in-person healthcare professionals, social networks can assist in reducing inequalities in healthcare, specifically in those with chronic illness and disability (Griffiths et al., 2012). Social networks can facilitate and enhance the distribution of related information and resources to populations who share a disorder or disease but may not have the same access (Griffiths et al., 2012). Additionally, those with mental illness, mild or severe, with secure adequate social network resources and supportive medical care report higher functioning, success in social roles, social satisfaction, and increased quality of life later on when compared with those who have weaker social network resources (Perry & Persocolido, 2015). Both quality medical care and social network strength play a significant role in patient outcomes.

Reduction in the diversity of social networks can result in negative health outcomes (Li & Zhang, 2015). A decline in the health of older adults during the natural aging process may relate to withdrawal in social relationships and a less diversified social network. Li and Zhang (2015) identified a strong association between four social network types (diverse, friend, family, restricted) and health outcomes (physical, cognitive, psychological, overall well-being). They found that a decrease in health indicators leads to withdrawal from

diversified network type, shifting more toward solely family-focused networks. In their study, family-focused network type was associated with stronger psychological outcomes while a friend-focused network was more beneficial in physical outcomes. Possessing a diverse network type resulted in the most beneficial health outcomes. Lacking diversity within one's social network leads to isolation and increasingly poorer health conditions. When communities organize healthy social activities and encourage older adults with and without psychological and physical conditions to participate, this leads to positive health outcomes (Li & Zhang, 2015).

Social Networks in PWA

Aphasia can have a profound effect on one's social relationships. Northcott et al. (2016) compared social networks and perceived social support of people who endured a stroke (n=11 with aphasia; n=60 without aphasia) to healthy older adults (n=160). Those with aphasia obtained significantly lower scores in overall social network compared to both those with only stroke and healthy older adults. PWA had less diverse social networks. While relationships with children and relatives remained relatively stable, there was a great reduction in the number and quality of friendships. Significant predictors of social network decline were aphasia and low levels of perceived social support.

A study comparing healthy older adults age-matched to PWA revealed, on average, that those with aphasia have nine fewer social contacts (primarily friends) and three fewer social leisure activities than peers without aphasia (Cruice et al., 2006). Cruice et al., (2006) conducted a study using the social convoy model (Antonucci & Akiyama, 1987), having persons with and without aphasia map social contacts onto one of three concentric circles depending on perceived closeness to that individual (inner circle: can't imagine your life without them; middle circle: not quite that close but still very important; outer circle: people whom you haven't mentioned but are still close enough to include). Data gathered through

social convoy model revealed those with aphasia had social contacts more concentrated in the center (mean of 9.1 inner circle, 7.3 middle circle, 4.5 outer circle), while control participants without aphasia were more distributed (mean of 10.3 inner circle, 10.5 middle circle, 9.6 outer circle). With the reduction of peripheral friendships occurring for a variety of reasons, direct familial relationships tend to become the strongest for PWA as PWA had 25.9% of total relationships as immediate family, while control participants without aphasia had 17% (Cruice et al., 2006).

Spouses tend to be the most important, stable source of support, providing many differing functions. Children are also described as a relatively stable source of support, but PWA tend to be concerned with ‘burdening’ their children. Relatives and friends provide more social support rather than ongoing practical support (Hilari & Northcott, 2017) and the most universally valued support function amongst PWA was “the sense that someone was concerned and cared” (Northcott & Hilari, 2018, p. 2439). Additionally, PWA valued social companionship, practical support provided sensitively, and shared worries and sensitive encouragement in their relationships (Northcott & Hilari, 2018).

With the decline in social connections and friendships post-aphasia, Brown et al. (2012) sought to investigate further the role of friendship when living successfully with aphasia. After completing semi-structured interviews with 12 community-dwelling people with chronic aphasia on the role of friendship, three main themes were revealed. These themes included *living with changes in friendships*, *having support from friends and good times together*, and *importance of having stroke and aphasia friends*. Essentially, friendships shift post-aphasia in both positive and negative ways. Loss of friendship commonly stems from lack of understanding about aphasia and how aphasia impacts communication and daily functioning. Positive aspects include resuming in leisure activities, engaging in community-based activities to feel a sense of normalcy, fostering meaningful relationships centralized

around acceptance and support, building increasingly strong and supportive relationships with family members, and developing and appreciating a positive outlook to living with aphasia.

Clinicians should consider the personal social relationships and networks of each client on an individual basis to enhance participation, accommodate throughout challenges, maintain friendships, and minimize social isolation (Brown et al., 2012). According to Simmons-Mackie (2013) clinicians need to facilitate conversational partner programs to provide training in communication strategies and encourage PWA to engage in leisure activities. Communication partner training is an evidence-based practice during which communication partners (e.g., family, friends, healthcare providers, volunteers, etc.) are trained in methods to improve communication, language, and participation during interactions with a PWA (Simmons-Mackie, 2013), and is one way to support improved quality of life and enhance beneficial social networks among individuals living with aphasia. A reduction in quantity and quality of social relationships can result in psychological distress and decreased quality of life. When implementing a LPAA, clinicians intentionally assist PWA to develop and maintain emotional well-being and social relationships.

Aphasia groups also provide opportunity to encourage the development and enhancement of social networks and improve overall communicative abilities. Vickers (2010) interviewed 40 PWA to examine social network pre- and post-aphasia as well as the influence of attending weekly aphasia group. Results confirmed a decrease in social network composition and life participation post-onset of aphasia across all interviewed. Furthermore, those who attended a weekly aphasia group (n=28) reported significantly less perceived social isolation and greater social connection than those who did not (n=12). Thus, aphasia group can encourage a sense of connectedness and social participation.

Aphasia groups are offered on a regular basis as part of “brick and mortar” aphasia centers, such as the Aphasia Institute in Toronto ON, Canada (Aphasia Institute, 2015), or may be part of a health system delivery, such as the Houston Aphasia Recovery Center (HARC, 2019). Aphasia groups may also be part of a community-based programming venture. Such is the case with the Chippewa Valley Aphasia Network. The Chippewa Valley Aphasia Network (CVAN) in Eau Claire, WI, is a non-profit organization that hosts a range of programs including weekly aphasia group, communication partners, exercise group, and aphasia camp. The CVAN partners with multiple community organizations formally and informally. Individuals with aphasia, as well as their family, friends, and caregivers are invited to attend with the goal to foster meaningful relationships, participation and improved communication skills through social interaction and community-based activity. The CVAN follows an indirect, community-based intervention model, viewing the client through the WHO-ICF model, utilizing the LPAA (Chippewa Valley Aphasia Group, 2018).

Measuring Social Networks in PWA

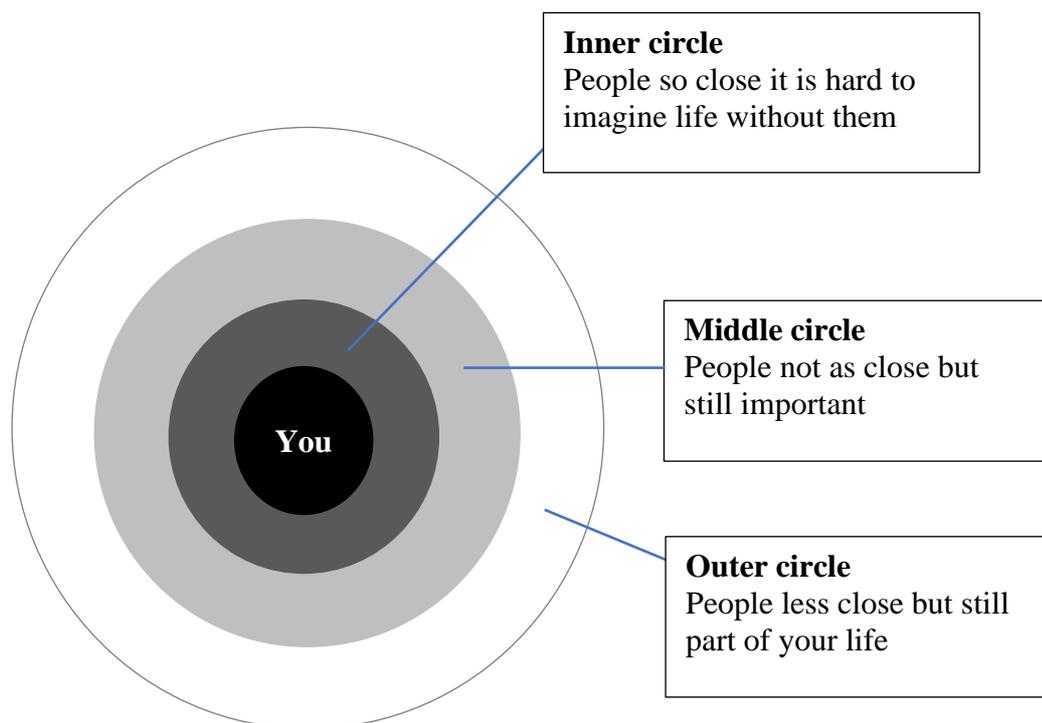
Numerous measures have been created to assess social participation and social support in PWA. The Social Support Survey (SSS; Sherbourne & Stewart, 1991) is a 5-point scale analyzing perceived availability to tangible, emotional/informational, social companionship, and affectionate support. The Communication Integration Questionnaire (CIQ; Willer et al., 1993) analyzes one’s home integration, social integration and productive activities with 15 items. The Social Activities Checklist (Aujla, et al., 2016) is a 20-item tool that quantifies one’s range and frequency of social activities through self-report under leisure, informal, and formal subscales.

Social network analysis takes a deeper look into the interdependent connections between individuals and their social sphere, with increased consideration into type and frequency of regular social contacts. Cruice et al. (2006) noted “social network analysis has

been used internationally, in research in Australia (Gibson, 1986; Hickson et al., 1995; Kendig & Brooke, 1997; Mugford & Kendig, 1987), the United Kingdom (Bowling, 1994), and America (Antonucci & Akiyama, 1987; Unger et al., 1999)” (p. 1211). Antonucci and Akiyama (1987) designed and implemented the social convoy model. In this model, participants are interviewed regarding their regular social contacts, which are mapped onto one of three concentric circles (Figure 3). Closest social contacts, as determined by the participant being interviewed, are nearest to the center and less strong social contacts further from the circle. Follow-up interview questions about frequency and type of contact adds valuable details (Papathanasiou & Coppens, 2017).

Figure 3

Social Convoy Model Framework (Antonucci & Akiyama, 1987; Cruice et al., 2006)



Although the social convoy model (Antonucci & Akiyama, 1987) was not originally designed for use with individuals with aphasia, Cruice et al. (2006) implemented this model

with 30 PWA (n=16 females, n=14 males) to compare the social lives of persons with and without aphasia. Participants scoring 5/10 or greater on the entire Comprehension subtest of the Western Aphasia Battery (WAB; Kertesz, 1982) were included. During administration of the social convoy model, the researchers utilized prompt cards with illustrated options to facilitate comprehension and expression. Among their conclusions was that the social convoy model (Antonucci & Akiyama, 1987) can be modified and used for PWA.

Self-Efficacy

According to Carey (2009), “self-efficacy reflects confidence in the ability to exert control over one’s motivation, behavior, and social environment” (para. 1). Perceived self-efficacy includes one’s own belief to exercise influence over the events that make up their life. It shapes one’s motivation, behaviors, accomplishment, and personal wellbeing in many differing ways (Bandura, 1994).

Those with high-perceived self-efficacy are believed to develop so through mastery experience, vicarious experience, and social persuasion (Bandura, 1994). Self-efficacy is fostered through a mastery perspective rather than a deficit perspective. Enduring persistently through trials and adversity while still believing one can grow and can succeed shapes an individual to have high self-efficacy. Observing social models with strong self-efficacious beliefs can positively shape one’s self-efficacy. Providing models, standards, or aspirations through the lens of high self-efficacy can guide the observer toward doing the same. Self-efficacious beliefs can morph across the lifespan depending on the available models to orient and foster the individual’s self-thoughts and perspective. Those who are verbally persuaded to seek to master challenging situations instead of avoiding them are more likely to succeed than those who do not. It is imperative to note social persuasion exists in the sphere of those encouraged to endure and work hard to succeed, avoiding comparison to others (Bandura, 1994).

Possessing and acknowledging the confidence and drive to work through difficulties, despite potential or previous failure or trial, is at the heart of high self-efficacious beliefs. Life presents itself with challenges, setbacks, and adversities. Self-efficacy therapy has had a large influence on numerous fields such as smoking cessation, alcohol use, eating, pain control, exercise, and self-management of chronic disease (Carey, 2009).

The Intersection Between Social Networks and Self-Efficacy

Palmer et al. (2019) sought to gain insight into the connection between social network and psychological well-being in community dwelling adults aged 65-94 with a range of communication disorders. Communication disorders were due to a wide range of head and neck etiologies (e.g., cancer, voice disorders, hearing impairment) but did not include persons with aphasia. Palmer et al. (2019) gave a variety of published measures to 240 participants to analyze social network, social support, and frequency of negative social interactions in addition to psychological measures assessing self-efficacy and depression. Two hundred older adults (n=50 of each group) were identified and contacted about being included in the study with the following communication disorders: benign voice disorders, neurologic disease, head and neck cancer, and hearing impairment.

Simply improving one's ability to communicate does not necessarily result in increased participation. However, enhancing one's self-efficacy has the potential to foster social and life participation. Communication impairment was identified as a significant, independent predictor of quantity and quality of social networks, depression, loneliness, and social self-efficacy (Palmer et al., 2019). Communication impairment was found to correlate with a reduction in friendships, social participation, and social self-efficacy. Essentially, communication effectiveness impacts social self-efficacy and also reassurance of worth, and both of these aspects in turn impact the presence or absence of depression (Figure 4).

Communication effectiveness additionally impacts social self-efficacy and loneliness (Figure

5). Results aligned with previous research indicating that friendship, as a category associated with social networks, disproportionately decreases post-onset of communication disorder in comparison to relatively stable family relationships. However, familial relationships can still be negatively affected as intimacy and satisfaction may become blame and resentment, ultimately causing individuals with communication impairment to withdraw and isolate from such relationships (Palmer et al., 2019). Palmer et al. (2019) discovered a significant relationship between communication impairment and social self-efficacy and noted, “a key finding from the current investigation was that, of the variables we examined, communication was the only significant predictor of social self-efficacy” (p. 14). Self-efficacy can be improved in clients with communication disorders through cognitive restructuring and social skill training to improve social outcomes, psychological well-being, and long-term health (Palmer et al., 2019; p. 14, Figure 4 & Figure 5).

