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FLOW EXPERIENCES AMONG INDIVIDUALS WITH APHASIA

by

Thomas W. Sather

A dissertation submitted to the Graduate College
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FLOW EXPERIENCES AMONG INDIVIDUALS WITH APHASIA

Thomas W. Sather, Ph.D.

Western Michigan University, 2015

Flow has been described as positive experiences of intense concentration, distorted time passage, and loss of self-consciousness. While flow has been reported for multiple populations in various settings, it has not been studied among individuals with aphasia. The purpose of this three paper dissertation is to examine flow experiences among individuals with mild aphasia, including environmental and personal factors associated with flow. Advocates of life participation approaches to aphasia stress the importance of interventions that support full engagement in life. Research on flow experiences and related environmental and personal factors may foster improved service delivery and outcomes for this population.

In Study One, eight participants at a weekend aphasia camp completed the Short Flow State Scale – 2 and ranked activities based on self-perceived flow experiences at the camp. Results of Wilcoxon-signed rank and paired *t*-tests indicate high perceptions of flow and stability of flow across ratings and ranking over the course of a weekend. In Study Two, the Experience Sampling Method was used to prompt nine participants to provide ratings of skill, challenge and environmental and personal factors associated with flow (defined operationally as high skill and high challenge ratings based on *z*-scores calculated within individuals). They used the FlowAphasia application for iOS, designed specifically for this study. Participant ratings met definitions for the quadrant experiences: apathy (31.6%), flow (27.3%), boredom (23%), and anxiety (18.1%). For Study Three, semi-structured interviews were completed with participants from Study Two and analyzed using qualitative content analysis. Results indicate that

participants experienced flow. Environmental factors that functioned as barriers to flow were coded as Mismatch of Demands, Task Characteristics, Other People, Physical Environments, and Non-stroke Related. Environmental factors that functioned as facilitators were coded as Task Characteristics, Other People, and Physical Environment. Personal factors identified as hindrances of flow included Avoidance, Emotional State, and Non-stroke Related. Personal factors identified as supports of flow included Strategic Management, Goal-directed Characteristics, Gaining Perspective, and Motivation to Help. Additionally, traits of the autotelic personality were observed in some participants. Implications and directions for future study are discussed in this dissertation.

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Thomas W. Sather

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CHAPTER 1

INTRODUCTION

This three paper dissertation provides a comprehensive examination of flow experiences among people with aphasia and the environmental barriers and facilitators to flow. Flow occurs when an individual is in an optimal balance of skill and challenge (Csikszentmihaly, 2008). During these times the individual may have a heightened sense of awareness of the task at hand and may lose track of time. When someone has this experience of increased concentration and control, it can be said that he or she is "in flow."

Opportunities for meaningful, relevant activity are desired by individuals with aphasia, but often such opportunities are limited (Dalemans, deWitte, Wade, & van den Heuvel, 2010). A better understanding of how individuals with aphasia experience flow, and the environmental factors involved in flow experiences, may promote increased opportunities for meaningful, relevant activity. The potential benefits of understanding what contributes to flow also may be applicable to individuals with aphasia. However, further study is needed regarding how individuals with aphasia experience flow and the environmental factors that are barriers and facilitators to flow. Although flow has been studied among a variety of populations, no formal studies could be found that have evaluated flow among individuals with aphasia.

The historical aspects of flow, including assessment of flow and implications of flow and aphasia, are presented within this first chapter. Three separate research studies are presented in Chapters Two through Four, evaluating characteristics of the flow experience among people with aphasia. A pilot study evaluating flow at a weekend aphasia camp is reported in Chapter Two. Chapter Three contains a study using the experience sampling method (ESM) to assess flow experiences via a portable computer application (app) in the moment among people with aphasia. Using this app, data were gathered on aspects of the flow experience throughout the course of one week. The final study, presented in Chapter Four, utilized qualitative methodology to examine environmental factors that may be barriers or facilitators to flow. Implications of the three studies are presented in Chapter Five, the final chapter of this dissertation.

Flow

The concept of flow was described originally in the 1970s by positive psychologist Mihaly Csikszentmihalyi, who expounded upon the concept throughout subsequent decades (Csikszentmihalyi, 1975; Csikszentmihalyi, 1997; Csikszentmihalyi & Lefevre, 1989). The term *flow* denotes the experience of being totally involved in the task at hand when the task challenges the user but does not overwhelm (Jackson, Eklund, & Martin, 2010). When a person experiences flow, there is typically an absence of awareness of the passage of time and a loss of self-consciousness. The concept of flow has been studied within a wide range of populations and situations, including work (Bauman & Scheffer, 2010; Csikszentmihalyi & Csikszentmihalyi, 1988), website building and online experience (Sicilia & Ruiz, 2007), elite athletic training (Jackson et al., 2010), musical training (Macdonald & Byrne, 2006) and academic learning (Peterson

& Miller, 2004). The concept of flow is associated with positive psychology (Csikszentmihalyi, 2008), and the influence of positive psychology is noted increasingly in the disability and rehabilitation literature (Dunn & Brody, 2008; Holland, 2007; Holland & Nelson, 2013). However, there is a paucity of literature with regard to the application of flow to individuals with disabilities, specifically individuals with aphasia.

A key concept of flow is the balance of task difficulty and user skills (Csikszentmihalyi, 2008). For flow to occur, a balance is required between user skill and task challenge. Flow occurs at a point in which task challenge is slightly greater than skill possessed by the user. According to flow theory, if user skill levels are too high, the result will be boredom. If task challenges are too high, the result will be anxiety. Flow occurs when the task demands of a moderate- to highly-challenging task are slightly greater than the skill the user possesses. The idea, however, that flow can be distilled into simply a balance of skill and challenge is a gross oversimplification. Flow reflects manifestations of behaviors and affective feeling (Huang, Chen-An, Sung, & Farn, 2011) and is thought to represent a complex experiential state consisting of the interaction of cognitive, motivational and emotional components along with an individual's personal characteristics (Delle Fave, Massimini, & Bassi, 2011a; Engeser & Schiepe-Tiska, 2012).

Flow, as experienced by the individual, typically involves high levels of concentration coupled with complete absorption in the task at hand, a combination of action and awareness, a loss of self-consciousness, a transformation of time and feelings of great freedom, and enjoyment and fulfillment (Bauman & Scheffer, 2010; Csikszentmihalyi, 2008;). Csikszentmihalyi (2008) identifies nine dimensions of the flow experience felt to be present in flow experiences regardless of the individual or setting in

which the flow experience occurs. Prior research suggests that the flow experience is consistent regardless of culture, socio-economic status, age or gender (Nakamura & Csikszentmihalyi, 2001). Jackson and Csikszentmihalyi (1999) concluded that there are universal qualities of flow that can occur regardless of the context. These include balance of challenge and skill, clear goals, concentration on the task at hand, loss of self-consciousness, autotelic experience (doing a task for the sake of doing the task), merging of action and awareness, clear feedback, sense of control, and change in perception of how time passes.

Benefits of Flow

There is debate regarding the benefits of experiencing flow. Positive aspects of flow may include improved life satisfaction (Csikszentmihalyi, 2008), improved happiness (Csikszentmihalyi & Lefevre, 1989), and improved disposition (Csikszentmihalyi, 2008). However, Landhauser and Keller (2012) argued that extreme caution is needed in any pursuit of analysis of potential causal consequences of flow. They postulated that the presence of other variables, including intrinsic motivation, might facilitate flow experiences even in situations of skill/challenge imbalance. They cautioned against a general acceptance of the concept of flow equating to positive consequences. They also reiterated that many questions remain unanswered regarding the flow state.

Although there remain inadequate data supporting a causal relationship between flow and positive emotion, flow is considered a positive experience that is typically associated with positive emotions including enjoyment, satisfaction and reward (Engeser

& Schiepe-Tiska, 2012). Flow activities and the accompanying emotions present during and following flow experiences have been associated with increased self-satisfaction (Freeman, Csikszentmihalyi, & Larson, 1986). These emotions may be transient or may endure for longer periods of time. Keller and Landhauser (2012) argued that the contribution of flow experiences can positively impact a person's subjective well-being and can support identity building and become sources of meaning for the individual (Delle Fave, 2009). Individuals incorporate these flow experiences into their sense of identity and sense of self (Graham, 2008). The emotions of flow experiences are not just relevant during the flow experience, but also in the time following flow experiences, where reflection and anticipation occur. There is a general consensus that flow experiences are *associated* with happiness (Csikszentmihalyi, 2008; Engeser & Rheinberg, 2008; Keller & Landhauser, 2012), and that after flow has been experienced there can be feelings of happiness, but that this is an association, not a causal relationship between flow and happiness (Csikszentmihalyi & Nakamura, 2005; Keller & Landhauser, 2012).

In addition to positive emotional states, there are also purported benefits of flow related to performance. Flow experiences are thought to be related to higher performance, although again, a causal relationship has not been identified (Engeser & Rheinberg, 2008). Changes in cortical activity during flow have been observed via fMRI (Ulrich, Keller, Hoenig, Waller, & Gron, 2013). These authors found that flow experiences were associated with left anterior inferior frontal gyrus and left putamen increases in neural activity and concluded these changes likely reflect psychological processes that map on the features of flow, including a deeper sense of cognitive control

and decreased negative arousal. These authors concluded that inducing flow experiences appears to have merit as a "promising tool" for stress reduction programs for persons with chronic stress. Landhauser and Keller (2012) cautioned against causal interpretation in performance related studies. They acknowledged studies by Jackson and Roberts (1992) as an example of association between flow experiences and performance; however, they reported that, in general, there is mixed evidence even in correlational studies regarding improved performance in flow situations.

Assessing Flow

Just as there are varied descriptors of flow, so too are there varied means to assess flow. The majority of assessment measures emphasize self-report of the individual's perceived state and environment (Delle Fave, Massimini, & Bassi, 2011a), although temporal requirements and level of detail of the flow experience vary (Moneta, 2012). Flow is often viewed as a multidimensional experience, and various studies have examined either the experience of flow as an entire entity or the sub-dimensions that influence and construct the flow experience (Shin, 2006). One challenge to flow assessment is the lack of consensus regarding how flow is operationalized in studies measuring flow.

The lack of a consensus measure of the flow experience makes study of the flow concept challenging (Martin & Jackson, 2008). Despite the lack of consensus measurement tool, methodologies for assessing flow include:

1. *Questionnaires and scales.* Questionnaires are used by the vast majority of studies measuring flow. Typically, these questionnaires measure the general or

specific life domain constructs of flow (Delle Fave, Massimini, & Bassi, 2011a). The temporal guidelines range from completion immediately following a task, to a set completion time such as at the end of a day or week. This method of flow assessment was utilized in Study 1 of this dissertation.

2. *Experience Sampling Method (ESM).* Developed by Csikszentmihalyi in the 1970s (Hektner, Schmidt, & Csikszentmihalyi, 2007), this sampling method utilizes data that are gathered when participants are "beeped" at random times throughout the day. This typically occurs several times a day, and some form of flow observation are recorded, either in free form or as part of some type of survey. This method was developed in part to counteract potential retrospective recall bias (Delle Fave, Massimini, & Bassi, 2011a). Experience Sampling Method has since become an established research method beyond the realm of flow (Myin-Germeys, et al., 2009). Hektner, Schmidt and Csikszentmihalyi (2007) opine that "while far from perfect," {ESM} is the best method for getting information on daily activities and dimensions of interest involved in these activities. This method of flow assessment was utilized in Study 2 of this dissertation.
3. *Interview, observations, and diaries*. This was the first method Csikszentmihalyi (1975) used during his initial investigations into optimal experience, and from which he derived the common experience of flow. Methods in this category range from qualitative analysis of broad journal entries to field observations of activity, performance, and perceptions. Such data-gathering techniques can be helpful in further exploration of specific populations, as well as assisting participants in

reflection on past flow experiences or lack thereof (Delle Fave, Massimini, & Bassi, 2011a). A variety of ethnographic studies (Brown, 2011; Seifert & Hedderson, 2010) have utilized observational techniques in addition to, or as substitute for, interviews or other gathering techniques. Qualitative analysis was used in Study 3 of this dissertation.

Aphasia

Concepts inherent within flow, such as a sense of control and a loss of self-consciousness may be particularly beneficial for individuals with physical, cognitive or communication limitations. Within the aphasia literature, there is a growing emphasis on the speech-language pathologist's (SLP) role not just in addressing the language aspect of aphasia recovery, but also in addressing the life effects of aphasia – that is, the impact of aphasia on an individual's participation in meaningful life activities (Kagan & Simmons-Mackie, 2007). A clinical philosophy known as the Life Participation Approach to Aphasia (LPAA) (Chapey et al., 2001) calls for a changing focus of aphasia rehabilitation and research toward a broader perspective on the consequences of aphasia. This comprehensive, holistic approach to aphasia, with an emphasis on activity, participation and the environment, meshes well with the concepts of the World Health Organization's International Classification of Functioning (WHO-ICF) (Howe, 2008; Simmons-Mackie & Kagan, 2007).

Adults with aphasia desire quality engagements in meaningful endeavors. To investigate social participation among individuals with aphasia, Dalemans, deWitte, Wade and van den Heuvel (2010) interviewed 13 people with aphasia. The authors

concluded that people with aphasia perceive the quality of engagement in activities in social/ life domains as more important than the quantity of activities (Dalemans et al., 2010). Critical in their findings is the perception that the degree of engagement is more important than the quantity or number of activities in which one is engaged. The construct of flow may parallel the experiences desired by the individual with aphasia when participating in daily activities. Flow experiences are generally accepted as positive in nature and may facilitate positive emotional states (Engeser & Schiepe-Tiska, 2012). Indirect benefits of flow experiences may include enhanced subjective well-being (Moneta, 2004) increased personal development (Csikszentmihalyi & Csikszentmihalyi, 1988) and an association between flow experiences and positive affect (Csikszentmihalyi & Lefevre, 1989). Landhauser and Keller (2012), while acknowledging the coinciding of flow conditions and flow experiences with positive emotional affect, emphasize that this relationship is often mediated by factors relating to the situation and the individual. Individuals with aphasia have a high prevalence of depression (Kauhanen et al., 2000) and the experiences of positive emotional states may be beneficial. However, Landhauser and Keller (2012) caution against the interpretation of a causal relationship between flow and positive wellbeing, and urge further study before definitive statements are made regarding the benefits of flow.

International Classification of Functioning, Disability, and Health (ICF)

The World Health Organization's International Classification of Functioning, Disability and Health (ICF) is a framework that conceptualizes the interaction of an individual's health condition with environmental and personal factors (WHO, 2013). There are two primary divisions of the ICF. The first division encompasses Functioning

and Disability and includes Body Functions/Structures as well as Activity/Participation. The second division encompasses Contextual Factors, and includes Environmental Factors and Personal Factors.

Environmental factors are a part of the ICF and include the impact of the physical, social and attitudinal aspects of the environment that may influence functioning (WHO, 2013). Environmental factors may be positive (facilitators) or negative (barriers) to the individual's interaction and participation (Threats, 2007). Threats (2007) emphasized the importance of not just identifying barriers and removing those barriers within the environment, but acknowledging the equal importance of increasing environmental facilitators.

The ICF model has been used as a framework for a multitude of services, from diabetic care to cancer care to stroke rehabilitation. The framework is also useful when evaluating services and options for individuals with aphasia and their families. As a framework for aphasia rehabilitation and to better understand the needs and wants of individuals with aphasia and their family members, Worrall et al. (2011) interviewed 50 individuals with aphasia using semi-structured in-depth interviews. The authors utilized the ICF framework in their review of responses and identified goal areas across the ICF framework, not just isolated to one specific area of the framework. They concluded that the majority of goals could be linked to Activities and Participation, followed by Environmental Factors, Body Functions and Structures, and Personal Factors. Although the concept of environmental factors is typically underrepresented, there has been increased attention (Grawburg, Howe, Worrall, & Scarinci, 2013; Worrall & Hickson, 2008) to the role of environmental factors and aphasia. Environmental factors are

prominent in the desired goal areas of individuals with aphasia and thus warrant the practitioner's careful consideration for intervention planning.

Participation and Aphasia

One of the many effects of aphasia on an individual's life is reduced social interaction and reduced participation in life activities (Code, Hemsley, & Herrmann, 1999; Davidson, Howe, Worrall, Hickson, & Togher, 2008). Several studies have shown that the environment with which the individual with aphasia interacts has an impact on participation, satisfaction and interaction. In a series of research studies, Howe, Worrall and Hickson interviewed (2008a) and observed (2008b) people with aphasia to evaluate environmental factors that influenced community participation. In their 2008a study, Howe, Worrall and Hickson conducted in-depth, semi-structured interviews to gather participant perceptions regarding community places, and environmental factors that made it easier or harder to participate in these places. In their 2008b study, these same authors used participant observation methods to observe people with aphasia in at least two events of participation that were perceived to be of different difficulty levels by the person with aphasia. In both studies, specific categories of environmental factor barriers and facilitators were identified as influencing participation. Brown, Worrall, Davidson and Howe (2010) used semi-structured in-depth interviews with participants who had aphasia and were at least two years post-stroke, and reviewed adjunct photographs taken by participants pertaining to living successfully with aphasia. The authors identified four core themes that related to living successfully with aphasia: doing things; meaningful relationships; striving for a positive way of life; and communication (Brown, Worrall,

Davidson, & Howe, 2010). For people with aphasia in this study, "doing things" was attributed to a sense of independence; ability and achievement; purpose or usefulness; pleasure and wellbeing; and stimulation for the brain (Brown, Worrall, Davidson, & Howe, 2010).

Environmental factors that impact communication access for individuals with aphasia has been studied in a variety of contexts. Simmons-Mackie et al. (2007) studied communication access within three healthcare settings: acute care, rehabilitation, and long-term care. They identified barriers and facilitators to both communication access and to implementing change in communication access within these settings. Consistent with the design of the environmental factors portion of the ICF, certain factors may function as either barriers or facilitators, or to some degree, both. For example, in the Simmons-Mackie et al. (2007) study, the factor of *time* was identified as both a facilitator and a barrier, depending upon the amount of *time* available to staff. In settings in which there was perceived to be more time allotted for program development and implementation, the researchers found the most positive change had occurred and thus *time* functioned as a facilitator. In settings in which there was the least amount of time, there were the fewest positive changes, and thus *time* functioned as a barrier. Additionally, facility-specific barriers and facilitators were identified, with implications for site-specific training to address these. Such an approach to the study of the environment, through analysis of both barriers and facilitators, is consistent with the ICF Environmental Factors structure, and is relevant to the study of flow environments.

Flow and Aphasia

Although flow has been mentioned in the aphasia literature (Holland & Nelson, 2013; Lyon, 2000; Lyon, et al., 1997), it has not been studied in depth among individuals with aphasia. Thus, it remains unclear how people with aphasia interpret flow concepts and flow experiences. It is theorized that a better understanding of how people with aphasia experience flow, and the factors associated with flow experiences among individuals with aphasia, may create a better understanding of environmental factors and supportive environments which facilitate flow for those with aphasia.

Linguistic limitations that are definitive of aphasia may complicate the use of the flow concept with individuals with aphasia. However, the universality of flow descriptions and constructs among a wide range of groups support the application of the flow concept to a variety of populations (Csikszentmihalyi & Nakamura, 2005). Research is needed to establish whether this includes people with aphasia. Based on his clinical experiences with individuals with aphasia, Lyon (2000) opined that, regardless of skill level, achievement of flow is possible. Lyon et al. (1997), when describing their clinical experience with a treatment program entitled *Communication Partners*, provided the following clinical anecdote, writing that the program was most effective when:

> …adults with aphasia became so immersed in the act of doing that they momentarily lost all sense of themselves. What evolved was a diminished awareness of one's disabled self. These adults become so absorbed in what they were doing that they forgot their typical preoccupation with matters of 'self,' where they were, or even what the outcome might be. As a key component to treatment, these adults appeared to temporarily suspend any awareness that they were communicatively disabled. (p. 703)

Engagement

In discussions of flow, the construct of *engagement* is typically discussed as well. The experiences of flow and engagement share some characteristics, and it appears that flow may be an indicator of engagement. That is, flow perceptions appear to be a representation of engagement, although definitions become somewhat circular. Part of the problem is that there is little consensus for a definition of the term *engagement* or the concept it represents (MacDonald, Kayes, & Bright, 2013; Tetley, Jinks, Huband, & Howells, 2011). Duchan (2009) devoted an entire paper to the concept of engagement, the usefulness of the construct, and how it may influence supports in place for individuals with communication disabilities. She wrote that the term *engagement* is semantically similar to, and supplanted by terms such as *involvement, inclusion* and *participation;* contrasting with opposite terms, such as *alienation, distancing, isolation, loneliness, withdrawal* (Duchan, 2009). Additionally the term *engagement*, similar to *involvement*, can be "used to convey a feeling of being drawn into and having connection with an activity" (Duchan, 2009, p. 12). In a series of interviews with SLP aphasia group staff and with individuals with aphasia in the United Kingdom, Duchan (2009) found that clinicians emphasized the importance of creating a climate for engagement within their aphasia groups, and that planning was crucial to ensure experiences that were accessible, respectful, interesting and supportive.

In studies of elderly populations without aphasia, Rowe and Kahn (1997) identify three components of successful aging: low probability of disease and disease-related disability, high cognitive and physical functional capacity, and active engagement with life. With regard to the component of active engagement with life, the authors identify

two main subcategories: maintenance of interpersonal relations, and maintenance of productive activities. It is through a combination of involvement in both of these subcategories, that successfully aging elders maintain active engagement in life.

Simmons-Mackie and Kovarsky (2009) defined engagement as "the level of interpersonal involvement displayed by participants in social situations or interactive activities" (p. 6). These authors identified the need for, and benefits of, a better understanding of successful interactions, especially studies of engagement in those with acquired communication disorders. They identified multiple reasons for the study of engagement, one of which being the importance of engagement as it relates to participation in social life. Those authors wrote, "With a greater understanding of the global and local influences on engagement in communicative interactions, we are in a better position to help reduce barriers to full engagement" (p. 9).

From a rehabilitation perspective, Lequerica and Kortte (2010) defined engagement as "a deliberate effort and commitment to work toward the goals of rehabilitation interventions, typically demonstrated through active, effortful, participation in therapies and cooperation with treatment providers" (p. 416). MacDonald, Kayes and Bright (2013) completed a systematic review with thematic analysis to explore the current knowledge base relating to perceived barriers and facilitators relating to engagement in stroke rehabilitation. Of the 1,597 articles identified using their original search terms, 17 articles were identified as meeting inclusion criteria for purposes of their review. Their review identified several factors that may help or hinder engagement in stroke rehabilitation depending on their presence, including: goal setting, therapeutic connection, personalized rehabilitation, patient centered practice, knowledge, feedback,

and achievement. Several of these themes parallel the original components of flow identified by Csikszentmihalyi, including the presence of clear goals, feedback, and control. MacDonald, Kayes and Bright (2013) concluded with an emphasis on the importance of a deeper understanding of engagement as a potential means to enhance the rehabilitation process for both the provider and the patient.

Challenges to Measuring Flow Among Individuals with Aphasia

Among the challenges with regard to measuring flow and the potential implications of flow for people with aphasia is the linguistic complexity and abstract nature required to explain the flow concept. Describing flow, delineating the makeup of what might or might not be a flow experience, describing what it is, and what it is not, certainly is challenging both linguistically and conceptually. A premise investigated across this series of three studies is that interpreting and communicating about these concepts in the presence of a language disorder may be difficult, but not impossible.

An Overview of the Three Studies

The pursuit and experience of flow in daily life has the potential to add meaning, understanding, and an enhanced sense of identity and wellbeing. Individuals with aphasia have expressed interest in goals and activity with a high degree of engagement and meaning (Dalemans, deWitte, Wade, & van den Heuvel, 2010). There has been an increased emphasis from aphasiologists to address all aspects of life impacted by aphasia, not just specifically verbalization. The Life Participation Approach to Aphasia (LPAA) (Chapey et al., 2001) is a consumer-driven approach to aphasia rehabilitation that

supports, encourages and facilitates participation in life among those impacted by aphasia. The LPAA emphasizes re-engagement in life through daily participation in activities that are identified by the individual with aphasia as meaningful and important. Flow experiences and the associated benefits may facilitate participation and may be associated with quality opportunities for individuals with aphasia. Designing environments that support, promote and facilitate flow may lead to greater opportunities for such experiences. However, before one can begin to design and structure environments that may facilitate flow, a better understanding is needed of the environmental factors that facilitate flow in individuals with aphasia. People with aphasia often doubt the benefits of, and their ability to engage in, well-developed and well-designed opportunities for challenge (Lyon, 2000). Thus, they need to be provided opportunities for such experiences within a well-designed environment. The chapters that follow contain a detailed assessment of flow perceptions by individuals with aphasia. A better understanding of flow perceptions and the environments that facilitate flow experiences for individuals with aphasia will assist in developing optimal environments with potential for flow.

Chapter Two is a report of a pilot study designed to evaluate flow experiences of participants with aphasia at a weekend aphasia camp. Flow perceptions were assessed using a self-rating questionnaire immediately after completion of a self-selected activity, and again in reflection at the end of the camp weekend. Results and implications are discussed as they relate to the specific camp environment and those in attendance. This study provides a framework for the study of flow in a specific, aphasia-friendly

environment and contributes an initial discussion of flow perceptions among individuals with aphasia.

Chapter Three reports a study utilizing the Experience Sampling Method (ESM) via a custom-designed iPod app to gather flow perceptions from individuals with aphasia throughout the course of a week. Participants were randomly prompted via the app six times per day over the course of the week. At each prompt, participants were asked to input information regarding flow perceptions as well as the presence of communication supports and characteristics of their surrounding environment. The data were analyzed for frequency of flow experiences as well as the relationship of environmental barriers and facilitators to flow experiences. This study enhances knowledge and understanding of flow as experienced by individuals with aphasia over the course of their typical daily activities. Additionally, this study uses aspects of the ICF framework to evaluate environmental factors that may contribute to reports of components that represent flow experiences. Subsequently, this study may help to identify environmental characteristics that are optimal for supporting flow experiences.

Chapter Four is a qualitative analysis of semi-structured interviews with participants from the Chapter Three study. Categories of barriers and facilitators to flow experiences were identified and discussed as well as flow experiences as perceived by those individuals with aphasia. These interviews may provide input toward environmental design that facilitates flow, as well as the potential perceived benefits or lack thereof, in awareness of flow and engaging in experiences.

This dissertation concludes with Chapter Five, an integration of the data and information gleaned through the quantitative and qualitative methods described above.

Implications for aphasia rehabilitation as well as environmental factors conducive to flow experiences are discussed as is the role of flow in the lives of individuals with aphasia.

References

Bauman, N., & Scheffer, D. (2010). Seeing and mastering difficulty: The role of affective change in achievement flow. *Cognition and Emotion, 24*(8).

Brown, J. (2011). In the zone: An authoethnographic study exploring the links between flow and mindfulness for a piano accompanist. *Studies in Learning, Evaluation, Innovation and Development, 8*(2), 83-95.

Brown, K., Worrall, L., Davidson, B., & Howe, T. (2010). Snapshots of success: An insider perspective on living successfully with aphasia. *Aphasiology*, *24*(10), 1267-1295.

Chapey, R., Duchan, J., Elman, R., Garcia, L., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2001). Life participation approach to aphasia: A statement of values for the future. In R. Chapey, *Language intervention strategies in aphasia related neurogenic communication disorders, 4th Edition.* Philadelphia: Lippincott, Williams and Wilkins.

Code, C., Hemsley, G., & Herrmann, M. (1999). The emotional impact of aphasia. *Seminars in Speech and Language, 20,* 19-31.

Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1997). *Finding Flow: The psychology of engagement with everyday life.* New York: BasicBooks, Harper Collins.

Csikszentmihalyi, M. (2008). *Flow: The psychology of optimal experience.* New York: Harper Perennial.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal Experience.* Cambridge: Cambridge University Press.

Csikszentmihalyi, M., & Lefevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*(5), 815-822.

Csikszentmihalyi, M., & Nakamura, J. (2005). The concept of Flow. In C. Snyder, & S. Lopez, *Oxford Handbook of Positive Psychology.* New York: Oxford University Press, Inc.

Dalemans, R., deWitte, L., Wade, D., & van den Heuvel, W. (2010). Social participation through the eyes of people with aphasia. *International Journal of Language and Communication Disorders, 45*(5), 537-550.