Figure 4

The Relationship Between Communication Effectiveness, Social Self-Efficacy, Reassurance of Worth, and Depression (Palmer et al., 2019, p. 14)

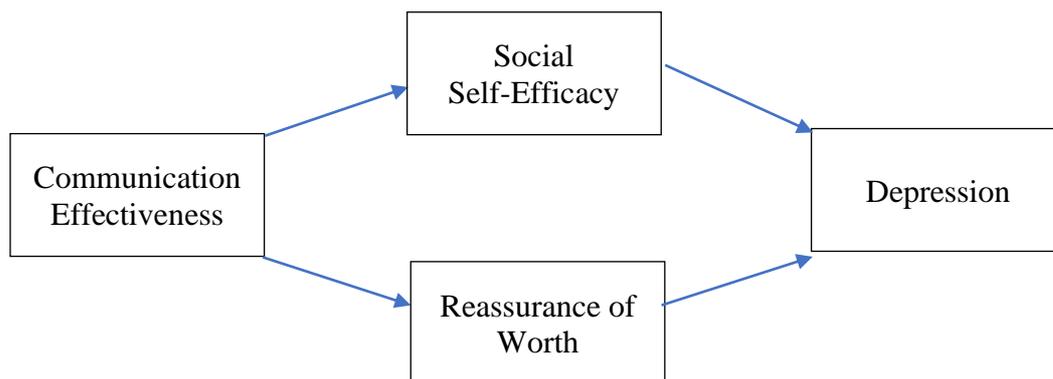
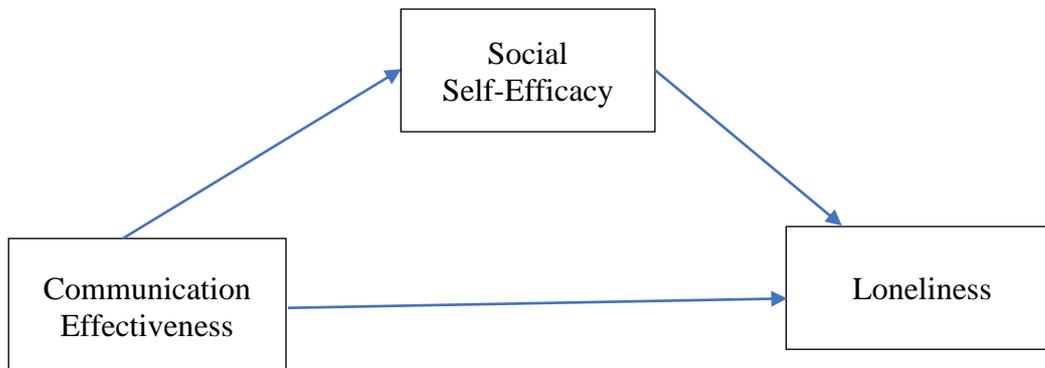


Figure 5

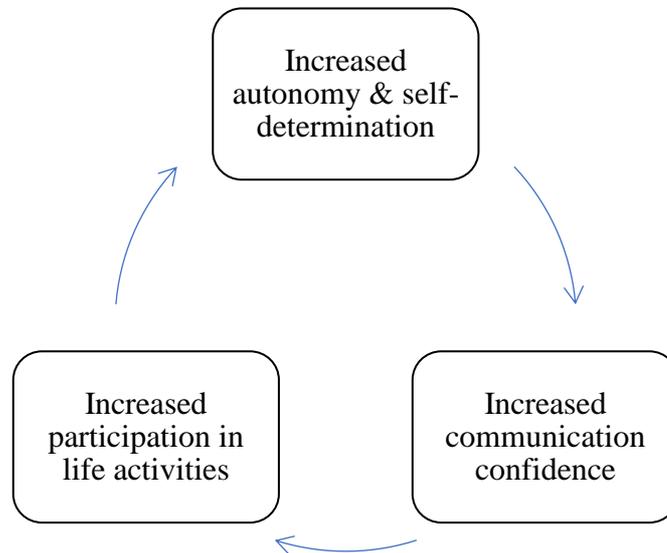
The Relationship Between Communication Effectiveness, Social Self-Efficacy, and Loneliness (Palmer et al., 2019, p. 14)



Another depiction of the relationship between self-efficacy and social network is shown in Figure 6 (Cherney et al., 2011). These researchers noted that, while confidence in communicating is important, there was a lack of tools to measure and treat communication confidence in PWA. They described a continuous process that takes place between increased autonomy and self-determination, increased communication confidence, and increased participation in life activities in people with aphasia.

Figure 6

The Relationship Between Increased Autonomy and Self-Determination, Increased Communication Confidence, and Increased Participation in Life Activities (Cherney et al., 2011)



Measuring Self-Efficacy

Self-efficacy, also described as self-confidence, is not typically evaluated or treated in formal speech and language therapy. However, knowing the impact of self-efficacy on psychosocial outcomes, may guide clinicians to provide treatment centralized around the WHO-ICF Model, the Chronic Care Model, and the LPAA framework. Babbitt and Cherney (2010) created the *Communication Confidence Rating Scale for Aphasia* (CCRSA; Babbitt & Cherney, 2010) to analyze PWA's confidence, or self-efficacy, in a variety of areas. The CCRSA (Babbitt & Cherney, 2010) is a 10-item rating scale which participants respond to question prompts with 0-100 (not confident to very confident).

The *General Self-Efficacy Scale* (Schwarzer & Jerusalem, 1995; Appendix A) consists of 10-items (1=none at all; 4=exactly true) related to general perceived self-efficacy in problem solving, confidence, and coping strategies. Responses are added up into a sum score ranging from 10-40. The scale has a high internal consistency (.76 to .90) and exists in

28 languages (Scholz et al., 2002). It has been used for over 25 years in numerous human sciences, healthcare, and education related fields (Scholz, et al., 2002).

Sherer and Maddux (1982) created *The Self-Efficacy Scale* containing two subscales: *Subscale 1: General Self-Efficacy* and *Subscale 2: Social Self-Efficacy*. Both subscales analyze one's belief to perform a behavior and individual attitude toward oneself. These scales are presented on a 5-point scale (1-strongly disagree; 4-strongly agree). The *Social Self-Efficacy Subscale* of the *Self-Efficacy Scale* (Sherer & Maddux, 1982; Appendix B) was used in Palmer et al. (refer to Figure 4 & Figure 5) to analyze social self-efficacy in persons with communication impairment. The *Social Self-Efficacy Subscale* consists of six items, providing insight into participants' interpersonal confidence and ability to problem solve challenging social interactions.

In conclusion, social networks, or the social relationships surrounding individuals, can have profound positive and/or negative effects on health outcomes (Antonucci et al., 2013). Social networks can promote or reduce addictive behavior (Meisel et al., 2012). Inclusion of social skill interventions to strengthen social networks can reduce depression in persons with ASD (Smith et al., 2012), and the organization of social activities to encourage diversity in social networks can reduce social isolation in healthy older adults (Li & Zhang, 2015).

In those with communication disorders without aphasia, communication effectiveness, reassurance of worth, and social self-efficacy were found to relate to the presence of absence of loneliness and depression (Palmer et al., 2019). Social networks of those with aphasia change in a variety of ways post onset of diagnosis. PWA tend to have less diverse social networks, while familial relationships tend to become the most stable (Cruice et al., 2006). Onset of aphasia can impact involvement in activities, and inclusion of aphasia group and communication partner programs can assist in curbing isolation (Vickers, 2010; Simmons-Mackie, 2013).

Statement of Purpose

In the present study, the researcher is interested in considering the relationship between social network quantity and quality, perceived self-efficacy, and aphasia group participation in persons with aphasia.

Therefore, the following research questions are proposed:

1. Among individuals with aphasia, how does perceived self-efficacy associate with the strength of social network composition?
2. What is the relationship between individual aphasia group participation, perceived self-efficacy, and social network composition?

Methods

Primary data sources for assessment of self-efficacy included 1) *General Self-Efficacy Scale* (Schwarzer & Jerusalem, 1995; Appendix A), and 2) *Social Self-Efficacy Subscale* (Sherer & Maddux, 1982; Appendix B). Primary data source for social network analysis included the social convoy model (Antonucci & Akiyama, 1987). Primary data source for individual aphasia group participation included a combined rating incorporating frequency of attendance, variety of involved programs, and contributions given by primary aphasia group supervisors (Appendix D). As there is a known connection between depression and communication impairment (Starkstein & Robinson, 1988), we included the modified *Hospital Anxiety and Depression* (HADS) Screener (Zigmond & Snaith, 1983) to address these variables. Participants were recruited through Chippewa Valley Aphasia Network programming. Recruitment was completed through distribution of cover letter and e-mail.

Participants

Inclusion criteria:

- ≥ 18 years of age
- Community dwelling

- Speaks English as a primary language
- Aphasia due to stroke, trauma, or tumor which is considered stable or improving
- At least six months with aphasia
- Mild to moderate aphasia as indicated by Level 4 or greater on both the Spoken Language Expression and the Spoken Language Comprehension subscales of the ASHA National Outcome Measures Functional Communication Measures (ASHA NOMS; Appendix E)
- Minimal to absent cognitive impairment or psychiatric impairment determined via self-report and observation by the researcher

Additional record of age, employment, marital status, and living situation were recorded as they may impact quantity and quality of social network.

Self-Efficacy Measures

Measures were chosen due to their aphasia-friendly nature including use of scales or visuals with large, dark text written in concise statements. The scales were adapted in modality, administration, and completion (e.g., verbally, written) depending on individual participant's strengths and needs.

Participants completed the following standardized self-efficacy measures:

- *General Self-Efficacy Scale* (Schwarzer & Jerusalem, 1995; Appendix A),
- *Social Self-Efficacy Subscale* (Sherer & Maddux, 1982; Appendix B).

Self-efficacy scales were used to gain a comprehensive picture of the participants' self-efficacious beliefs, generally and in social situations. The *General Self-Efficacy Scale* (*GSES*; Schwarzer & Jerusalem, 1995) provided a broad overview of perceived self-efficacy and provides a score range of 10-40. The *Social Self-Efficacy Subscale* (*SSES*; Sherer & Maddux, 1982) was used in Palmer et al. (2019), which solidified the connection between

communication impairment and reduced self-efficacy. This subtest provided a score range of 0-24. Higher scores on both the *GSES* (Schwarzer & Jerusalem, 1995) and *SSES* indicate higher self-efficacy.

Social Network Analysis

Social network quality and quantity were measured through the social convoy model (Antonucci & Akiyama, 1987), adapted from Cruice et al. (2006). This model was chosen because it has been successfully used in the past with PWA. While the *SSS*, *SIQ*, *SOCAT* (refer to literature review) were considered, convoy modeling appeared to be the most effective and efficient tool to utilize given the intent of this pilot study, and prior use with PWA (i.e., Cruice et al., 2006). Utilization of the social network convoy model may lead to more comprehensive and functional outcomes in interpretation, discussions, and potential future studies.

Recruitment

Recruitment consisted of two emails sent to all individuals on the Chippewa Valley Aphasia Network mailing list, with approximately two weeks elapsed time between emails. The emails contained basic information about the study using an IRB-approved script. Interested individuals who responded were provided additional information and were then scheduled to meet with the primary investigator to review the consent form and secure consent if interested. There are approximately eighty email addresses in the Chippewa Valley Aphasia Network email list. Of those eighty email addresses, 31 are speech-language pathology or healthcare providers who work regularly with individuals with aphasia. The remaining 49 email addresses represent single, or multi-person households of individuals with aphasia, spouses of individuals with aphasia or family members of those with aphasia.

Participant Characteristics

Five participants consented to participate. Demographic information provided here is intentionally vague in order to provide the reader an understanding of participant characteristics, but without the specificity that may result in identification of participants, some of whom are local community members. Etiologies were due to a multitude of stroke and non-stroke related conditions. Three participants were males and two participants were females. Age varied from 39 to 90 years of age. Employment included volunteer, part-time employment, retired. Participant marital status included married and divorced. All participants resided in the western half of Wisconsin.

Descriptive data were summarized for all of the study variables. Modified *HADS* results reflect the mean of both sessions scores. Social convoy model results reflect each participant's final result post the second session. The following study variables will be described in more detail: modified *HADS*, self-efficacy as measured by the *GSES* and *SSES*, social network analysis using the social convoy model, and aphasia group participation ratings.

Procedure

Information was gathered across two 60-minute sessions. Approximately one week passed between session one and session two. Sessions took place in the participants location of choice. One participant completed the study in the UW-Eau Claire Center for Communication Disorders, while the remaining four participants completed the study in their home. Table 1 below depicts events, which took place during the first and second sessions.

Table 1*Procedures for First Session and Second Session of Study*

Task	First Session	Second Session
Demographics	X	
Modified <i>HADS</i>	X	X
<i>GSES</i>	X	
<i>SSES</i>	X	
Social Convoy Model	X	X

During the first session, upon obtaining consent, each participant was asked to share demographics (i.e. age, aphasia onset, employment, marital status) and then complete the modified *Hospital Anxiety and Depression Scale* (modified *HADS*; Appendix F) derived from Zigmond & Snaith (1983) to screen for anxiety and depression. The modified *HADS* included 14 short statements presented on a visual rating scale. The modified *HADS* provided ‘within normal limits’, ‘borderline’ and ‘outside normal limits’ scores. Participants then completed the *GSES* (Schwarzer & Jerusalem, 1995; Appendix A) and *SSES* (Schwarzer & Jerusalem, 1995; Appendix B). The self-efficacy scales were presented in written form, but the researcher provided communication supports as necessary and read out loud, if preferred, to enhance understanding and fit the preferred modality of each participant. Responses from participants were provided via an aphasia-friendly, numbered scale. Upon completion of the modified *HADS* and self-efficacy scales, social network analysis was then initiated using the social convoy model (Antonucci & Akiyama, 1987).

During social network analysis (Antonucci & Akiyama, 1987; Appendix C), the researcher provided three pre-drawn large, concentric circles on a 3-ft. by 3-ft. paper roll. The inner circle was dark gray, middle circle light gray, and outer circle white. Each participant

was prompted to name individuals within their social network using the following descriptors of the representation of the concentric circles adapted from Cruice et al. (2006):

- Inner circle: *‘people whom you feel so close that it is hard to imagine your life without them.’*
- Middle circle: *‘people who you may not feel quite that close to but are still very important to you.’*
- Outer circle: *‘people whom you haven’t mentioned but are still close and important enough in your life to be placed in your social network.’*

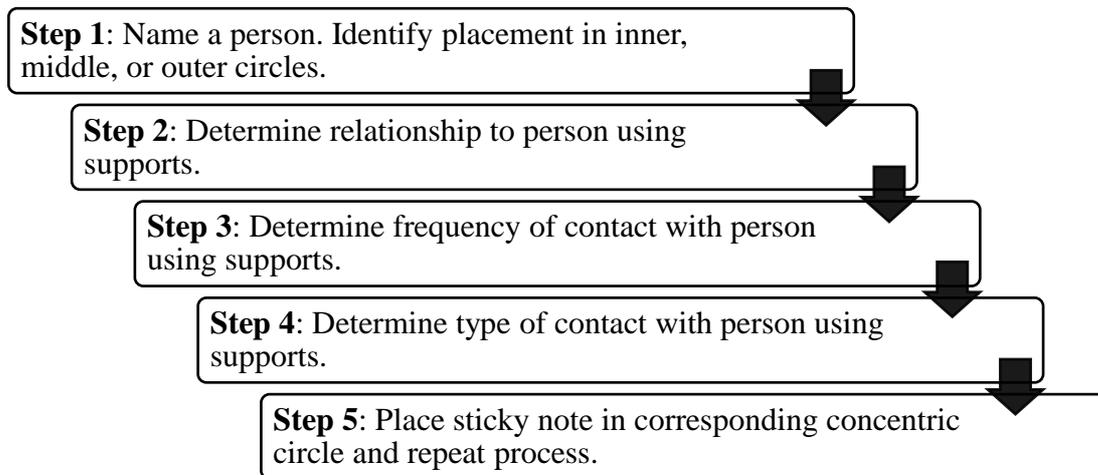
The researcher used uniform pre-prepared pages with written choice to facilitate communication for all participants (Appendix G). The researcher encouraged participants to use visual supports and technology (e.g., iPad, phone) as appropriate to share pictures of social network contacts and modality of choice (e.g., verbal, written) as communication supports. Per participant’s discretion, spouses and/or frequent communication partners were invited to attend to assist in prompting the participant.

The researcher first prompted the participant to name a single person in their own social network. The researcher provided communicative supports as necessary to support conversation and support the participant identifying individuals to place in the social network concentric circles. Social contacts were identified via any modality. The researcher then asked additional follow-up questions regarding relationship to participant (i.e., friends, other relative, immediate family, neighbors, undifferentiated groups, workmates, formal & leisure groups, trades people, helpers), frequency of interaction (i.e., weekly, rarely, monthly, daily, yearly), and type of interaction (i.e., face to face, telephone or video chat, write or text, living with). Relationship category “helpers” referred to medical professionals and non-familial caregivers. All information for a single social network contact was immediately written on a sticky note and placed in corresponding concentric circle (inner, middle, outer) of

participant's choice to indicate closeness to the participant. The researcher then prompted for additional persons in participant's social network and the process continued until the participant felt that the network was comprehensively and adequately represented. This process can be visualized in Figure 7.

Figure 7

Adapted Process for Social Network Analysis Using the Social Convoy Model (Antonucci & Akiyama, 1987; Cruice et al., 2006)



After all social network contacts were expressed, written onto sticky notes, and placed in their respective concentric circles, the researcher took a photo to keep in record. The researcher then ensured all notes were stuck on with tape, rolled the final product, and had the participant keep it. If the participant did not want to keep or hold onto the product, the participant was then asked to take a picture of the social network. Participants were asked to spend time considering his/her social network, making changes on placement/closeness of social network contacts in concentric circles (inner, middle, outer), in addition to additional information (relationship, frequency, type) if desired prior to the next session.

Participants were rated in aphasia group participation by a supervisor of aphasia program, in collaboration with other aphasia group staff, using a rubric (Appendix D) developed for this study. Participants were rated on attendance, variety, and contributions to

provide a score ranging from 3-9. Persons receiving a score from 3-4 were considered ‘low,’ 5-7 ‘moderate,’ and 8-9 ‘high’ participation. Attendance, variety and contributions were weighted equally, as the research team felt contributions to each of these three areas equally important.

The participant and researcher met for session two approximately one week after session one to discuss any changes and finalize the social network product in person in preparation for subsequent analysis. At this time, the participant again completed the modified *HADS* to ensure reliability of results. A mean score of the two sessions was calculated and used for analysis.

Analysis

Due to the smaller than anticipated n , and the non-normal distribution of social network data gathered in this study, the analysis plans were modified from that which was originally anticipated, and non-parametric measures were utilized to avoid violation of necessary assumptions of normality. Descriptives, both on an individual and combined basis, are used, included frequency counts, and medians. Additionally, the following data sets were used according to their categorical aspects.

Modified HADS Scores

Anxiety and depression scores were each categorized separately using the same classification provided by Zigmond and Snaith (1983): Within normal limits (0-7); Borderline (8-10); Outside of normal limits (11-21).

GSES Score

Scores on the *GSES* were categorized based on comparison to national normative data reported by Scholz et al. (2002) as part of their broader study evaluating the validity of the measure. That study provided a broad mean of the *GSES* across multiple nations, including

the USA. *GSES* scores in our study are categorized as binary variables either *above* or *below* the approximate mean score of 29.5, as provided by Scholz et al. (2002).

Aphasia Group Scores

These ratings were classified as low (3-4); moderate (5-7); high (8-9). Subsequently chi-square associations were calculated to analyze the potential associations across variables. It was our hypothesis that Aphasia Group Participation + Self-Efficacy Scores predict Social Network.

Research Question 1: Among individuals with aphasia, how does perceived self-efficacy associate with the strength of social network composition?

This was analyzed by chi-square analysis of general self-efficacy and social network closeness as measure by the *GSES* and most concentrated concentric circle (social convoy model); least concentrated concentric circle (social convoy model), and primary social network composition as was defined in the literature review earlier in this paper (friend focused, family focused, diverse, restricted; Li & Zhang, 2015).

Research Question 2: What is the relationship between individual aphasia group participation, perceived self-efficacy, and social network composition?

To account for non-parametric data sets, chi-square associations were completed using the following outline:

- *GSES* Score (high/low) x Highest Concentrated Concentric Circle
- *GSES* Score (high/low) x Lowest Concentrated Concentric Circle
- *GSES* Score (high/low) x Primary Social Network Composition (friend focused, family focused, diverse, restricted; Li & Zhang, 2015)
- Aphasia Participation Ratings x Highest Concentrated Concentric Circle
- Aphasia Participation Ratings x Lowest Concentrated Concentric Circle
- Aphasia Participation Ratings x Primary Social Network Composition

- Aphasia Participation Ratings x *GSES* Score

Results

Statistical Analysis

IBM Statistical Package for the Social Sciences (SPSS), Version 24.0 was used to analyze the association between study variables (i.e., modified HADS scores, GSES scores, aphasia group scores, social network composition and closeness).

Modified *HADS* & Self-Efficacy Score Results

The modified *HADS* was administered during both sessions. Participant scores for each response in sessions one and two were combined to determine a mean overall score. Specific responses for each participant can be found in Appendix H-L. A score of 0-7 within a given subsection (i.e., anxiety, depression) is considered within normal limits. A score of 8-10 within a given subsection is considered borderline. A score of 11-21 is considered outside of normal limits (Table 2; Zigmond & Snaith, 1983).

The GSES (Schwarzer & Jerusalem, 1995) scores and *SSES* (Sherer & Maddux, 1982) were added to create a combined self-efficacy (SE) score. Three (Appendix C; statements 1, 3, 5) of the six statements on the *SSES* were reversed ensuring a higher score would reflect higher perceived self-efficacy. In an international study of the validity of the *GSES*, Scholz et al. (2002), reported North American scores across all participants averaging approximately 29.5.

Table 2*Individualized Participant Results for Modified HADS and Self-Efficacy Scores*

Assessment Measure	Participants					
	#1	#2	#3	#4	#5	Median
Modified HADS Anxiety	4.5	3	1	11.25 ^a	9.75 ^b	4.5
Modified HADS Depression	4	1.5	1.5	3.75	3	3
Combined HADS	8.5	4.5	2.5	15	12.75	
GSES	32	33	34	29	30	32
SSES	11	21	11	16	14	14
Combined SE Score	43	54	45	45	44	45

Note. ^aClassified as *outside normal limits* score per guidelines provided by Zigmond & Snaith, 1983

^bClassified as *borderline* score per guidelines provided by Zigmond & Snaith, 1983

Social Network Analysis

Social network analysis was conducted using the social convoy model (Antonucci & Akiyama, 1987). Data obtained included number of inner circle contacts, number of middle circle contacts, number outer circle contacts, and total number of contacts. Additional data was modeled after Cruice et al. (2006) considering closeness (i.e., inner, middle, outer, total), relationship (i.e., friends, other relatives, immediate family, neighbors, undifferentiated groups, workmates, formal & leisure groups, trades people, helpers), frequency (i.e., weekly, rarely, monthly, daily, yearly), and type (i.e., face-to-face, telephone or video chat, write or text, live with). Immediate family refers to a parent, sibling, child, spouse, grandparent or grandchild, with the inclusion of in-laws, half, adopted, and stepfamily members.

The highest proportion of composition across participants was “immediate family”, next was “friends” followed by other areas such as other relatives, contacts associated with formal and leisure groups, neighbors and helpers (Figure 8). Contacts, with the exception of participant #2, were more distributed in across the inner and middle concentric circles, with participants naming fewer outer circle contacts (Figure 9). The inner circle across four out of five of the participants was highly composed of immediate family (Figure 10). Figures 11-15 depict individual social network scores.

Figure 8

Social Network Composition Across All Participants

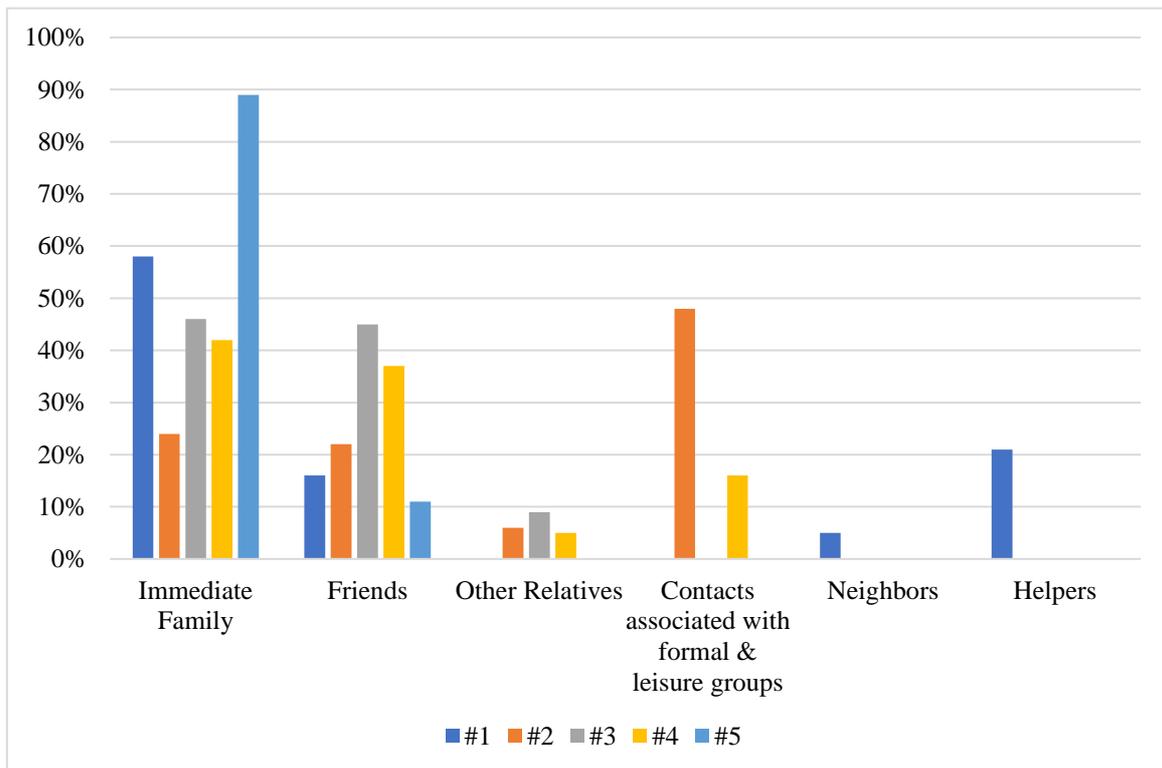


Figure 9

Social Network Closeness Across All Participants

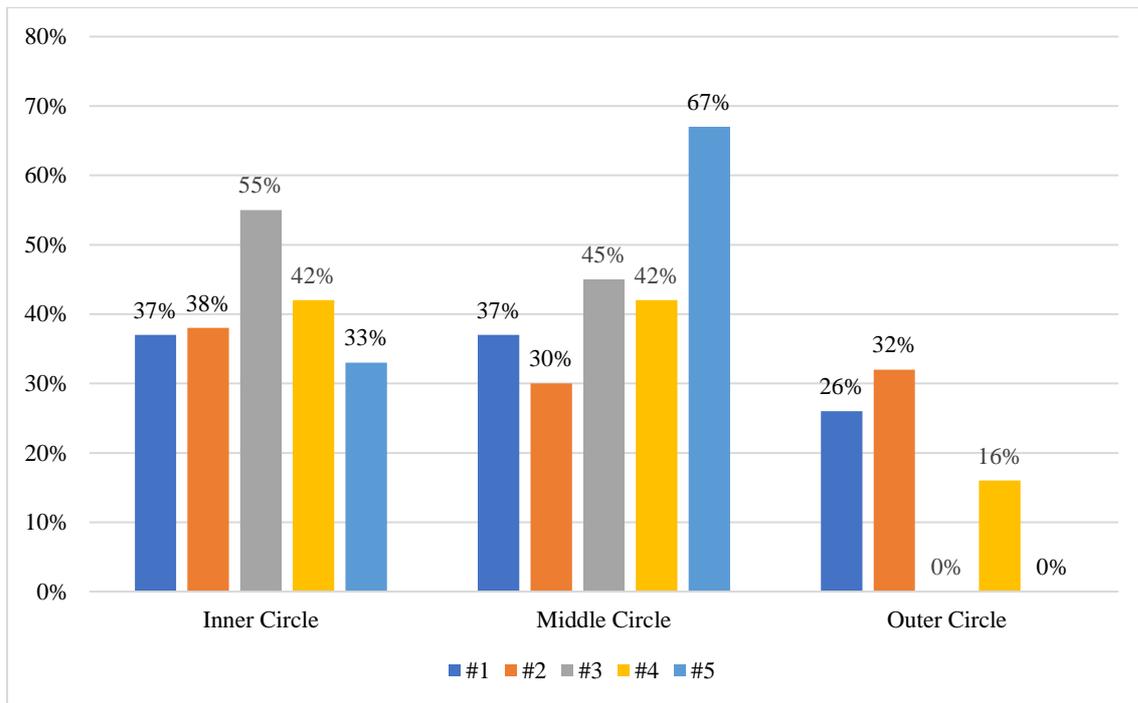


Figure 10

Inner Composition Across All Participants

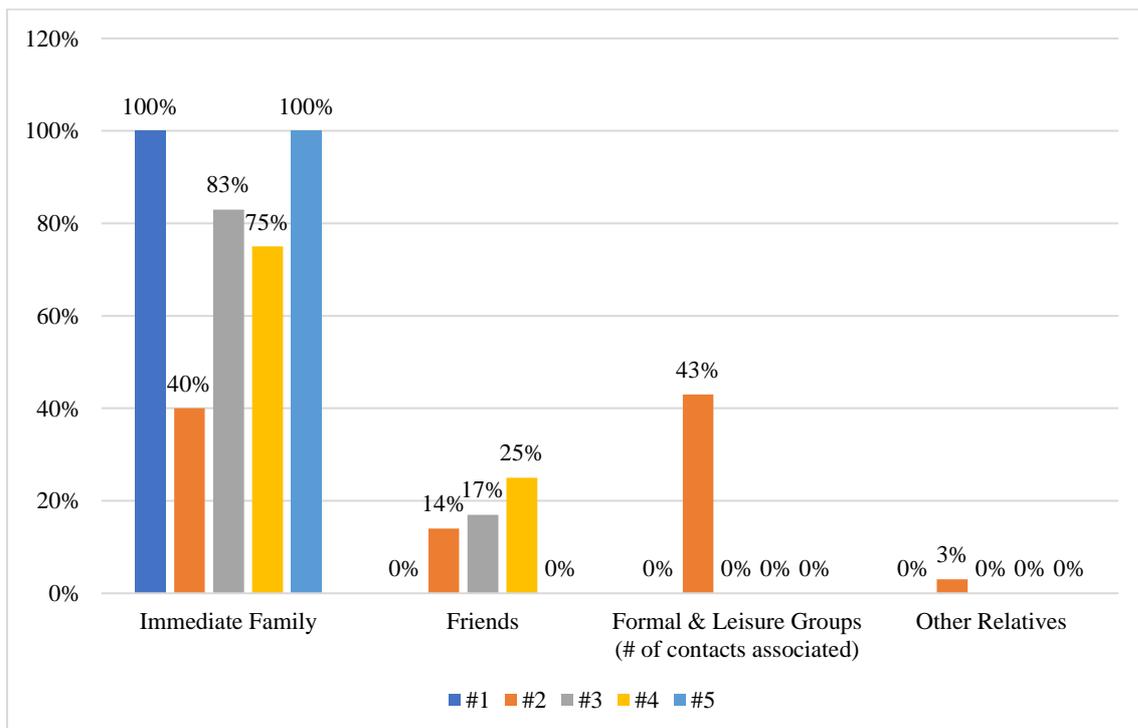
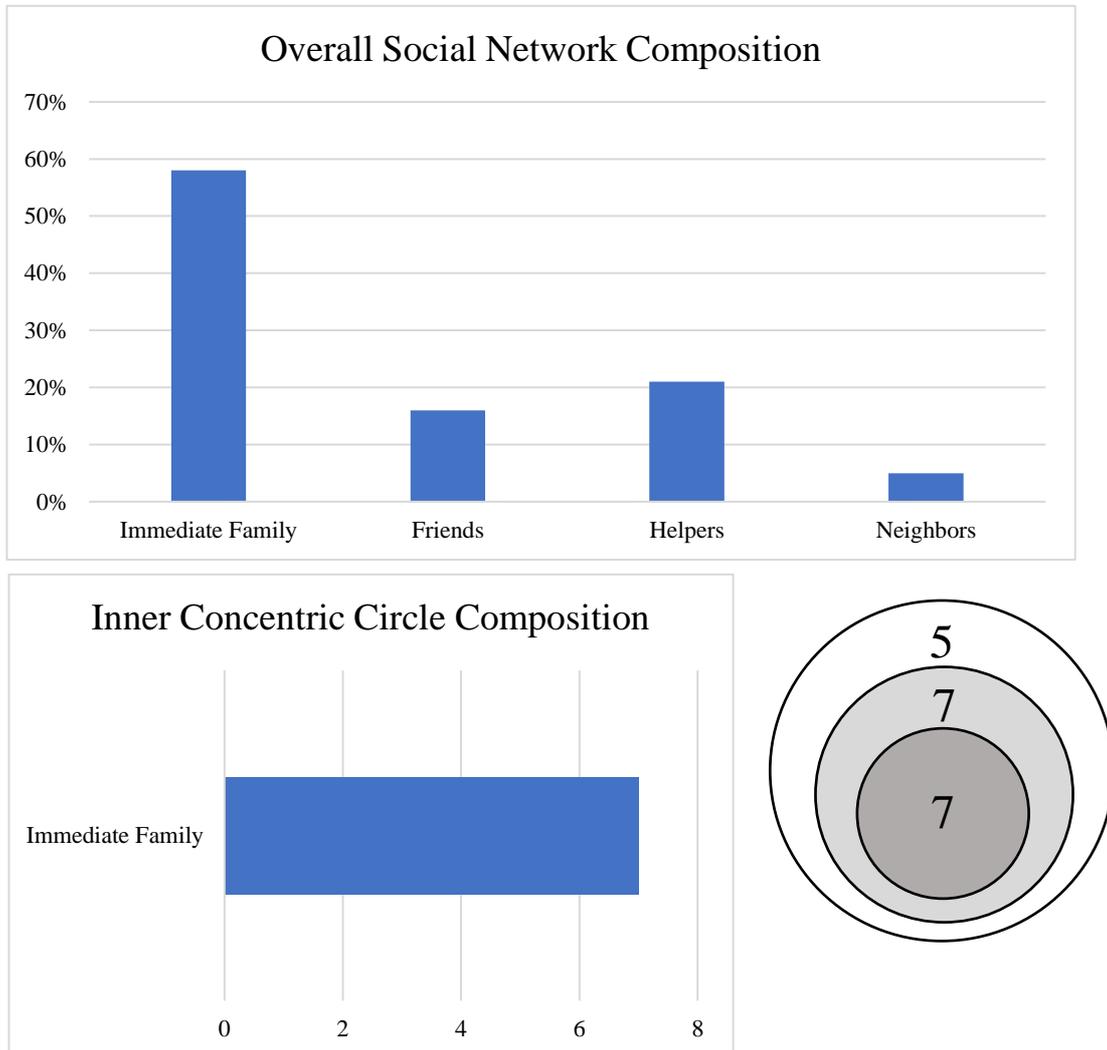