Davidson, B., Howe, T., Worrall, L., Hickson, L., & Togher, L. (2008). Social participation for older people with aphasia: The impact of comunication disabilty on friendships. *Topics in Stroke Rehabilitation, 15*(4), 235 - 340.

Delle Fave, A. (2009). Optimal experience and meaning: Which relationship? *Psychological Topics, 18*(2), 285-302.

Delle Fave, A., Massimini, F., & Bassi, M. (2011). Instruments and methods in flow research. *Psychological Selection and Optimal Experience Across Cultures, 2*, 59-87.

Duchan, J. (2009). Engagement: A concept and some possible uses. *Seminars in Speech and Language*, 30 (1), 11-17.

Dunn, D., & Brody, C. (2008). Defining the good life following acquired physical disability. *Rehabilitation Psychology, 53*(4), 413-425.

Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion, 32*, 158-172.

Engeser, S., & Schiepe-Tiska, A. (2012). Historical lines and an overview of current research on flow. In S. Engeser, *Advances in Flow Research* (pp. 1-22). Heidelberg: Springer.

Freeman, M., Csikszentmihalyi, M., & Larson, R. (1986). Adolescence and its recollection: Toward an interpretive model of development. *Merrill-Palmer Quarterly,* 167-185.

Graham, J. (2008). Self-expansion and flow in couples' momentary experiences: An experience samplying study. *Journal of Personality and Social Psychology, 95*(3), 679-694.

Grawburg, M., Howe, T., Worrall, L., & Scarinci, N. (2013). Describing the impact of aphasia on close family members using the ICF framework. *Disability and Rehabilitation, 36* (14), 1184-1195.

Hektner, J., Schmidt, J., & Csikszentmihalyi, M. (2007). *Experience Sampling Method: Measuring the quality of everyday life.* Thousand Oaks: Sage Publications.

Holland, A. (2007). Counseling/Coaching in chronic aphasia. Getting on with life. *Topics in Language Disorders, 27*(4), 339-350.

Holland, A., & Nelson, R. (2013). *Counseling in Communication Disorders: A wellness perspective* (2nd Edition ed.). San Diego: Plural Publishing.

Howe, T. (2008). The ICF Contextual factors related to speech-language pathology. *International Journal of Speech-Language Pathology, 27*(4), 27-37.

Howe, T., Worrall, L., & Hickson, L. (2008a). Interviews with people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22:10,* 1092-1120.

Howe, T., Worrall, L., & Hickson, L. (2008b). Observing people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22:6,* 618-643.

Huang, L., Chen-An, C., Sung, K., & Farn, C. (2011). A comparative study on the flow experience in web-based and text-based interaction environments. *Cyberpsychology, Behavior and Social Networking, 14*(1-2), 3-11.

Jackson, S., & Csikszentmihalyi, M. (1999). *Flow in sports.* Champaign: Human Kinetics.

Jackson, S., & Roberts, G. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. *The Sport Psychologist, 6,* 156-171.

Jackson, S., Eklund, B., & Martin, A. (2010). *The FLOW Manual: The Manual for the Flow Scales.* Mindgarden, Inc. Secured online 12/7/10.

Kagan, A. (1998). Supported conversation for adults with aphasia: Methods and resources for training conversation partners. *Aphasiology, 12*(9), 816-830.

Kagan, A., & Simmons-Mackie, N. (2007). Beginning with the end: Outcome-driven assessment and intervention with life participation in mind. *Topics in Language Disorders, 27*(4), 309-317.

Keller, J., & Landhauser, A. (2012). The flow model revisited. In S. Engeser, (Ed.), *Advances in Flow Research* (pp. 51-64). New York: Springer.

Landhauser, A., & Keller, J. (2012). Flow and its affective, cognitive, and performance-related consequences. In S. Engeser, (Ed.), *Advances in Flow Research* (pp. 65-85). New York: Springer.

Lequerica, A., & Kortte, K. (2010). Therapeutic engagement: A proposed model of engagement in medical rehabilitation. *American Journal of Physical Medicine and Rehabilitation, 89*, 415-422.

Lyon, J. (2000). Finding, defining, and refining functionality in real life for people confronting aphasia. In L. Worrall, & C. Frattalli, (Ed.), *Neurogenic Communication Disorders: A functional approach* (pp. 137-161).

Lyon, J., Cariski, D., Keisler, L., Rosenbek, J., Levine, R., Kumpula, J., . . . Blanc, M. (1997). Communication partners: Enhancing participation in life and communication for adults with aphasia in natural settings. *Aphasiology, 11*(7), 693-708.

MacDonald, G., Kayes, N., & Bright, F. (2013). Barriers and facilitators to engagement in rehabilitation for people with stroke: a review of the literature. *New Zealand Journal of Physiotherapy, 41*(3), 112-121.

Macdonald, R., & Byrne, C. (2006). Creativity and flow in musical composition: an empirical investigation. *Psychology of Music, 34*(3), 292-306.

Martin, A., & Jackson, S. (2008). Brief approaches to assessing task absoprtion and enhanced subjective experience: Examining 'short' and 'core' flow in diverse performance domains. *Motivation and Emotion, 32*, 141-157.

Moneta, G. (2012). On the measurement and conceptualization of flow. In S. Engeser, (Ed.), *Advances in Flow Research* (pp. 23-50). Springer.

Myin-Germeys, I., Oorschot, M., Collip, D., Lataster, J., Delespaul, P., & van Os, J. (2009). Experience sampling research in psychopathology: opening the black box of daily life. *Psychological Medicine, 39*(9), 1533-1547.

Nakamura, J., & Csikszentmihalyi, C. (2001). The Concept of Flow. In C. Wright, & S. Lopez, (Eds.), *Handbook of Positive Psychology.* Oxford University Press.

Peterson, S., & Miller, J. (2004). Comparing the quality of students' experiences during cooperative learning and large-group instruction. *The Journal of Educational Research, 97*(3), 123-134.

Rowe, J., & Kahn, R. (1997). Successful aging. *The Gerontologist, 37*(4), 433 - 440.

Seifert, T., & Hedderson, C. (2010). Intrinsic motiviation and flow in skateboarding: An ethnographic study. *Journal of Happiness Studies, 11*, 277-292.

Shin, N. (2006). Online learners 'flow' experience: an empirical study. *British Journal of Educational Technology, 37*(5), 705-720.

Sicilia, M., & Ruiz, S. (2007). The role of flow in website effectiveness. *Journal of Interactive Advertising, 8*(1), 33-44.

Simmons-Mackie, N., & Kagan, A. (2007). Application of the ICF in aphasia. *Seminars in Speech-Language Pathology, 28*(4), 244-253.

Simmons-Mackie, N., & Kovarsky, D. (2009). Engagement in clinical interaction: An introduction. *Seminars in Speech and Language, 30*, 305-310.

Simmons-Mackie, N., Kagan, A., Christie, C., Huijbregts, M., McEwen, S., & Willems, J. (2007). Communicative access and decision making for people with aphasia: Implementing sustainable healthcare systems change. *Aphasiology, 21*(1), 39-66.

Tetley, A., Jinks, M., Huband, N., & Howells, K. (2011). A systematic review of measures of therapeutic engagement in psychosocial and psychological treatment. *Journal of Clinical Psychology, 67*(9), 927-941.

Threats, T. (2007). Access for persons with neurogenic communication disorders: Influences of Personal and Environmental factors of the ICF. *Aphasiology, 21:1,* 67-80.

Ulrich, M., Keller, J., Hoenig, K., Waller, C., & Gron, G. (2013). Neural correlates of experimentally induced flow experiences. *NeuroImage, 86,* 194-202.

WHO. (2013). *How to use the ICF: A practical manual for using the International Classifcation of Functioning, Disability and Health (ICF). Exposure draft for comment.* Geneva: World Health Organization.

Worall, L., Sherratt, S., Rogers, P., Howe, T., Hersh, D., Ferguson, A., & Davidson, B. (2011). What people with aphasia want: Their goals according to the ICF. *Aphasiology*, *25*(3), 309-322.

Worrall, L., & Hickson, L. (2008). The use of the ICF in speech-language pathology research: Towards a research agenda. *International Journal of Speech-Language Pathology*, *10*(1-2), 72-77.

CHAPTER 2

THE CONCEPT OF FLOW IN APHASIA—A PILOT STUDY

The concept of flow, which was described and named in the 1970s by positive psychologist Mihaly Csikszentmihalyi (Delle Fave, Massimini, & Bassi, 2011), refers to the absorbing nature of certain experiences. Flow occurs when one is totally involved in the task at hand and when the task challenges the individual but does not overwhelm. Csikszentmihalyi (2008) identified nine dimensions characterizing flow as follows: balance of challenge and skill, clear goals, concentration on the task at hand, loss of self-consciousness, autotelic experience (doing a task for the sake of doing the task), merging of action and awareness, clear feedback, sense of control, and change in perception of how time passes.

Flow has been studied across multiple populations including elite athletes (Jackson, Eklund, & Martin, 2010), employee work settings (Csikszentmihalyi & Csikszentmihalyi, 1988), artists (Csikszentmihalyi, 1997) and website users (Sicilia & Ruiz, 2007). Flow experiences are typically universal with characteristics of flow described similarly by multiple populations across settings (Csikszentmihalyi, 2008).

While flow has been studied in a variety of populations, it has not been explicitly studied among individuals with aphasia. Aphasia pervades many aspects of life beyond solely communication abilities. Individuals with aphasia often have reduced levels of participation (Chapey et al., 2001), high prevalence of depression (Kauhanen, et al.,

2000), and reduced social networks (Ross & Wertz, 2003). Although research has not yet shown a direct causal link between flow and positive emotion (Landhauser & Keller, 2012), flow experiences are typically associated with positive emotions such as enjoyment, satisfaction, and reward (Engeser & Schiepe-Tiska, 2012). Additionally flow experiences are typically associated with happiness (Csikszentmihalyi, 2008; Landhauser & Keller, 2012). Thus the positive emotions associated with flow may be especially relevant to those with aphasia. Additionally, flow experiences inherently involve a distorted passage of time such that time is experienced to pass quickly, and there is often a reduced awareness of one's own self-consciousness. Such experiences may present opportunities to "forget" about aphasia. Because research on flow perceptions of individuals with aphasia has not been reported, little is known about the impact, perceptions, and importance of flow in the lives of those affected by aphasia. A better understanding of perceptions of flow among individuals with aphasia may create a better understanding of environmental factors and supportive environments that facilitate flow for individuals with aphasia.

Several factors may influence the usefulness and application of flow constructs among individuals with aphasia. One factor is whether people with aphasia, who, by definition, have language difficulties, can demonstrate that they have understood the concept of flow, which is generally explained in linguistic terminology that is somewhat abstract. Evidence for comprehension of the construct of flow might be established by first having people rate flow variables after completing certain activities. These ratings of activity could then occur following a set passage of time (end of day, end of week, etc.). Subsequently, these ratings could be reviewed for variability, and could be

examined for stability of their flow ratings over time to determine whether flow ratings were fleeting perceptions or stable across time. Variability across activities could support the hypothesis of validity of the flow construct as discerned by participants with aphasia. Consistency of flow ratings over time (immediately and after time passage) could support the ability of people with aphasia to assign flow ratings that are reliable across periods of time.

In addition to consistency over time, another factor relating to the usefulness and application of flow constructs among individuals with aphasia is the degree of variance and discrimination across a variety of activities. In theory, not all activities facilitate flow to an equal degree. Different activities may present different opportunities for flow, depending on the complex interaction of variables such as the individual's personality, levels of motivation, the environment, the activity itself, and the person's prior experiences. Thus one would expect that flow perceptions would vary across activities if the construct has meaning for the individual. A lack of discriminability in flow perceptions across activities might be indicative of a diminished understanding of the flow concept or an overgeneralization of what flow is or is not. Again however, there are no published research reports of flow perceptions among individuals with aphasia.

Aphasia can be associated with stroke sequelae that present as physical limitations as well as language limitations. That is, participants who have aphasia may or may not have motor impairments such as hemiparesis. Thus, in addition to potential language changes status post stroke with aphasia, the individual may also have motor changes as well. With regard to variance or discriminability among flow ratings for people with aphasia, there may be a tendency for ratings to differ depending on the type of activity

and whether the activity is more physically demanding or sedentary, perhaps making it more mentally demanding. Such a variable might be particularly important for people who have motor difficulties as a consequence of stroke, even if they are mild. Studies among individuals without aphasia have supported that physically active tasks enhance mood states (Blair, 2009; DiLorenzo, et al., 1999; Warburton, Nicol, & Bredin, 2006), and the opportunities for flow within physical activity have been discussed by multiple authors, including Jackson and Csikszentmihalyi (1999). Although flow opportunities are present in physical activities, Jackson and Csikszentmihalyi (1999) concluded that the presence or absence of physical activity did not directly impact the perception of flow among their participants (none of whom had aphasia). The exploration of physical demands and how that may impact flow experiences factors may lead to a greater understanding of how individuals with aphasia perceive flow. There may be a greater propensity for flow experiences in activities that may, for example, have greater motor demands versus language demands, or vice versa.

Unique to the present study is the setting. This study took place at a weekend camp that is designed to provide a supportive environment to facilitate participation and communication of people with aphasia, regardless of degree of aphasia. The camp is staffed by speech-language pathologists and trained volunteer staff who are skilled at interacting with people with aphasia. The purpose of the camp is to provide opportunities for participation, to develop and nurture relationships and to support communication and conversation (Clark, Hoepner, & Sather, 2015). Principles of camp are largely influenced by the Life Participation Approach to Aphasia (LPAA) (Chapey, et al., 2001). Within the camp, activities take place based on participant preference. All activities are self-

selected with no external requirements of activity participation. Activities are designed to provide optimal challenge to all participants, with supports in place to ensure participation from any camper interested in being part of the activity.

To provide preliminary information about whether and how people with aphasia experience flow while engaged in a variety of self-selected activities within a supportive environment, the following research questions were established for this study:

1. Is there variability in how people with aphasia perceive flow in an environment of self-selected, supported activities?
2. Are people with aphasia consistent in their perceptions of flow over time for specific activities?
3. Do flow experiences differ for people with aphasia in sedentary tasks compared to physically active tasks?

Methods

Design and Setting

This study utilized a descriptive design with repeated measures to study flow as experienced by eight people with aphasia within a supported environment at a rural aphasia weekend camp. Methods and consent procedures were approved by Human Subjects Institutional Review Board at both the University of Wisconsin – Eau Claire and Western Michigan University. The setting was a participation-based, weekend aphasia camp located in the Midwest. In this setting, campers begin the weekend by selecting from a range of activities in which they wish to participate throughout the weekend. The camp schedule allows for participation in approximately five structured activities per day (10 total for Friday and Saturday) from a choice of approximately 21 total activities. Table 1 shows a list of activity choices from which campers selected. Activities were

classified as *physically active* or as *sedentary* post hoc, in consensus with two other aphasia camp staff members, based on what were the agreed upon primary components of each activity.

Table 1

Camp Activities from which Participants Could Select

Physically Active	Sedentary
Archery	Aphasia information discussion
Biking	Boating
Canoeing	Crafts (e.g., bracelet making, crocheting)
Field games (e.g., Frisbee golf, whiffle ball)	Fishing clinic
Geocaching	Fishing
Golf	Photography
Minute-to-Win-It group activity (small-group, multi-task collaborative activities requiring combination of physical, communication and strategic demands)	Prayer
Nintendo Wii™	Technology
Yoga	Woodworking

Note: Categorization of "physically active" versus "sedentary" was based on the characteristics of the activity and not visible to the participants.

The primary goal of the aphasia camp was to provide an environment conducive to participation, comfort, and conversation (Clark, Hintgen, Hoepner, & Sather, 2006). Aphasia Camp is a three-day annual event sponsored by local health systems in partnership with a local university in a Midwestern state and staffed by licensed speech-language pathologists (SLPs) and trained university volunteers. Trained volunteers were undergraduate and graduate university students majoring in communication sciences and disorders who apply for a volunteer staff position. Upon acceptance, student volunteers

participated in three, two-hour trainings facilitated by aphasia camp SLP staff in the months prior to camp. These trainings addressed the purpose and intent of camp (specifically, to support conversation, relationship development and participation in the camp environment, rather than to provide traditional speech therapy intervention per se). Additionally, these trainings provided communication partner training to support communication with individuals with aphasia, and addressed logistical aspects of the camp. Attendance at the annual aphasia camp ranges from 12-20 people with aphasia, with approximately two-thirds of attendees accompanied by a spouse, family member or friend. Camp attendees primarily come from the Midwest, some have attended from across the United States.

Inclusion/Exclusion Criteria and Sample

Inclusion criteria were: aphasia secondary to cerebrovascular event, score of ≥ 4 on the Functional Communication Measures (FCM) of Spoken Language Comprehension and Spoken Language Expression (American Speech-Language-Hearing Association, 2013), mild-moderate or less motor involvement based on the Wallace Motor Screening Scale (Wallace, 2010), and attendance at the current aphasia camp for at least one full day. Screening for inclusion criteria was conducted based on self-reported information attendees provided in their camp registration materials and camp staff knowledge of campers from prior years at camp. Ten campers met the inclusion criteria and were invited to participate in the research; two declined to participate, and eight agreed to participate and gave their consent. Thus, the sample consisted of eight participants with

mild-moderate aphasia and with mild-moderate motor symptoms who participated in an aphasia camp and who agreed to take part in the study.

Data-gathering Tools

Two data-gathering tools were used, one of which was drawn from the literature on flow and one of which was designed especially for this study. Both measures were self-ratings completed by the participant using a clipboard and paper forms with support from trained volunteers as necessary. The measures were as follows:

1. *Short Flow State Scale - 2* (SFSS-2; Jackson, Eklund, & Martin, 2010; Appendix A). This published scale asks raters to indicate the degree to which they would rate their experience in each of nine statements regarding the nine dimensions of flow. These nine dimensions of flow are those originally identified by Csikszentmihalyi (Jackson, Eklund, & Martin, 2010), and listed in the background section of this paper. Immediately after each activity, participants were asked to rate their level of agreement with each of the nine flow dimensions from one (*strongly disagree*) to five (*strongly agree*), as experienced in the activity. Thus, a total score for any activity could range from 0 to 45 (9 ratings x high score of 5). A good fit of the data among individuals without aphasia has been demonstrated via confirmatory factor analysis for examination of item identification and cross validation (Kawabata, Mallett, & Jackson, 2008). Brief flow measures, as concluded by Martin and Jackson (2008), "are appropriate for research and examining task absorption, subjective experience, and cognate constructs such as motivation" (pg. 141). These authors additionally investigated the internal and external validity of the SFSS-2

(Martin and Jackson, 2008), concluding that the scale was reliable and approximately normally distributed when examined across domains of work, sport and music.

2. *Global Flow Self-Ranking*. This was an experimenter-designed instrument in which participants were asked simply to rank-order their top three activities in order of where they recalled their highest levels of flow experience (first, second, and third). This tool consisted of a list of the activities with the associated icon in which each particular individual with aphasia had participated during the course of the aphasia camp weekend. This tool was completed only once, at the end of the camp weekend, during a group closure activity. This rank ordering method differed purposefully from the SFSS ratings in order to measure whether holistic rank ordering at the end of camp would be consistent with multi-component flow level ratings gathered immediately after completing each activity. We reasoned if rank orders assigned holistically at the end of camp were consistent with the orders based on numerical SFSS ratings made immediately after each activity, that would provide evidence of stability of flow concepts and recall of flow experiences over time. It also would have been time prohibitive to ask participants to repeat the rating for multiple activities during the camp closing session, which had purposes beyond our data gathering.

Data-gathering Procedures

The concept of flow was presented to the entire camp during the initial welcome and orientation at the beginning of the camp weekend. The flow presentation was brief (10 minutes) and presented to all staff and campers, whether a study participant or not. Throughout the weekend, trained volunteers gathered SFSS-2 data forms after each

aphasia camp activity, although some data were not collected for a variety of reasons (e.g., no survey forms available in remote spots of camp, surveys not turned in, etc.). The goal was for the SFSS-2 to be completed by the participant immediately after each activity in which he or she participated. Participants were assisted as needed by student volunteer aphasia camp staff, all of whom had completed the aforementioned training. The support that staff provided to participants was logistical (e.g., providing survey, holding clipboard), or communicative (e.g., emphasizing key words within the survey, clarifying rating scale). A single sentence formed with simple syntax (see Appendix A) was added for each item on the scales of the original SFSS-2 to further clarify the flow concept while maintaining the integrity of the survey. These additional single sentences were created by the primary author (TS) in collaboration with an expert aphasiologist familiar with the flow concept. At the end of the weekend, the Global Flow Rankings were completed by participants. These procedures are summarized in Figure 1.

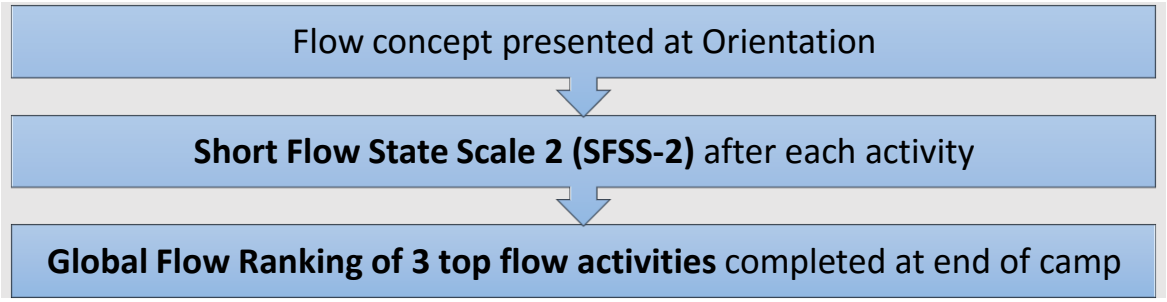


Figure 1. Research procedure and data collection schedule.

Data Analyses

Tests of normality (Kolmogorov-Smirnov & Shapiro-Wilk) showed that the data from this small pilot sample did not meet assumptions for parametric statistics. Therefore,

non-parametric tests were used for the majority of calculations (SPSS, Version 18, 2009, Chicago) to answer questions one and two. However, to answer question three, paired *t*-tests were used for comparison of means for Type of Activity (physically active versus sedentary). This parametric measure was appropriate given the normalcy of the distribution in the differences in the means (Field, 2009). The following analyses were completed:

1. To answer question 1 regarding variability of ratings, variance of flow ratings for each participant was calculated and descriptive observations were made for these calculations.
2. To answer question 2, ratings immediately after activity completion were compared to rankings of the same activity at the end of the weekend utilizing the Wilcoxon-sign test. For this analysis, the numeric SFSS-2 ratings completed immediately after activity completion ratings were recoded into their order rankings, such that each participant's SFSS-2 ratings were organized from highest to lowest, and assigned rankings accordingly.
3. To answer question 3, the mean ratings for Type of Activity (physically active vs. sedentary) were analyzed using the paired *t*-test for comparison of means. With regard to the Type of Activity, at the time of data analysis, all activities offered were categorized as either Physically Active or Sedentary (see Table 1). The participants were not aware of these separate categories and activities were presented in mixed order on the menu of choices.

Note that while there remains debate regarding the nature of Likert scale data, and whether such data are considered ordinal versus interval (Carifio & Perla, 2008;

Jamieson, 2004; Norman, 2010), Likert data in this study were considered interval in these calculations, and parametric measures of central tendency including mean and standard deviation were used based on Carifio and Perla (2008).

Results

The mean age of the eight participants was 57 years old (38 years – 70 years). Four of the participants were $\geq$ 8 years post onset aphasia; one participant was <3 years post aphasia, and the remaining three participants were 4-7 years post onset. A total of eight participants completed the SFSS-2 on a total of 38 camp activities with a mean of two separate ratings per each camp activity. Each participant completed seven activities throughout the aphasia camp weekend, for a total of 56 completed activities across all participants. However, due to logistical challenges not all data points were captured, and SFSS-2 ratings were gathered for 68% (38 of 56) of the completed activities.

The first research question proposed in this study was in regard to how people with aphasia perceive flow in an environment of self-selected, supported activities. Specifically, the question was whether the individual with aphasia would show variability among different activities in which he or she participated. The rationale was that evidence of greater variability would be an indication that people with aphasia were discriminating features of activities that represented higher and lower levels of the nine flow components (Csikszentmihalyi, 2008) on the SFSS-2.

Responses from the SFSS-2 by participant are displayed in Table 2. Significant values were attained on tests of normality of the distribution of SFSS-2 scores (Kolmogorov-Smirnov and Shapiro-Wilk) indicating non-normal distribution. A limited

range of scores for three of the eight participants was noted (scores ranging from 4-5). For the remaining five participants, a range of greater than three points was observed. Variance for four of the eight participants was ≥ 0.2.

Table 2

Short Flow State Scale-2 Responses by Participant

Participant	Number of Activities Rated	Range of Scores	Mean (SD)	Variance
Participant 1	5	4-5	4.98 (.05)	.002
Participant 2	6	1-5	4.53 (.45)	.205
Participant 3	4	3-5	4.69 (.28)	.077
Participant 4	4	4-5	4.61 (.11)	.012
Participant 5	4	4-5	4.69 (.25)	.061
Participant 6	6	1-5	4.13 (.58)	.338
Participant 7	5	2-5	4.04 (.56)	.312
Participant 8	4	3-5	4.61 (.48)	.235
Total Participant Sample	38	1-5	4.51 (.48)	.231

S-FSS -2 = Short Flow State Scale 2; 1 = Strong disagree; 5 = Strongly agrees

$D(38) = .251, p < .005$

The focus of the second research question was on the consistency of flow ratings over time associated with particular activities. In order to address this question, SFSS-2 scores completed immediately after activity completion were ranked from highest flow scores to lowest flow scores. At the end of the weekend, participants were asked to identify and rank the top three activities from the camp weekend that they perceived to be the most flow experiencing as an individual. In order to evaluate consistency over time, these individual rankings at the end of the weekend were compared to the individual SFSS-2 rankings. The experimental hypothesis was that the rank order positions of the two rankings would not be significantly different from each other. To complete this

analysis, the Wilcoxon-signed rank test was utilized. Of the 18 activities offered at camp, nine activities had enough paired rankings to compute the statistic. Results of the Wilcoxon-signed rank test indicated no significant differences ($p > .05$; see Table 3) in rankings immediately after activity completion in comparison to rankings of the same activities at the end of the weekend. This suggested a positive answer to the question whether people with aphasia would be able to demonstrate a general consistency in their responses about flow variables, even when asked in two different ways, and at two time points each over the course of the three-day camp weekend.

Table 3

Wilcoxon Signed Rank Activity Beginning of Camp Rating vs. End of Camp Rating

Activity	Z score	*p* Value (2-tailed)
Aphasia Information	-1.6[a]	.11
Archery	-.45[a]	.66
Boating	-1.5[a]	.13
Photography	-.97[a]	.33
Field Games	-.45[b]	.66
Golf	-1.0[b]	.32
Evening Activity	-1.1[a]	.27
Technology	-.48[a]	.66
Wii	-1.3	.18

a. Based on negative ranks
b. Based on positive ranks

Evaluating potential differences in flow ratings for activities classified as being more active or sedentary (see Table 1) was the focus of research question three. Paired *t*-test results of mean ratings for Type of Activity (Table 4) indicated no significant

difference in ratings between physical activities (M = 4.5, SE = .223) and sedentary activities (M = 4.4, SE = .183), $t(8) = 0.707$, $p = 0.50$. This suggested that participants with aphasia, while they did provide ratings consistent with flow, did not perceive flow differently for activities that varied in their physical demands.

Table 4

Paired Sample Statistics – Type of Activity

	Mean	N	Std. Deviation	Std. Error of Mean
Physical Activity	4.51	9	.67	.223
Sedentary Activity	4.44	9	.55	.182

Discussion

This pilot study explored variability and stability of the flow construct among participants with aphasia at a participation-based aphasia camp environment. People with aphasia indicated high flow perceptions for self-selected activities, with limited variability. Evidence for the viability of the concept of flow among people with aphasia was observed in the consistency in rankings completed immediately after the activity and at the end of the camp weekend, reinforcing a stability of the flow construct. Finally, no statistical differences were found between ratings of physically active and sedentary activities. This suggests that there are no systematic differences in the experience of flow by people with aphasia based on whether the activities are more physical or sedentary, even though some of them had mild-to-moderate motor limitations.