Figure 11

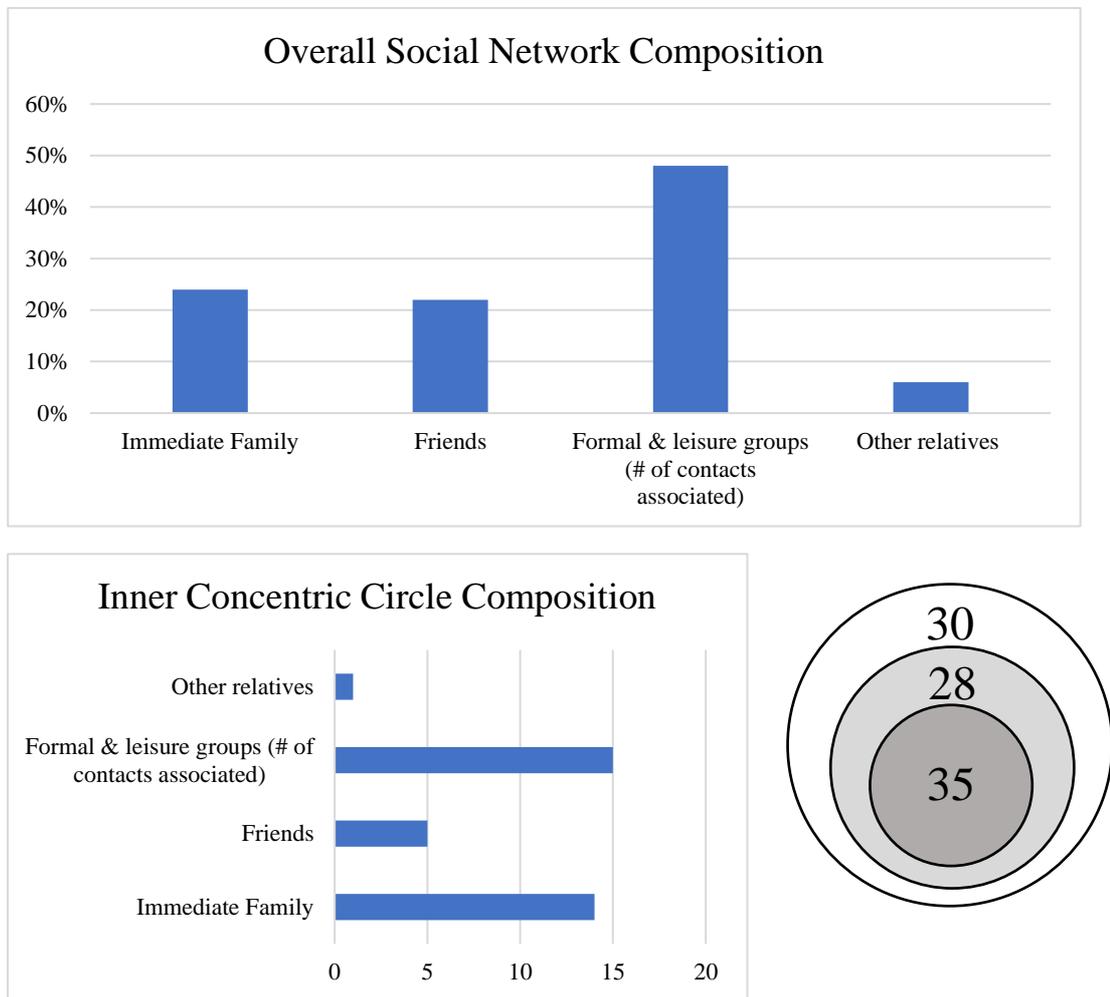
Participant #1 Social Network Scores



Note. Participant #1 indicated 58% (n=11) of contacts as immediate family, 16% (n=3) as friends, 21% (n=4) as helpers, and 5% (n=1) as neighbors. Immediate family member contacts were concentrated near the center of the social network, while friends, helpers, and neighbors were placed more toward the middle and outer portion of the social network. Helpers included health professionals related to aphasia services and hearing specialists. Participant #1 did not name any members of aphasia group or Chippewa Valley Aphasia Network (CVAN) services.

Figure 12

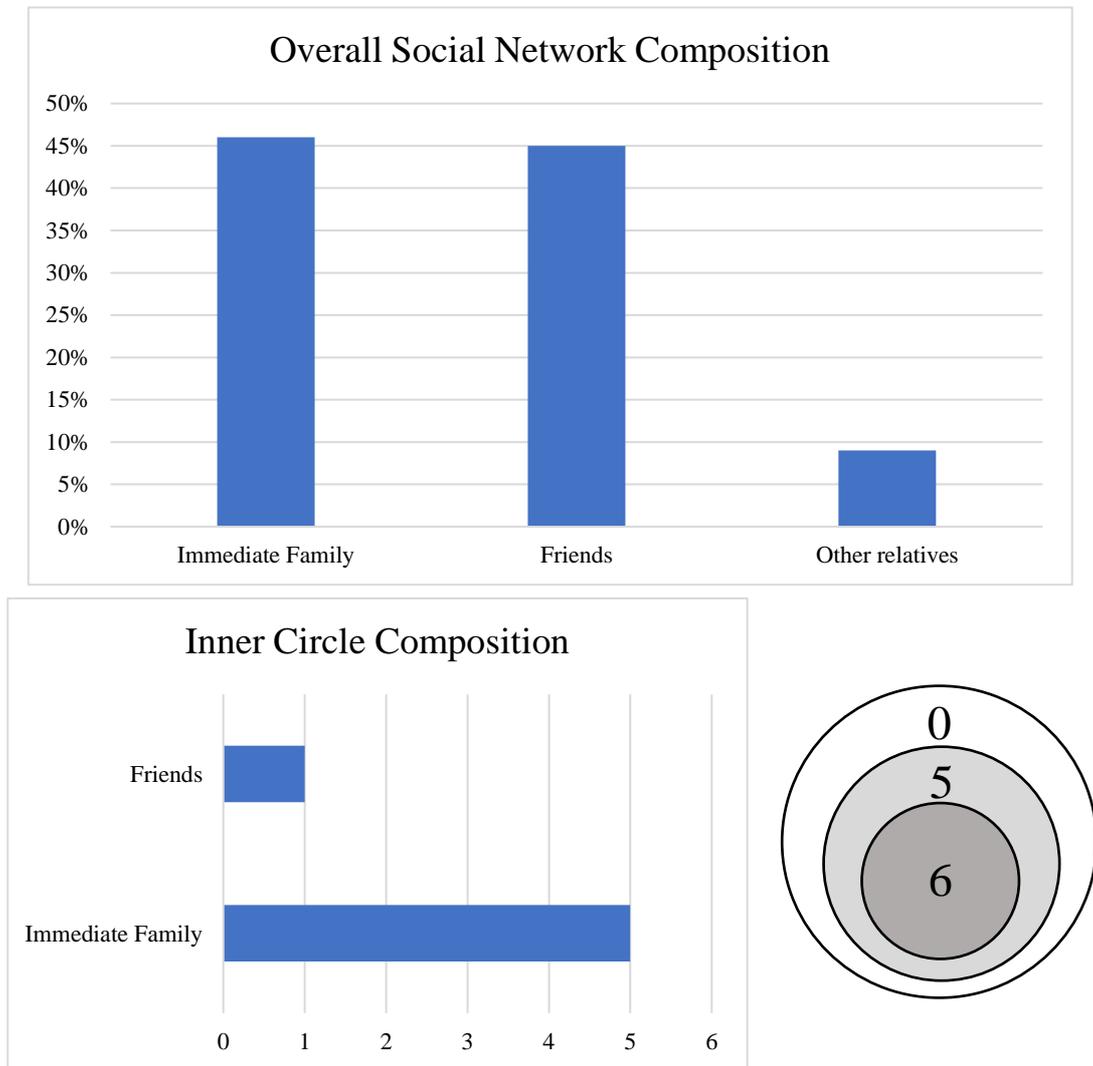
Participant #2 Social Network Scores



Note. Participant #2's social network consisted of 24% (n=22) immediate family, 6% (n=6) other relatives, 22% (n=22) friends, and 48% (n=45) contacts from formal and leisure groups. Immediate family was concentrated near the center of the social network, while other relatives, friends, and contacts from formal and leisure groups were generally evenly distributed across the inner, middle, and outer circles. Formal and leisure groups (volunteer positions) were a part of participant #2's life prior to onset of aphasia. Participant #2 deliberately as looking through each Facebook contact while sharing contacts. Participant #2 did not name any members of aphasia group or CVAN services.

Figure 13

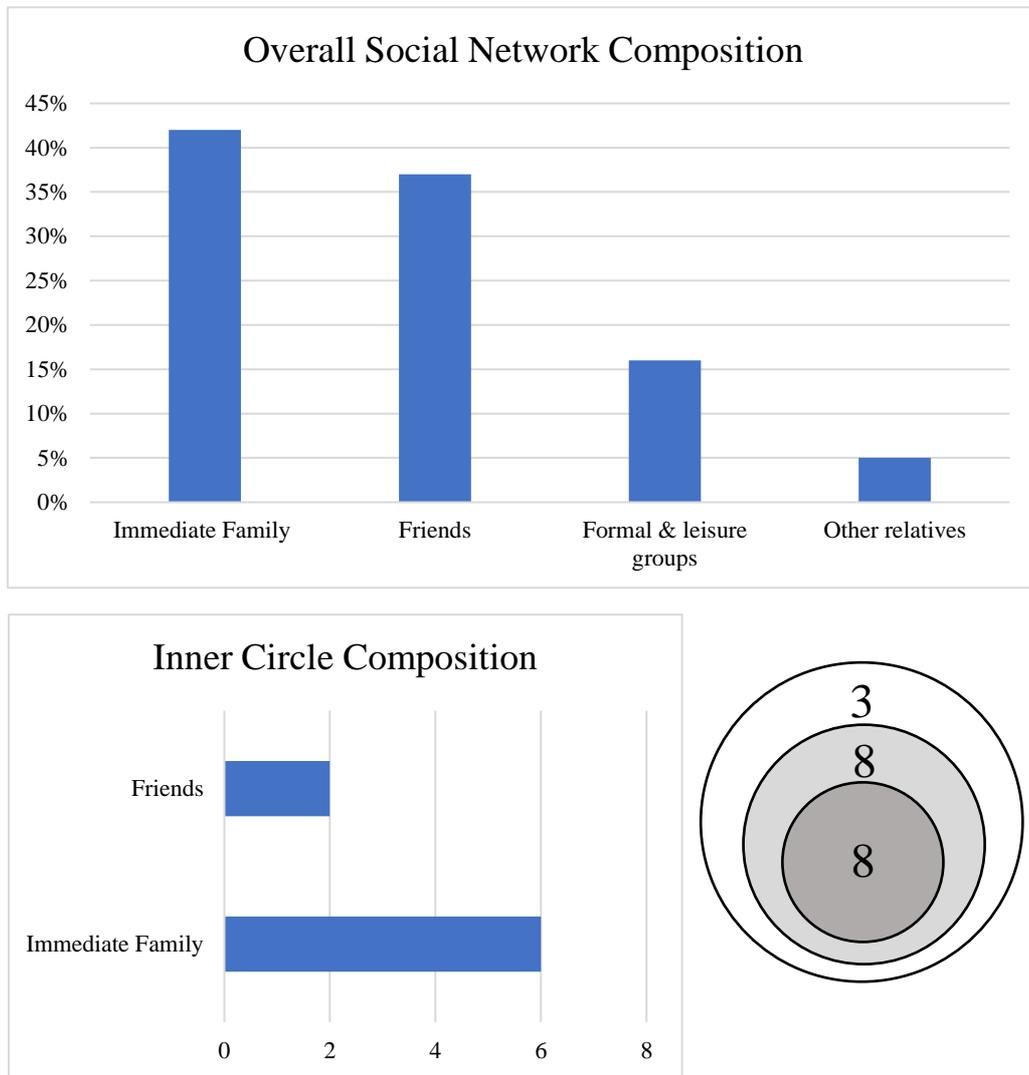
Participant #3 Social Network Scores



Note. Participant #3 had a social network that consisted of 46% (n=5) immediate family, 45% (n=5) friends, and 9% other relatives (n=1). Immediate family were concentrated near the inner circle, while friends and other relatives were distributed near the middle circle. Participant #3 did not name any member of aphasia group or CVAN services.

Figure 14

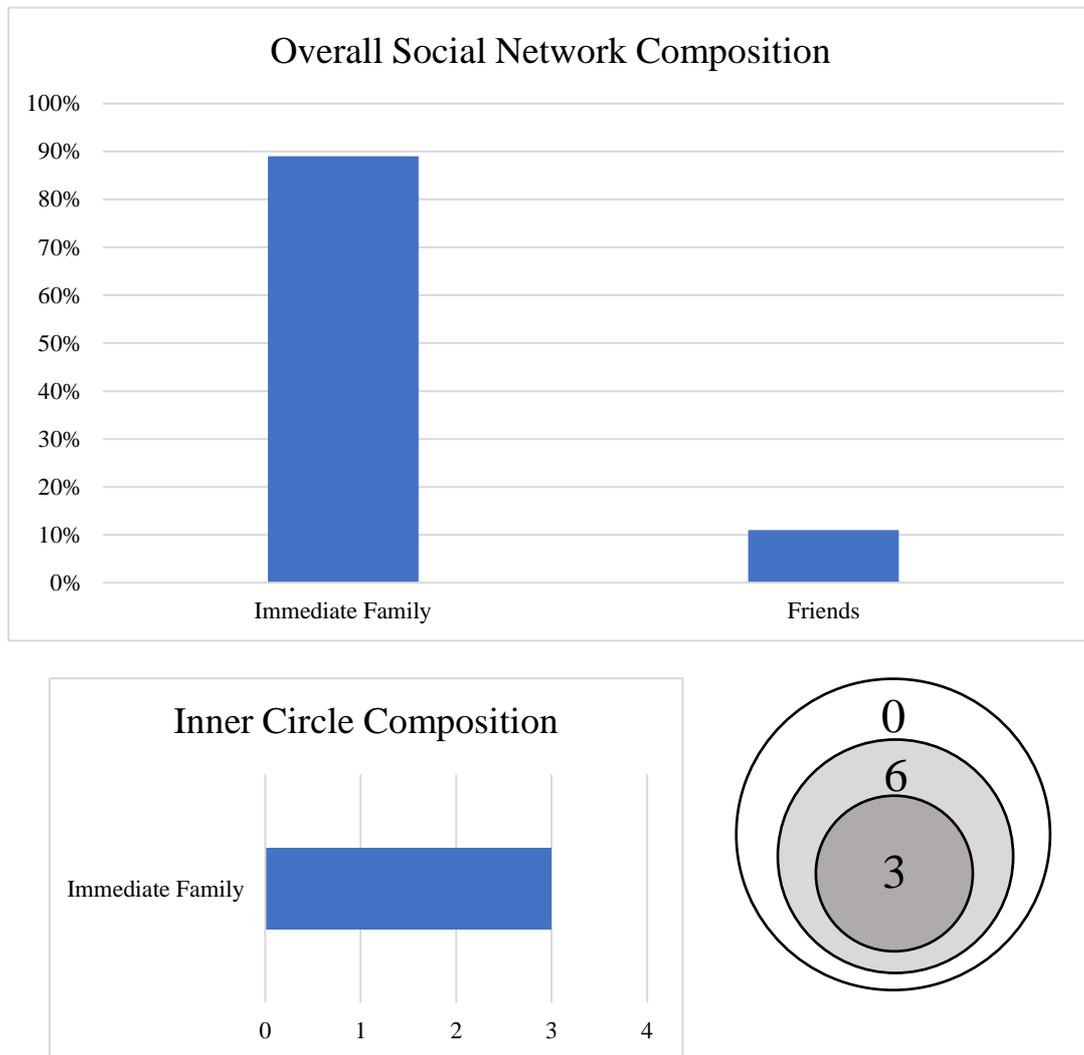
Participant #4 Social Network Scores



Note. Participant #4 reported a social network that was 42% (n=8) immediate family, 37% (n=7) friends, 16% contacts associated with formal and leisure groups, and 5% (n=1) other relatives. Immediate family were concentrated near the inner circle, while friends, and other contacts were distributed throughout middle and outer circles. Participant #4 named two members of aphasia group or CVAN services.

Figure 15

Participant #5 Social Network Scores



Note. Participant #5 shared a social network that was 88% immediate family (n=8) and 11% (n=1) friends. Immediate family was equally distributed between inner and middle circle, while the friend contact was placed in the middle circle. Participant #5 named one member of aphasia group or CVAN services.

Aphasia Group Participation Ratings

Aphasia group participation ratings were agreed upon by a member of the primary aphasia program from which participants participated. In the case of one participant, who had limited group program opportunities, a primary rating was provided accounting for access and availability in her area. A composite aphasia group participation rating was given based off attendance, variety of programs, and contributions. Table 3 depicts individual participant aphasia group participation ratings.

Table 3

Aphasia Group Participation Ratings

#1	#2	#3	#4	#5	Median	Mean
5/9	9/9	8/9	8/9	7/9	8/9	7.5/9
Moderate	High	High	High	High	High	(SD: 1.26) High

Association of variables

Associations between multiple variables were analyzed using non-parametric measures due to the non-normal distribution of the social network data. Distribution of each of the three social network closeness components (inner circle, middle circle, and outer circle) was analyzed independently using the Shapiro-Wilk test, a measure used to examine the normalcy of variable distribution, and recommended for small sample sizes (Privetera, 2015). The Shapiro-Wilk assumes a null hypothesis of normal distribution. The Shapiro-Wilk showed a significant departure from normality for all three social network closeness components, and the null is rejected for each of the three conditions. Results are as follows:

- Inner circle contacts: $W(5) = .693, p = .008$
- Middle circle contacts: $W(5) = .768, p = .043$
- Outer circle contacts: $W(5) = .727, p = .018$

The chi-square test of association was utilized to examine the relationship between categorical variables within this study. The χ^2 test is a non-parametric evaluation of association of two categorical variables. Specifically, bivariate associations were evaluated broadly between:

- Anxiety as measured by the modified *HADS* and social network characteristics;
- Depression as measured by the modified *HADS* and social network characteristics;
- Self-efficacy as measured by the *GSES* and social network characteristics;
- Aphasia group participation and social network characteristics;
- Aphasia group participation and self-efficacy as measured by the *GSES*

Details are provided below, however, in summary, there were no associations of significance identified.

HADS Anxiety

Modified HADS Anxiety score was dichotomized as within normal limits, or outside of normal limits based on modified *HADS* criteria. Most prevalent social network closeness circle was categorized as *inner*, *middle*, and *inner/middle tie*. No association was found between anxiety as measured by the modified *HADS* anxiety subtest and most prevalent social network closeness circle ($\chi^2 (2) = 2.917, p = .233$). Social network closeness was dichotomized by the concentric circle with the *least* amount of contacts (*middle*, *outer*). No association was found between anxiety as measured by the modified *HADS* anxiety subtest and least prevalent social network closeness circle ($\chi^2 (1) = .833, p = .361$). Social network composition was dichotomized as being primarily composed of *immediate family* or *non-aphasia friends*. No association was found between anxiety as measured by the modified *HADS* anxiety subtest and social network composition ($\chi^2 (1) = .833, p = .361$).

GSES Mean

Associations between self-efficacy and social network characteristics were evaluated. Self-efficacy as measured by the *GSES* was dichotomized as *below* or *above* the mean of 29.5 based on normative data provided by Scholz et al. (2002). The most prevalent social network closeness was categorized as *inner*, *middle*, or *inner/middle tie*. No association was found between self-efficacy and most prevalent social network closeness ($\chi^2(2) = 1.875, p = .392$). The least prevalent social network closeness was dichotomized as *middle* or *inner*. No association was found between self-efficacy and least prevalent social network closeness ($\chi^2(1) = .313, p = .576$). Social network composition was dichotomized as being primarily composed of *immediate family* or *non-aphasia friends*. No association was found between self-efficacy and social network composition ($\chi^2(1) = .313, p = .576$).

HADS Depression

An analysis of association was attempted between depression as measured by the modified *HADS*, and the social network closeness circle with the most contacts, with the least contacts, and with primary social network composition. However, all modified *HADS* depression scores fell within the normal range, and thus no statistics are computed because modified *HADS* depression score is a constant.

Aphasia Group Ratings

Aphasia group participation was dichotomized as *moderate* or *high*. The least prevalent social network closeness was dichotomized as *middle* or *inner*. No association was identified between aphasia group participation and least prevalent social network closeness ($\chi^2(1) = .313, p = .576$). The most prevalent social network closeness was categorized as *inner*, *middle*, or *inner/middle tie*. No association was identified between aphasia group participation and least prevalent social network closeness ($\chi^2(2) = 1.875, p = .392$). Social network composition was dichotomized as being primarily composed of *immediate family* or *non-aphasia friends*. No association was identified between aphasia group participation and

primary social network composition ($\chi^2(1) = .313, p = .576$). Lastly, self-efficacy as measured by the *GSES* was dichotomized as *below* or *above* the mean of 29.5 based on normative data provided by Scholz et al. (2002). No association was identified between aphasia group participation and self-efficacy ($\chi^2(1) = .313, p = .576$).

Discussion

As previously stated, the intent of this study was to determine the relationship between perceived self-efficacy, social network composition, and aphasia group participation among person with aphasia. The discussion will be based on the results of the two research questions followed by additional comparing the results of this study to related studies.

Research Question #1: Among individuals with aphasia, how does perceived self-efficacy associate with the strength of social network composition?

The chi-square associations indicate no associations between self-efficacy and social network composition as measured. Specifically, this was addressed through exploring chi-square associations across multiple binary interactions between self-efficacy scores and social network components.

Perceived self-efficacy scores using the *GSES* (Schwarzer & Jerusalem, 1995) had minimal variability as all participants were within the average range based on normative data provided by Scholz et al. (2002). In contrast, variability in total number of contacts within social networks ranged from very few to very high. Participant #2 shared 93 total social contacts, greater than three standard deviations above the mean reported for both PWA and healthy older adults in Cruice et al. (2006) ($n=30, SD: 16.2$), while participant #5 shared only nine total social contacts, greater than one standard deviation below the Cruice et al. (2006) mean. With a large range of social contacts across participants, yet relatively similar general self-efficacy scores within normal limits, this resulted in no association between variables.

Recall that was our hypothesis that that Aphasia Group Participation + Self-Efficacy Scores

predict Social Network. At this time, we cannot yet make a definitive statement, but we can determine, based on the results of this study, that there is not an association between social network size and perceived self-efficacy.

Participants in the current study scored a mean of 14.5 (SD: 3.40) with a range of 11-21 in the *Social Self-Efficacy Subscale (SSES)*. The *SSES* was additionally administered during the study completed by Palmer et al. (2019) to 240 adults aged 65-94 with a range of communication disorders. Participants in the Palmer et al. (2019) study achieved a mean score of 14.56 (SD=3.66), remarkably close to the *SSES* results of the current study.

A reduction in social network may not be a result of lower self-efficacy, as measured by the *GSES*. Although four out of five of the participants reported fewer social contacts than the control group of adults without aphasia in Cruice et al. (2006), all participants achieved scores near national average in the *GSES* (Schwarzer & Jerusalem, 1995). All participants scored above the national average of the *GSES*, with the exception of participant #4 scoring 0.5 points below the national average. We postulate that lower social network contacts may instead be due to the language impairment itself or numerous other related factors, such as geographical location, age, involvement in volunteer positions/work prior to stroke. However, it is interesting to note that all participants in this study scored near the national average on the *GSES* self-efficacy measure that was normed across a population *without* aphasia, and yet the majority of participants have smaller social networks than the control group population in the Cruice et al. (2006) study.

Research Question #2: What is the relationship between individual aphasia group participation, perceived self-efficacy, and social network composition?

The chi-square associations indicate no association between individual aphasia group participation, perceived self-efficacy, and social network composition. Given the small number of participants and non-normal distribution patterns of responses, only non-

parametric statistics were utilized in analysis. We looked only at bivariate associations via chi-square and did so only with measures that were categorically assessed. Thus, we were not able to analyze associations with both self-efficacy scales. We used only the *GSES* as it had pre-established categorical variables. We anticipate that as this research continues beyond this pilot study, more comprehensive analysis will occur as a larger *n* is obtained.

A purpose of aphasia groups and programming, in addition to allowing for functional communication practice, is to foster meaningful relationships through social interaction and community-based activity. Vickers (2010) compared social networks of those attending a Communication Recovery Group and those who did not and observed no significant differences in the network sizes of the groups observed. It is interesting to note that in the current study, while the participants of this study were rated as moderate and high participators in their local aphasia group programming, few named members of aphasia programming in their social network.

The total number of social network members aggregated across all participants was 151. The percentage of non-staff members of local aphasia groups named across all contacts was 1.9% ($n=3$; Table 4). The total percentage of aphasia group staff included in participants' social networks was 2.6% ($n=4$). This could be due to a variety of factors such as subjectivity of naming contacts during the social convoy model, however, this raises the question regarding the extent to which relationships within aphasia group translate to membership within one's social network. One of the intentions of the primary aphasia network in which the majority of attendees participate is to develop, substance, and enhance relationships. Frankly, it came as a surprise and point of concern to the thesis advisor (who is a member of the aphasia group staff) that there was such a paucity of mentions of others with aphasia, from within the aphasia network, in the social network compositions of participants. This

may speak to the need of greater emphasis and consideration placed in development of meaningful relationships within groups, possibly in a more explicit manner.

Four out of five participants named fewer contacts in the outer circle, compared to inner and middle circles during implementation of the social convoy model. Contacts in the outer circle represent individuals who ‘*people whom you haven’t mentioned but are still close and important enough in your life to be placed in your social network.*’ As the contacts are less close to participants compared to other contacts of social convoy model, it can be challenging to differentiate memory or linguistic difficulties from versus genuine reduction in outer circle contacts.

Table 4

Composition of Social Contacts as Aphasia Group Members

	<i>Participants</i>				
	#1	#2	#3	#4	#5
<i>SN aphasia group members</i>	0/19 0%	0/93 0%	0/11 0%	2/19 11%	1/9 11%

However, simply because participants did not name many members of aphasia groups or CVAN programming in their social convoy model does not mean they may not be benefiting from involvement in aphasia programming and groups. Aphasia groups provide opportunities to enhance personal value and develop a renewed identify and purpose post onset of aphasia (Lanyon et al., 2018; Rotherham et al., 2015). All participants in the current study achieved *GSES* slightly above the national average, indicating perceived strengths in problem solving, confidence, and coping strategies, as well as moderate-high aphasia group ratings, indicating these members may have a positive self-image. As friendships tend to decrease and family tends to be the most stable support post aphasia (Hilari & Northcott, 2017), aphasia groups cans provide community and social opportunities outside of the family

or home setting. Aphasia groups are a place where individuals can come to obtain information about aphasia and develop communication strategies to foster effective social communication (Rotherham et al., 2015). These are independent to naming social network contacts and are undeniably valuable to many individuals with aphasia.

By evaluating the two research questions listed above, there are several points of discussion relevant to those research questions, and the extension of those questions based on the results of this study. Always accounting for the small n , there are discussion points of consideration with regard to the current study. These points will be addressed in further detail relating to comparison of social networks of PWA compared to other relevant studies and consideration into what constitutes a “healthy” social network.

Social Networks in PWA

Social network results of the current study can best be compared to results from Cruice et al. (2006) as methods of the studies are most similar in the procedure for gathering social contacts through the social convoy model (Antonucci & Akiyama, 1987) for PWA. Inclusion criteria for both studies included moderate comprehension abilities with no concomitant neurological disease, although Cruice et al. (2006) included control participants without aphasia as comparison. Participants with aphasia in Cruice et al. (2006) ranged from 57 to 88 years old while participants in the current study ranged from 39 to 90. Cruice et al. compared age-matched adults without aphasia ages 62 to 98. Refer to Table 5 for direct comparison.

Closeness

Both Cruice et al. (2006) and the current study reported a reduced number of contacts for PWA in the outer concentric circle compared to the inner concentric circle. Contrastively, healthy older adults had social contacts generally equally distributed across inner, middle, and outer concentric circles. The total number of contacts shared by PWA of both studies was

similar (current study median = 19; Cruice et al. M = 21 (SD = 12.7)) and was reduced in comparison to healthy older adults (Cruice et al. M = 30 (SD = 16.2)). The overall range of number of contacts was largest in the current study (n = 9-93), reaching approximately 17 contacts higher than the healthy older adults in Cruice et al. (3-76). This was due to participant #2 providing an inordinately large number of contacts compared to other participants. This can be visualized in Table 5.

Table 5

Social Network Closeness Compared to Cruice et al., (2006)

	<i>Current study</i>	<i>Cruice et al. (2006) PWA</i>	<i>Cruice et al. (2006) Adults w/o aphasia</i>
<i>Closeness</i>	<i>Median & range</i>	<i>Mean (SD) & range</i>	<i>Mean (SD) & range</i>
Inner	7	9.1 (5.9)	10.3 (7.1)
	3-35	1-23	1-40
Middle	7	7.3 (6.2)	10.5 (5.8)
	5-28	0-21	0-25
Outer	5	4.5 (5.8)	9.6 (9.5)
	0-30	0-27	0-49
Total	19	21 (12.7)	30 (16.2)
	9-93	5-51	3-76

Relationship

Friends, other relatives, and immediate family were identified as the largest composition type of social network of people with aphasia in both studies, as well as healthy older adults. Participants in the current study named more immediate family contacts (median = 8; range = 5-22) than Cruice et al. (2006) across both PWA (M = 4.9; SD = 3.4) and adults without aphasia (M = 4.4; SD = 2.5). Adults without aphasia named approximately double the number of friends (Cruice et al.; M = 12.2 (SD = 8.8) compared to the both PWA in Cruice et al (M = 6.5; SD = 6.4) and in the current study (median = 5, range = 3-20). However, when combining ‘immediate family’ and ‘other relatives’ categories comparative

to friends, both studies, across PWA and healthy older adults named a slightly larger proportion of family than friends. This can be visualized in Table 6.