Discerning Variability in the Flow Experience

The first research question focused on the variability in flow ratings across activities. Although flow ratings were consistently high across participants and activities, a range of SFSS-2 scores appears to indicate that participants discerned flow experiences with a limited, but present variability. Thus, rather than indiscriminate ratings of activities, it appears that participants did discriminate aspects of activities that were more consistent with flow while other aspects that were not consistent with flow. In general, flow ratings were high for all activities and participants. There are a variety of potential reasons for these high flow ratings, and these reasons are discussed later in this paper.

The current research design included only people with aphasia. Thus it is impossible to make a direct comparison of flow perceptions on the SFSS-2 among individuals with aphasia compared to those without. Jackson (2010), in the Flow State Scale Manual, however, presented preliminary data regarding SFSS-2 scores in a variety of activities for a sample that excluded people with cognitive, physical or communication limitations. Jackson made it clear that the data she presented were not gathered from a random sample and should be considered descriptive only. For example, her SFSS-2 data comparing flow ratings for Exercise and Yoga showed mean scores of 3.88 (SD =.56) for Exercise and 3.85 (SD =.45) for Yoga. By comparison, the group mean for the 8 participants in this study was 4.51 (SD = .48). Thus although the data cannot be compared directly, from a descriptive standpoint the flow ratings from aphasia camp are consistently higher, but the standard deviation is comparable. When interpreting these results, it is important to keep in mind the nature of this constrained environment. The aphasia camp is by design an aphasia-friendly environment to facilitate comfort, support

and participation (Clark, Hintgen, Hoepner, & Sather, 2006; Clark, et al., 2009). The environment is intentionally designed for self-selection of activities. Thus, campers choose only the activities they wish to complete and are not required to do any that are not of their choosing. This may have contributed to the relatively high SFSS-2 ratings among this group.

Future studies might investigate the relationship between perceived flow experiences in different environments. For example, an experimental design could be used to investigate whether flow ratings in an aphasia camp environment are different than in the typical daily environments of an individual's home community. Although the influence of the aphasia camp environment is not known from the results of the current study, which was not designed to study that variable, it is postulated that the setting environment might have influenced perceived flow experiences given that the aphasia camp environment is designed specifically to promote successful participation for individuals with aphasia. The question of the role of environmental factors should be investigated in future studies.

Another possible explanation for the high flow scores is the possibility that participants equated flow ratings (erroneously) with enjoyment or fun of a particular task, which is not an accurate parallel (Collins, Sarkisian, & Winner, 2009). While positive emotions are often associated with flow, flow events are not inherently happy or joyful. There is a general consensus that flow experiences are *associated* with happiness, and that after flow has been experienced there can be feelings of happiness, but that this is an association, not a causal relationship between flow and happiness (Csikszentmihalyi & Nakamura, 2005; Landhauser & Keller, 2012). Perhaps campers were experiencing

frequent positive emotions, which they equated with flow experiences. This question requires further investigation.

It is impossible to know how developed the concept of flow was in the minds of the participants within this study. An aphasia-friendly overview of the flow construct was presented to all campers at the beginning of the camp weekend. This was done in order to reinforce the concepts of flow and an understanding of flow. Although flow has not been studied with people with aphasia, Collins, Sarkisian, and Winner (2009) found in their study of older adults without aphasia that "the majority of older adults demonstrated an understanding of the concept of flow" (pg. 717). However, the aphasia camp presentation may have been incomplete in fully describing the flow construct and ensuring adequate understanding. It would be beneficial in future studies to use qualitative research methods to evaluate participant descriptions of what they perceive to constitute flow experiences.

Another potential reason for the positive flow perceptions may relate to the characteristics of the population in this study. Participants already were enrolled in the weekend long aphasia camp when they were invited to participate in this research. It is theorized by the author based on his experiences at aphasia camp that the weekend camp experience might be outside of the comfort zone of many other potential participants, and those who elect to attend the camp are likely are more willing to take risks and are motivated to engage in new experiences. Thus, from a personality/motivation standpoint, these may be individuals who are already at a higher propensity for flow experience. Waterman et al. (2003) found that measures of the subjective experience of intrinsic motivation were strongly intercorrelated and that self-determination was strongly

associated with measures of flow experiences. These individuals are already demonstrating a high degree of motivation in their own recovery process by paying for camp, driving to camp, etc. High engagement in daily activities is one characteristic of successful aging (Rowe & Kahn, 1997), and these participants may have a higher propensity for activity and engagement in daily activities. There is also the potential for respondent bias. Respondents were aware of the time and effort involved in designing the aphasia camp, and there is the possibility that they were responding in a way they felt the researcher would want them to respond.

Future studies might investigate the relationship between perceived flow experiences in the presence of different environmental factors. For example, an experimental design could be used to investigate whether flow ratings in an aphasia camp environment are different than in the typical daily environments of an individual's home community. Although the influence of the aphasia camp environment is not known from the results of the current study, it is postulated that the setting environment might have influenced perceived flow experiences given that the aphasia camp environment is designed specifically to promote successful participation for individuals with aphasia. The question of the role of environmental factors should be investigated in future studies in environments that are more natural.

Tasks and activities at camp are based on camper feedback and have been modified over the years, providing new opportunities while maintaining repeated, well-reviewed activities. The intent of the camp is to provide optimal support within these activities, which may impact flow perceptions, as well. The perceived importance of an activity and motivation factors have been studied by Engeser and Rheinberg (2008), who

concluded that the relationship between skill and challenge in the flow experience was moderated by the perceived importance of the task at hand as well as by achievement motive. Landhauser and Keller (2012) represented these factors in their revised flow model, which suggests that flow varies as a function of both fit between skill and task demands, as well as the subjective value, as perceived by the participant, of the task at hand. Thus, it may be that the aphasia camp environment influenced the flow ratings to be higher; however, again, no relationship can be inferred given the design of the current study. This, however, does raise potential implications for future study.

Stability of the Construct of Flow Over Time

The second research question in this study was in regard to the consistency of flow perceptions over time. Determining the consistency of flow perceptions at two separate points in time using slightly different data-gathering methods may provide information regarding the consistency and stability of the ratings and support for a psychological reality of the construct of flow among the participants. Results of this study found consistency in rankings across time when SFSS-2 ratings made immediately after each activity were ranked and compared with overall rankings (in the top three or not) at the end of the camp weekend. No significant differences were found in the rankings for specific activities made at the two points in time. This appears to indicate a degree of consistency of the flow construct across time, without degradation or alternation in interpretation over time.

In addition to potentially indicating a degree of stability in flow perceptions, these consistencies may also be useful with regard to the measurement of flow perceptions.

Given that there were no significant differences in the perceptions of relative levels of flow (measured as rank order) at the two points in time (immediately after the activity and at the end of the weekend), one may postulate that flow perceptions could be gathered after a duration of time rather than immediately upon completion of an activity and be reliable. These results also offer weak support for the reliability of flow ratings made by people with aphasia in general.

Although the current study was not designed to identify assessment protocols definitively, these findings also lend tentative support to the use of reflective flow ratings, which is an alternative to the experience sampling method. In the current study, it was challenging to gather flow perceptions immediately after the campers completed tasks, which was one reason why data points were missing. It may be just as valid to gather flow perceptions at the end of the day or end of a weekend experience. However, the amount of time passage involved in this study was a maximum of 48 hours. In relative terms, this may be considered a short period of time, and thus caution is required with regard to generalizations of stability of constructs over a period of time beyond the 48 hours in this study. It may be that there is degradation in memory of perceptions beyond a critical time period yet to be determined.

Flow Experiences in Physical and Sedentary Types of Activities

The third and final research question was in regard to differences in perceived flow experiences in physical types of activities in comparison to sedentary types of activities. Regardless of activity or whether the activity was physical or sedentary, flow perceptions also were high and no significant differences in ratings between the two types

of activities were observed. Thus, people with aphasia, some of whom might have mild-moderate physical limitations, reported similarly high levels of flow whether an activity was classified as involving physical activity or being more sedentary. A premise of flow experience is a balance of challenge and skill, with the demands or challenges of the task slightly higher than the skills possessed by the participant. This slightly higher task demand is felt to be a function of a flow inducing experience (Csikszentmihalyi, 2008), and based on results of this study, can be experienced in physically active tasks as well as sedentary tasks.

In the camp environment, activities are set up such that supports are in place to maximize participation as much as possible, regardless of physical limitations. Thus, for example, physical therapy staff are present to assist with transfers and optimal positioning. Occupational therapy staff provide adaptive devices and strategies to compensate for potential physical weakness or coordination difficulties. Therefore, even for participants with some degree of physical impairment, the environment may have an optimized the challenge/skill balance due to compensations present to meet physical demands. These compensations may not be available in the participants' typical environments.

Finally, there were criteria for inclusion in this study, including motor functioning. Thus, by design, individuals with greater motoric involvement were excluded from this study, although individuals with mild-moderate motor problems could participate. Certainly future studies evaluating the influence of motoric involvement and flow experiences would be beneficial.

Limitations

Only those with mild-moderate aphasia were included as participants in this study. Although the implications of negative life changes as a result of mild aphasia are well documented (Armstrong, Fox, & Wilkinson, 2013), the effects of moderate to severe aphasia on flow experience is not captured in the present criteria for this study. Similarly, as previously mentioned, individuals with greater motoric involvement were not included in this study. Additionally, it is difficult to compare flow experiences for people with aphasia to other normative data due to the wide variety and methods of previously gathered flow data. The small sample size and missing data require cautious interpretation. With regard to time, the construct of consistency was measured only over the course of a weekend, and the use of different data gathering methods may have introduced another source of variation that could have affected results. Further temporal extension using identical data gathering methods are needed to add evidence of the reliability of flow ratings in this population. Finally, as discussed previously, this study took place in only one environment, and it was an environment unique to individuals with aphasia. The aphasia camp environment is designed to facilitate support and participation for people with aphasia. Flow experiences in other environments were not compared.

Conclusions

This descriptive study is a first step in a closer examination of the utility of the concept of flow in the population of individuals with aphasia. People with aphasia indicated high flow perceptions for self-selected activities and showed consistency in

rankings completed immediately after the activity and at the end of the camp weekend. These findings contribute to a sense of stability in perceived flow ratings by people with aphasia and support potential use of flow indices as a meaningful tool for people with aphasia.

There is a call from academia and aphasiologists to focus not just on the resumption of activity, but also on the resumption of activity that is productive and engaging to the individual with aphasia following stroke, with an increased emphasis on the quality of the participation (Chapey, et al., 2001; Dalemans, deWitte, Wade, & van den Heuvel, 2010). Oftentimes quantifying and qualifying such engagement is difficult. The concept of flow may be beneficial and critical in moving towards an emphasis and measurement of engagement and quality of engagement in aphasia rehabilitation. An awareness of flow and the flow experience may additionally assist as a means to better understand the impact of environmental factors within the lives of individuals with aphasia, and serve as a foundation toward modification of the environment. Further study is needed to explore how individuals with aphasia perceive concepts of flow and the type of environments in which they perceive flow more consistently.

References

American Speech-Language Hearing Association (2013). National Outcomes Measurement System (NOMS): Adults Speech-Language Pathology User's Guide. Retrieved from http://www.asha.org/uploadedFiles/ASHA/NOMS/Adult-NOMS-FCMs.pdf

Armstrong, E., Fox, S., & Wilkinson, R. (2013). Mild aphasia: Is this the place for an argument? *American Journal of Speech-Language Pathology, 22* (2), S268 - S278.

Bauman, N., & Scheffer, D. (2010). Seeing and mastering difficulty: The role of affective change in achievement flow. *Cognition and Emotion, 24*(8), 13-4 - 1328.

Blair, S. (2009). Healthy hearts and the universal benefits of being physically active: Physical activity and health. *Annals of Epidemiology, 19*(4), 253-256.

Carifio, J., & Perla, R. (2008). Resolving the 50-year debate around using and misusing Likert scales. *Medical Education, 42*, 1150-1152.

Chapey, R., Duchan, J., Elman, R., Garcia, L., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2001). Life participation approach to aphasia: A statement of values for the future. In R. Chapey, (Ed.), *Language intervention strategies in aphasia related neurogenic communication disorders, 4th Edition.* Philadelphia: Lippincott, Williams and Wilkins.

Clark, M., Hintgen, T., Hoepner, J., & Sather, T. (2006). Aphasia camp: Meaningful participation and communication in a rusting setting. *American Speech-Language Hearing Association National Convention.* Miami.

Clark, M., Hintgen, T., Hoepner, J., Sather, T., Schmerbauch, M., & Clarke, J. (2009). Environmental strategies that improve social participation at aphasia camp. *American Speech Language Hearing Association National Convention.* New Orleans.

Clark, M., Hoepner, J., & Sather, T. (2015). Facilitating participation via a camp model: Eleven years of aphasia camp. *Aphasia Access.* Boston .

Collins, A., Sarkisian, N., & Winner, E. (2009). Flow and happiness in later life: An investigation into the role of daily and weekly flow experiences. *Journal of Happiness Studies, 10*(6), 703-719.

Csikszentmihalyi, M. (1997). *Finding Flow: The psychology of engagement with everyday life.* New York: BasicBooks, Harper Collins.

Csikszentmihalyi, M. (2008). *Flow: The psychology of optimal experience.* New York: Harper Perennial.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal experience.* Cambridge: Cambridge University Press.

Csikszentmihalyi, M., & Nakamura, J. (2005). The concept of Flow. In C. Snyder, & S. Lopez, (Eds.), *Oxford Handbook of Positive Psychology.* New York: Oxford University Press, Inc.

Dalemans, R., deWitte, L., Wade, D., & van den Heuvel, W. (2010). Social participation through the eyes of people with aphasia. *International Journal of Language and Communication Disorders, 45*(5), 537-550.

Delle Fave, A., Massimini, F., & Bassi, M. (2011). Instruments and methods in flow research. *Psychological Selection and Optimal Experience Across Cultures, 2*, 59-87.

DiLorenzo, T., Bargman, E., Stucky-Ropp, R., Brassington, G., Frensch, P., & LaFontaine, T. (1999). Long term effects of aerobic exercise on psychological outcomes. *Preventive Medicine, 28*(1), 75-85.

Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion, 32*, 158-172.

Engeser, S., & Schiepe-Tiska, A. (2012). Historical lines and an overview of current research on flow. In S. Engeser, (Ed.), *Advances in Flow Research* (pp. 1-22). Heidelberg: Springer.

Field, A. (2009). *Discovering Statistics Using SPSS, 3rd Edition.* London: Sage Publications Ltd.

Jackson, S., & Csikszentmihalyi, M. (1999). *Flow in sports.* Champaign: Human Kinetics.

Jackson, S., Eklund, B., & Martin, A. (2010). *The FLOW Manual: The Manual for the Flow Scales.* Mindgarden, Inc. Secured online 12/7/10.

Jamieson, S. (2004). Likert scales: how to (ab)use them. *Medical Education, 38,* 1217-1218.

Kauhanen, M., Korpelainen, J., Hiltunen, P., Maatta, R., Mononen, H., Brusin, E., . . . Myllyla, W. (2000). Aphasia, depression and non-verbal cognitive impairment in ischaemic stroke. *Cerebrovascular Diseases, 10*(6), 455-461.

Kawabata, M., Mallett, C., & Jackson, S. (2008). The Flow State Scale - 2 and Dispositional Flow Scale - 2: Examination of factorial validity and reliability for Japanese adults. *Psychology of Sport and Exercise, 9*, 465 - 485.

Landhauser, A., & Keller, J. (2012). The flow model revisited. In S. Engeser, (Ed), *Advances in Flow Research* (pp. 51-64). New York: Springer.

Martin, A., & Jackson, S. (2008). Brief approaches to assessing task absoprtion and enhanced subjective experience: Examining 'short' and 'core' flow in diverse performance domains. *Motivation and Emotion, 32*, 141-157.

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Science Education, 15,* 625-632.

Ross, K., & Wertz, R. (2003). Quality of life with and without aphasia. *Aphasiology, 17,* 355-364.

Rowe, J., & Kahn, R. (1997). Successful aging. *The Gerontologist, 37*(4), 433 - 440.

Sicilia, M., & Ruiz, S. (2007). The role of flow in website effectiveness. *Journal of Interactive Advertising, 8*(1), 33-44.

Wallace, G. (2010). Profile of life participation after stroke and aphasia. *Topics in Stroke Rehabilitation, 17*(6), 432-450.

Warburton, D., Nicol, C., & Bredin, S. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal, 174*(6), 801-809.

Waterman, A., Schwartz, S., Goldbacher, E., Green, H., Miller, C., & Philip, S. (2003). Predicting the subjective experiene of intrinsic motivation: The roles of self-determination, the balance of challenges and skills and self-reallization values. *Personality and Social Psychology Bulletin, 29*(11), 1447 - 1458.

CHAPTER 3

EXPLORATION OF FLOW EXPERIENCES AND APHASIA USING THE EXPERIENCE SAMPLING METHOD

Introduction

Flow represents a concept denoting total involvement in absorbing experiences in which one achieves an optimal balance of skill and challenge (Csikszentmihalyi, 2008). Chapter 1 of this dissertation contains an historical overview of flow and aphasia, and notes the absence of systematic study of flow experiences as perceived by individuals with aphasia. In Chapter 2, a study of flow experiences among individuals with aphasia at a weekend aphasia camp is described. This current chapter describes a study using the Experience Sampling Method to gather flow perceptions over the course of a week. The participants were individuals with aphasia who agreed to participate by using a software application on a computer tablet to rate what they were experiencing when prompted at random points throughout a day over the course of one week. In addition to flow perceptions, participants recorded their perception of four environmental factor variables and indicated whether they were alone at the sampling point in time. The results of this study may contribute to improved quality of experiences through increased flow opportunities among individuals with aphasia.

Background

Flow is a term attributed to positive psychologist Mihaly Csikszentmihalyi (Csikszentmihalyi, 1975). It refers to the absorbing nature of certain experiences in which time passes differently and the task at hand challenges the individual but does not overwhelm him or her. Flow has been studied in a wide range of activities and populations including elite sports (Jackson & Eklund, 2002), website building and online experiences (Sicilia & Ruiz, 2007), and employment settings (Csikszentmihalyi & Csikszentmihalyi, 1988). Throughout a wide range of settings, participants describe the flow experience similarly, regardless of the setting or participant characteristics (Csikszentmihalyi & Nakamura, 2009).

There are uniform characteristics of flow experiences, regardless of the population or participant. Flow typically involves complete absorption in the task at hand, a change in the perception of time passage, and an optimal balance of skill and challenge (Bauman & Scheffer, Seeing and mastering difficulty: The role of affective change in achievement flow, 2010; Csikszentmihalyi, 2008). Although there remains debate regarding the impact and benefit of flow experiences, positive emotions are typically associated with flow experience (Csikszentmihalyi, 2008). It remains unclear, however, whether emotions such as enjoyment and satisfaction are a result of flow, or if the presence of such emotions may instead facilitate flow experiences.

Given the known reduced levels of participation compared to pre-stroke levels reported in studies that include people with aphasia (Dalemans, deWitte, Wade, & van den Heuvel, 2010), providing opportunities that elicit flow experiences may be appealing to people with aphasia, their families, and rehabilitation service providers. A better

understanding of flow perceptions among people with aphasia would further the understanding of task and environmental characteristics that may support quality participation among people with aphasia.

Operationalizing the Concept of Flow

Historically, the definition of flow has evolved from early concepts of purely a balance of task challenge and skill, regardless of the degree of task difficulty, to the current conception of flow in which perceived challenge is slightly greater than skill, and both are above average to the individual (Csikszentmihalyi & Nakamura, 2009). Csikszentmihalyi and LeFevre (1989) introduced a quadrant model of the flow state. In this model, there are two major dimensions representing low to high challenge and skill, which in combination would define quadrant experiences as flow (high challenge, high skill), boredom (low challenge, high skill), apathy (low challenge, low skill), or anxiety (high challenge, low skill) (see Figure 2). Prior to the quadrant model, flow experience was thought to occur at any point in which there was a skill/challenge balance, even in a low skill/low challenge situation. However, the quadrant model postulates that a low skill/low challenge state is representative of apathy. Thus, in order for flow to occur, two conditions need to occur: 1) a balance of challenge and skill, and 2) both skill and challenge must occur at a level greater than that which the individual typically experiences (Moneta, 2012).

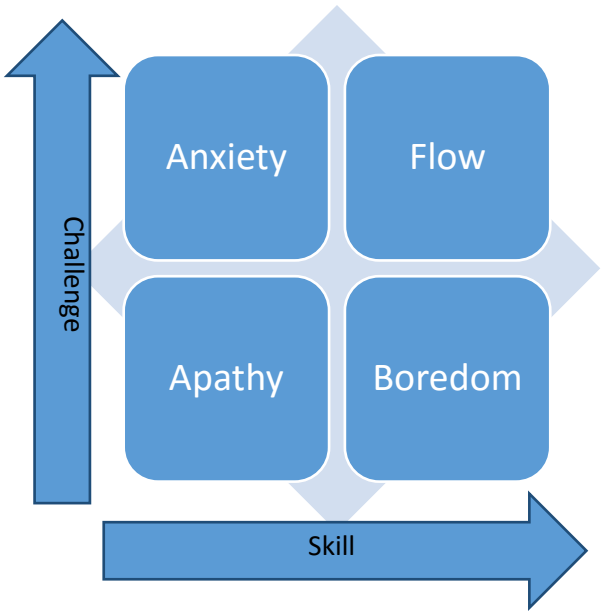


Figure 2. Quadrant experience model (Csikszentmihalyi & Lefevre, 1989).

Strengths and weaknesses of such a model have been identified. Moneta (2012) notes that one positive aspect of the model is that, although simplistic, it allows for discerning flow experiences. However, there are also weaknesses. The quadrant model still remains only an approximation, lacking succinct precision for defining the flow state. It also describes a flow state that may be overinclusive, likely overestimating the occurrences of flow state (Moneta, 2012).

Other models of operationalizing flow exist, including the Experience Fluctuation Model (Massimini, Csikszentmihalyi, & Carli, 1987) and the Regression Modeling Approach (Moneta & Csikszentmihalyi, 1996). A challenge to operationalizing flow is that there is not a gold standard assessment (Moneta, 2012). An element of circularity also impedes evaluation. That is, often the measure of flow a researcher chooses to use is based on the flow model he or she espouses, increasing the likelihood that it will identify the latent constructs encompassed by the model. Although several models of flow exist, these models are considered dependent on the developers' interpretations of flow, and

tend to simplify flow theory (Moneta, 2012). These factors, which include the presence of multiple models of flow, and subsequently, a variety of measures to assess flow, complicate the assessment of flow. This study will utilize the quadrant model, using its two dimensions of challenge and skill, as a means to operationalize flow and to assess flow experiences. This model was selected because, in the primary researcher's opinion, it contains key elements of the flow construct presented in a concrete, linguistically simplified operationalization of the flow construct conducive to comprehension abilities of those with aphasia.

The Potential Benefits of Flow

One of the primary reasons to assess flow pertains to the purported benefits that being in flow may have for individuals. Flow is associated with enjoyment, facilitates engagement, and is a rewarding experience (Engeser & Schiepe-Tiska, 2012). Flow itself is not defined as an affective state; however, it is typically associated with positive emotions including improved life satisfaction (Csikszentmihalyi, 2008), improved happiness (Csikszentmihalyi & Lefevre, 1989) and improved disposition (Csikszentmihalyi, 2008). Whereas positive emotions have been associated with flow, there is an absence of evidence to support this as a causal relationship.

Landhauser and Keller (2012) argued that extreme caution is needed in any pursuit of analysis of potential causal consequences of flow. They postulated that the presence of other variables, including intrinsic motivation, might facilitate flow experiences even in situations of skill/challenge imbalance. They cautioned against a general acceptance of the concept of flow equating to positive consequences. They also

reiterated that many questions remain unanswered regarding the purported benefits of the flow state.

Application of Flow to Interventional Programs/Environments that Facilitate Flow

Concepts of flow are being increasingly incorporated in academic settings such as Montessori schools (Kahn, 2000) and in the process of learning and gaining knowledge in non-academic settings (Csikszentmihalyi, 2014). Nakamura and Csikszentmihalyi (2002) identify two primary types of interventions relating to flow. The first is modification of the activity or the environment to facilitate flow or minimize barriers to flow. Application examples of this first type can be found in the human resources literature (Kira, 2002), leadership and management (Csikszentmihalyi, 2004) and education (Schmidt, 2010). The second type is that which supports the individual in achieving flow. In the second type of example, there is a direct focus on refining or enhancing the skills, perceptions or other characteristics of the individual such that flow is experienced more frequently, or more intensely. There is a direct focus on the individual, rather than solely the environment. Nakamura and Csikszentmihalyi (2002) referenced examples such as the Key School in Indianapolis, where the explicit goal is a combination of facilitating flow through the environment and through the individual.

Mindfulness strategies have been growing in popularity for the general public, as well as for people with aphasia (Orenstein, Basilakos, & Marshall, 2012). Mindfulness interventions have been used among elite athletes to facilitate the likelihood of flow experiences (Aherne, Moran, & Londsale, 2011; Gardner & Moore, 2004). Aherne, Moran and Londsale (2011) evaluated the effectiveness of a mindfulness training

program on flow as experienced by competitive sport athletes as measured by the Short Flow State Scale – 2 (Jackson, Eklund, & Martin, 2010). They found increased global flow scores among athletes who underwent the mindfulness training.

Imagery has been used in interventional studies of flow experience among elite athletes (Nicholls, Polman, & Holt, 2005), as has hypnosis (Lindsay, Maynard, & Thomas, 2005) and a combination of music and imagery (Pain, Harwood, & Anderson, 2011). Both the Nicholls et al. (2005) study and the Lindsay et al. (2005) study were inconclusive in their determination of the effects of interventions on flow experiences. That is, despite small positive changes in flow experiences, the effects of the interventions on flow experiences of the users were unclear. Swann et al. (2012) conclude, based on their systematic review of flow in elite sport, that there is a lack of evidence supporting flow interventions among athletes to date. However, they attributed this largely to the absence of an adequate model of flow, and do offer potential for interventions to increase flow experience among elite sport athletes.

Although application of flow to individuals with aphasia is sparse in the literature, a better understanding of engagement within the rehabilitation process may support incorporation of flow principles. Given the above literature that supports emerging evidence of potentially beneficial interventions to support flow experiences, applications within the rehabilitation context may be beneficial as well. MacDonald, Kayes, and Bright (2013) completed a review of the stroke rehabilitation literature relating to engagement. Although they did not identify any papers that expressly studied the concept of engagement among rehabilitation of individuals with strokes, they did identify themes from 17 papers regarding barriers and facilitators to engagement during the

experience of stroke rehabilitation. These themes included goal setting, therapeutic connection, personalized rehabilitation, paternalism versus independence, patient centered practice, knowledge is power, and feedback and achievement (MacDonald, Kayes, & Bright, 2013). The concepts of flow applied to the inpatient and outpatient rehabilitation settings may have the potential to alter outcomes. Based on their review of the literature, MacDonald, Kayes and Bright (2013) described benefits of engagement on outcomes from adherence to treatment protocols to higher levels of function after discharge from rehabilitation. A better understanding of factors that facilitate and hinder flow experiences, from both the patient perspective and the facility perspective, in the inpatient and outpatient settings, may positively impact rehabilitation outcomes and patient involvement.

Similarly, application of flow principles when providing opportunities for individuals with aphasia at the community level, including support or therapy groups and camps, may also support better outcomes. Law (1991) encouraged occupational therapists and rehabilitation professionals to consider concepts of flow and how those concepts apply to the environment. She encouraged cojointly working with clients to optimize the balance of challenge and skill, and to progress activities in complexity to continue to foster optimal balance of skill and challenge. She cautioned against increasing challenge to the point of anxiety, and instead proposed that therapists should provide challenge adequate to encourage adaptation (Law, 1991).

Experience Sampling Method

The experience sampling method (ESM), which was used in this investigation, is a process of collecting information on a random schedule throughout a day or multiple days. It is well suited for gathering data about how individuals perceive the context and content of their daily lives, including components related to flow. As a measurement method for investigating flow experiences, prior studies of flow (e.g., Csikszentmihalyi & Lefevre, 1989; Hektner, Schmidt, & Csikszentmihalyi, 2007) have used signaling devices to provide random alerts, indicating a time to answer a set of pre-developed questions related to flow.

Csikszentmihalyi is typically credited with the development of ESM in the early 1970s as a means to gather richer, more detailed flow data than that which was being provided by subjects in diary entries that were used previously (Hektner, Schmidt, & Csikszentmihalyi, 2007). According to Hektner and colleagues (2007), the first published report of ESM was a study of adolescent activity published by Csikszentmihalyi along with two of his graduate students (Csikszentmihalyi, Larson, & Prescott, 1977). This method has been used in the study of a variety of social, academic, and healthcare contexts. Benefits of ESM include naturalistic observations with higher degrees of ecological validity, non-intrusive diaries, and the higher likelihood with ESM of avoiding the pitfalls of typical self-report including memory bias (Scollon, Kim-Prieto, & Diener, 2003; Hektner, Schmidt, & Csikszentmihalyi, 2007).

Conversely, there are drawbacks to the use of ESM in the assessment of flow. Of primary concern is that the method is felt to potentially "impose" the perception of flow

on participants when responding (Moneta, 2012). Additionally, the scales used with ESM are lacking in reports of content and construct validity (Moneta, 2012).

Three common sampling schedules are used in ESM (Reis & Gable, 2000). These are:

- Interval–contingent sampling: Participants complete self-reports at the same time every day or at regular intervals.
- Event-contingent sampling: Participants complete a report following an event or occurrence of interest or study.
- Signal-contingent sampling: This is the most common schedule. It involves a set amount of random signals or 'beeps' occurring over the course of a day.It is the type of schedule that was used in this study.

Although used commonly in social sciences, ESM has rarely been used within aphasia research. Fitzgerald-DeJean, Rubin, and Carson (2012) used ESM to conduct a single subject case study evaluating the ability of an individual with aphasia to successfully participate in an ESM paradigm using a hand-held digital device. The participant in this single-subject study was a 75 year-old male described as having moderate to severe impairments, involving Broca's aphasia, dysarthria, apraxia of speech and mild cognitive impairment. Four variables were assessed (perceived happiness, perceived stress, perceived tiredness and perceived communication satisfaction) using an interval-contingent sampling schedule of four fixed-time probes per day over the course of a 35-hour per week, 6-week intensive treatment program. All ESM samples were gathered on-site at the university clinic during the hours of the intensive treatment program. Additionally, at the pre-defined set times, the clinician cued the participant to

complete the sampling questions. The researchers initially used paper copies of experience sampling forms in addition to the handheld digital device due to concerns of potential difficulties of their participant's use of technology. However, the researchers concluded that their participant adjusted well to the handheld digital device and thus eliminated the paper forms after the first week.

Fitzgerald-DeJean, Rubin and Carson (2012) concluded that the participant was able to demonstrate extremely high compliance, with an actual compliance of 100% for the entire 29 day period, completing 464 out of a possible 464 potential responses. Given that the participant was cued by a clinician, it may be somewhat less surprising that compliance was so high. The researchers concluded that the participant demonstrated adequate operational competence for use of the digital handheld device in their study, a Palm Pilot using the Purdue Momentary Assessment Tool software. This software tool, however, is no longer available (Fitzgerald-DeJean, personal communication, July 23, 2013). The authors did conclude that ESM implementation in their case study was successful and they suggested further exploration into the application of ESM in aphasia research.

Experience Sampling Methods Using Electronic Data-gathering Tools

Fitzgerald-DeJean, Rubin and Carson (2012) utilized a Palm Pilot Personal Digital Assistant (PDA) device and reported successful implementation of ESM data gathering in their single-subject report. With the continued explosion in portable technologies with digital applications, and the increasing affordability of hand-held, sophisticated but intuitive devices, utilization of such devices for ESM data gathering with individuals with aphasia appears to have potential. Unique to using such devices

with individuals with aphasia is the possible presence of difficulties comprehending visual, auditory, or sequential coding that may be presented as an ESM sampling program. Thus it is critical to incorporate premises of aphasia-friendly design into ESM programming.

The current study used iPod Touch devices with a customized ESM application (app) for data gathering. Although the app operated in a manner similar to other electronic ESM devices, the app used was developed specifically to be used by people with aphasia in this study. Therefore, aphasia-friendly designs and concepts were implemented to maximize ease of use and maximize comprehension. (See Methods section for details.)

Augmented input (supplementing oral language with gestures, visuals, written key words) has been studied in aphasia as a means to facilitate comprehension. Wallace, Dietz, Hux and Weissling (2012) posited that the success associated with augmented input for people with aphasia may be due to decreased cognitive load and increased access to prior knowledge. Wallace et al. (2012) studied the effects of four types of non-personalized visuographics on auditory comprehension of narratives by people with aphasia, finding that the type of visuographic utilized by the participants did not influence response accuracy for comprehension tasks.

In a study of printed healthcare education materials, Rose, Worrall, Hickson and Hoffmann (2011) conducted semistructured interviews with 40 adults with aphasia regarding qualities of effective aphasia-friendly reading materials. Barriers and facilitators were identified and grouped into two categories relating to content and design characteristics. The researchers concluded that there is no unified aphasia-friendly

formatting that is applicable to all individuals with aphasia. However, they did identify content and design characteristics to be considered when developing aphasia-friendly materials.

Brennan, Worrall and McKenna (2005) explored aphasia-friendly reading formats and their effects on reading comprehension for nine individuals with aphasia. They found a significant increase in comprehension of aphasia-friendly paragraphs versus control paragraphs. The authors identified the following adaptations, when tested in isolation, as having a positive significant impact on reading comprehension: simplified vocabulary and syntax, large print, and increased white space.

The use of pictures to support comprehension among people with aphasia remains unsettled. Brennan, Worrall, and McKenna (2005) found what appeared to be a slight advantage for comprehension of paragraphs with pictures compared to those without, but analysis did not reveal statistically significant differences. They did, however, find a significant benefit when all four formatting principles (including pictures) were applied simultaneously. From this they concluded that it would be premature to reject the use of pictures as a part of aphasia-friendly formatting. Rose, Worrall and McKenna (2003) reported a small portion of individuals with aphasia in their study who perceived inclusion of clipart images and line drawings as being disrespectful and absent of benefit.

With regard to type of font, there is an absence of known data regarding effective font types for individuals with aphasia. However, Rose et al. (2011) indicate that san serif fonts are typically recommended within the disability literature, citing Levy (2005), Mencap (2000) and Rodgers et al. (2004).

The WHO and Environmental Factors

In the current study, ESM was applied to questions about environmental factors and their association to flow experiences among people with aphasia. Moneta (2012) concluded that ESM can be used as a means to assess factors such as skill and challenge. Thus, the use of this method appears reasonable for the investigation of environmental factors and their association to flow. Environmental factors are a part of the World Health Organization's International Classification of Functioning, Disability and Health (ICF). The WHO-ICF is a framework that conceptualizes functioning as a "dynamic interaction between a person's health condition, environmental factors and personal factors" (WHO, 2013, p. 3). There are two primary divisions of the ICF. The first division encompasses Functioning and Disability and includes Body Functions/Structures as well as Activity/Participation. The second division encompasses Contextual Factors, and includes Environmental Factors and Personal Factors.

Environmental factors are one component of the WHO-ICF's Contextual Factors. Environmental factors include the impact of the physical, social and attitudinal aspects of the environment that may influence functioning (WHO, 2013). Environmental factors may be positive (facilitators) or negative (barriers) to the individual's interaction and participation, and are factors that are external to the individual (Threats, 2007). This same author emphasized the importance of not just identifying barriers and removing those barriers within the environment, but also the equal importance of increasing environmental facilitators. The second component of the WHO-ICF's Contextual Factors is personal factors. Personal factors are those characteristics of the individual that are not

a result of the health condition (Threats, 2007) and may be changeable or unchangeable (Howe, 2008).

In two studies, Howe, Worrall and Hickson interviewed (2008a) and observed (2008b) people with aphasia to evaluate environmental factors that influenced community participation. In their 2008a study, they interviewed people with aphasia to better understand influencing factors on the participation. In their 2008b study, they observed individuals with aphasia using participant observation methods during events of participation. Overlapping themes identified in both studies included: familiarity, availability of extra support for communication, time available for communication, and communication complexity. Their findings influenced the development of the environmental factors variables to be assessed in this study, which are described in the *Methods* section of this paper.

Development of the Research Questions

Larson and Delespaul (1992), in their guidebook for analyzing experience sampling data related to flow, identified one of the most common ESM data analysis issues as being the confusion regarding the type of question being asked and the importance of differentiating between questions about *situations* or questions about *persons*. Questions about *situations* included comparisons between "context of daily life, as defined by people's activities (e.g., work vs. leisure), companionship (being with family vs. friends), location, or time of day…[and] might also be differentiated by subjective states" (p. 60). Thus, a study using questions of *situations* would typically use the same group of people (e.g., a group of teachers, or a group of nurses) and would compare their responses in different situations, such as flow perceptions at the start of the

day, at the end of the day, during preparation time, while at work, while at home, etc. These questions are not concerned with comparisons between groups of people, but rather between moments in time. However, questions about *persons* include comparisons between different groups of people or comparisons between people with different trait characteristics. In such a study, researchers may compare flow perceptions throughout the day for high-achieving high school students versus low-achieving high school students, or they may compare moods throughout the day of people who have physical disabilities versus those who do not have physical disabilities. Hektner, Schmidt and Csikszentmihalyi (2007) emphasize the critical importance of establishing the type of question as it relates to aspects of the situation or aspects of the person.

In the current study, the research questions focused on *situations*. They are questions being investigated regarding context and companionship (Larson & Delespaul, 1992) in a particular population (i.e., people with aphasia), and the same group was studied throughout this study. The research questions relate to differentiated states regarding environmental factors and flow.

In order to explore flow experiences among individuals with aphasia, the following questions were investigated:

1. How often do individuals with mild aphasia produce ratings that are consistent with the experience of flow compared to ratings consistent with the remaining three experience quadrants over the course of one week?
2. Among individuals with mild aphasia, to what extent are flow ratings in each of the four quadrants associated with positive and negative environmental factors?

3. Are there differences in the frequency with which individuals with mild aphasia produce ratings in the flow quadrant (and in the three other quadrants) when they are alone versus when they are with others?

Methods

Participants

Participants were recruited utilizing convenience sampling from groups who might meet the study criteria. Ethics approval for recruitment and consent procedures were obtained from the Human Subjects Institutional Review Board (HSIRB) at both Western Michigan University and the University of Wisconsin – Eau Claire.

A total of nine individuals with aphasia agreed to participate in this study (see Table 5) for demographic characteristics). Inclusion criteria included the following:

- Age of 25 years or older
- Mild aphasia based on Western Aphasia Battery (WAB- R) (Kertesz, 2007) Aphasia quotient $\geq$ 76
- Reading score adequate at the sentence level as evidenced by score of $\geq$ 24/40 on Reading Comprehension of Sentences subtest of WAB-R (Kertesz, 2007)
- Etiology of aphasia secondary to non-traumatic cerebrovascular event (thus excluding surgical or tumor-related aphasia) occurring six months or more prior to the study
- Moderate or less motor involvement based on Wallace Motor Screening Scale (Wallace, 2010; Appendix B)

- Native English speaker
- Absence of significant cognitive or psychiatric impairment as determined by self-report and clinical observation by the investigator

Table 5

Participant Characteristics (N = 9)

Sampling variables	
Mean age	66.8 yrs (56 yrs – 77 yrs)
Mean Years post stroke	8.2 yrs (1 – 14)
Mean WAB-R Aphasia Quotient	88.6 (80.2 – 93.8)*
Mean WAB-R Reading Comprehension score	35.8 (26 – 40)
Mean Wallace Motor Screening Scale	1.8 (1-3)
Premorbid handedness	L: 1 R: 8
Highest education level completed	High School: 2 Some post high school: 2 2-year degree: 1 4 year degree: 2 Post-graduate: 2
Living situation	Living with spouse: 5 Living with partner: 1 Single (and living alone): 3

** Note that the participant who scored 93.8 has been previously diagnosed with aphasia secondary to CVA, still perceived herself to have aphasia and actively attends aphasia groups and aphasia camps)*

Data-gathering Tools

Data were gathered via an app designed specifically for this study, called the FlowAphasia app, using the iOS 7 operating system via an iPod Touch. It was designed by GalacticTech, LLC, in consultation with the author. Five loaner iPod Touch devices

were secured for this study, allowing for simultaneous data collection for a maximum of five individuals. The app was utilized to provide randomized signaling across daytime hours, providing a prompt for participants to input data about what they were doing at the moment, and to maintain data until it could be downloaded. The scale was presented within the app on 1-5 increments similar to the increments used by Jackson and Eklund (2002) and Paul et al. (2004). Although others have used a 7-item Likert scale (e.g., Engeser & Rheinberg, (2008), a scale of 1-5 was used to minimize complexity (Paul, et al., 2004), to be consistent with flow assessment from Jackson and Eklund (2002), and because there is no definitive recommendation for incremental recommendations on the Likert scale. A vertical Likert scale was used because it has been postulated to be more effective for individuals with aphasia than a horizontal Likert scale and is used in the American Speech Language-Hearing Association's Quality of Communication Life (Paul et al., 2004). Participants entered their answers using touch screen sliders (See Figure 3 - Screenshot 1). Note that screenshots of all FlowAphasia screen displays can be found in Appendix C, and the FlowAphasia app dashboard can be found in Appendix D. Industry standard and industry exceeding encryption and password protection were utilized to maximize security.

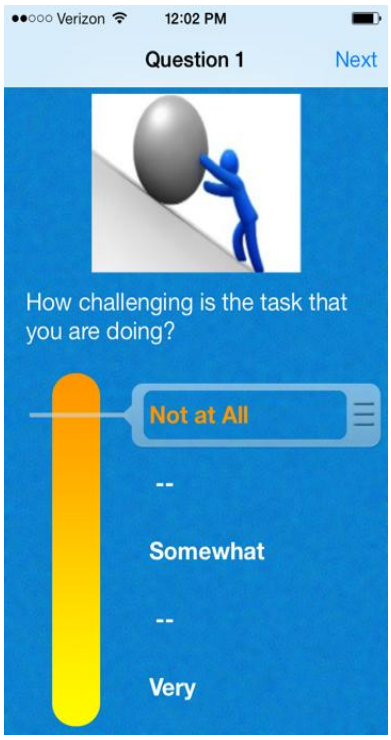


Figure 3. - Screenshot 1 – FlowAphasia app.

Aphasia-friendly design principles were incorporated into the FlowAphasia app used for this study. Syntax of content was simplified and the questions were reduced as much as possible to the essence of meaning (Dalemans, Wade, van den Heuvel, & de Witte, 2009), given the complexity of the concepts of flow. Additionally, each question of the FlowAphasia app was supported using a pictogram as suggested by Dalemans and colleagues. Simple images were added to each concept following consensus agreement among experts in aphasia and research design. One image was used, with permission, from the Aphasia Institute (Appendix H). Although confined to the size of the iPod Touch screen, print was maximized to facilitate augmented input and presented in a san serif font. Figure–ground principles were incorporated to maximize augmented input and reduce cognitive load. Finally, individuals with aphasia piloted the FlowAphasia app

prior to the study and their feedback was incorporated into further design principles of the app.

Data-gathering Procedures

This study utilized a signal-contingent sampling method of six randomized indicators per day during a 12-hour continuous time period. The typical timeframe was from 8:00 a.m. to 8:00 p.m. over the course of seven consecutive days. There was an option, depending on participant request, to adjust beginning and end times to accommodate a participant's schedule (such as a very early riser or a very late riser) while maintaining the continuity of a 12 hour uninterrupted sampling period; however, no participants opted for this modification. The week-long duration is consistent with recommendations by Hektner et al. (2007), who advocated for a typical duration of seven days, a timeframe which usually garners a representative sample without placing on the participants the undue burden of unnecessarily lengthy timeframes.

Variables

Three primary sets of variables were defined to make it possible to answer the questions posed for this study (see Figure 4). The first set comprised the two Flow Variables (FV), skills and challenges, that were used for rating the two low-to-high dimensions that define which of the four quadrants (flow, boredom, apathy, anxiety) was consistent with the participant's ratings. The second set of variables comprised four Environmental Variables (EV) that were taken primarily from the work of Howe, Worrall and Hickson (2008a, 2008b)**.** The third variable comprised a single binary Solitude Variable (SV**),** which asked the participant to indicate whether the activity was done in

solitude or with other people. Each set of variables is discussed in more detail in the following paragraphs.

Flow Variables

The crux of the flow experience relates to the balance of challenge and skill (Csikszentmihalyi, 2008; Csikszentmihalyi & Nakamura, 2009). These are the two dimensions that can vary from low to high, and define the quadrants of the quadrant model. The experiential state within the quadrant model was operationalized via the following two continuous discrete variables:

a. Challenge: *How challenging is the task you are doing?*

b. Skill: *How much skill do you have in this task?*

In order to operationalize the presence of flow, aggregated *z*-score values were determined at the subject level (Bassi & Delle Fave, 2012). Challenge ratings and Skill ratings at each sampling point were converted to *z*-score values for each participant, so that 0 was the mean for that individual and the z-scores indicated the standard deviations above or below the person's mean. If the *z*-score for Challenge was greater than zero, and the *z*-score for Skill was greater than zero (high challenge, high skill), then that sampling point was operationalized as flow. Subsequently, if the *z*-scores for Challenge and for Skill for the sampling point were both below zero, that sampling point was operationalized as apathy (low challenge, low skill). A sampling point indicative of low challenge (z-score below zero), high skill (z-score above zero) was operationalized as boredom while a high challenge (*z*-score above zero), low skill (z-score below zero) ratio was operationalized as anxiety.

Environmental Variables

The inclusion and definitions for environmental factor variables were based on research by Howe, Worrall and Hickson (2008a; 2008b) as outlined in the background section of this paper. Between their two studies, a total of 13 themes were identified. Of those 13, nine were found in only one of the studies, whereas four were identified in both studies. The four themes common to both studies were: Familiarity, Communication Complexity, Time Available for Communication, Availability of Extra Support for Communication. Consideration was taken with regard to the ability to convey these concepts via phrase or pictoral descriptions and whether participants would be able to easily differentiate these concepts in ESM sampling. Sampling needed to be brief in order to maximize responses. Through discussion and revision with experts in aphasia and qualitative research, the following four variables were established.

a. Support for Communication – Howe et al. (2008a) described this as the "presence of additional assistance from other people and multimodal cues that enable the individual with aphasia to participate" (p. 1112). This variable was presented via the FlowAphasia app as follows: "How much communication support do you have right now?"
b. Awareness of Aphasia – Howe et al. (2008a) described this as "other people's general awareness of aphasia as well as their knowledge of a specific individual's communication difficulties" (p. 1108). This was presented to the participant as follows: "How much do the people around you right now know about aphasia?"

c. Time Available for Communication – Howe et al. (2008a) described this as "time the individual with aphasia was allowed to complete the communication tasks" (p. 1112). This was presented to the participant as follows: "How much time pressure for communication do you feel?"

d. Complexity of Communication – Howe et al. (2008a) described this as involving the "degree of complexity of verbal and written tasks" (p. 1112). This was presented to the participant as follows: "How complex is the communication right now?"

See Figure 4 for variables.

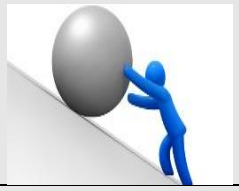
Variable	**Question**	1	2	3	4	5
FV- Task Challenge 	How **challenging** is the task you are doing?	Not at all		Somewhat		Very
FV – Skill 	How much **skill** do you have in this task?	None		Some		A lot
EF – Support for communication 	How much **communication support** do you have right now?	None		Some		A lot

Figure 4—Continued

EF – Awareness of Aphasia* 	How much do the people around you right now **know about aphasia**	Nothing		Some		A lot
EF – Time Available for Communication 	How much **time pressure** for communication do you feel?	None		Some		A lot
EF – Communication Complexity 	How **complex** is the communication right now?	Not at all		Somewhat		Very
SV – Solitude 	Are you doing the task **alone** or **with someone** (Dichotomous)	Alone		With someone		

FV = Flow Variable
EF = Environmental Factors Variable
SV = Situational Variable

*Note: Awareness of aphasia image used for this study with permission courtesy of the Aphasia Institute, Toronto, Ontario

Figure 4. Variables.

In order to operationalize the environmental factors as either facilitators or barriers, environmental factors were deemed a facilitator if the rating after z-score aggregation at the subject-level was above zero, and were considered a barrier if the rating for a particular data point after z-score aggregation was below zero. Note that the environmental factors of Time Pressure and Complexity of Communication were reverse scored such that the increased presence of time pressure or of complexity of communication was deemed a barrier.

Solitude Variable

Walker (2010) studied flow experiences occurring in the presence of others (social flow) versus solitary flow and concluded that, while both conditions were enjoyable, social flow experiences were more enjoyable than solitary flow experiences. His study related primarily to conditions of solitary versus interdependent sport/activity participation and thus do not contain the degrees of complexities that communication may bring for people with aphasia. However, he identified examples of flow occurring alone, co-actively, or interactively. *Alone flow* was defined as solitary flow, and the task was completed alone without other persons nearby (e.g. running alone, fishing alone). *Co-active flow* was defined as "any situation that involved doing a unitary task concurrently with one or more other people (e.g., running in a pack of people)" (Walker, 2010, p. 5). *Interactive flow* was identified as occuring "when a conjunctive divisible task absolutely required cooperation from one more other people; a task best done by a group and impossible to do alone (e.g., playing a game of pick-up basketball)" (Walker, 2010, p. 5). Walker (2010) also asserted that, within Western culture, rather than being conducive to the flow experience, groups appear to hinder flow experiences more than

facilitate flow. Thus, in this line of thinking, consideration would need to be made for the potential postive or negative impact of aphasia groups on flow experiences despite the promotion of, and identified benefits of aphasia groups (Elman, 2007; Glista & Pollens, 2007; Marshall, 1999). In the current study, the situation analyzed was similar to *Alone Flow* versus *Co-* and *Interactive flow* combined. That is, no attempt was made to differentiate other than "alone" versus "with someone" due in part to the contextual complexity and the difficulty differentiating these conditions on the sampling measure. Thus, the construct of *alone* was defined consistent with Walker (2010) as "solitary; the task is unitary and no other person is nearby" (p. 5), however in this study the caveat was added to participant instruction that "nobody is nearby *that you you know or have a relationship with."*

a. Solitary: This binary variable was presented to the participants as the following: "Are you doing the task alone or with someone?"

Thus in this study, the following variables exist:

Outcome (dependent variable): Quadrant experience (flow, boredom, apathy, anxiety)

Predictor (Independent Variable, I.V): Support for Communication (Barrier vs. Facilitory)

Predictor (I.V.): Awareness of Aphasia (Barrier vs. Facilitory)

Predictor (I.V.): Time Available (Barrier vs. Facilitory)

Predictor (I.V.): Complexity of Communication (Barrier vs. Facilitory)

Predictor (I.V.): Solitude (Alone vs. Interactive)

Analysis of Results

Hektner et al. (2007) emphasized that there is not a standard, recommended approach for analyzing ESM data, but rather multiple means through which to explore analyses. A primary concern is the perception of independence of the observations. Significance tests are used with the assumption that all points of data are independent; however that is not the case in most ESM studies, including the current study.

Research question one asked about the frequency of flow occurrences over the course of one week among individuals with aphasia. Individual variables, gathered at each sampling event, were converted to *z*-scores, as advised by Moneta (2012) and Hektner et al. (2007). The values obtained for each variable were converted into *z*-scores by subtracting each value from the individual's mean for the item and dividing it by its standard deviation, resulting in the mean skill and challenge for each participant as zero (Bassi & Delle Fave, 2012). Note that this analysis was done at the individual subject level. Analysis at the subject level can reduce potential problems of unequal weighting (Larson & Delespaul, 1992). *Z*-scores were determined for each individual rather than collectively as an entire group of participants in order to ensure statistical validity. Because of the nature of ESM data, traditional repeated measures are not valid. From a statistical standpoint, a growing number of studies are utilizing multilevel modeling techniques including Hierarchical Linear Modeling (HLM) (Hektner, Schmidt, & Csikszentmihalyi, 2007; Larson & Delespaul, 1992; Moneta, 2012). Such analyses allow for a statistical interpretation of relationships of Level 1 and Level 2 (and beyond) variables. However, the use of *z*-scores is common within ESM data analysis and offers to control for participant differences in the use of scales as well as the ability to provide a

standardized metric to the data gathered (Hektner, Schmidt, & Csikszentmihalyi, 2007). It is known that there are flaws within the process of analyzing aggregated data, primarily the issue of heteroskedasticity, which is the violation of the assumption that variance of the residuals is constant (Schwartz & Stone, 1998). The use of z-scores, as described in this paper, is encouraged by prominent ESM authors, including Larson and Delespaul (1992) and Hektner, Schmidt and Csikszentmihalyi (2007). Additionally, the primary author reviewed the statistical plan on three separate occurrences with university statistical consultation, and also discussed the use of z-scores as outlined in this paper with Dr. Hektner (personal communication, October 20, 2014) and the plan was considered appropriate.

Each sampling event was categorized at the subject level, for that individual only, and was classifed as one of four quadrant experiences: flow (*z*-scores of challenge and skill each above zero), apathy (*z*-scores of challenge and skill both below zero), boredom (*z*-scores of challenge below zero, and *z*-score of skill above zero) or anxiety (*z*-score of challenge above zero, *z*-score of skill below zero). This allowed for a calculation of percentage of sampled events that each participant was in flow, boredom, anxiety, or apathy and thus answers the first research question.

In order to answer research question two, which asked about the association of flow experiences and environmental factors, the Environmental Variables were converted to *z*-scores consistent with Moneta (2012) and Hektner, Schmidt and Csikszentmihalyi (2007) as noted above. Aggregated *z*-score values at the individual level were again determined at the subject level (Bassi & Delle Fave, 2012). Note that the environmental factors of Time Pressure and Complexity of Communication were reverse scored such

that the increased presence of time pressure or of complexity of communication was deemed a barrier.

In order to answer research question three in regard to the experience of flow alone versus with others, percent of occurrence of flow events alone versus with somone were calculated, again on a subject-level.

Results

Frequency of Participant Ratings Consistent with the Experience of Flow, Boredom, Apathy, and Anxiety

The first research question relates to the frequency of participant ratings consistent with the experience of flow compared with the other three quadrants. All nine participants experienced flow based on the operational definition of flow in this study as being z-scores for both challenge and skill greater than zero. Table 6 presents data regarding frequency of each quadrant experience (flow, apathy, boredom, anxiety) as a basis of overall percentage of sampled events for each participant. Flow ranged in occurrence from 7.9% of sampled events (participant 5) to 59.3% of sampled events (participant 8) over the course of the week of sampling.

Presented in a slightly different format, Figure 5 displays the aggregated (across participants) percentage of occurrence for each of the four quadrant experiences.

Table 6

Frequency of Quadrant Experiences

Participant	Number of samples	Frequency (and percentage of occurrence) that a participant's ratings met criteria for one of the four quadrants"			
		Flow	Apathy	Boredom	Anxiety
Participant 1	38	8 (21.1%)	4 (10.5%)	9 (23.7%)	**17 (44.7%)**
Participant 2	18	3 (16.7%)	**10 (55.6%**	3 (16.7%)	2 (11.1%)
Participant 3	39	**13 (33.3%)**	**13 (33.3%)**	9 (23.1%)	4 (10.3%)
Participant 4	39	11 (28.2%)	**16 (41.0%)**	9 (23.1%)	3 (7.7%)
Participant 5	38	3 (7.9%)	11 (28.9%)	**18 (47.4%)**	6 (15.8%)
Participant 6	36	8 (22.2%)	8 (22.2%)	5 (13.9%)	**15 (41.7%)**
Participant 7	39	12 (30.8%)	**14 (35.9%)**	12 (30.8%)	1 (2.6%)
Participant 8	27	**16 (59.3%)**	8 (29.6%)	1 (3.7%)	2 (7.4%)
Participant 9	30	9 (30.0%)	**12 (40.0%)**	4 (13.3%)	5 (16.7%)
Totals	304	83 (27.3%)	96 (31.6%)	70 (23%)	55 (18.1%)

Note. Item in bold is most frequent experience. Participant 3 had ties for percentage of occurrence for both flow and apathy.