Table 6

Social Network Relationship Compared to Cruice et al. (2006)

	<i>Current study</i>	<i>Cruice et al. (2006) PWA</i>	<i>Cruice et al. (2006) Adults w/o aphasia</i>
<i>Relationship</i>	<i>Median & range</i>	<i>Mean (SD) & range</i>	<i>Mean (SD) & range</i>
Friends	5 3-20	6.5 (6.4) 0-24	12.2 (8.8) 0-44
Other relatives	1 1-6	6.4 (5.9) 0-21	9.2 (8.1) 0-47
Immediate family	8 5-22	4.9 (3.4) 0-13	4.4 (2.5) 0-9 0.6 (2.5)
Neighbors	0 0-1	1.1 (2.2) 0-11	0-13
Undifferentiated groups	0	0.8 (1.4) 0-7	0.32 (0.9) 0-5
Workmates	0	0.5 (1.5) 0-6	0.7 (2.4) 0-17
Formal & leisure groups	0 0-45 (contacts named: 0-5 groups named)	0.3 (1.1) 0-6	0.62 (1.3) 0-7
Trades people	0	0.3 (0.7) 0-3	0.25 (0.9) 0-6
Helpers	0 0-4	0.2 (0.7) 0-3	0.06 (0.3) 0-2

Frequency & Type

The primary frequency of interaction for PWA in the Cruice et al. (2006) study was “weekly” (M = 6.4, range = 0-18). The primary frequency of contact in the current study was

also “weekly” (median = 8, range = 2-12). Types of interaction used most often across both studies and populations of PWA and healthy older adults were “face to face” and “telephone or video chat.” Frequency and type were generally comparable across both PWA and healthy older adults. This can be visualized in Table 7.

Table 7

Social Network Frequency & Type Compared to Cruice et al. (2006)

	<i>Current study</i>	<i>Cruice et al. (2006) PWA</i>	<i>Cruice et al. (2006) Adults w/o aphasia</i>
<i>Frequency</i>	<i>Median & range</i>	<i>Mean (SD) & range</i>	<i>Mean (SD) & range</i>
Weekly	8 2-12	6.4 (5.2) 0-18	8.6 (7.5)
Rarely	1 0-15	4.1 (4.7) 0-20	7 (7.1) 0-34
Monthly	6 2-37	3.7 (4.5) 0-16	5.3 (4.3) 0-17
Daily	2 1-4	2.4 (1.6) 0-6	2.1 (1.9) 0-7
Yearly	2 1-25	1 (2.9) 0-11	1.7 (3.2) 0-15
<i>Type</i>			
Face-to-face	8 3-53	11.9 (9.7) 0-39	17 (12.7) 1-57
Telephone or video chat	7 4-38	6.4 (5.5) 0-19	8.9 (6.8) 0-33
Write or text	0 0-3	0.6 (2) 0-9	2.5 (3.8) 0-21
Living with	1 0-2	0.8 (0.8) 0-3	0.6 (0.5) 0-2

Broad Comparison

Information from the current study as well as the Cruice et al. (2006) study can be compared to other studies analyzing social networks of person.

ns with aphasia. Hilari & Northcott (2006) used the social convoy model (Antonucci & Akiyama, 1987) to research social networks of those with chronic aphasia by adding together “spouse/partner, children, close friends, close relatives, and aphasia group membership/voluntary activities” (p. 22). Participants in their study shared a range of contacts from 1-40, with a mean of 10.1 total contacts, nearly half the median number of total contacts participants in the current study shared.

Vickers (2010) considered the social networks of those attending a Communication Recovery Group and those who did not, pre- and post-onset of aphasia, through two different calculations. The first calculation including “life partners, good friends/close relatives, and acquaintances (p. 908)” provided a social network score of 75.35 (SD = 87.90) prior to onset of aphasia and 39.50 (SD = 19.90) post-aphasia. The second calculation included “life partners, good friends/close relatives, and unfamiliar partners (p. 908)” resulted in a social network of 45.05 (SD: 24.35) prior to onset of aphasia and 36.78 (SD = 21.23) post-aphasia. The number of social contacts of those with aphasia across both calculation in Vickers (2010) was nearly double Cruice et al. (2006) and the current study, and four times that of Hilari & Northcott (2006). While a large variation in contacts was reported in the current study, this is consistent with previous studies analyzing social networks of people with aphasia.

Variation could be due to a range of factors including method of obtaining contact information (e.g., addition of pre-determined categorical contacts; open-ended nature of the social convoy model). According to Holt-Lundstad and Smith (2012), complex measures of social networks have been shown to be more predictive of outcomes such as longevity than simpler measures such as marital status of living arrangement. Nevertheless, all studies, including this study, recognize and acknowledge the reduction in number of contacts of PWA compared to healthy adults.

Defining a “Healthy” Social Network

According to Li & Zhang (2015), family focused networks, among those without aphasia, are associated with stronger psychological outcomes, while a friend-focused network is more beneficial in physical outcomes. Possessing a diverse network type, with supportive friends and family, is most beneficial. Lack of diversity or isolation can lead to increasingly poor health outcomes, and a decline in health during the natural aging process can lead to less diversified social networks. This theory can be applied to chronic illness such as aphasia. In the current study, we identified, accounting for the small *n*, a bimodal distribution in which participants #2, #3, and #4 show relatively diversified social networks, while participants #1 and #5 presented with relatively family-focused social networks (Table 8). However, utilizing the social convoy model, even with descriptive information related closeness, relationship, frequency, and type, the supportiveness or influence of those contacts is not addressed.

Table 8

Percentage of Social Network as Family vs. Friend

<i>Composition</i>	<i>Participant</i>				
	#1	#2	#3	#4	#5
Family	58%	30%	54%	47%	89%
Friends	16%	20%	45%	37%	11%

Social networks are undeniably complex and multidimensional. Evaluating solely the quantity or diversity of contacts does not account for the quality or influence of those contacts. Yet, while quality has been deemed more predictive of health outcomes, in terms of mental health and mortality, quantity is necessary to establish or maintain that quality (Antonucci et al., 2013).

According to Antonucci et al. (2013), social contacts or relationships vary in closeness (inner, middle, outer concentric circles), quality (e.g., positive, negative, affection, support, conflict, tension), function (e.g., help, affirmation), and structure (e.g., frequency,

type of contact, size of social network). Additionally, personal and situational characteristic such as gender, age, SES, race/ethnicity, and role demands can influence quality, function, and structure of relationships. This is consistent with Penn and Armstrong (2016) who considered the comorbid factors resulting in social exclusion of PWA. While language impairment can be a definite inhibiting factor, comorbidities, such as poverty, can also have a large impact on quality of life.

Li and Zhang (2015) considered how the reduction of friendships with natural aging results in less diversified social networks and poorer health outcomes. However, Antonucci and Akiyama (1987) argues that social isolation in older adults could be due to a desire to use time and energy efficiency, spending time mainly with people who are most important to them. This highlights the complicated nature, yet immense value, in interpreting social networks through the myriad of related factors, including quality and function of the relationship.

One may also hypothesize that a relationship or contact with positive influence (quality and function) results in positive outcomes and a relationship with negative influence may result in negative outcomes. However, according to Antonucci et al. (2013), this may not be the case, as qualities and functions of relationships, both positive and negative, can both foster and/or hinder health outcomes (bidirectional). Positive aspects (e.g., high levels of support) of relationships may actually hinder health, while negative aspects (e.g., demanding, critical) may foster it. For example, surprisingly, “individuals with chronic illness who reported lower levels of spousal love and were demanding and critical relationships with their spouses were less likely to die than those reporting higher levels of love and less demanding critical relationships” (Birditt & Antonucci, 2008), in Antonucci et al., 2013, (p. 87). In this current study, we did not evaluate the impact of the social relationships, rather just the

quantity and type of social network composition. It would be additionally valuable to identify the influence (positive or negative) of these social network members.

Identifying a “healthy” social network requires acknowledgement that it may not be so clearly cut (Antonucci et al., 2013). Solely identifying number of contacts, as well as relationship, frequency, and type, conveys one aspect of the individual’s social network. This is important information in better understanding the individual social network characteristics, however, it is not completely comprehensive. However, while the social convoy model recognizes the multitude of factors, it considers the variety and places them in manageable categories to analyze the information in with a comprehensive perspective, giving credence to the complexity of individual social networks. By including aspects of the social convoy model in the current study, we are able to consider closeness (concentric circles) in a meaningful and visual manner, compared to simply gathering general contacts.

Limitations

One limitation of this study is the small sample size for quantitative analysis. Statistical analysis would benefit from a larger sample size. This study is further limited by the severity of aphasia included. Participants had mild to moderate aphasia due to stroke, trauma, or tumor considered stable or improving. This research, therefore, does not include the perspectives of people with declining conditions (e.g., primary progressive aphasia) or severe aphasia.

Four of the five participants in this study were rated in the “high” category in aphasia group participation, and one participant was rated “moderate.” As participants in this study were contacted through the CVAN, it was challenging to recruit those who are less involved or participatory. All participants additionally reported a *GSES* higher than the national average, with the exception of participant #4 who scored 0.5 points below the national average. However, this did not allow for the desired diversity of the study, and the

association of differences in aphasia group participation levels and self-efficacy to other variables.

The format of self-efficacy scales was a challenge for some participants semantically and syntactically. Although statements were relatively short and presented with a visual rating scale, some participants had difficulty responding, even when read to. Self-efficacy scales may benefit from additional wording.

As mentioned, this study primarily and intentionally considered the composition of social network, not the quality or satisfaction of contacts. Antonucci et al. (2013) reminds of the multidimensional and bidirectional influence of the quality of contacts based on quality and function. While the social convoy model provides exceptionally detailed and thorough information, this study did not consider how quality and influence of contacts affects well-being.

Conclusions & Future Studies

Although this pilot study did not yield a large enough sample size or include participant variation of variables (i.e., self-efficacy, aphasia group participation) to complete more complex statistical analysis, descriptive takeaways were formed based on related studies.

Median number of contacts of PWA, with the exception of participant #2 as an outlier, was relatively similar to mean number of contacts of PWA in Cruice et al. (2006), using a similar procedure and population. In both studies PWA showed contacts more concentrated in the inner and middle circles compared to the outer circle, whereas adults without aphasia tended to share contacts more distributed across all three concentric circles. Consistent with other studies analyzing social networks of persons with aphasia (Cruice et al., 2006; Hilari & Northcott, 2006; Vickers, 2010), a wide range (9-93) of social contacts across participants were shared in the current study. Four out of five participants in the current study

(exception of participant #2) shared fewer contacts compared to the control group of healthy older adults in Cruice et al. (2006), consistent with other studies noting a decline in social contacts post onset of aphasia or compared to adults without aphasia (Vickers, 2010; Hilari & Northcott, 2006).

Participants in the current study, with the exception of participant #2, named immediate family as the largest relationship composition category. Participants tended to place immediate family in their inner circle, while friends, other relatives, and contacts associated with formal and leisure groups, neighbors, and helpers generally evenly distributed in middle and outer circles. This is consistent with Cruice et al. (2006) indicating a reduction in peripheral friendships results in the strengthening of familial relationships.

Nevertheless, it was interesting to note that all of the participants in the current study achieved a *GSES* above the national average range, suggesting self-efficacy may not impact on the reduction of all contacts. In addition, all participants were rated moderate or high aphasia group participators, yet a slim number of social contacts represented contacts formed through aphasia programing, indicating the meaningful, deep relationships intended may not be developing as strong as initially considered or desired by aphasia service programmers. However, it should be noted that aphasia groups and programing have yielded positive outcomes unrelated to social networks such as fostering positive self-identify, obtaining information about aphasia, and providing opportunity for social contact and conversational practice (Rotherham et al., 2015; Lanyon et al., 2018).

Future studies should seek to additionally consider qualitative aspects of participants social network. Simply because one has a large, diverse social network does not mean they are satisfied with that network. Emphasis should be placed on influence of social contacts and participants perceived satisfaction of social networks.

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Appendices A-L

Appendix A

General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995)

Item	1 Not at all	2 Hardly true	3 Moderately true	4 Exactly true
I can always manage to solve difficult problems if I try hard enough.				
If someone opposes me, I can find the means and ways to get what I want.				
It is easy for me to stick to my aims and accomplish my goals.				
I am confident that I could deal efficiently with unexpected events.				
Thanks to my resourcefulness, I know how to handle unforeseen situations.				
I can solve most problems if I invest the necessary effort.				
I can remain calm when facing difficulties because I can rely on my coping abilities.				
When I am confronted with a problem, I can usually find several solutions.				
If I am in trouble, I can usually think of a solution.				
I can usually handle whatever comes my way.				

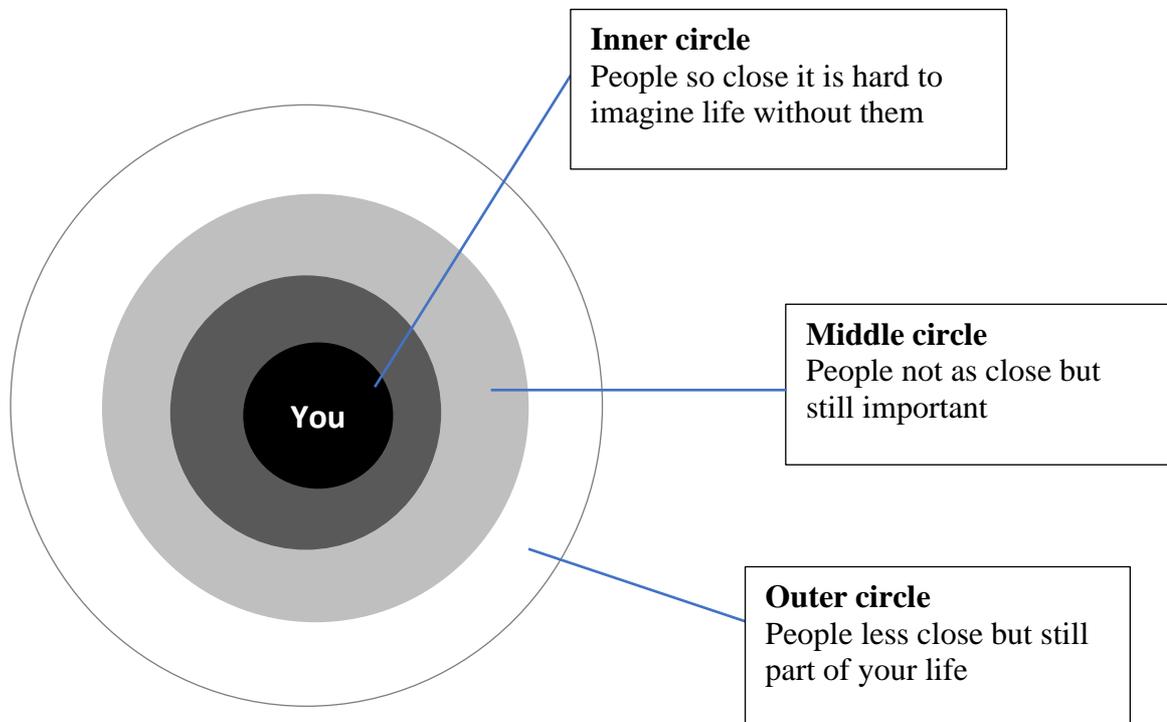
Appendix B

Social Self-Efficacy Subscale (SSES; Sherer & Maddux, 1982)

Item	0 Not at all	1 Hardly true	2 Fairly true	3 Moderately true	4 Extremely true
It is difficult for me to make new friends					
If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.					
If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.					
When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.					
I do not handle myself well in social gatherings.					
I have acquired my friends through my personal abilities at making friends.					

Appendix C

Social Network Convoy Model (Antonucci & Akiyama, 1987; Cruice et al., 2006)



Appendix D

Aphasia Participation Rubric (Miller, 2019)

	1	2	3
Attendance (Of single program with the highest attendance)	0-33%	34-66%	67-100%
Variety (Within the last 12 months)	One of the following programs: -Aphasia Camp -Aphasia Group -Aphasia Exercise -Communication Partners	Two or three of the following programs: -Aphasia Camp -Aphasia Group -Aphasia Exercise -Communication Partners	Four of the following programs: -Aphasia Camp -Aphasia Group -Aphasia Exercise -Communication Partners
Contributions (During most recently attended semester)	Does not contribute to the group's goals and purpose.	Generally contributes to the group's goals and purpose.	Often contributes to the group's goals and purpose.