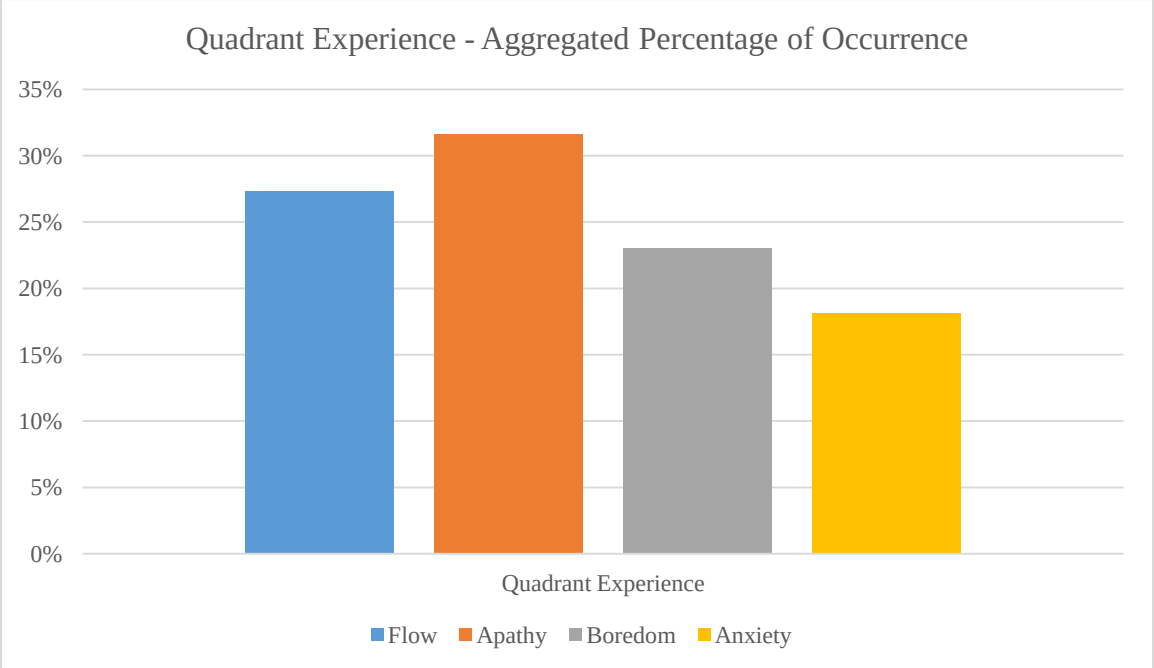


Figure 5. Quadrant experience - aggregated percentage of occurrence.

Environmental Factors Associated with Flow, Boredom, Apathy and Anxiety

The second research question is related to the nature of the environmental factors associated with flow and the other three quadrant experiences. In order to address this question, data are first presented in Table 7 related to the frequency of occurrence of barriers and facilitators in each of the four environmental factors (Communication Support, Knowledge of Aphasia, Time Pressure, Complexity of Communication) regardless of the quadrant experience. Recall that Time Pressure and Complexity of Communication were reverse scored, such that these factors were considered facilitory if, in essence, there was reduced time pressure or reduced complexity of communication. Conversely, these reverse scored environmental factors were considered barriers if, in essence, there was increased time pressure or increased complexity of communication.

Because the construct of flow was of specific interest in this study, the nature of the environmental factors (barriers or facilitators) for each data point of flow occurrence is presented in Table 8.

Figure 6 provides graphic display of the percentages of the four environmental factor ratings that fell in the facilitator range when skill and challenge ratings met criteria for flow (high, high) versus being categorized in any of the other three quadrants.

Table 7

Environmental Factors Barriers and Facilitators Regardless of Quadrant Experience

Participant	Number of samples	Environmental Factors (Percentage of Occurrences)							
		Communication Support Frequency (Percentage of Occurrences)		Knowledge of Aphasia Frequency (Percentage of Occurrences)		Time Pressure Frequency (Percentage of Occurrences)		Complexity of Communication Frequency (Percentage of Occurrences)	
		Barrier	Facilitator	Barrier	Facilitator	Barrier	Facilitator	Barrier	Facilitator
Participant 1	38	27 (71.1%)	11 (28.9%)	27 (71.1%)	11 (28.9%)	13 (34.2%)	25 (65.8%)	14 (36.8%)	24 (63.2%)
Participant 2	18	17 (94.4%)	1 (5.6%)	5 (27.8%)	13 (72.2%)	3 (16.7%)	15 (83.3%)	1 (5.6%)	17 (94.4%)
Participant 3	39	35 (89.7%)	4 (10.3%)	35 (89.7%)	4 (10.3%)	1 (2.6%)	38 (97.4%)	4 (10.3%)	35 (89.7%)
Participant 4	39	23 (59.0%)	16 (41.0%)	20 (41.3%)	19 (48.7%)	9 (23.1%)	30 (76.9%)	12 (30.8%)	27 (69.2%)
Participant 5	38	30 (79.9%)	8 (21.1%)	34 (89.5%)	4 (10.5%)	10 (26.3%)	28 (73.7%)	9 (23.6%)	29 (76.3%)
Participant 6	36	24 (66.7%)	12 (33.3%)	25 (69.4%)	11 (30.6%)	17 (47.2%)	19 (52.8%)	18 (50.0%)	18 (50.0%)
Participant 7	39	22 (56.4%)	17 (43.6%)	20 (51.3%)	19 (48.7%)	10 (25.6%)	29 (74.4%)	10 (25.6%)	29 (74.4%)
Participant 8	27	14 (41.9%)	13 (48.1%)	14 (51.9%)	13 (48.1%)	13 (48.1%)	14 (51.9%)	13 (48.1%)	14 (51.9%)
Participant 9	30	21 (70.0%)	9 (30.0%)	28 (93.3%)	2 (6.7%)	18 (60.0%)	12 (40.0%)	5 (16.7%)	25 (83.3%)
Totals (Avg Percentage)	304	213 (70.1%)	91 (29.9%)	208 (68.4%)	96 (31.6%)	94 (30.9%)	210 (69.1%)	86 (28.3%)	218 (71.7%)

Table 8

Environmental Factors Barriers and Facilitators during Flow Experiences

			Environmental factors during flow experiences (Percentage of Occurrences within Samples Rated as Flow)							
Participant	Number of samples	Total flow occurrences (Percentage of Occurrence)	Communication Support (Percentage of Occurrence)		Knowledge of Aphasia (Percentage of Occurrence)		Time Pressure (Percentage of Occurrence)		Complexity of Communication (Percentage of Occurrence)	
			Barrier	Facilitator	Barrier	Facilitator	Barrier	Facilitator	Barrier	Facilitator
Participant 1	38	8 (21.1%)	7 (87.5%)	1 (12.5%)	7 (87.5%)	1 (12.5%)	2 (25.0%)	6 (75.0%)	3 (37.5%)	5 (62.5%)
Participant 2	18	3 (16.7%)	3 (100%)	0 (0.0%)	1 (33.3%)	2 (66.7%)	3 (100%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
Participant 3	39	13 (33.3%)	11 (84.6%)	2 (15.4%)	11 (84.6%)	2 (15.4%)	1 (7.7%)	12 (92.3%)	3 (23.1%)	10 (76.9%)
Participant 4	39	11 (28.2%)	3 (27.3%)	8 (72.7%)	3 (27.3%)	8 (72.7%)	5 (45.6%)	6 (54.4%)	5 (45.5%)	6 (54.5%)
Participant 5	38	3 (7.9%)	2 (66.6%)	1 (33.4%)	3 (100%)	0 (0.0%)	1 (33.3%)	2 (66.7%)	1 (33.3%)	2 (66.7%)
Participant 6	36	8 (22.2%)	3 (37.5%)	5 (62.5%)	4 (50.0%)	4 (50.0%)	6 (75.0%)	2 (25.0%)	5 (62.5%)	3 (37.5%)
Participant 7	39	12 (30.8%)	6 (50.0%)	6 (50.0%)	7 (58.3%)	5 (41.7%)	7 (58.3%)	5 (41.7%)	4 (33.3%)	8 (66.7%)
Participant 8	27	16 (59.3%)	6 (37.5%)	10 (62.5%)	8 (50.0%)	8 (50.0%)	10 (62.5%)	6 (37.5%)	10 (62.5%)	6 (37.5%)
Participant 9	30	9 (30.0%)	3 (33.3%)	6 (66.7%)	8 (88.9%)	1 (11.1%)	6 (66.7%)	3 (33.3%)	3 (33.3%)	6 (66.7%)
Totals (Avg Percentage)	304	83 (27.3%)	44 (53.0%)	39 (47.0%)	52 (62.7%)	31 (37.3%)	41 (49.4%)	42 (50.6%)	34 (41.0%)	49 (59.0%)

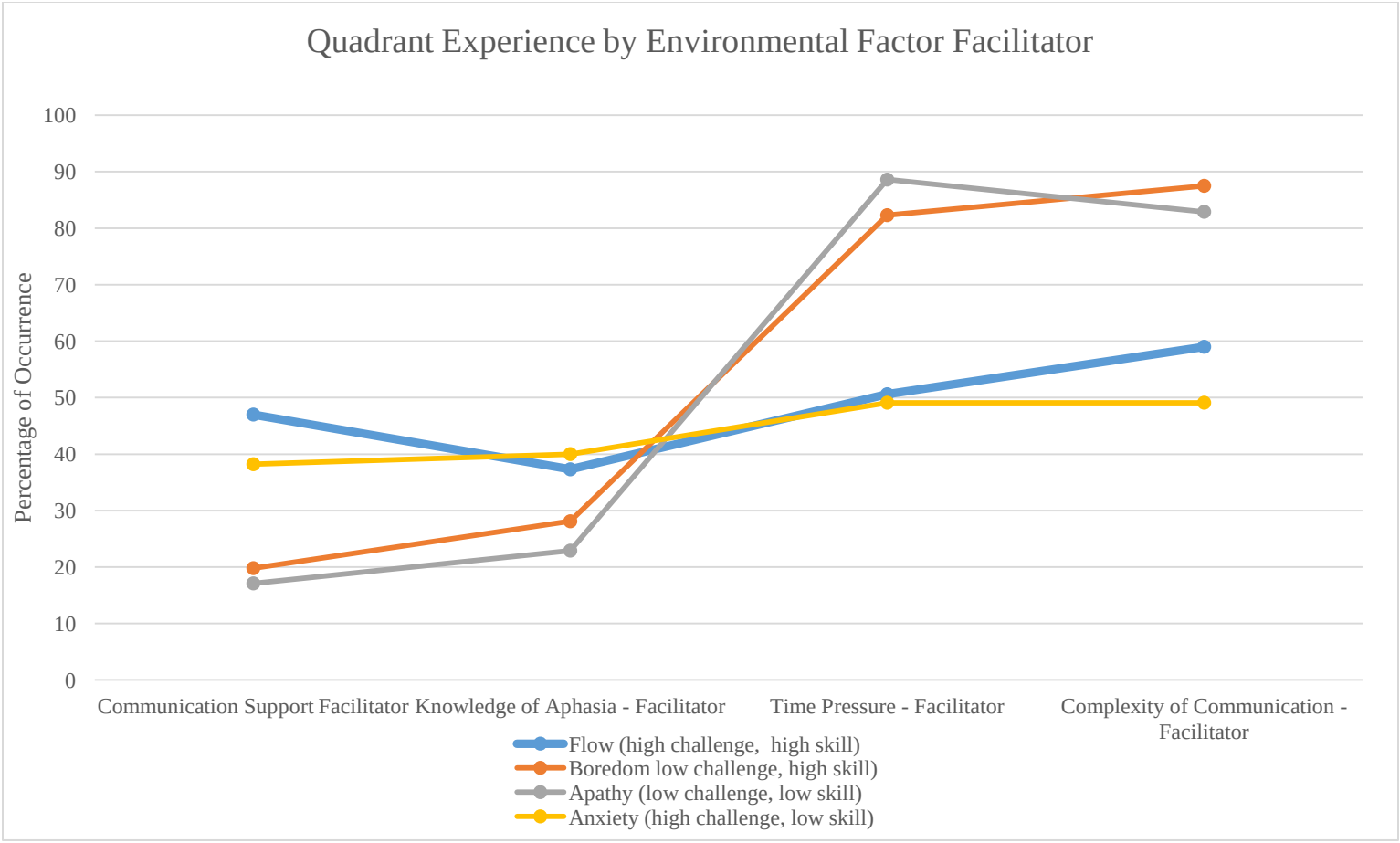


Figure 6. Quadrant experience as function of when ratings for each of the four environmental factors met criteria as a facilitator.

Flow Experiences in Solitude Versus with Someone

The final research question in this study was in regard to the experience of flow in solidtude versus with someone. Results are displayed in

Table 9. When individuals were sampled, they were alone (engaged in a task or activity that was primarily done on their own, without known companions) 66.2% of the time. When they experienced flow they were alone 59% of the time. Five participants provided ratings consistent with flow more frequently when they were alone. Two participants provided ratings consistent with flow more freuqently when they were with someone, and the remaining two participants reported equal flow experiences in both conditions.

Table 9

Flow Alone Versus with Someone

Participant	Number of flow occurrences (percentage of total occurrences)	Percent of Sampling events participant was Alone	Flow Experience (Percentage of Occurrences)	
			Flow Alone (Percentage of Occurrences)	Flow with someone (Percentage of Occurrences)
Participant 1	8 (21.1%)	55.3%	5 (63%)	3 (37%)
Participant 2	3 (16.7%)	66.7%	3 (100%)	0 (0%)
Participant 3	13 (33.3%)	89.7%	11 (84.6%)	2 (15.4%)
Participant 4	11 (28.2%)	84.6%	6 (54.5%)	5 (45.5%)
Participant 5	3 (7.9%)	89.5%	3 (100%)	0 (0%)
Participant 6	8 (22.2%)	72.2%	4 (50%)	4 (50%)
Participant 7	12 (30.8%)	56.4%	6 (50%)	6 (50%)
Participant 8	16 (59.3%)	44.4%	7 (43.8%)	9 (56.2%)
Participant 9	9 (30.0%)	36.7%	4 (44.4%)	5 (55.6%)
Totals	**83 (27.3%)**	**66.2%**	**49 (59%)**	**34 (41%)**

Discussion

The results of this study showed that participant ratings were consistent with flow more than one-quarter of the time, and only apathy was experienced more frequently across participants. Interestingly, there was a broad range of quadrant experience frequencies reported. Two participants reported ratings indicative of flow as the most frequently occurring quadrant experience, or tied for the most frequently occurring experience. Additionally, two participants reported ratings indicative of flow as the least frequently occurring quadrant experience, or tied for the least frequently occurring quadrant experience. The study also revealed that two environmental factors, Communication Support, and Knowledge of Aphasia, occurred as facilitators most frequently in combination with flow experiences compared to non-flow experiences. Flow was experienced both in solitude and with others.

With regard to the first research question pertaining to the frequency with which ratings met criteria for each of the four quadrants, people with aphasia did indeed provide ratings consistent with flow (27.3% of sampling events). All participants reported ratings consistent with flow at some time during the course of the week-long sampling period. Participants' ratings were consistent with apathy most frequently (31.6% of sampling events), followed by flow (27.3%), boredom (23%) and anxiety (18.1%).

It is difficult to compare flow experiences in this study to those of other studies in part based on the variations in the operationalization of the concept of flow across studies. Collins, Sarkisian and Winner (2009) evaluated flow experiences among older adults. A sample of 54 older adults with mean age of 77.5 yr (SD = 3.7) were asked to complete a flow questionnaire at the end of each day for an entire week. They were

asked to read two descriptions of flow and indicate if they had had such an experience on that day. The authors reported that a majority of the older adults reported at least one flow experience.

Nakamura and Csikszentmihalyi (2002) cited a 1998 Gallup Poll and Noelle-Neumann (1995) indicating that approximately 16% of Americans experience involvement so intense they lose track of time at least daily. The same authors reported that approximately 42% of Americans *rarely or never* have such experiences. Thus, it was somewhat surprising to this researcher that ratings consistent with flow occurred with such high frequency in this study. It is encouraging to see that participants with aphasia in this study did indeed provide ratings consistent with flow, as operationally defined in this study, despite the presence of aphasia.

Although flow is rarely mentioned within the disabilities studies literature, the similarities in flow descriptions across cultures, professions and socioeconomic status (Csikszentmihalyi & Nakamura, 2005), as well as the results of this study indicating that individuals with aphasia do indeed experience flow, support Dunn and Brody (2008) who stated that "variables such as social class, gender, culture, age—and we might add disability – have no impact on its {flow} occurrence" (p. 420). Dunn and Brody (2008) listed several reasons why flow, and the achievement of flow, is relevant to people with disabilities, and those working with disabilities. These reasons include skill enhancement, positive outcomes, committing to goals and achieving goals (Dunn & Brody, 2008). They highlighted the pre- versus post-disability changes that may impact achievement of flow, including the potential for differences in activities that induce flow pre- versus post disability, and advocate for the likelihood of seeking new or modified

activities. Certainly this could be a role for a rehabilitation professional to support and facilitate. However, providing a "flow-inducing" environment for individuals with aphasia requires a careful tailored approach that includes an understanding of the balance of skill and challenge unique to each individual with aphasia.

Aspects of Challenge versus Relaxation

Whereas ratings used to define apathy (low challenge, low skill) constituted the most frequently occurring quadrant experience (31.6%), ratings used to define boredom (low challenge, high skill) constituted the third most frequently experienced combination (23%). There are discussions in prior literature regarding the Moneta (2012) quadrant experience labeled "boredom" (low challenge, high skill). Some have purported re-labeling this quadrant as "relaxation" and indicate that there are potentially positive elements of such a state (Csikszentmihalyi & Nakamura, 2009). In a low challenge, high skill situation, some may find relaxation, such as a skilled skier enjoying the relaxation of an easier downhill course, or a skilled musician enjoying a break from intense focus of a challenging piece by playing a less challenging, but relaxing piece. Csikszentmihalyi and Nakamura (2009) speculate that two of the four quadrant experiences may be rewarding intrinsically – those that relate to flow and those that relate to relaxation/boredom. Additionally, they argue that the remaining two quadrant experiences (anxiety and apathy) are potentially less pleasant, and that there may be self-preservation strategies that trigger avoidance of experiences that may produce anxiety or apathy. Within the experiences consistent with boredom (or relaxation), both Time Pressure and Communication Complexity were identified as facilitory 88.6% and 82.9% of the time, respectively. In essence, these situations are marked by minimal time pressures, and

minimal communication complexity, and thus, may indeed be consistent with a relaxing experience.

Nakamura and Csikszentmihalyi (2002) addressed issues of apathy and boredom related to populations without aphasia. They noted that there is a tendency among all of us for a preference for relaxation versus flow. The presence of challenge is stressful and it may be self-serving in either a conscious or sub-conscious mindset to try to reduce that challenge. In their study of adolescents in the United States, Csikszentmihalyi and Nakamura (1989) found that motivation and happiness were greater in low-challenge, high-skill situations (boredom) than in high-challenge, high-skill situations (flow). Certainly the change in terms from boredom to relaxation carries more than just a semantic value. There is a connotation that boredom is reflective of lack of initiation or drive, while relaxation may be more of an intentional act and one that is good for the psyche. Both flow and anxiety occurrences had similar profiles for all four environmental factors. Both had moderate facilitory aspects of Communication Support and Knowledge of Aphasia, as well as both Time Pressure and Complexity of Communication. The environmental factors profiles for both flow and anxiety are strikingly similar, and may represent the high challenge aspect of both of these experiences (flow being high challenge, high skill; anxiety being high challenge, low skill).

The Role of Environmental Factors Related to Flow and Non-flow Experiences

The second research question in this study related to quadrant experiences (flow, boredom, apathy, anxiety) and environmental factors. In the current study, four

environmental factors were investigated: Communication Support, Knowledge of Aphasia, Time Pressure and Communication Complexity. Each of the four environmental factors will be discussed separately, however they will first be discussed in pairs, given the interesting similarities between the two pairs: Communication Support and Aphasia Knowledge; and Time Pressure and Complexity of Communication.

As indicated in Figure 6 of the Results section, the facilitory nature of Communication Support and Aphasia Knowledge was similar during all four quadrant experiences. The percentage of occurrence between each factor within each dyad was similarly facilitory during each of the four quadrant experiences (flow: 47%/37.3% for Communication Support and Knowledge of Aphasia respectively; anxiety: 38.2%/40%; boredom 17.1%/22.95; apathy: 19.8%/28.1%). Thus not only are these two factors similar in their proximity to each other for percentage of facilitory occurrences, they both have relatively higher frequency of facilitory occurrences during flow and anxiety experiences, in comparison to relatively lower frequency of facilitory occurrences for apathy and boredom.

Time Pressure and Complexity of Communication, the other dyad of environmental factors, were similar to each other throughout all four quadrant experiences with regard to similar percentage of occurrence to each other, as well as a relatively higher percentage of occurrence during boredom and apathy, and a relatively low percentage of occurrence for anxiety and flow. Recall that Time Pressure and Complexity of Communication were reverse scored, such that these factors were considered facilitory if there was reduced time pressure or reduced complexity of communication.

One could postulate that, in essence, the dyad of Communication Support and Aphasia Knowledge is, in a sense, positive. That is, based on literature, an environment that facilitates Communication Support and Aphasia Knowledge is generally considered a positive environment for those with aphasia, and a positive environment to support communication and participation. Indeed, in this study, these two environmental factors as facilitators occurred with a higher percentage of occurrence during flow and anxiety states, when compared with boredom and apathy states. One could also postulate that the other dyad of Time Pressure and Complexity of Communication might, in a sense, be negative. That is, based on literature, these two environmental factors may hinder participation and/or communication. Interestingly, however, these two factors occurred as facilitators with a relatively high degree of occurrence during boredom and apathy, and occurred as facilitators with a relatively low degree of frequency during flow and anxiety. This raises the possibility that too little time pressure or communication complexity may preclude flow experiences (and anxiety experiences) and similarly, such environments with little time pressure or complexity may facilitate experiences of boredom and/or apathy. There may also be interactions of either of the above two dyads in isolation or in combination that go beyond the scope of this study. Increasing the challenge by increased time pressure and/or increased communication complexity may be necessary when considering optimal balance of skill and challenge as key aspects of flow experiences. However, there is a fine line between flow-conducive environments versus anxiety-provoking environments. Further observations follow regarding each of the environmental factors in this current study individually.

Communication Support

Participants in this study provided ratings of Communication Support as a facilitator in approximately 30% of all aggregated samples, thus meaning it was deemed a hindrance 70% of the time. However Communication Support was a facilitator in 47% of all aggregated flow experience and conversely was a facilitator in only 20% of all aggregated apathy experiences. Although no causal relationships or associations can be inferred, the presence of communication support may assist the individual with aphasia in optimizing the communicative skill and communicative challenge balance. Benefits of partner supports for those with aphasia have been reported (Howe, 2008). Garrett and Beukelman (1995) observed increasingly substantive and cohesive interactions when communication support via written choice was provided by the partner in an interaction with an individual with severe aphasia. A systematic review of communication partner training in aphasia (Simmons-Mackie, Raymer, Armstrong, Holland, & Cherney, 2010) concluded that such training was effectiveness of communication to improve communication activities and/or participation. Flow experiences may be conducive to positive participation experiences, and the increased presence of communication supports during flow may be yet another reason to encourage and facilitate opportunities for communication partner training and community communication supports.

Knowledge of Aphasia

Participants in this study provided ratings of Knowledge of Aphasia as a facilitator in 31.6% of aggregated responses, a very similar aggregated response frequency to Communication Support (29.9%). There may be a direct relationship

between Knowledge of Aphasia and Communication Support such that if an individual possesses an increased knowledge regarding aphasia, he or she may provide more optimal communication support. Again, no relationship can be deduced from this study, but it does raise potential for future investigations of such a relationship. With regard to flow experience occurrences, there was a slight increase in the facilitory nature of Knowledge of Aphasia when individuals were in flow (37.3%). An interesting challenge to the participant was in regard to rating the environment's "knowledge of aphasia." In some cases participants may not know how much the people around them know about aphasia. The people around them may be communicating in a supportive manner, but doing so out of a general communication principle rather than because they knew the participant had aphasia. In an international survey of 978 individuals comprising the general public, Simmons-Mackie, Code, Armstrong, Stiegler and Elman (2002) found that approximately 14% had heard of aphasia and only approximately 5% of survey respondents possessed basic knowledge of aphasia. Therefore it may be concluded that the participants in the current study were around individuals who had more knowledge of aphasia than the general public. However, the participants' ratings of aphasia knowledge of those around them is also likely indicative of the frequent presence of family and/or friends who likely have some knowledge of aphasia based on their relationship with the participant. Similarly to Communication Support, facilitating Knowledge of Aphasia may provide increased opportunities for flow. Additionally, increasing Communication Support may have a direct effect on Knowledge of Aphasia as well.

Time Pressure for Communication

Participants in this study provided ratings of Time Pressure for Communication as a facilitator 69% of the time regardless of quadrant experience. However, Time Pressure for Communication was facilitory in only 50.6% of occurrences of flow experiences. Thus, participants perceived an increase in Time Pressure for Communication during flow experiences, as indicated by a diminished frequency of facilitory occurrences. This may reflect an increase in challenge in such situations, as communication is anticipated to be more challenging with increased Time Pressure for Communication. In their 2008 study, Howe, Worrall and Hickson identified "Time Available for Communication" as a key theme that supported participation. Additionally, in their structured interviews with individuals with aphasia, Dalemans, deWitte, Wade and van den Heuvel (2010) noted the recurring challenges of perceived time pressure on both communication skills and on participation. In their study, "on many occasions, they {people with aphasia} were unable to take part in conversation: they needed too much time to think, to say what they wanted or to understand what other people were saying" (p. 543). The need for a slower, deliberate form of communication is not a choice, but rather "the only accessible pace" (Pound & Hewitt, 2004, p. 163). However, a higher than typical challenge is a necessary component of flow, and increased Time Pressure may increase the challenge at hand. Thus, this increase in Time Pressure for Communication may have been an essential aspect of flow experience involving communication. Conversely for quadrant experiences of boredom and apathy, Time Pressure was highly facilitory (88.6% and 82.5% respectively).

One reason for the largely facilitory nature of time pressure may be that the individuals with aphasia were surrounded and supported by a knowledgeable base of communication partners that supported the individuals in communication, and thus overtly attempted to minimize time pressure. However, note that both Communication Support and Knowledge of Aphasia were identified as facilitators approximately 30% of the time (29.9% and 31.6% respectively) while Time Pressure was a facilitator 69% of the time. Thus this likelihood appears less plausible.

A second potential reason for a largely perceived facilitory aspect of Time Pressure for Communication may be that the participants were either not typically in a situation of high time pressure, or they did not respond to sampling when they were in such a situation. It may have been that they were sampled in the midst of a relatively pressured situation, and the thought of then answering the sampling questions in the midst of the already time-pressured situation seemed untenable. During times of low challenge, such as apathy and boredom, they may have had more time to respond and may have been more likely to respond given the relative absence of pressure.

A third, and potentially more plausible reason, may be an intentional avoidance of situations, partners, or settings in which time pressure may be less facilitory. As discussed earlier in this paper, avoidance has been recognized as a primary coping strategy among individuals without aphasia and is present among those with aphasia. Regardless of a presence of aphasia or not, there is a tendency to be drawn to comfort, which is more typically identified in the high skill, low challenge quadrant.

Complexity of Communication

Participants in this study provided ratings of Complexity of Communication as a facilitator in 71.7% of all sampling occurrences. This frequency of occurrence is similar to that of Time Pressure, as mentioned above, that was facilitory in 69.1% of all occurrences. That is, in general, participants' ratings for both Complexity of Communication and Time Pressure were identified as facilitory in approximately 70% of sampling occurrences. During high challenge situations, Complexity of Communication was facilitory in 59% of flow quadrant experiences and facilitory in 49.1% of anxiety quadrant experiences. Conversely, during low challenge quadrant experiences of apathy and boredom, Complexity of Communication was facilitory in 87.5% and 82.9% of occurrences respectively. Thus, during experiences of low challenge, Complexity of Communication was more likely to be facilitory than in periods of high challenge. This profile of Complexity of Communication is similar to that of Time Pressure, which also was more facilitory in nature during low challenge situations.

There are several potential rationales for the high percentage of occurrence observed for Complexity of Communication as a facilitator. It certainly may be that individuals with aphasia are excluded from opportunities for engagement. People with aphasia report being upset by the presence of boredom (Worall, et al., 2011). However, the primarily facilitory nature of Complexity of Communication may again reflect a conscious or sub-conscious avoidance of such situations as mentioned earlier. Additionally, the linguistic aspect of Complexity of Communication may create additional consternation during such situations. The use of language among people with aphasia may be a likely source of anxiety (Cahana-Amitay, et al., 2011). These same

authors posit the term “linguistic anxiety” to reflect the emotional state associated with anxiety in anticipation of errors associated with verbal output and there is a disproportionately high preoccupation with the risk involved in a communicative event. If provided with a choice to participate in a task or situation of high linguistic challenge, or to avoid participation in such a task, it may be human nature to avoid that which is uncomfortable or potentially unduly challenging. A mismatch of linguistic challenges and linguistic skills additionally has the potential to negatively spiral such that after so many negative linguistic experiences, there may be a propensity for avoidance in future potentially linguistically complex tasks.

Solitude Flow Versus Flow with Someone

Research question three related to flow experienced alone versus with someone. While on the surface, the concept of “alone” versus “with someone” may seem quite discrete, in reality, it was a difficult concept to operationalize. Concepts of “alone” are difficult to discern if, for example, someone is shopping by themselves in a crowded grocery store, or is working out alone at a busy YMCA. Recall that in this study, the definition of “alone” was based on Walker’s (2010) construct of alone: “solitary; the task is unitary and no other person is nearby” (p. 5), but with the aditional description to participants added that “nobody is nearby *that you you know or have a relationship with.”*

In the current study, participants were alone 66.2% of sampling occurrences. The quadrant experience of flow was experienced in 27.3% of the total sampling events. When flow was experienced, 59% of the time this occurred when the individual was alone, 41% of the time when the individual was with someone. Thus flow occurred more

frequently when the individual was alone, although participants were more frequently alone when sampled than with someone else. However, these results indicate that individuals with aphasia experience flow when alone and when with someone else.

Individuals with aphasia potentially may find differences in the flow experience depending on whether the individual is alone or with someone. Interactive, or social flow (Walker, 2010) should occur within similar basic conditions which include a match of skills and challenges within the environment, regardless of whether the individual is alone or with someone. In a series of three studies, Walker (2010) investigated flow experiences among college student participants when they were alone and when they were with others. In his first study, he compared social flow with solitary flow while in the final two studies he operationalized definitions of such flow experiences and investigated potential differences in enjoyment of social flow versus solitary flow. He concluded that social flow was more enjoyable to his participants than solitary flow. He noted the presence of emotional contagion, such that the positive experiences from others within social flow spread among the participants within their groups. However, he exerts that further exploration is certainly needed, especially related to flow dynamics among groups and the ultimate purpose of social flow and solitary flow. It may be that each condition serves separate purposes, either explicitly or implicitly. The application of interactive or together flow appears especially pertinent for individuals with aphasia as it relates to aphasia groups. Aphasia groups may provide an optimal environment of communication support, aphasia awareness, and familiarity such that communication and participation are facilitated. Although it has not been studied, flow experiences during

aphasia groups versus outside of aphasia groups would provide additional insights into the flow experience.

Individuals with aphasia in this study had a tendency to be involved in less challenging events or activities, as determined by their ratings of challenge. The primary experience quadrant was that of apathy (low skill, low challenge). With regard to Complexity of Communication and Time Pressure, both of these environmental factors were generally rated as facilitators rather than barriers. This is not entirely surprising. As Worrall and Frattali (2000) wrote, "It is not strange in this real-life context that refusal to act is a common occurrence. Every act, especially in the early stages of redefining one's changed self, serves as a vivid reminder of what does not work, rather than what does" (p. 157). A better understanding of the perception of the match or mismatch of skill and challenge from the perspective of the person with aphasia is imperative. With that knowledge, the clinician and person with aphasia can collaboratively develop, implement, review and revise plans for return to meaningful activity. Taking a coaching role (Holland & Nelson, 2013) facilitates guidance and support without being prescriptive. It is critical that individuals with aphasia have such a support, as they "often doubt whether properly restructured challenge…can yield outcomes of preference and pleasure in real life. They must often be shown convincingly and repeatedly that such doors exist and that entry is neither as formidable nor as adverse as they may envision, before they are apt to make a concerted effort" (Worrall & Frattali, 2000, p. 157).

Limitations

Primary limitations relate to the use of the app during this study, the operationalization of the concept of flow, and the operationalization of environmental factors as barriers or facilitators. The experience sampling method, and the app itself, have limitations that warrant caution in interpretation of results. Individuals may have not fully understood the question prompts, despite modifications to the presentation and design of the app. The use of apps with people with aphasia has been studied (Brandenburg, Worrall, Rodriguez, & Copland, 2013; Holland, Weinberg, & Dittelman, 2012). Barriers to mobile technology include language impairments among people with aphasia as well as non-language related barriers such as physical limitations secondary to stroke (Brandenburg, Worrall, Rodriguez, & Copland, 2013). Additionally, a general "digital divide" may make implementation of newer technology more difficult for aging adults. Certainly during this study there were challenges related to participants' operational competence when accessing both the iPod device in general, and FlowAphasia app specifically. Numerous measures were taken to maximize ease of use, and despite field-testing, there were two occurrences requiring the primary researcher to meet with the participant shortly after the study began to problem-solve operational issues. Great lengths were taken to design an aphasia-friendly app using the iOS platform. However, carrying an iPod Touch device was out of the norm for a few participants in this study who either rarely or never carried portable devices or cellphones prior to the study. One commented that he would rather have worn a watch with alarms set, rather than carry the device.

In addition to operational use of the device, there are limitations in the structure of the app itself. Trials of multiple iterations of programming, language, and images within the app occurred in order to maximize clarity and user-friendliness of the app. Despite this, the questions and/or layout of the vertical sliders may have been challenging to the users and may have resulted in inaccurate or misrepresented responses. Further training, and potentially audio enhancements, done so in a manner that accounts for privacy, may provide further supports for the app use. The participants may also have opted to not answer the beep. They were explicitly instructed not to respond to the beep if there was any potential of creating harm, such as while driving, or if it was a sub-optimal time as determined by the participant. Participants may have opted not to respond to the app because they were beeped at a time in which they were not doing anything active or productive (as mentioned by one participant anecdotally).

Operationalization of flow is not without controversy. The quadrant model, as used in this study, has limitations of oversimplification of the complex experience of flow. Additionally, operationalizing environmental factors barriers and facilitators using *z*-scores has limitations as well. Conceptually, utilizing a binary construct of either/or (barrier or facilitator) may limit the reality of the environmental factor. Attempting to quantify an abstract experience such as flow may be ineffective. Operationalizing flow as a binary construct of either presence/absence may both oversimplify the construct of flow, and may potentially lead to over-identification of flow occurrences. Similarly, environmental factors were operationalized as barriers or facilitators in a similar manner, as binary constructs. A qualitative study, such as that presented in Chapter 4, may provide a more comprehensive framework of flow experiences and environmental

factors, and may better capture the subtle nuances in a more effective manner than the binary construct utilized during this study.

The concept of solitude versus with someone may, on the surface, seem relatively straightforward. However, one limitation of this current study is how solitude was assessed. The challenge relates to how to identify oneself as being 'alone' or 'with someone' when he or she is, for example, at the grocery store by oneself, or in the waiting room of a doctor's office. In both situations, there may be people around the individual, but the individual may be shopping alone, or at the doctor's office alone. He or she may even interact with those people, but still be considered alone. Because of the complexity of this topic, participants were instructed to answer as being 'alone' if "there is nobody nearby that you know or have a relationship with." This definition attempted to capture the idea of 'alone' as potentially occurring truly in isolation or among strangers. To add to the complexity, even when someone is alone, he or she may be communicating. They may be communicating with a waiter, or with the staff at a business, or they may be texting or online chatting.

Finally, there are limitations in the utilization of aggregated *z*-scores as a method of quantifying ratings into quadrants (flow, boredom, apathy, anxiety) and into binary facilitators or barriers. These limitations were addressed in the *Methods* section of this paper. Hierarchical Linear Modeling (HLM) is used frequently as a statistical analysis in ESM studies, and such an analysis in future studies may shed light on flow as experienced by individuals with aphasia.

Conclusion

This appears to be the first study to evaluate flow perceptions among people with aphasia over the course of one week using Experience Sampling Methodology. Results of this study provide a better understanding regarding the perceived skills possessed and challenges experienced among individuals with aphasia. Brown, Worrall, Davidson and Howe (2010) highlight the need for a broader extension of living successfully with aphasia, extending the definition from the treatment room to the individual's everyday lived experience.

Interviews with people with aphasia reflect not just a need and desire for more activity, but rather the importance of engagement in communication and social interactions (Dalemans, deWitte, Wade, & van den Heuvel, 2010). "The process of interaction between the person with aphasia and the direct envrionment (close others and others) is central for the possibilities of engagement in social participation" (Dalemans, deWitte, Wade, & van den Heuvel, 2010, p. 545).

There is not a uniform solution or catch-all service delivery to facilitate flow in individuals, whether with aphasia or not. Although the flow experience is universal (Csikszentmihalyi & Csikszentmihalyi, 1988), the precipitating events are unique to the individual. These experiences must be tailored to the individual to account for the individual's skill set and presenting level of challenge. This certainly holds true for the individual with aphasia. The clinician can provide a strong level of understanding of communication skills and strategy use, as well as the potential environmental barriers and facilitators and how these factors fit with the individual with aphasia's skill set. Worrall and Frattali (2000) encouraged clinicians to be especially attentive to goals that account

for the balance of skill and challenge present, and that build in opportunities for feedback. It is in these roles that the clinician supports the person with aphasia in guiding or coaching experiences that optimally balance skill and challenge.

According to the results and operationalization of flow within this study, people with aphasia experience flow. There is a tendency to experience flow in an environment that provides some degree of communication support and possesses some degree of knowledge of aphasia, and that also provides challenge through increased communication pressure and complexity. Note that no causal or direct relationships can be inferred from this study. However, even though individuals with aphasia do indeed experience flow, as a group they experience apathy (low challenge, low skill) as operationalized in this study, the most frequently. Individually, there is a range of most frequently occurring quadrant experiences, with flow occurring most frequently, or tied for most frequently, for two of the participants. Further exploration in regard to the impact of the skill possessed, versus the challenge of the environment, and the interaction of these two, is warranted. Additionally, perceived versus actual skill and challenges present may shed greater light onto the participation of individuals with aphasia in challenging situations.

An environment supportive of the needs of people with aphasia, including communication needs, is certainly imperative to facilitate success and participation. However, the characteristics of such an optimal environment are not clear. Results from this study appear to indicate the need for a degree of challenge, perhaps via increased complexity of communication and/or time pressure. Although it may, in some ways, seem counterintuitive to the characteristics of an aphasia-friendly environment, the

presence of optimally challenging activities may foster flow experiences and subsequent positive engagement in such tasks.

Aphasia is a disruptive force in the lives of individuals with aphasia and their social networks. Negative consequences are observed from a linguistic, social and activity perspective. Re-engaging in life participation is a key to aphasia therapy (Chapey, et al., 2001), and optimizing the skill-challenge balance is critical to participation. "Often the key to bringing people with aphasia to the threshold of participating in real-life is to focus their complete attention on the contrast between doing and not doing any modified skill, challenge or activity of interest" (Worrall & Frattali, 2000, p. 157). Increased awareness of the concept of flow and the balance of skill and challenge from both the individual with aphasia's perspective and that of the clinician is a crucial factor in the resumption of life participation.

References

Aherne, C., Moran, A., & Londsale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist, 25*, 177 - 189.

Bassi, M., & Delle Fave, A. (2012). Optimal experience among teachers: New insights into the work paradox. *The Journal of Psychology: Interdisciplinary and Applied, 146* (5), 553-557.

Bauman, N., & Scheffer, D. (2010). Seeing and mastering difficulty: The role of affective change in achievement flow. *Cognition and Emotion, 24*(8), 1304 - 1328.

Brandenburg, C., Worrall, L., Rodriguez, A., & Copland, D. (2013). Mobile computing technology and aphasia: An integrated review of accessibilty and potential uses. *Aphasiology, 27*(4), 444 - 461.

Brennan, A., Worrall, L., & McKenna, K. (2005). The relationship between specific features of aphasia-friendly written material and comprehension of written material for people with aphasia: An exploratory study. *Aphasiology, 19*(8), 693-711.

Brown, K., Worrall, L., Davidson, B., & Howe, T. (2010). Snapshots of success: An insider perspective on living successfully with aphasia. *Aphasiology, 24*(10), 1267-1295.

Cahana-Amitay, D., Albert, M., Pyun, S., Westwood, A., Jenkins, T., Wolford, S., & Finley, M. (2011). Language as a stressor in aphasia. *Aphasiology*, *25*(2), 593 - 614.

Chapey, R., Duchan, J., Elman, R., Garcia, L., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2001). Life participation approach to aphasia: A statement of values for the future. In R. Chapey (Ed.), *Language intervention strategies in aphasia related neurogenic communication disorders, 4th Edition.* Philadelphia: Lippincott, Williams and Wilkins.

Chavez, E. (2008). Flow in sport: A study of college athletes. *Imagination, Cognition and Personality, 28*, 69-91.

Collins, A., Sarkisian, N., & Winner, E. (2009). Flow and happiness in later life: An investigation into the role of daily and weekly flow experiences. *Journal of Happiness Studies, 10*(6), 703-719.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (2004). *Good Business: Leadership, flow and the making of meaning.* New York: Penguin Group.

Csikszentmihalyi, M. (2008). *Flow: The psychology of optimal experience.* New York: Harper Perennial.

Csikszentmihalyi, M. (2014). *The collected works of Mihaly Csikszentmihalyi.* New York: Springer.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal experience.* Cambridge: Cambridge University Press.

Csikszentmihalyi, M., & Lefevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*(5), 815-822.

Csikszentmihalyi, M., & Nakamura, J. (1989). The dynamics of intrinsic motivation: A study of adolescents. In R. Ames, & C. Ames (Eds.), *Research on motivation in education: Goals and cognitions* (pp. 45-71). New York: Academic Press.

Csikszentmihalyi, M., & Nakamura, J. (2005). The concept of Flow. In C. Snyder, & S. Lopez (Eds.), *Oxford Handbook of Positive Psychology.* New York: Oxford University Press, Inc.

Csikszentmihalyi, M., & Nakamura, J. (2009). Flow theory and research. In C. Snyder, & S. Lopez (Eds.), *Oxford Handbook of Positive Psychology.* New York: Oxford University Press.

Csikszentmihalyi, M., Larson, R., & Prescott, S. (1977). The ecology of adolescent activities and experiences. *Journal of Youth and Adolescence, 6*, 281-294.

Dalemans, R., deWitte, L., Wade, D., & van den Heuvel, W. (2010). Social participation through the eyes of people with aphasia. *International Journal of Language and Communication Disorders, 45*(5), 537-550.

Dalemans, R., Wade, D., van den Heuvel, W., & de Witte, L. (2009). Facilitating the participation of people with aphasia in research: a description of strategies. *Clinical Rehabilitation, 23*, 948 - 959.

Dietz, A., Hux, K., McKelvey, M., & Beukelman, D. (2009). Reading comprehension by people with chronic aphasia: A comparison of three levels of visuographic contextual support. *Aphasiology, 23*(7-8), 1053-1064.

Dunn, D., & Brody, C. (2008). Defining the good life following acquired physical disability. *Rehabilitation Psychology, 53*(4), 413-425.

Elman, R. (2007). The importance of aphasia group treatment for rebuilding community and health. *Topics in Language Disorders, 27*(4), 300-308.

Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion, 32*, 158-172.

Engeser, S., & Schiepe-Tiska, A. (2012). Historical lines and an overview of current research on flow. In S. Engeser (Ed.), *Advances in Flow Research* (pp. 1-22). Heidelberg: Springer.

Fitzgerald-DeJean, D., Rubin, S., & Carson, R. (2012). An application of the experience sampling method in the study of aphasia: A case report. *Aphasiology, 2*, 234-251.

Gardner, F., & Moore, Z. (2004). A mindfulnes-acceptance-commitment-based approach to athletic performance enhancement: Theoretical considerations. *Behavior Therapy, 35*, 707-723.

Garrett, K., & Beukelman, D. (1995). Changes in interaction patterns of an individual with severe aphasia given three types of partner support. *Clinical Aphasiology, 23*, 237 - 251.

Glista, S., & Pollens, R. (2007). Educating clinicians for meaningful, relevant, and purposeful aphasia group therapy. *Topics in Language Disorders, 27*(4), 351-371.

Hektner, J., Schmidt, J., & Csikszentmihalyi. (2007). *Experience sampling method: Measuring the quality of everyday life.* Thousand Oaks: Sage Publications.

Holland, A., & Nelson, R. (2013). *Counseling in communication disorders: A wellness perspective* (2nd Edition ed.). San Diego: Plural Publishing.

Holland, A., Weinberg, P., & Dittelman, J. (2012). How to use apps clinically in the treatment of aphasia. *Seminars in Speech and Language, 33*(3), 223 - 233.

Howe, T. (2008). The ICF Contextual factors related to speech-language pathology. *International Journal of Speech-Language Pathology, 10*(1-2), 27-37.

Howe, T., Worrall, L., & Hickson, L. (2008a). Interviews with people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22* (10), 1092-1120.

Howe, T., Worrall, L., & Hickson, L. (2008b). Observing people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22* (6), 618-643.

Jackson, S. (1992). Athletes in flow: A qualitative investigation of flow states in elite figure skaters. *Journal of Applied Sport Psychology, 4*, 161 - 180.

Jackson, S. (1995). Factors influencing the occurrence of flow state in elite athletes. *Journal of Applied Sport Psychology, 7*, 138-166.

Jackson, S., & Eklund, R. (2002). Assessing flow in physical activity: The Flow State Scale - 2 and Dispositional Flow Scale -2. *Journal of Sport and Exercise Psychology, 24*, 133-150.

Jackson, S., Eklund, B., & Martin, A. (2010). *The FLOW Manual: The Manual for the Flow Scales.* Mindgarden, Inc. Secured online 12/7/10.

Kahn, D. (2000). Montessori's positive psychology: A lasting imprint. *NAMTA Journal, 25*(2), 1-5.

Kertesz, A. (2007). *Western Aphasia Battery - Revised.* San Antonio: Harcourt Assessment, Inc.

Kira, M. (2002). Moving from consuming to regenerative work. In J. Forslin, P. Docherty, & A. Shani (Eds.), *Creating sustainable work systems: Developing social sustainability* (pp. 29-39). London: Routledge.

Landhauser, A., & Keller, J. (2012). The flow model revisited. In S. Engeser (Ed), *Advances in Flow Research* (pp. 51-64). New York: Springer.

Larson, R., & Delespaul, P. (1992). Analyzing experience sampling data: a guidebook for the perplexed. In M. deVries (Ed.), *The Experience of Psychopathology* (pp. 58-78). New York: Cambridge Univdersity Press.

Law, M. (1991). The environment: a focus for occupational therapy. *Canadian Journal of Occupational Therapy, 58*(4), 171 - 180.

Lindsay, P., Maynard, I., & Thomas, O. (2005). Effects of hypnosis on flow states and cycling performance. *The Sport Psychologist, 19*, 164 - 177.

MacDonald, G., Kayes, N., & Bright, F. (2013). Barriers and facilitators to engagement in rehabilitation for people with stroke: A review of the literature. *New Zealand Journal of Physiotherapy*, *41*(3), 112-121.

Marshall, R. (1999). *Introduction to group treatment for aphasia.* Butterworth-Heinemann.

Massimini, F., Csikszentmihalyi, M., & Carli, M. (1987). The monitoring of optimal experience: A tool for psychiatric rehabilitation. *The Journal of Nervous and Mental Diseases, 175,* 545 - 549.

Moneta, G. (2012). On the measurement and conceptualization of flow. In S. Engeser (Ed.), *Advances in Flow Research* (pp. 23-50). Springer.

Moneta, G., & Csikszentmihalyi, M. (1996). The effect of perceived challenges and skills on the quality of subjective experience. *Journal of Personality, 64*, 275 - 310.

Nakamura, J., & Csikszentmihalyi, C. (2002). The Concept of Flow. In C. Wright, & S. Lopez (Eds.), *Handbook of Positive Psychology.* Oxford University Press.

Nicholls, A., Polman, R., & Holt, N. (2005). The effects of individualized imagery interventions on golf performance and flow states. *Athletic Insight, 7,* 43-64.

Orenstein, E., Basilakos, A., & Marshall, R. (2012). Effects of mindfulness meditation on three individuals with aphasia. *International Journal of Language and Communication Disorders, 47*(6), 673 - 684.

Pain, M., Harwood, C., & Anderson, R. (2011). Pre-competition imagery and music: The impact on flow and performance in competitive soccer. *The Sport Psychologist, 25*, 212-232.

Paul, D., Frattali, C., Holland, A., Thompson, C., Caperton, C., & Slater, S. (2004). *The American Speech-Language Hearing Association Quality of Communication Life Scale (QCL): Manual.* Rockville: American Speech-Language Hearing Association.

Pound, C., & Hewitt, A. (2004). Communication barriers: Building access and identity. In J. Swain, S. French, C. Barnes, & C. Thomas (Eds.), *Disabling barriers - enabling environments* (pp. 161 - 168). London: Sage.

Reis, H., & Gable, S. (2000). Event-sampling and other methods for studying everyday experience. In H. Reis, & C. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 190-222). New York: Cambridge University Press.

Rose, T., Worrall, L., & McKenna, K. (2003). The effectiveness of aphasia-friendly principles for printed health education materials for people with aphasia following stroke. *Aphasiology, 17*, 947-963.

Rose, T., Worrall, L., Hickson, L., & Hoffmann, T. (2011). Aphasia friendly written health information: Content and design characteristics. *International Journal of Speech-Language Pathology*, *13*(4), 335-347.

Schmidt, J. (2010). Flow in Education. In E. Baker, P. Peterson, & B. McGaw (Eds.), *International encyclopedia of education, 3rd Edition* (pp. 605 - 611). London: Elsevier.

Schwartz, J., & Stone, A. (1998). Strategies for analyzing ecological momentary assesment data. *Health Psychology, 17*(1), 6-16.

Scollon, C., Kim-Prieto, C., & Diener, E. (2003). Experience Sampling: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies, 4*, 5-34.

Sicilia, M., & Ruiz, S. (2007). The role of flow in website effectiveness. *Journal of Interactive Advertising, 8*(1), 33-44.

Simmons-Mackie, N., Code, C., Armstrong, E., Stiegler, L., & Elman, R. (2002). What is aphasia? Results of an international survey. *Aphasiology, 16* (8), 837-848.

Simmons-Mackie, N., Raymer, A., Armstrong, E., Holland, A., & Cherney, L. (2010). Communication partner training in aphasia: A systematic review. *Archives of Physical Medicine and Rehabilitation, 91*(12), 1814 - 1837.

Sugiyama, T., & Inomata, K. (2005). Qualitative examination of flow experience among top Japanese athletes. *Perceptual and Motor Skills, 100*, 969-982.

Swann, C., Keegan, D., Piggott, D., & Crust, L. (2012). A systematic review of the experience, occurrence, and controllability of flow states in elite sport. *Psychology of Sport and Exercise, 13,* 807 - 819.

Threats, T. (2007). Access for persons with neurogenic communication disorders: Influences of Personal and Environmental factors of the ICF. *Aphasiology, 21* (1), 67-80.

Walker, C. (2010). Experiencing flow: Is doing it together better than doing it alone? *The Journal of Positive Psychology, 5*(1), 3-11.

Wallace, G. (2010). Profile of life participation after stroke and aphasia. *Topics in Stroke Rehabilitation, 17*(6), 432-450.

Wallace, S., Dietz, A., Hux, K., & Weissling, K. (2012). Augmented input: The effect of visuographic supports on the auditory comprehension of people with chronic aphasia. *Aphasiology, 26*(2), 162-176.

WHO. (2013). *How to use the ICF: A practical manual for using the International Classifcation of Functioning, Disability and Health (ICF). Exposure draft for comment.* Geneva: World Health Organization.

Worall, L., Sherratt, S., Rogers, P., Howe, T., Hersh, D., Ferguson, A., & Davidson, B. (2011). What people with aphasia want: Their goals according to the ICF. *Aphasiology, 25*(3), 309-322.

Worrall, L., & Frattali, C. (. (2000). *Neurogenic communication disorders: A functional approach.* New York: Thieme.

CHAPTER 4

FLOW EXPERIENCES AS PERCEIVED BY INDIVIDUALS WITH APHASIA: A QUALITATIVE ASSESMENT

Throughout this dissertation, the concept of flow and how flow is experienced by individuals with aphasia has been investigated. This current qualitative study is designed to contribute to a comprehensive assessment of flow experiences as perceived by individuals with aphasia. This qualitative descriptive study used semi-structured interviews to explore flow experiences, and personal and environmental factors that may hinder or facilitate flow, adding to the depth of understanding regarding how people with aphasia may experience flow.

In this study, people with aphasia were interviewed regarding their recent experiences using an iPod application to rate concepts related to flow, particularly with regard to skill and challenge levels in current activities. Flow refers to an experience of total absorption, in which time passes differently and the participant's skills are in optimal balance with the challenge of the task. In addition to probing the participants' experiences of flow in general, environmental factors were investigated as they relate to potential barriers or facilitators to flow, as well as personal factors that might support or hinder flow experiences.

Background

The concept of flow originated from Csikszentmihalyi's qualitative exploration of optimal experience (Csikszentmihalyi, 1975; Delle Fave, Massimini, & Bassi, 2011a). The term *flow* denotes the experience of being totally involved in the task at hand, when the task challenges the user but does not overwhelm (Jackson, Eklund, & Martin, 2010). When a person experiences flow, there is typically an absence of awareness of the passage of time and a loss of self-consciousness.

The WHO and Environmental Factors

As described previously in this dissertation, environmental factors constitute one component of the World Health Organization's *International Classification of Functioning, Disability and Health (ICF)* (World Health Organization, 2002). The ICF provides a standard framework and language across disciplines for descriptions and classifications of health and health-related domains. The ICF framework has been utilized to guide rehabilitation decision making for multiple disorders and diseases, including spinal cord injuries (Rauch, et al., 2010), traumatic brain injury (Koskinen, Hokkinen, Sarajuuri, & Alaranta, 2007), and stroke (Tempest & Mcintyre, 2006). Environmental factors can hinder or facilitate an individual's participation (Threats, 2007) and they are especially relevant to those with aphasia. A better understanding of environmental factors and how they impact participation and communication among individuals with aphasia may provide a better understanding of optimal environments for those with aphasia.

Howe and colleagues (Greig, Harper, Hirst, Howe, & Davidson, 2008; Howe, 2006; Howe, Worrall, & Hickson, 2004; Howe, Worrall, & Hickson, 2008a; Howe, Worrall, & Hickson, 2008b) have studied environmental factors and aphasia extensively. They identified multiple barriers and facilitators to community participation as perceived by individuals with aphasia and concluded such information was beneficial and relevant to increase awareness and to assist in structuring optimal environments for those with aphasia.

Personal factors are one component of the ICF and relate to the characteristics of the person that are not a result of the health condition (Threats, 2007). Personal factors may be changeable or unchangeable (Howe, 2008) and have the potential to impact how an individual responds to impairments secondary to stroke or aphasia (Threats, 2007). Personal factors are the least discussed of the ICF components, possibly because there is no ICF coding for personal factors (Threats, 2007). This lack of coding is likely reflective of the extensive variation among personal factors. Together with environmental factors, personal factors make up the contextual factors portion of the ICF framework.

Semi-structured Interviews

In this study, information gathering took place via semi-structured interviews. This type of interview has several advantages when compared to structured interviews. Semi-structured interviews provide flexibility for both the interviewer and the participant to follow the lead of the participant's perceptions to probe important aspects or themes of

the content (Brinkmann, 2013). Additionally, the flexibility of semi-structured interviews provides less constraint with regard to topic focus (Brinkmann, 2013).