Appendix E.1

American Speech Language Hearing Association National Outcomes Measures

Spoken Language Comprehension

Level 1: Individual is alert, but unable to follow simple directions or respond to yes/no questions, even with cues

Level 2: With consistent, maximal cues, the individual is able to follow simple directions, respond to simple yes/no questions in context, and response to simple words or phrases related to personal needs

Level 3: Individual usually responds accurately to simple yes/no questions. The individual is able to follow simple directions out of context, although moderate cueing is consistently needed. Accurate comprehension of more complex directions/messages is infrequent.

Level 4: Individual consistently responds accurately to simple yes/no questions and occasionally follows simple directions without cues. Moderate contextual support is usually needed to understand complex sentences/messages. The individual is able to understand limited conversations about routine daily activities with familiar communication partners.

Level 5: Individual is able to understand communication in structured conversations with both familiar and unfamiliar communication partners. The individual occasionally requires minimal cueing to understand more complex sentences/message. The individual occasionally initiates the use of compensatory strategies when encountering difficulty.

Level 6: Individual is able to understand communication in most activities, but so some limitations in comprehension are still apparent in vocational, avocational, and social activities. The individual rarely requires minimal cueing to understand complex sentences. The individual usually uses compensatory strategies when encountering difficulty.

Level 7: Individual's ability to independently participate in vocational, avocational, and social activities is not limited by spoken language comprehension. When difficulty with comprehension occurs, the individual consistently uses a compensatory strategy.

Appendix E.2

American Speech Language Hearing Association National Outcomes Measures

Spoken Language Expression

Note: This FCM should not be used for individuals using an augmentative-alternative communication system.

Level 1: The individual attempts to speak, but verbalizations are not meaningful to familiar or unfamiliar communication partners at any time.

Level 2: The individual attempts to speak, although few attempts are accurate or appropriate. The communication partner must assume responsibility for structuring the communication exchange, and with consistent and maximal cueing, the individual can only occasionally produce automatic and/or imitative words and phrases that are rarely meaningful in context.

Level 3: The communication partner must assume responsibility for structuring the communication exchange, and with consistent and moderate cueing, the individual can produce words and phrases that are appropriate and meaningful in context.

Level 4: The individual is successfully able to initiate communication using spoken language in simple, structured conversations in routine daily activities with familiar communication partners. The individual usually requires moderate cueing, but is able to demonstrate use of simple sentences (i.e. semantics, syntax, and morphology) and rarely uses complex sentences/messages.

Level 5: The individual is successfully able to initiate communication using spoken language in structured conversations with both familiar and unfamiliar communication partners. The individual occasionally requires minimal cueing to frame more complex sentences in messages. The individual occasionally self-cues when encountering difficulty.

Level 6: The individual is successfully able to communicate intelligibly in most activities, but some limitations in spoken language are still apparent in vocational, avocational, and social activities. The individual rarely requires minimal cueing to frame complex sentences. The individual usually self-cues when encountering difficulty.

Level 7: The individual's ability to successfully and independently participate in vocational, avocational, or social activities is not limited by spoken language skills. Independent functioning may occasionally include use of self-cueing

Appendix F

Modified HADS (Zigmond & Snaith, 1983)

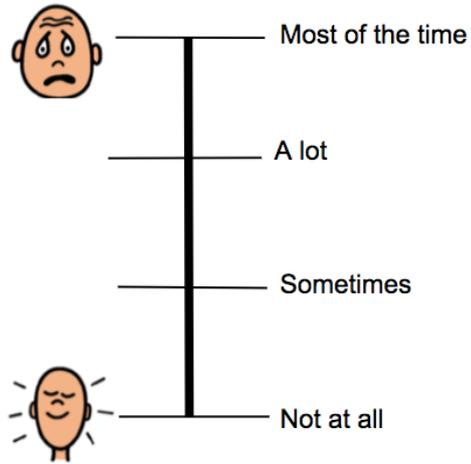
Modified *Hospital Anxiety and Depression Scale (HADS)*

Images derived from *Boardmaker (2019)*

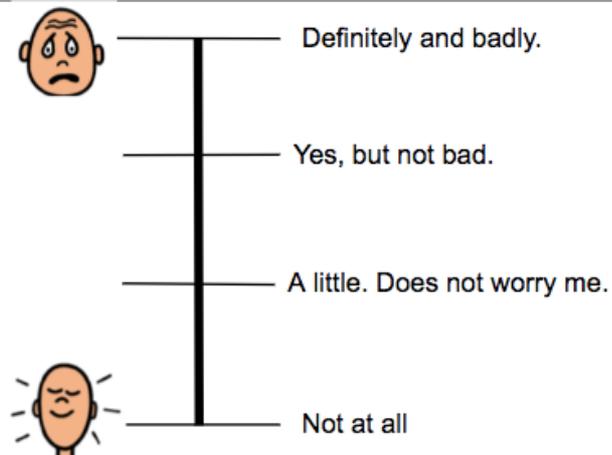
By: Bailey Miller, B.S.

- Think about the ***last week***
- ***Put line*** on scale that matches how you ***feel***
- ***14*** statements
- ***Quick reply*** is best

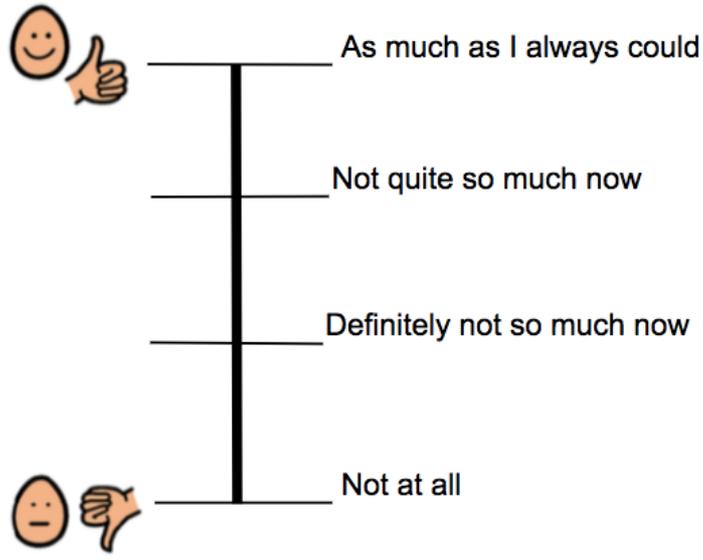
I feel *tense* or '*wound up*'



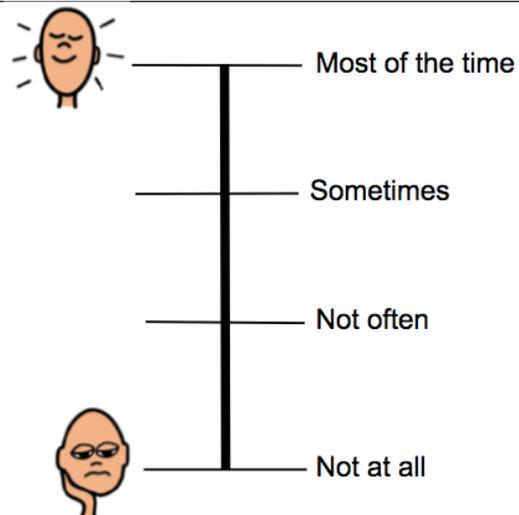
I get sort of a *frightened feeling* as if something awful is about to happen



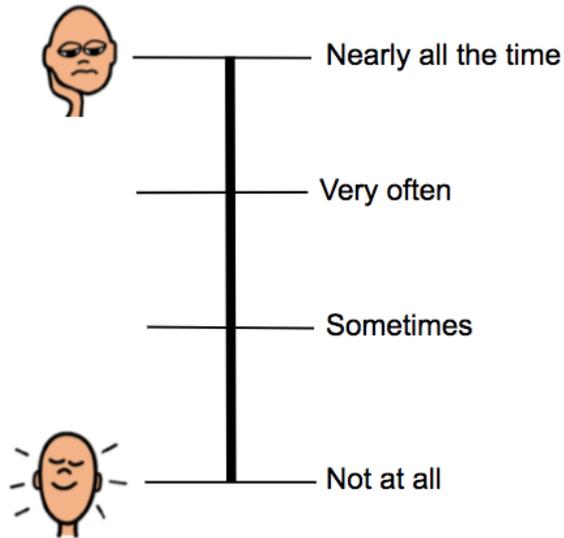
I can *laugh* and *see the funny side* of things



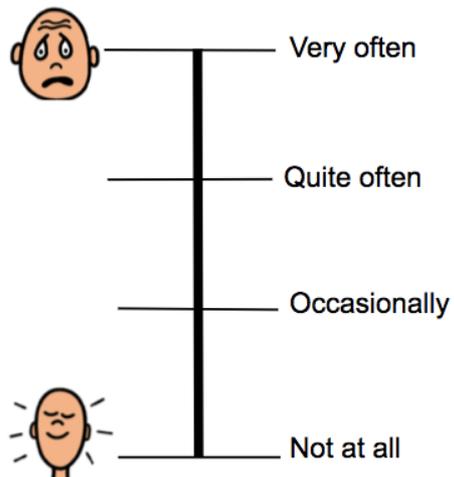
I feel *cheerful*



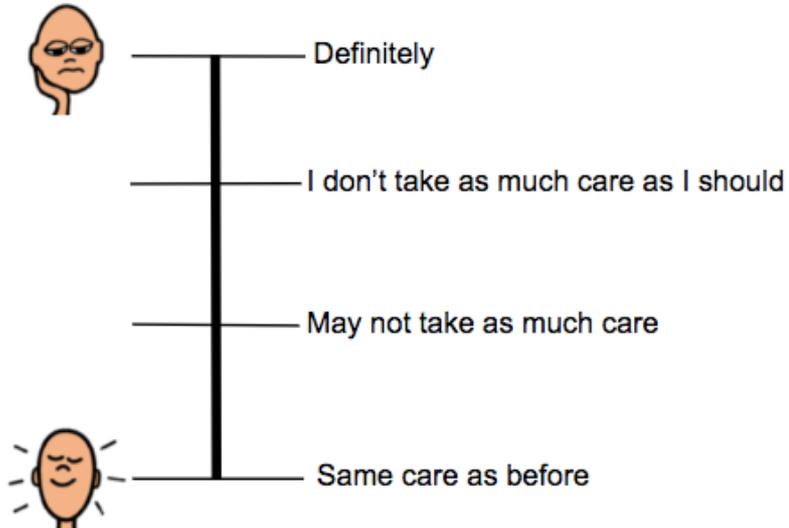
I feel as if I am **slowed down**



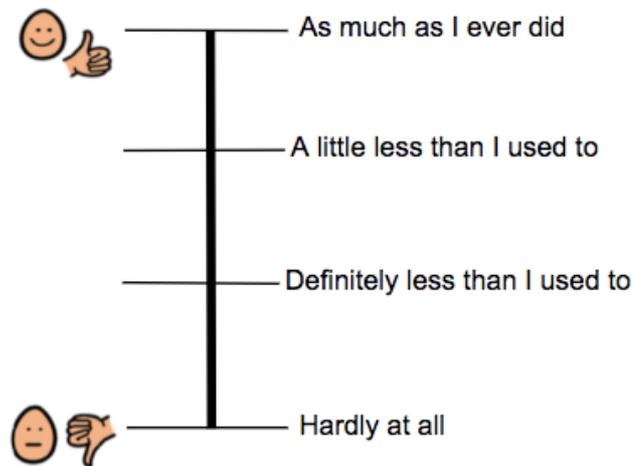
I get a sort of **frightened feeling** like 'butterflies' in the stomach



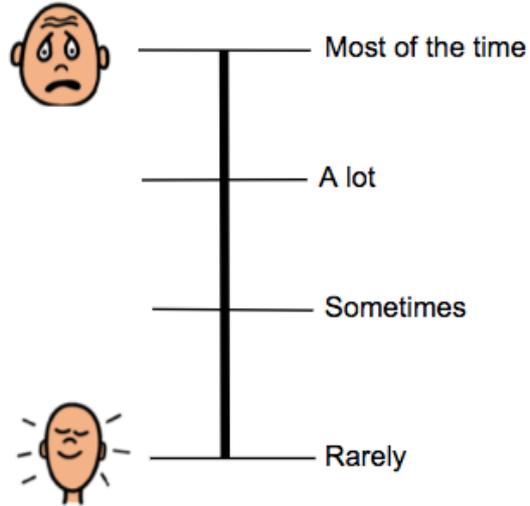
I have **lost interest** in my **appearance**



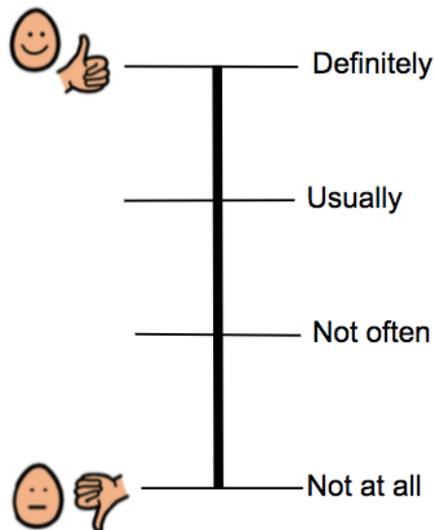
I **look forward** with **enjoyment** to things



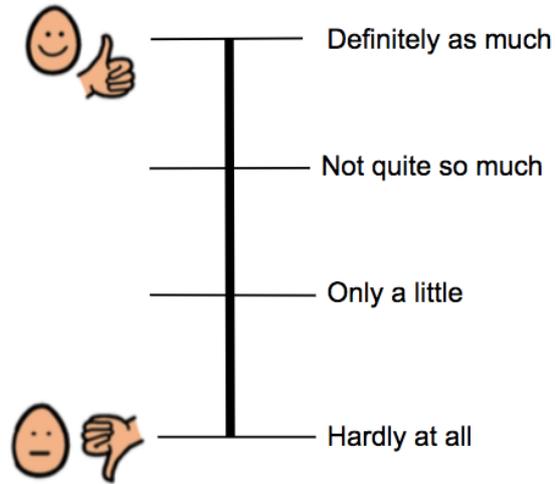
Worrying thoughts go through my mind



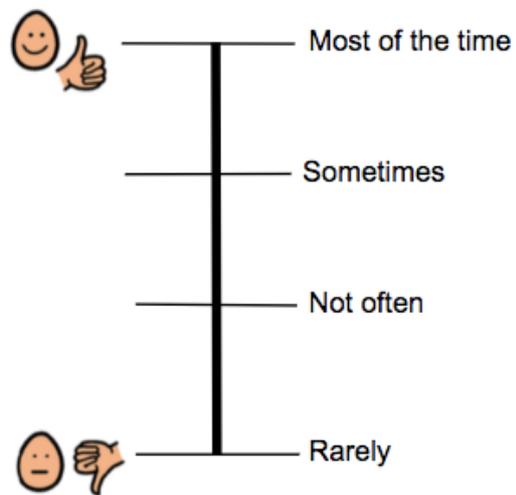
I can sit at ease and **feel relaxed**



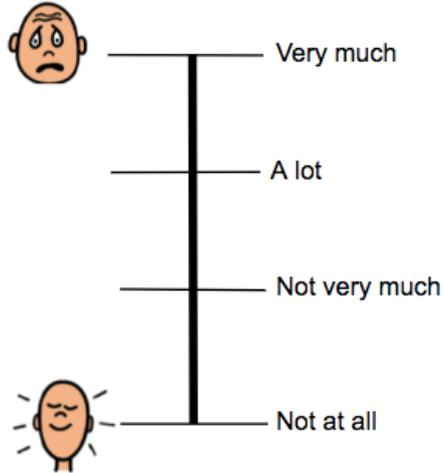
I **still enjoy** the things I used to enjoy