Cruice, Hill, Worrall, and Hickson (2010) used structured interviews to investigate quality of life among older individuals with aphasia. In doing so, they identified strengths of such an approach, including being able to gather perceptions of a large number of participants in a timely manner. However, they also acknowledged weaknesses with the structured interview format related to the absence of prompting and follow-up questions within the structured interview, which would be possible when using a semi-structured format. They speculated regarding the completeness of responses and whether the responses to the questions in the structured context adequately reflected the participants' actual perceptions of quality of life, their topic of investigation.

Semi-structured Interviews and Aphasia

Interviewing individuals with aphasia presents additional potential challenges related to the language difficulties inherent with aphasia (Bronken & Kirkevold, 2013; Brown, Worrall, Davidson, & Howe, 2013). Bronken and Kirkevold (2013) utilized supported communication strategies within their interviews, as did the interviewer in the Howe, Worrall, and Hickson study (2008a). Luck and Rose (2007) also utilized communication strategies and conversational supports to facilitate gathering information in semi-structured interviews with people with aphasia. They advocated for the qualitative interviewer in such situations either to have experience within the aphasiology field or to be a trained communication partner. Creswell (2013) cautioned the researcher not to become too involved in the interactions within the interview as this could

unintentionally direct the interview; however, given the nature of aphasia, which by definition involves communicative challenges, it is relevant and necessary in this study that communication support strategies be utilized.

Luck and Rose (2007) discussed potential method adjustments to the process of interviewing individuals with aphasia. In their pilot study, they found that diminished information was gathered when the interviewers maintained an open-ended question approach to the interview. Conversely, they found that when the researcher implemented supported conversation techniques and became a more active communication partner, the language output was richer in semantic content and intent (Luck & Rose, 2007). They advised the researcher to support the conversation using strategies such as acknowledgement, narrowing questions, providing requests for clarification, and other communication strategies. They also suggested providing a brief, overt discussion with the participant regarding the potential and anticipated challenges inherent in interviewing, and asking the participant about effective communication strategies that might be beneficial during the course of the interview.

Despite challenges involved with asking individuals with aphasia to express their thoughts and beliefs verbally in semi-structured interviews, it is important not to limit such opportunities for individuals with aphasia. To do so would be to continue a degree of disempowerment common within the lives of those with aphasia. It is not unusual for individuals with aphasia, because of their expressive and receptive language difficulties, to be excluded from studies of stroke (Bronken & Kirkevold, 2013; Lloyd, Gatherer, & Kalsy, 2006). Arguing against this practice, Brown et al. (2013) emphasized that "improving access to and inclusion in the research process for individuals with aphasia

also needs to be considered in greater depth" (p. 1224). Bronken and Kirkevold (2013) also emphasized the importance of inclusion of individuals with aphasia and other communication marginalization.

Brinkmann (2013) explained that there is no singular correct way to execute a semi-structured interview, and that the interviewer should consider the purpose of the interview when considering semi-structured interview techniques. Therefore, modifying the semi-structured interview to include opportunities for communication strategies and support are beneficial toward the goal of optimal understanding of the flow experience as perceived by individuals with aphasia.

Semi-structured interviews have been used as a primary data-gathering method in qualitative studies evaluating flow experiences (Delle Fave, Massimini, & Bassi, 2011a), however, no published studies have been found utilizing semi-structured interviews to investigate flow experiences among individuals with aphasia. The concept of flow has been studied within a wide range of populations and situations, including work (Bauman & Scheffer, 2010; Csikszentmihalyi & Csikszentmihalyi, 1988), website building and online experience (Sicilia & Ruiz, 2007), and elite athletic training (Jackson et al., 2010). The concept of flow is associated with positive psychology (Csikszentmihalyi, 2008), and the influence of positive psychology is noted increasingly in the disability and rehabilitation literature (Dunn & Brody, 2008; Holland, 2007). Flow experiences among people without disabilities have been explored via both quantitative (Delle Fave, Massimini, & Bassi, 2011b; Hektner, Schmidt, & Csikszentmihalyi, 2007) and qualitative methods (Hefferon & Ollis, 2006; Reynolds & Prior, 2006; Suqiyama & Inomata, 2005). Individuals with aphasia have reported a desire for improved quality of activities

(Dalemans, deWitte, Wade, & van den Heuvel, 2010). Flow experiences may be one such example of improved quality of experiences. A better understanding flow perceptions among individuals with aphasia, including the environmental and personal factors associated with these experiences, may promote opportunities for improved quality of experiences for individuals with aphasia. Therefore, the following research questions are proposed for this study:

1. How do people with mild aphasia experience flow?
2. What environmental factors are facilitators to flow experiences from the perspective of individuals with mild aphasia?
3. What environmental factors are barriers to flow experiences from the perspective of individuals with mild aphasia?
4. What personal factors support flow experiences from the perspectives of individuals with mild aphasia?
5. What personal factors hinder flow experiences from the perspective of individuals with mild aphasia?

Methods

The current study utilized a qualitative descriptive research strategy (Neergaard, Olesen, Andersen, & Sondergaard, 2009; Sandelowski, 2000; 2010). This qualitative method has been used frequently in the health care field (Brown & Jemmott, 2002; Weibull, Olesen, & Neergaard, 2008) and has been described in detail by Sandelowski (2000, 2010). Although qualitative description is designed to remain nearer to the data, it is a research method that can be interpretive, requiring the researcher to explicitly acknowledge his or her topical assumptions at the onset of the project, and prepare for the

likelihood of those perceptions evolving throughout the project (Sandelowski, 2010). Qualitative content analysis (Graneheim & Lundman, 2004) was used to identify categories and sub-categories using semi-structured interviews as the unit of analysis. The research questions identified prior to the interviews served as basic guidelines for the semi-structured interview (Appendix E).

Participants

Participants were recruited utilizing a convenience sampling technique as described in Chapter Three, which describes the separate quantitative study that was conducted prior to these qualitative interviews. That study utilized Experience Sampling Methodology (ESM) to garner skill, challenge, solitude and environmental factor ratings throughout the course of one week. Upon completion, qualitative interviews that provided data for this study took place. The invitation to participate in this current study occurred at the same time as the invitation to participate in the quantitative flow study. Although participants were not obligated to participate in qualitative interviews in order to participate in the ESM study, all opted to do so. Ethics approval for recruitment and consent procedures were obtained from IRB's at both Western Michigan University and the University of Wisconsin – Eau Claire.

Inclusion criteria included the following:

- Age of 25 years or older
- Mild aphasia based on Western Aphasia Battery (WAB- R) (Kertesz, Western Aphasia Batter - Revised, 2007) Aphasia quotient $\geq$ 76. (Note that the participant who scored 93.8, the upper limits of the WAB-R, has been previously

diagnosed with aphasia secondary to CVA, still perceived herself to have aphasia and actively attends aphasia groups and aphasia camps)

- Reading score adequate at the sentence level as evidenced by score of ≥ 24/40 on the Reading Comprehension of Sentences subtest of WAB-R (Kertesz, 2007)
- Etiology of aphasia secondary to non-traumatic cerebrovascular event (thus excluding surgical or tumor-related aphasia) occurring six months or more prior to the study
- Moderate or less motor involvement based on Wallace Motor Screening Scale (Wallace, 2010; Appendix B)
- Native English speakers
- Absence of significant cognitive or psychiatric impairment as determined by self-report and clinical observation by the investigator.

Demographic characteristics for participants in this study can be found in Chapter Three.

Data Collection Procedures

Semi-structured interview methods for this study were similar to the interview method described by Luck and Rose (2007). Some focused questions were established prior to the interview in order to ensure that aspects relevant to the study were covered, but with the flexibility to probe further as the interview proceeded. The semi-structured interviews in this study took place face-to-face on an individual basis, as recommended by Brinkmann (2013).

In prior studies (Hersh, 2001; Parr, 2001), researchers have completed interviews with people with aphasia with their spouses/significant others present. In the current

study, to avoid the potential influence of the spouse present, and to avoid the potential for surrogate communication, the plan was for participants to be interviewed alone (Luck & Rose, 2007). However, for three of the interviews, the participant's spouse was present for all or portions of the interview due to requests of the partner. Interviews took place in person, at a suitable location of the participant's choosing. Four participants were interviewed at their homes, three participants at a restaurant, one at a library, and one at a university clinic. All interviews and responses were audio- and video-recorded digitally and subsequently transcribed. Interviews were conducted by the primary investigator (author of this dissertation) who has 18 years of experience in aphasia therapy, supporting communication with individuals with aphasia, and providing aphasia group leadership. Supported conversation techniques (Kagan, 1998) and multi-modal communication strategies were utilized to maximize communication (Luck & Rose, 2007). Total interview time for all participants combined was 454 minutes with an average time of approximately 50 minutes (range 28:17 – 71:28).

Transcription

Transcription conventions recommended by Luck and Rose (2007) were utilized in this study. These authors transcribed verbalizations verbatim as well as total communication strategies (gesture, writing, etc.), bracketing these strategies within the transcript. In order to verify accuracy of transcription and interpretation of communication strategies, 10% of the transcripts were verified at random by an expert (licensed speech-language pathologist with >10 years' experience working with individuals with aphasia). All interviews were digitally video recorded, which is deemed

crucial to transcription and interpretation of non-verbal communications, particularly critical when interviewees have aphasia (Bronken & Kirkevold, 2013; Luck & Rose, 2007).

Reflexivity

Creswell (2013) referred to reflexivity as the process by which the researcher or writer acknowledges his or her own biases, values, and experiences. In this sense, the researcher is reflective in his or her own contributions to the final research product (Brinkmann, 2013). Creswell (2013) identified two primary aspects of reflexivity: first, the researcher's own experiences with the phenomenon that is currently being studied, and second, how these experiences shape the researcher's current view or perception of the phenomenon being studied. Such potential sources of bias must be acknowledged and considered as they influence the interview procedures and interpretations. Brinkman (2013) referred to these as *confessional* forms or *analytical* forms. These reflections occurred via researcher journaling in the planning phases of the study, and throughout the data gathering and analysis process. Additionally, throughout the course of this study, during committee discussions, reflective notes were taken. In this study, in order to enhance the primary researcher's reflexivity, both aspects of Creswell's reflexivity correlates occurred.

Curtin and Fossey (2007) advocated further for qualitative researchers to explicitly disclose personal biases, assumptions and values. Thus, the primary researcher reflected on his perceptions on his own experiences with people with aphasia, as well as on flow in his own life experiences and how these perceptions influence his view of flow

as it applies to this study, with this reflection culminating in the following statement of the primary investigator's assumptions, values and experiences as related to this study.

Statement of Primary Investigator's Assumptions, Values, and Experiences

As primary investigator, I have been interested in the concepts of flow personally and professionally for over 15 years. I find the concept valuable in my own personal and professional life and frequently apply it to tasks at hand. I am interested in experiences in which I find flow and am motivated to continue seeking those experiences. With regard to flow and aphasia, I find intriguing the idea of potentially getting so lost in an experience that the possibility of forgetting about aphasia exists. Jon Lyon wrote about this in 1997 (Lyon, et al., 1997) and Audrey Holland has referenced this in writing and in conferences I have attended. I am influenced by the Life Participation Approach to Aphasia (LPAA) and have attempted to implement such paradigms espoused through community aphasia groups and aphasia camps. I have been involved in both community aphasia groups for 18 years and aphasia camps for 12 years. There have been times that I have overtly designed tasks in pursuit of facilitating experiences such that the potential for forgetting about aphasia may exist. I value the concepts of flow and the potential benefits of the flow construct among individuals with and without aphasia, including myself.

Rigor

Numerous authors have described strategies for increasing the rigor of qualitative research (Creswell, 2013; Hays & Singh, 2012; Lincoln & Guba, 1985). The credibility

of a qualitative study is reflected in the truthfulness of the findings and the maximum opportunities for participant voices to be heard in the specified context (Hays & Singh, 2012). There are several criteria for trustworthiness within a qualitative study including *credibility*, *transferability*, *dependability*, and *confirmability* (Hays & Singh, 2012; Lincoln & Guba, 1985).

Credibility, proposed as the correlate to internal validity (Lincoln & Guba, 1985), was addressed by maintaining a research diary as well as separating transcript, personal, and analytical files (Luck & Rose, 2007; Seidman, 2013). Additionally, peer debriefing (Mertens, 2015) involved review and discussion of the data gathering and analysis on a regular basis with the researcher's dissertation committee.

Transferability, the approximate correlate of external validity (Lincoln & Guba, 1985), refers to aspects of generalizability. Note that generalizability is not a goal of qualitative research in the way that it may be for quantitative studies. Instead, the goal with regard to transferability is to provide adequate description of the research process such that the reader can make interpretations and decisions regarding the relevance of the study to his or her particular setting (Graneheim & Lundman, 2004; Hays & Singh, 2012). The research description, participant characteristics and analysis are described explicitly in this study to facilitate transferability.

Confirmability reflects the degree to which researcher interference or intrusion was minimized (Hays & Singh, 2012). Transparency in the analytical process via reporting in the analytical file occurred as one way to address confirmability.

Dependability refers to the consistency of results across researchers and over the course of time, correlating most similarly with the construct of reliability. *Dependability* was addressed via cross-checking transcriptions and ambiguities as recommended by Graneheim and Lundman (2004).

Data Analysis

Data analysis techniques followed the qualitative content analysis procedures as outlined by Graneheim and Lundman (2004) and used similarly by Howe, Worrall and Hickson (2008a). Qualitative content analysis is commonly used in qualitative descriptive designs (Milne & Oberle, 2005; Sandelowski, 2000).

I used the following steps to conduct the analysis, with checking and confirmation or suggestions offered at each point by other members of the dissertation committee:

1. Immersion into all transcripts by reading, and re-reading all transcripts in entirety.
2. Identification of codeable statements as any statement that related to flow, environmental factors and/or personal factors; all utterances that did not fit these characteristics were eliminated from further analysis.
3. Identification of meaning units from the remaining utterances. Meaning units are "constellation[s] of words or statements that relate to the same central meaning" (Graneheim & Lundman, 2004, p. 106).
4. Identification of condensed meaning units and potential code development for each condensed meaning unit.

Following a collaborative discussion with the dissertation committee, the primary investigator repeated the coding process, adding an interpretive rationale for potential coding. Categories and subcategories were developed. Categories share common threads, and are considered a descriptive level of content (Graneheim & Lundman, 2004) (Figure 7). The coding process in its entirety was completed on four separate occasions with each evolution of coding reviewed by a member/s of the dissertation committee. While full consensus was not garnered, nor intended or attempted to be garnered, by all committee members, there were suggestions and strategies identified following review of each coding iteration process. Graneheim and Lundman (2004) and Elo et al. (2014) supported the interaction of researchers and highlight the value of such discussion in the coding and interpretive process through these discussions among committee members. It was evident throughout the coding process that there was under- and over-shooting with regard to coding on behalf of the primary researcher. This in part relates to the complexity and challenge of interpreting flow in general. After the first iteration, it was generally agreed upon by the research committee that there needed to be a broader scope of coding that utilized more of the transcript content. The researcher then approached coding (both inclusion of transcript utterances, and with regard to flow concepts) with a broader lens. Subsequent codings appeared too liberal in the utilization of coding and transcript utterances and suggestions were made by the research committee to repeat the coding process with a more focused lens. Following third and fourth rounds of coding, there appeared to be a more consistent balance of inclusion of transcript utterances as well as coding relating to flow and environmental factors. That is, a balance became

apparent in the coding process based on review of feedback from the multiple coding iterations.

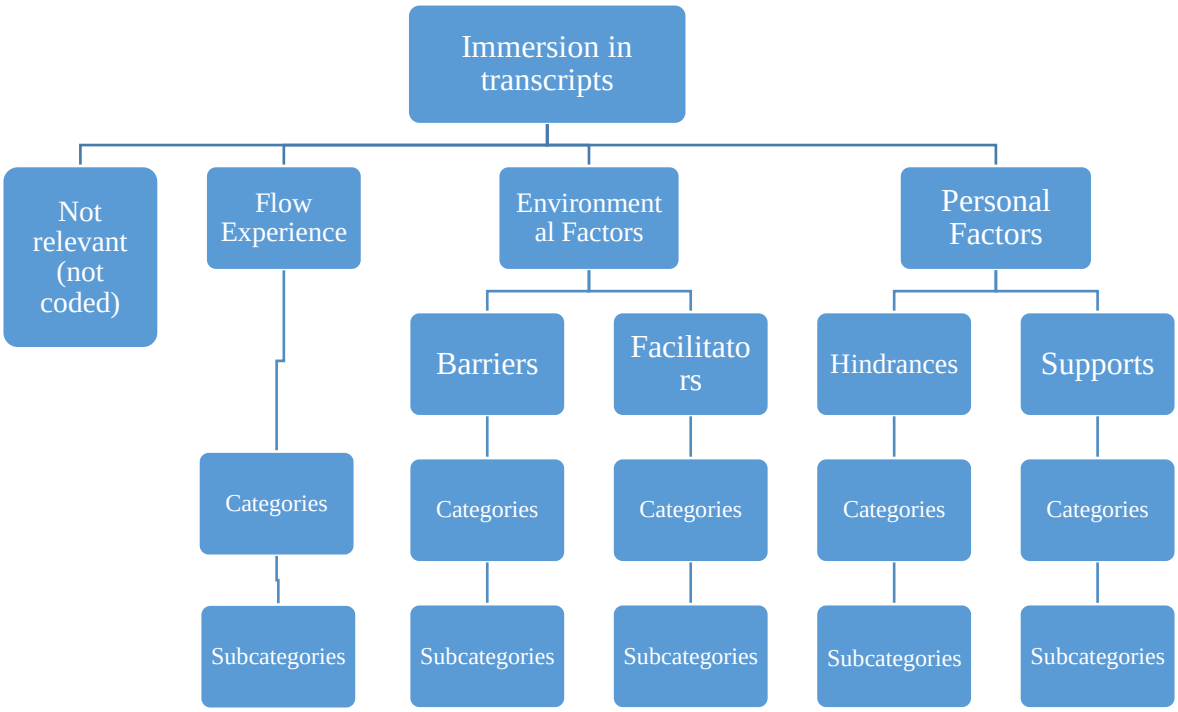


Figure 7. Coding process.

Results

The iterative process of qualitative content analysis led to the identification of a number of categories and subcategories, which are summarized in Table 2. With regard to flow experiences, five categories were identified. With regard to environmental factors barriers and facilitators, six categories of barriers were identified and three categories of facilitators. Finally, there were three categories related to personal factors hindrances and four categories related to personal factors supports. Overall results can be viewed in Table 2, and are discussed in the sections that follow.

Results Related to Flow Experiences

Interview responses that captured the flow experience, or lack thereof, are included in this section. These are not differentiated as barriers or facilitators, but rather as globally related to flow experiences. Five categories were identified along with 18 sub-categories.

The first category, Flow Despite Aphasia, captured descriptions of the experience of flow despite the presence of aphasia. This category included difficulties relating to flow and aphasia, but highlights that participants were able to report flow despite the presence of aphasia. Sub-categories with included example transcript items are displayed in Figure 8. Impact of Aphasia, the first sub-category, referenced statements reflecting how aphasia may impact flow experiences. One characteristic of flow is a loss of self-consciousness, and the second sub-category related to whether one forgets about aphasia. Inherent in the descriptions of flow were communication difficulties describing or relating flow experiences, and these statements were contained within sub-category three, Challenges of Describing Flow due to Aphasia. The fourth sub-category, Flow During Activities Impacted by Aphasia, captured statements of flow experiences in activities directly impacted by aphasia. The fifth and final sub-category, Lack of Impact of Aphasia on Flow, contained statements from participants regarding the presence of aphasia, but the limited impact that aphasia has on his or her flow experiences.

Table 10

Categories and Sub-categories of Flow Experiences, Environmental Factors, and Personal Factors

Flow Experiences	Environmental Factors		Personal Factors	
	Barriers	**Facilitators**	**Hindrances**	**Supports**
Flow Despite Aphasia				
Impact of aphasia on flow experiences	**Mismatch of Demands**	**Task Characteristics**	**Avoidance**	**Strategic Management**
Forgetting aphasia (or not)	Physical demands	Communication	Risk avoidance	Adaptation
Challenges describing flow due to aphasia	Place demands	Productive vs. non-productive	Challenge avoidance	Facing challenge
Flow during activities impacted by aphasia	Communication demands	Interest	Communication avoidance	Intentionality
Lack of impact of aphasia	Attentional demands	Modifiable	Enhancement avoidance	
	Excessive challenge	Familiar vs. non-familiar	Activity avoidance	**Goal-directed Characteristics**
Characteristics of Flow Experiences	Stress	Skill improvement	Lack of adaptation / flexibility	Perseverance
Enjoyment		Interactions		Self-improvement
Minimal thoughts	**Task Characteristics**	Adjunct activities	**Emotional State**	Goal-establishing
Engrossed	Pre- vs. post-stroke	Challenges	Unpleasant emotions	Seeking accomplishment
	Familiar vs. non-familiar	Successes	Fear of communication	Internal drive
Presence of Flow	Speed	Supports inherent in the task itself	Perfectionism	
Variability	Financial			**Gaining Perspective**
Conflicting reports	Absence of time constraints		**Non-stroke Related**	Self-awareness
Alone vs. with someone		**Other People**	Hearing	Acceptance / adjustment
Other activities adjunct to flow	**Other People**	Alone vs. with someone		Spirituality
Differentiating flow vs. non-flow	Partner behaviors	Aphasia groups		Innate characteristics
Uncertainty about what flow feels like	Instructors / activity leaders	Effective partners		Mindfulness
Facilitating Flow	**Physical Environment**	**Physical Environment**		**Motivation to Help / support Others**
Flow and skill	Physical space	Location		Sharing
Pre- vs. post-stroke flow		Characteristics		Helping
Awareness of flow	**Non-stroke Related**	Controllability		Making others happy
Uncertainty in knowing how to enhance flow experiences	Interactions			
	Technology			
Other				
Non-stroke related physical difficulties	**Other**			
	Transportation			

Example transcripts are presented below. Throughout the remainder of this paper, exemplar quotations from participants will be presented in table format, along with the number of utterances pertaining to category or sub-category in parentheses.

Flow Experiences
Category 1: Flow Despite Aphasia (34)

a. **Impact of aphasia (6) -** Participant 9: "[Aphasia is] always in the back of my mind."

b. **Forgetting aphasia (or not) (5):**
   Forgetting about aphasia **-** Participant 7: "Well, there's times when you don't even think of what aphasia is."
   Not forgetting about **aphasia -** Participant 9: "[Aphasia is] always in the back of my mind."

c. **Challenges of describing flow due to aphasia (16) -** Participant 4: "Um when I'm in flow. Hmm. (4 sec) You know I can't explain… I know, I know. But I can't explain um."

d. **Flow during activities impacted by aphasia (5) -** Participant 5: "I I I read all of my ah, ah, I write maybe 3 or 4 sentences and then you have to go over and over again to then you can, so you do ah, you do um, like 3 sentences and then you read them again. And then see if they're right, if they are right. You know. The flow of that."

e. **Lack of impact of aphasia on flow (2) -** Participant 1: (5 seconds) "Hmmm. (4 seconds) I don't really think it makes any difference, at least for me. If I'm communicating I try to do as best I can, or it doesn't, doesn't really lose the, I don't lose the flow" [in response to question if aphasia impacts flow].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 8. Flow despite aphasia.

The second category identified, Characteristics of Flow Experience, related to the descriptors of flow experiences and characteristics of flow as described by participants (Figure 9). Three sub-categories were identified. The sub-category of Enjoyment is reflected in statements of pleasure and positive emotion. The second sub-category, Minimal Thought, reflected a general effortless aspect of flow experiences, while the

third sub-category, Engrossed, reflected the sense of being absorbed in the flow experience.

Flow Experiences
Category 2: Characteristics of Flow Experiences (28)

a. **Enjoyment (9) -** Participant 1: "It's two things: One is just relaxing. You know, gardening relaxes me. And I think that makes me feel at peace with it. You know. And I just feel like I'm, you know, it's just fun, you know."

b. **Minimal thought (1) -** Participant 5: "So when you feel {shakes head no} when you see the pattern, it flows. You don't really think about it too much" [referring to doing beading activity].

c. **Engrossed (18)** - Participant 5: "And if you ah, very, ah, if you are in - into the project, you don't eat sometimes."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 9. Characteristics of flow experiences.

The third category, Presence of Flow, contained six sub-categories. The first sub-category, Variability, reflected the variability in presence or degree of flow among tasks and situations. Some participants gave statements regard flow or lack of flow that appeared to contradict with prior statements, and thus the second sub-category of Conflicting Reports. The third sub-category was Alone vs. With Someone, and contained statements of flow experiences in solitude, as well as with other people. Other Activities Adjunct to Flow related to participation in activities prior to, or subsequent to, flow experiences. The final two categories, Differentiating Flow vs. Non-Flow, and Uncertainty About What Flow Feels Like indicated the discernment of the presence or absence of flow, and the sometimes uncertain nature of identifying such experiences. These six sub-categories and examples are provided below in Figure 10.

Flow Experiences
Category 3: Presence of Flow (59)

---

a. **Variability of flow (4)** - Participant 5: "Well it's (flow) different with different projects."

b. **Conflicting reports (3)** - Participant 4: "Well before my stroke I never had uh a flow [laughs] you know? But after the stroke oh my god. Um." [However, in later utterance, participant states: "Well, yes you know. Um but if I was teaching I was in the flow." Note that she was a teacher prior to her stroke].

c. Alone vs. with someone (8):

Flow alone - Participant 5: "...by myself" [in response to question if she experienced flow more by herself or with someone].

Flow with someone - Participant 8: "[proper name] uh the uh person that that helps me um clean um uh it's um uh some sometimes I um I get so uh and um um (6 sec) so in the flow um I forget uh ah that it's uh time for lunch."

Either - Participant 9: "It it really doesn't make a difference, a whole lot of difference" [in response to whether she experiences flow with someone versus alone].

d. **Other activities adjunct to flow (1)** - Participant 7: "Maybe I've found other things with Pinterest." [She uses other experiences, resources to contribute to making cards, which is a frequent flow activity for her].

e. **Differentiating flow vs. non-flow (40) -** Participant 5: "Or you know, not so, I don't not so I don't think the flow and the yoga" [doesn't think that she experiences flow with yoga].

f. **Uncertainty about what flow feels like (3) -** Participant 4: "But um the stroke I don't know um 'bout my stroke or um about my flow."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 10. Presence of flow.

The fourth category identified among Flow Experiences is Facilitating Flow, which related to the comments from participants regarding potential influences on flow. Four sub-categories were identified. The first sub-category, Flow and Skill, referred to situations in which skill development may have been either an impetus for flow

experience or a byproduct of such an experience. Participants in this study provided statements that reflected perspectives of pre-stroke flow experiences as well as post-stroke flow experiences, and the potential complexities that arise when comparing such experiences. This second sub-category was identified as Pre- vs. Post-Stroke Flow. The third sub-category, Awareness of Flow, reflected statements indicative of awareness of flow experiences, but also reflected statements in which there was a lack of awareness about flow or how flow may or may not be experienced in daily life. The fourth and final sub-category, Uncertainty of Knowing What to Do to Enhance Flow, reflected the uncertainty participants reported with regard to enhancing the potential likelihood of flow. Sub-categories and examples are provided below in Figure 11.

Flow Experiences
Category 4: Facilitating flow (43)

a. **Flow and skill (3) -** Participant 1: *"*Yeah, I think in my garden, that was very good. You know. Um, because I have a lot of skill in that area."

b. **Pre- vs. post-stroke flow (14) -** Participant 9: "It's harder" [after the stroke to get in flow].

c. **Awareness of flow (12)** – Participant 4: "Flow. Hadn't thought much about it. Nope, I haven't thought about anything… Flow? {rising intonation}[laughs]."

d. **Uncertainty of knowing what to do to enhance likelihood of flow (14) -** Participant 4: "Boy I don't know. I don't know" [in response to "What would need to happen for you to be in flow more often?"].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 11. Facilitating flow.

The fifth and final category, labeled Other, related to statements and characteristics that did not fit into other categories or sub-categories (Figure 12).

Flow Experiences
Category 5: Other (5)

a. **Non-stroke related physical difficulties (5) -** Participant 4: "Because I mean my hand is, this is not, this is a problem right now, this whole thing {touches right shoulder}."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 12. Flow experiences – other.

Results Related to Environmental Factors - Facilitators

Three primary categories were identified relating to environmental factors facilitators and include Physical Environment, Other People, and Task Characteristics. Within these three categories, seventeen sub-categories were identified as facilitators related to flow experiences.