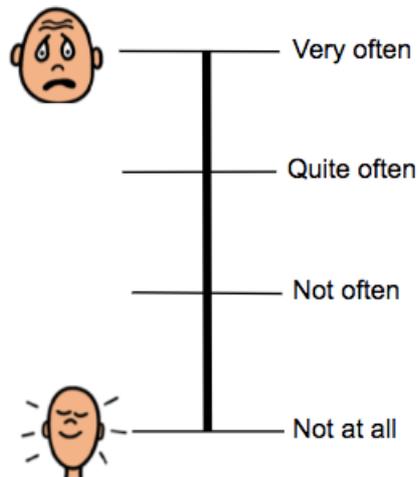
I can **enjoy** a good **book** or **radio** or **TV program**



I feel **restless** as I have to be on the move



I get sudden feelings of **panic**



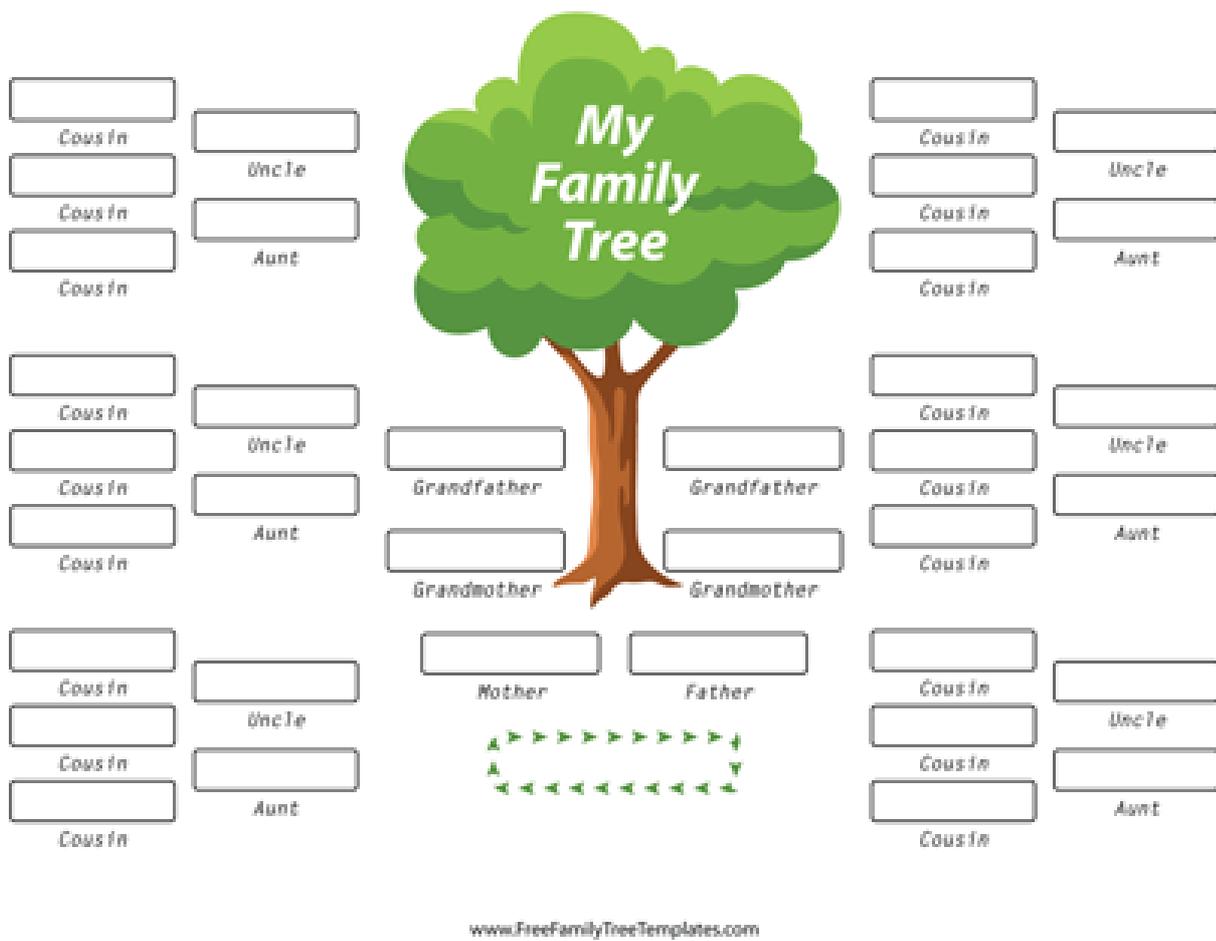
Citations

Boardmaker Online. (n.d.). Retrieved from <https://boardmakeronline.com/Activities/Search>

Hospital Anxiety and Depression Scale (HADS). (n.d.). Retrieved from <https://www.svri.org/sites/default/files/attachments/2016-01-13/HADS.pdf>

Social Network Convoy Model visual supports created by Bailey Miller (2019-20)
Supports for Type of Social Network Contact

Friends
Spouse
Father
Mother
Sister
Brother
Daughter
Son
Aunt
Uncle
Cousin
Niece or nephew
Neighbor
Organizational Colleague – club or group
Helper – health care or other
Other



Note. derived from www.freefamilytreetemplates.com

Appendix G.2

*Social Network Convoy Model visual supports created by Bailey Miller (2019-20)
 Supports for Frequency of Social Network Contact*

- Daily
- Weekly
- Monthly
- Yearly
- Rarely
- Other



Note. Derived from generalblue.com

Appendix G.3

Social Network Convoy Model visual supports created by Bailey Miller (2019-20)
Supports for Mode of Communication with Social Network Contact

Face-to-face



Telephone



Video chat



Write



Other

Appendix H

Participant #1 Scores

Modified Hospital Anxiety and Depression Scale (HADS)

Stimulus statement	Session 1	Session 2	Average score
1A. I feel tense or 'wound up.'	1	0	0.5
2D. I still enjoy the things I used to enjoy.	1	3	2
3A. I get sort of a frightened feeling as if something awful is about to happen.	0	0	0
4D. I can laugh and see the funny side of things.	0	1	0.5
5A. Worrying thoughts go through my mind.	1	1	1
6D. I feel cheerful.	0	1	0.5
7A. I can sit at ease and feel relaxed.	1	1	1
8D. I feel as if I am slowed down.	1	0	0.5
9A. I get sort of a frightened feeling like 'butterflies' in the stomach.	1	0	0.5
10D. I have lost interest in my appearance.	1	0	0.5
11A. I feel restless as I have to be on the move.	1	1	1
12D. I look forward with enjoyment to things.	0	0	0
13A. I get sudden feelings of panic.	0	0	0
14D. I can enjoy a good book or radio or TV program.	0	0	0
Total depression (D) score	3	5	4
Total anxiety (A) score	5	3	4.5

General Self-Efficacy Scale (GSES)

Stimulus Statement	
1. I can always manage to solve difficult problems if I try hard enough.	4
2. If someone opposes me, I can find the means and ways to get what I want.	3
3. It is easy for me to stick to my aims and accomplish my goals.	3

4.	I am confident that I could deal efficiently with unexpected events.	3
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	3
6.	I can solve most problems if I invest the necessary effort.	3
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	3
8.	When I am confronted with a problem, I can usually find several solutions.	4
9.	If I am in trouble, I can usually think of a solution.	3
10.	I can usually handle whatever comes my way.	3
Total GSE Score		32

Social Self-Efficacy Subscale (SSES)

Stimulus Statement	Score w/o reversal	Score w/ reversal
1. It is difficult for me to make new friends.	0	4
2. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	N/A	0
3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.	1	3
4. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	N/A	1
5. I do not handle myself well in social gatherings.	3	1
6. I have acquired my friends through my personal abilities at making friends.	N/A	2
Total SSE Score	-	11

Total Self-Efficacy Score w/ reversal **	43
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Appendix I

Participant #2 Scores

Modified Hospital Anxiety & Depression Scale (HADS)

Stimulus statement	Session 1	Session 2	Average score
1A. I feel tense or 'wound up.'	0	0	0
2D. I still enjoy the things I used to enjoy.	1	0	0.5
3A. I get sort of a frightened feeling as if something awful is about to happen.	0	0	0
4D. I can laugh and see the funny side of things.	0	0	0
5A. Worrying thoughts go through my mind.	1	0	0.5
6D. I feel cheerful.	0	0	0
7A. I can sit at ease and feel relaxed.	3	0	1.5
8D. I feel as if I am slowed down.	1	1	1
9A. I get sort of a frightened feeling like 'butterflies' in the stomach.	0	1	0.5
10D. I have lost interest in my appearance.	0	0	0
11A. I feel restless as I have to be on the move.	0	1	0.5
12D. I look forward with enjoyment to things.	0	0	0
13A. I get sudden feelings of panic.	0	0	0
14D. I can enjoy a good book or radio or TV program.	0	0	0
Total depression (D) score	2	1	1.5
Total anxiety (A) score	4	2	3

General Self-Efficacy Scale (GSES)

Stimulus Statement	
1. I can always manage to solve difficult problems if I try hard enough.	4
2. If someone opposes me, I can find the means and ways to get what I want.	3

3.	It is easy for me to stick to my aims and accomplish my goals.	3
4.	I am confident that I could deal efficiently with unexpected events.	4
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	4
6.	I can solve most problems if I invest the necessary effort.	4
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	3
8.	When I am confronted with a problem, I can usually find several solutions.	2
9.	If I am in trouble, I can usually think of a solution.	3
10.	I can usually handle whatever comes my way.	3
Total GSE Score		33

Social Self-Efficacy Subscale (SSES)

Stimulus Statement	Score w/o reversal	Score w/ reversal
1. It is difficult for me to make new friends.	0	4
2. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	N/A	3
3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.	1	3
4. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	N/A	4
5. I do not handle myself well in social gatherings.	1	3
6. I have acquired my friends through my personal abilities at making friends.	N/A	4
Total SSE Score	-	21

Total Self-Efficacy Score w/ reversal **	54
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Appendix J

Participant #3 scores

Modified Hospital Anxiety & Depression Scale (HADS)

Stimulus statement	Session 1	Session 2	Average score
1A. I feel tense or 'wound up.'	1	0	0.5
2D. I still enjoy the things I used to enjoy.	0	0	0
3A. I get sort of a frightened feeling as if something awful is about to happen.	0	0	0
4D. I can laugh and see the funny side of things.	0	0	0
5A. Worrying thoughts go through my mind.	0	0	0
6D. I feel cheerful.	0	0	0
7A. I can sit at ease and feel relaxed.	0	0	0
8D. I feel as if I am slowed down.	1	1	1
9A. I get sort of a frightened feeling like 'butterflies' in the stomach.	0	0	0
10D. I have lost interest in my appearance.	0	0	0
11A. I feel restless as I have to be on the move.	0	1	0.5
12D. I look forward with enjoyment to things.	1	0	0.5
13A. I get sudden feelings of panic.	0	0	0
14D. I can enjoy a good book or radio or TV program.	0	0	0
Total depression (D) score	2	1	1.5
Total anxiety (A) score	1	1	1

General Self-Efficacy Scale (GSES)

Stimulus Statement	
1. I can always manage to solve difficult problems if I try hard enough.	3
2. If someone opposes me, I can find the means and ways to get what I want.	4
3. It is easy for me to stick to my aims and accomplish my goals.	3

4.	I am confident that I could deal efficiently with unexpected events.	3
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	3
6.	I can solve most problems if I invest the necessary effort.	4
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	4
8.	When I am confronted with a problem, I can usually find several solutions.	4
9.	If I am in trouble, I can usually think of a solution.	3
10.	I can usually handle whatever comes my way.	3
Total GSE Score		34

Social Self-Efficacy Subscale (SSES)

Stimulus Statement	Score w/o reversal	Score w/ reversal
1. It is difficult for me to make new friends.	1	3
2. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	N/A	1
3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.	2	2
4. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	N/A	2
5. I do not handle myself well in social gatherings.	2	2
6. I have acquired my friends through my personal abilities at making friends.	N/A	1
Total SSE Score	-	11

Total Self-Efficacy Score w/ reversal **	45
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Appendix K

Participant #4 scores

Modified Hospital Anxiety & Depression Scale (HADS)

Stimulus statement	Session 1	Session 2	Average score
1A. I feel tense or 'wound up.'	1	1	1
2D. I still enjoy the things I used to enjoy.	0	0	0
3A. I get sort of a frightened feeling as if something awful is about to happen.	2	1	1.5
4D. I can laugh and see the funny side of things.	1	1	1
5A. Worrying thoughts go through my mind.	3	1	2
6D. I feel cheerful.	1.5	0	0.75
7A. I can sit at ease and feel relaxed.	1	1	1
8D. I feel as if I am slowed down.	2	1	1.5
9A. I get sort of a frightened feeling like 'butterflies' in the stomach.	2	1.5	1.75
10D. I have lost interest in my appearance.	0	0	0
11A. I feel restless as I have to be on the move.	3	2	2.5
12D. I look forward with enjoyment to things.	1	0	0.5
13A. I get sudden feelings of panic.	1	2	1.5
14D. I can enjoy a good book or radio or TV program.	0	0	0
Total depression (D) score	5.5	2	3.75
Total anxiety (A) score	13	9.5	11.25

General Self-Efficacy Subscale (GSES)

Stimulus Statement	
1. I can always manage to solve difficult problems if I try hard enough.	3
2. If someone opposes me, I can find the means and ways to get what I want.	1

3.	It is easy for me to stick to my aims and accomplish my goals.	4
4.	I am confident that I could deal efficiently with unexpected events.	3
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	3
6.	I can solve most problems if I invest the necessary effort.	3
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	3
8.	When I am confronted with a problem, I can usually find several solutions.	3
9.	If I am in trouble, I can usually think of a solution.	3
10.	I can usually handle whatever comes my way.	3
Total GSE Score		29

Social Self-Efficacy Subscale (SSES)

Stimulus Statement	Score w/o reversal	Score w/ reversal
1. It is difficult for me to make new friends.	0	4
2. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	N/A	4
3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.	3	1
4. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	N/A	1
5. I do not handle myself well in social gatherings.	0	4
6. I have acquired my friends through my personal abilities at making friends.	N/A	2
Total SSE Score	-	16

Total Self-Efficacy Score w/ reversal **	45
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Appendix L

Participant #5 scores

Modified Hospital Anxiety & Depression Scale (HADS)

Stimulus statement	Session 1	Session 2	Average score
1A. I feel tense or 'wound up.'	1	2	1.5
2D. I still enjoy the things I used to enjoy.	1	0	0.5
3A. I get sort of a frightened feeling as if something awful is about to happen.	3	2	2.5
4D. I can laugh and see the funny side of things.	0	0	0
5A. Worrying thoughts go through my mind.	1	1	1
6D. I feel cheerful.	1	1	1
7A. I can sit at ease and feel relaxed.	1	0	0.5
8D. I feel as if I am slowed down.	1	1	1
9A. I get sort of a frightened feeling like 'butterflies' in the stomach.	1	1	1
10D. I have lost interest in my appearance.	0	0	0
11A. I feel restless as I have to be on the move.	1.5	2	1.75
12D. I look forward with enjoyment to things.	0.5	0.5	0.5
13A. I get sudden feelings of panic.	2	1	1.5
14D. I can enjoy a good book or radio or TV program.	0	0	0
Total depression (D) score	3.5	2.5	3
Total anxiety (A) score	10.5	9	9.75

General Self-Efficacy Scale (GSES)

Stimulus Statement	
1. I can always manage to solve difficult problems if I try hard enough.	4
2. If someone opposes me, I can find the means and ways to get what I want.	4
3. It is easy for me to stick to my aims and accomplish my goals.	3

4.	I am confident that I could deal efficiently with unexpected events.	3
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	3
6.	I can solve most problems if I invest the necessary effort.	3
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	3
8.	When I am confronted with a problem, I can usually find several solutions.	2
9.	If I am in trouble, I can usually think of a solution.	2
10.	I can usually handle whatever comes my way.	3
Total GSE Score		30

Social Self-Efficacy Subscale (SSES)

Stimulus Statement	Score w/o reversal	Score w/ reversal
1. It is difficult for me to make new friends.	2	2
2. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.	N/A	2
3. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.	1	3
4. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.	N/A	2
5. I do not handle myself well in social gatherings.	1	3
6. I have acquired my friends through my personal abilities at making friends.	N/A	2
Total SSE Score		14

Total Self-Efficacy Score w/ reversal **	44
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