The first category of environmental factor facilitators was that of the Physical Environment (Figure 13). This category was comprised of three sub-categories. Location referred to the physical location characteristics of the task or event. Characteristics referred to the components of the physical environment that were considered facilitators such as physical environments that were identified as relaxing. The third and final sub-category, Controllability, referred to those environments in which the participant felt increased control over some aspect(s) of the physical environment, and that that control facilitated flow.

Environmental Factors – Facilitators
Category 1: Physical Environment (33)

a. **Location (22) -** Participant 5: "Well, right now I still go to bead classes. Sometimes. Umm. And I love them. You know. That, you can get in the flow okay" [the characteristics of the bead class facilitate flow].

b. **Characteristics (4)** - Participant 5: "So I want to go with other people in more relaxing situations. You know?"

c. **Controllability (7)** - Participant 5: "So you know, sometimes, I sleep on my ideas to then percolate them in my mind. So then I go back to the paper. Okay. When I'm in a class you can't do that" [being able to have time to think on ideas and concepts supports her experiences].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 13. Physical environments.

The second category of environmental factor facilitators was Task Characteristics (Figure 14). In this category, aspects of the task were identified as facilitators. This category was comprised of eleven sub-categories. Communication referred to aspects of communication that facilitated flow experiences. Participants identified facilitators to flow as occurring in productive and non-productive times, and those were captured in that aptly named sub-category. The third category, Interest, reflected the facilitory role that Interest had with participants' flow experiences. Environments that were Modifiable, the fourth sub-category, were identified as facilitory to participants as well, with participants expressly identifying modifications that supported their involvement in flow experiences. Aspects of Familiarity, the fifth sub-category, were discussed as well, and included both familiar- and non-familiar situations as facilitators of flow. Tasks and environments that utilized the individuals' current skills, and enhanced those current skills, were identified

in the sub-category of Skill Improvement. Interactions, which was also identified earlier as a barrier, was identified here as a facilitator for flow, and the importance of interactions from the participants' perspectives was addressed. Participants reported that activities secondary to a primary task, such as looking on Pinterest for card-making ideas, facilitated opportunities for flow, and as such the sub-category Adjunct Activities, the eighth sub-category, was identified. The importance of Challenge was identified by participants, as was the feedback that occurred with Success. Finally, the sub-category Supports Inherent in the Task Itself referred to task specific characteristics that facilitated flow experiences.

The third category of environmental factor facilitators related to Other People (Figure 15). Within this category, three sub-categories were identified highlighting the facilitory nature of interactions with other people. Alone vs. With Someone, the first sub-category, contained commentary on flow experiences that occurred alone or with someone. The presence of flow in Aphasia Groups was captured in the second sub-category and finally, Effective Partners, the third sub-category, contained commentary on the effectiveness of partners in flow experiences.

Environmental Factors – Facilitators
Category 2: Task Characteristics (31)

a. **Communication (verbal vs. non-verbal) (4) -** Participant 9***:*** **"**Both, really. Both"[finds flow in things that involve conversation and those things that don't].

b. **Productive vs. non-productive (1)** - Participant 5: "You know? So Solitaire is not a good thing, but anyway, sometimes I take too much time on solitaire."

c. **Interest (2)** - Participant 2: "But my, my reading like books and catalogs [UI] is, is made me concentrate in books, because I want to slow {gestures} slow, reading but, I, I interesting. Yeah."

d. **Modifiable (6)** - Participant 9: "Like I couldn't climb the uprights anymore. I gotta have ladders" [describing modifying access to his hunting blind].

e. **Familiar vs. non-familiar (5) -** Participant 8: "Uh when I uh I'm uh cleaning my bedroom um and uh I have a some music on and um I get so much involved in it that uh um all of sudden I /mitch/ miss miss my lunch And uh it's uh time to make a supper ready. Yeah."

f. **Skill improvement) (2) -** Participant 1: "Yeah, I think in my garden, That was very good. You know. Um, because I have a lot of skill in that area."

g. **Interactions (4)** - Participant 5: "You know. Because even even when you are thinking you are doing better in the flow when alone, but you can't do that you have to have more opportunities to have speech. You know."

h. **Adjunct activities (1)** - Participant 9: "And I had to get into it to get the aphasia camp stuff out." [needing to prepare for upcoming aphasia camp was catalyst to complete a task he had been avoiding]

i. **Challenge (4)** - Participant 2: "Yes. And then check, maybe, read again, re-read, you know. And then, okay. And then {gestures hand in a forward, circular motion}. Yeah" [describing her reading process].

j. **Successes (1)** - Participant 9: "Um, at the meeting it was hard, but it was successful. And I think that's part of it" [referring to participation in a volunteer community meeting, non-aphasia related].

k. **Supports inherent in the task itself (1)** - Participant 5: "When you are doing a project with beads, you have a pattern. You have to still figure out the pattern, or ah, you can figure out the directions and when you have that, you just go. You know, and then you can change ah different colors and stuff other way."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 14. Task characteristics.

Environmental Factors – Facilitators
Category 3: Other People (45)

a. **Alone vs. with someone (21) -** Participant 5: "Right, or ah, like if I have, if you were in a, if I go ah, I joined a card stamping group. And if I go card, uh, bead classes. There are people around you, you can still be in the flow with them {opens arms wide} but you are doing your project by yourself."
Alone – Participant 6: "When I'm around {alone}" [being engaged is easier].
With Someone - Participant 8: "Because, uh, I got something, uh, somebody to do something with."
***Both* –** Participant 1**: "**I don't know, I like both" (in regard to being alone vs. with someone when in flow).

b. **Aphasia groups (9)** - Participant 4: Um um let's see. I was in flow when I was in the [aphasia group] meeting.[participant referring to the experience of flow in aphasia group, and that she rarely, if ever, experienced flow outside of aphasia group experiences].

c. **Effective partners (15) -** Participant 8: "Um [proper name] and um [proper name], um um they'll give me a chance to, to um tell them what I'm gonna do or de- describe it to them ah, what I'm gonna do and then they'll take a guess."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 15. Other people.

Results Related to Environmental Factors - Barriers

Six primary categories were identified as environmental factors that functioned as barriers to flow, along with seventeen sub-categories. Categories and sub-categories, along with example transcript items, are displayed below with the number of coded utterances provided in parentheses.

The first category of environmental factors barriers was Mismatch of Demands (Figure 16). In this category, six sub-categories were identified. Physical Demands referred to the demands of the environment on the participant from a physical standpoint, and related to physical obstructions to flow experiences. Place Demands referred to

characteristics of the location that were barriers to flow. Excessive Challenge, the third sub-category, referred to the characteristics of statements regarding the negative aspects of excessive challenge, when task demands far exceed the capabilities of the participant. Communication Demands, the fourth sub-category, referred to the environmental demands placed on communication and the negative impact of such demands. Similarly, Attentional Demands referred to environmental demands, but explicitly focused on attentional processes, which participants may have referred to as concentration or focus. The final sub-category identified was Stress, and referred to the negative impact of overload or imbalance of environmental demands.

The second category, Task Characteristics (Figure 17), consisted of aspects of the task that are identified as barriers to flow. This category was made up of five sub-categories. The first sub-category, Pre-vs. Post-stroke Characteristics, captured the commentary relating to differences in task abilities pre- vs. post-stroke. The second sub-category, Familiar vs. Non-familiar, highlighted the perceptions of participants relating to the impact of familiarity on flow and the potential role familiar vs. unfamiliar experiences may have on flow experiences. Speed, the third sub-category, captured the impact that speed demands had on flow. Financial aspects of tasks, including costs, and the role of limited financial resources, were addressed in the fourth sub-category. Deadlines, the fifth sub-category, were identified as potential barriers to flow. Without the constraints of deadlines, participants indicated a diminished likelihood of task completion, which often results in "putting things off" or lacking urgency or necessity to complete certain tasks. When such tasks became particularly challenging, the participant could just leave the task rather than be forced to finish in order to meet a deadline.

Environmental Factors – Barriers
Category 1: Mismatch of Demands (90)

a. **Physical Demands (16) -** Participant 9: "Yeah. That's one thing as a matter of fact two year or year ago it was getting late, it was still hunting season but it was getting late. And deer came in and I couldn't pick him up in the scope. And it was hopping toward the field away from me but I I couldn't pick him up in the scope. But that's just the scope or that's just one handed you can't do it. But a lot of things that you could do with both hands."

b. **Place Demands (2) -** Participant 6: "Um even even uh when I go down to the gym uh because there's people around whether it's the noise or the clanking of (2 sec) weights you know it's it's hard on me because you know I'm trying."

c. **Excessive Challenge (8) -** Participant 1: "The thing about being in the flow. If you go to something that's really hard, you don't want to do it anymore."

d. **Communication Demands (54)** - Participant 6: "And I it sometimes uh when people are talking [hand gestures] it different than to even talk because um you only got. Your mind runs you know if they're talking about stuff uh I wanna I wanna comment on that and then uh you know talks talks a lot. What do you think? [laughs] I can't think. I forgot probably."

e. **Attentional Demands (6)** - Participant 6**: "**I only do it when my wife is not home. I says 'are you gonna be gone for four hours?' Cause at that time I don't want her to um water her plants. I just [makes noise with mouth]. I'm trying to fill this carburetor [laughs] you, no I didn't" [referring to that he does certain work only when he won't be distracted].

f. **Stress (4)** - Participant 5: "If you have a lot of stress at your home life, then if it is balance, balanced in your work life, it's not so much. If they both are very stressful, then you don't really do a lot of flow, so much. You know?"
Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 16. Mismatch of demands.

Environmental Factors – Barriers
Category 2: Task Characteristics (36)

a. **Pre-vs. Post-stroke task characteristics (25)** - Participant 6: "Well it, it should be real easy for me and it isn't…I used to do stuff like that."

b. **Familiar vs. non-familiar (5) -** Participant 8: "If I'm not in flow with um anything uh that uh uh comes up as a change."

c. **Speed (2) -** Participant 5: "So you have to be in the top of it. You know. And I was reading specialist and you had to get {snaps fingers} ah, corrections all the time. On the, at your fingertips {snaps fingers}. Yes? Ok. I can't do that anymore. Umm, and sometimes when I teach with um my friends want me to do a big work with them. Well it's a little tricky sometimes you know but you know we we do it, but it's a challenge. So difficult for the flow, you know."

d. **Financial (2)** - Participant 6: And I, you know, went hunting and [my wife asked me] 'why didn't you go hunting?' And I haven't got the money yet. I just, you know, make this much money and now I got it so I can go up north go two weeks and I got enough money if I get the "gear" to have it butchered."

e. Time constraints / Deadlines (2) - Participant 9: "That's exactly right. Not the same deadline" [He conveys that he does not have the deadlines that he had when working, and thus doesn't have those external deadlines pushing him to get things completed].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 17. Task characteristics (2).

The third environmental factor category identified as a barrier to flow was Other People (Figure 18). In this category, aspects relating to the behavior and interactions of familiar and unfamiliar individuals were identified. This category was comprised of two sub-categories. Partner behaviors refers to the behaviors of partners that were interpreted as influencing or facilitating flow experiences. Instructors/Activity Leaders was the second and final sub-category, and referred to the comments by participants regarding the actions of such individuals during community programs or exercises classes such as yoga and swimming.

Environmental Factors – Barriers
Category 3: Other People (31)

a. Partner behaviors (25) - Participant 4: *"*But the point is is that I have no um friends. Uh well. Ah let's see. I have friends but they're not too interested in me."

b. Instructors / Activity leaders (6) - Participant 5: "I don't know. You know, sometimes, you know, I think she's [the yoga instructor] too, sometimes she's too slow {laughs} umm, sometimes ah, my body just not do it. You know."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 18. Other people (2).

The fourth environmental factor barrier category related to the Physical Environment with one sub-category - Physical Space. Although there was just one utterance, it appeared valuable to warrant coding and inclusion (Figure 19).

Environmental Factors – Barriers
Category 4: Physical Environment (1)

Physical Space (1) - Participant 6**: "**You can't fish with two grandkids and me and my son on the dock."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 19. Physical environment (2).

The fifth environmental factor barrier consisted of Non-stroke Related Barriers (Figure 20) and included two sub-categories. Within this category were contained aspects of flow experiences that do not necessarily relate primarily or solely to aphasia. These aspects may be considered as potentially present even in the absence of aphasia. However, even though these may occur without aphasia, it is not unreasonable to assume that the presence of aphasia may exacerbate these factors, although this is not studied in the current paper. The first sub-category, Interactions, reflected some of the interactional

barriers that were present either prior to the stroke or indicative of occurring regardless of aphasia. Technology barriers, the second sub-category, again were interpreted as present regardless of the presence of stroke. These factors may, however, be potentially exacerbated by aphasia.

Environmental Factors – Barriers
Category 5: Non-stroke related barriers (7)

a. **Interactions (4)** - Participant 7: "We always had different groups that would say come on over for supper, and then we'd have for the next couple of weeks we'd have somebody else friends that's come over let's do that or we're gonna do this. We always had couples. Here [in the new apartment complex they've lived at prior to her stroke] we just friends [that don't come over]."

b. **Technology (3)** - Participant 6: "But uh it's some of that stuff it's like why did they do that? You know. It's like um uh iPad that's got different stuff on it and uh I mostly into windows and you can open more windows [hand gestures] [referring to his familiarity with Windows operating systems and desktops, rather than the newer, more mobile technology with touch screens]."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 20. Non-stroke related barriers.

The last barrier category was identified as Other, and included aspects of statements that did not fit in the other categories or sub-categories (Figure 21).

Environmental Factors – Barriers
Category 5: Other (5)

a. Transportation (5) - Participant 6**:** "Um, when I have my boat here I can go all the way around the lake and I know exactly where the fish are [hand gestures]. And right here [on the dock] you have to wait for them to come in" [comparing his experience of fishing in a boat versus fishing on the dock].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 21. Environmental factors barriers – other.

Results Related to Personal Factors - Supports

Four primary categories of personal factor supports were identified and included Strategic Management of Challenge, Goal-directed Characteristics, Gaining Perspective, Motivation to Help / Support Others. Sixteen sub-categories were identified.

The first category, Strategic Management of Challenge, consisted of three sub-categories (Figure 22). The first sub-category, Adaptation, referred to the adaptations participants have implemented that support flow experience. The second sub-category, Facing Challenge, contained commentary from participants regarding examples of times and events when they had addressed challenges and the overt role of challenge. The third and final sub-category, Intentionality, referenced intentional implementation of strategies.

Personal Factors – Supports
Category 1: Strategic Management of Challenge (34)

a. **Adaptation (7)** - Participant 3: "And make little motifs of counter cross stitch and put 'em on the cards but my hands, I'm getting arthritis in my hands and it's hard to hold the material and the needle. So I haven't done any of that in about a year. So I went back to the paper cut out" [referring to adaptations made in her card-making process].

b. **Facing challenge (11)** - Participant 6: "And and and it's tough for me because I gotta concentrate on it" [referring to flow-experiencing tasks while doing repairs].

c. **Intentionality (16)** - Participant 5: "But that is different. It's not, it's not like here. I am consciously blocking a lot here. Okay?" [referring to using a personal strategy to cope with an environmental factor barrier, the busy atmosphere at the public, metro location of the interview].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 22. Strategic management of challenge.

The second category, Goal-directed Characteristics, referred to the presence of goal directed characteristics within participants' statements (Figure 23). This category was comprised of five sub-categories. The first sub-category, Perseverance, referred to consistent, repeated attempts or efforts despite potential difficulties that may arise. The second sub-category, Improving Skills, referred to an overt attempt to improve one's own skills or abilities. Similarly, participants' statements were identified as Goal-Establishing, if they reflected an intentional attempt on behalf of the participant to establish a goal or address a prior-identified goal. Several participants identified characteristics of Seeking Accomplishment, and this was the fourth sub-category. The fifth and final sub-category within the Goal-Directed Characteristics, was the presence of an Internal Drive.

Personal Factors – Supports
Category 2: Goal-directed Characteristics (31)

a. **Perseverance (7) -** Participant 5: "And I would write a long time but, but that, ah, (3 seconds) that was still a little difficult. You know?" [referring to writing her personal memoir of her stroke experience].

b. **Self-improvement (Improving skills) (5) -** Participant 1: "Umm, because if I like, I stopped reading. I did that for a while. It was hard to get back into it. You know, um. When I stopped writing, I lose the skill. So I have to do it. I have to keep everything up."

c. **Goal-establishing (2) -** Participant 1**:** "And that's that's the big thing, you have to have a goal."

d. **Seeking accomplishment (4) -** Participant 1: "It was very difficult to understand, cause, but, um, well we got a lot accomplished and I felt really good about that" [referring to a writing task she did with clinicians].

e. **Internal drive (13) -** Participant 5: "So you wanted to go on and on and on and on because you wanted to…that that helped to get my spelling skills better."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 23. Goal-directed characteristics.

The third category, Gaining Perspective, captured insights and perspectives evident in the utterances of participants and consists of five sub-categories (Figure 24). The first sub-category, Self-Awareness, included commentary from participants indicating a reflective nature relating to his or her own performance or personal characteristics. Participants described, either explicitly or implicitly, aspects of their own acceptance and adjustment to the changes brought on by stroke aphasia. These comments were included in the second sub-category, Acceptance. One participant in particular conveyed the importance of spiritual aspects of his daily routines. His and others'

comments in this regard were included in the sub-category Spirituality. Although only one participant mentioned her innate personal qualities relating to a flow-experiencing disposition, this comment was considered valuable and included in the sub-category Innate Characteristics. The fifth and final sub-category, Mindfulness, referred to descriptions by participants in regard to intentional aspects of awareness in order to enhance experiences.

Personal Factors – Supports
Category 3: Gaining Perspective (23)

a. **Self-awareness (3) -** Participant 4: "Boy oh boy. I think that I could maybe try a little harder."

b. **Acceptance / adjustment (4) -** Participant 1: "You know, umm, but when even if I screw up, it doesn't bother me. It's just, like when I, when I go and talk to um, [proper name's] class, you know. I know that I'm gonna screw up because that's who I am now. You know, that's the way it is. And so, I don't let that bother me."

c. **Spirituality (5) -** Participant 2: "Concentrate. On my mind. Oh, I pray" [he prays during his exercises when he's working out, a flow experience for him].

d. **Innate characteristics (1**) - Participant 1: "I've always had it. Yeah, Yep. My, my um, mother says that I'm the most positive person she's ever known {laughs}."

e. **Mindfulness (10)** - Participant 5: "But anyway in the pool if you focus on each movement, and the movement of the water, and the lights and the sounds {gestures widely} you get more, ah, more ah in a, meditative state to do it."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 24. Gaining perspective.

The fourth and final category identified was that of a Motivation to Help/Support Others. Within this category were three sub-categories (Figure 25). Sharing includes references participants made to sharing items they produced during flow experiences, such as cards and artwork, and such examples comprise this first sub-category. The

second sub-category, Helping, was identified as it relates to participants who reported their interest in helping others, including others with aphasia. Finally, the third sub-category, Desire to Make Others Happy, contained references to emotions and values associated with interpreting their own actions as fostering happiness in others.

Personal Factors – Supports
Category 4: Motivation to Help / Support Others (5)

a. **Sharing (1) -** Participant 5: "Yeah. And I really want to share what things that I have produced" [referring to sharing items that she has made].

b. **Helping (2) -** Participant 1: "That, you know, I was so upset I couldn't teach, but I found something else, to help people that have aphasia."

c. **Desire to make others happy (2) -** Participant 7: "Um, it's enjoyable for me because it's if it's something I know I'm going to have it and somebody's going to be happy, make for that to make for myself to give away" [referring to making cards that she gives to others].

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 25. Motivation to help/support others.

Results Related to Personal Factors - Hindrances

Three categories of personal factors hindrances were identified. Within those three categories were ten sub-categories. The first category, Avoidance, related to concepts contained within interviews that addressed, either directly or indirectly, aspects of avoiding (Figure 26). Multiple aspects of avoidance were addressed as reflected in the three sub-categories which included Risk Avoidance, Challenge Avoidance, Communication Avoidance, Enhancement Avoidance and Activity Avoidance. Additionally, Lack of Adaptations on behalf of participants were present and identified as such in the sixth and final sub-category. Examples including transcript samples are displayed below.

Personal Factors – Hindrances
Category 1: Avoidance (29)

a. **Risk avoidance (3) -** Participant 2**: "**I tend to go to not extremes. Like, I tend to be comfortable."

b. **Challenge avoidance (16) -** Participant 3: "Ahh, I probably don't do a lot of things that are really challenging any more. It's just too much bother."

c. **Communication avoidance (2)** - Participant 7: "I, talk about something else or just not listening, I listen to them but don't say anything back."

d. **Enhancement avoidance (2)** - Participant 4: "Oh no I don't know either" [in response to question of if she could facilitate flow in her own life more frequently].

e. **Activity avoidance (3)** - Participant 2**:** "Um (7 sec) I, um, I don't um, I don't, do a lot of stuff."

f. **Lack of adaptation/flexibility (3)**: **Participant 9:** "You do it the same way."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 26. Avoidance.

The second category of personal factors hindrances related to the participants' Emotional States and was comprised of three sub-categories (Figure 27). The impact of Unpleasant Emotions, including frustration, anger, and feeling in a rut, were included in the first sub-category. Fear of Communication, the second sub-category, was identified by one participant as impacting his involvement in social interactions. Finally, characteristics of Perfectionism were included in the third category as they relate to striving for perfection, and the potential pitfalls that may entail.

Personal Factors – Hindrances
Category 2: Emotional State (12)

a. **Unpleasant emotions (9) -** Participant 1: **"**Yeah, and so I feel like, it's my responsibility to fix it but no matter what I do it doesn't work. So, yeah. And so then I'm out of flow because I can't even, even get, get out of that state of mind, you know."

b. **Fear of communication (1) -** Participant 2: "I want to communicate but I'm scared, you know?"

c. **Perfectionism (2)** - Participant 1: "At first, like when up there and talked to the aphasia group, you know, and I get, get so confused cuz I want to be perfect {laughs}."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 27. Emotional state.

The third and final category of personal factors hindrances was Non-stroke Related Hindrances (Figure 28). These were hindrances interpreted as likely to occur regardless of the presence of stroke or not. Note however, that aphasia may exacerbate such hindrances, although that was not explored in this study.

Personal Factors – Hindrances
Category 3: Non-stroke Related (2)

a. **Hearing (2) -** Participant 3: "I think that was my biggest problem wasn't the aphasia, it's more being able to hear."

Note: *The number in parentheses refers to the number of coded utterances pertaining to respective category or sub-category.*

Figure 28. Non-stroke related.

Discussion

The results of this study indicated that people with aphasia experienced flow, and that there were similar characteristics of their flow experiences in comparison to flow experiences of other populations without aphasia. Participants even reported flow experiences in activities directly impacted by aphasia (e.g., conversation, writing, reading). Environmental factors that were facilitators and/or barriers influenced flow experiences. Individual personal factors also supported or hindered flow experiences for participants in this study.

Flow Experiences

There are unique aspects for individuals with aphasia to convey their flow experiences. Flow is a complex construct that has a tendency to break down if over-simplified. The linguistic complexity required to describe the concept of flow to individuals with aphasia presents a challenge. Additionally, the ability to relate or describe flow experiences is complex, even for those without aphasia. The presence of aphasia has the potential to exacerbate the difficulties describing flow experiences. An example was the following set of utterances that occurred when a participant was attempting to relate how flow feels to her, stating *"Um, when I'm in flow. Hmm. (4 seconds) You know I can't explain. I know, I know. But I can't explain."* There are also challenges in describing the concept of flow *to* people with aphasia. One participant made clear that even the researcher's attempts at aphasia-friendly descriptions were sub-optimal by making the following indirect request: *"If you, if you can use a different words to make it easier for me."* Although this study excluded those with more extensive

language impairments secondary to aphasia, there is no reason to believe that those individuals cannot experience flow. The inability to communicate the experience does not preclude, or eliminate, possibility for such an experience. However, further exploration will require increased support for comprehension of the concept of flow among participants with aphasia and for expression of thoughts related to flow.

Participants in general had little prior awareness of the concept of flow prior to this study. It is unclear to what extent the presence of aphasia influenced awareness of flow. There was evidence that flow was not a familiar concept, and for many, it did not resonate with their own schema. One participant responded *"I, I thought 'a flow' {rising intonation}? What's a flow?"* indicating that she was not familiar with the concept at all prior to the study. It appeared most participants had not thought about their daily lives as they relate to balance of skill and challenge. While this is not necessarily surprising, there was evidence of some evolving thought and application of flow concepts during the course of Study 2 as well as during these interviews. One participant commented, "*I'm a just getting use to, um, the flowing experience. Um and um (4 sec) I'll, um, I'll learn to think about it, um and uh experience it a little more.*"

Flow perceptions are impacted by pre-stroke perspectives for many of the participants. "Return to pre-stroke life" was one of nine goal categories that Worall et al. (2011) identified in their interviews with people with aphasia. They found the desire to return to pre-stroke abilities was present in the early period of aphasia and also with some individuals who had chronic aphasia. Ellis-Hill, Payne and Ward (2000) interviewed eight individuals who had had a stroke (but not aphasia), and they identified themes of *utter new world experiences* and *fundamental physical and psychological challenges*

present in those individuals, in comparison to their pre-stroke selves. It would be short-sighted to assume that such perspectives do not influence flow perceptions. Individuals may perceive inordinate challenges for tasks they had completed with ease prior to their stroke. Attempts at such tasks may be clouded with negative perspectives, with frequent comparisons to pre-stroke task completion. Such perspectives increase the complexity of the lens through which participants view skill and challenge. Participants commented on "what they used to be able to do" and commented about tasks that "should be easy" but are not now post-stroke. Thus their comparison to skill possessed is influenced by skill possessed *prior to the stroke*, and understandably so. However, such perspectives may preclude flow experiences as the task itself, or the anticipation of the task, is imbalanced due to the perceived lack of skill *in comparison to pre-stroke status.*

Environmental Factors - Barriers

The nine participants in this study talked about a variety of environmental factors that they perceived were barriers to their flow experiences. Mismatch of Demands was found for almost all of the participants. Less commonly found were barriers related to Other People and the Physical Environment.

Participants discussed the presence of challenge in their lives, and related examples of mismatch of challenge. This mismatch of challenge extended to physical demands as well as communication and attentional demands. Some participants identified physical demands that precluded participation in flow-inducing experiences (i.e., difficulty shooting a rifle with one hand while hunting). Communication challenges precluded some from participating in pre-requisite activities for flow-inducing situations

such as bartering with others for selling and trading machinery and engines to be repaired, illustrated by the following quote: *"but he was gonna trade it with a boat but his stuff is new and mine wa-, is old and I can't deal with people on that*." Other situations were identified in which the individual continued to participate in an activity, but was no longer able to engage communicatively as she had prior to the stroke, and thus had a more passive role in the experience:

> We are driving down to [redacted], and sometimes I'll stay, -sit in the back seat or sometimes in the front... I'm listening, or they're talking about something, and there's...it's just isn't my not, kind of listen to what they're talking about things. I just, I just stop talking all the while, well, not all the way. There's things that I want to talk about, something "Hey is this a, look at all the sheep on the next {points}, you know." And, it it's just I want to say more about it, but it's already by.

Although excessive challenge was recurrent content throughout the interviews, the concept of minimal challenge was addressed as well, although with less frequency. One participant commented on the absence of deadlines and how that relates to reduction in challenge. From a broader sense, this may relate to issues of voluntary vs. obligatory contexts addressed by Lyon (1999). An absence of deadlines, and in essence, an absence of challenge to the individual with aphasia to complete a task, may reduce the likelihood of flow experiences. Without a pressing, external deadline, such as one might have at work or during committee involvement, it is apparent from participants that the likelihood of engaging in the task at hand is lessened.

The presence or absence of partners was identified as both a facilitator and barrier to flow experience. Partner behaviors to support communication and participation have been of increasing interest in the aphasia (Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001) and brain injury (Hoepner & Turkstra, 2013) literature. In their systematic

review of nine conversational partner training programs, Turner and Whitworth (2006) found favorable outcomes have been reported from such programs, highlighting the importance of the role of the partner. Similarly in this study, the role of partner supports as a facilitator of flow experiences was evident in several interviews. It is apparent that partners may mediate the presenting task challenge, serving as a "filter" in order to discern optimal challenge and adjust the task accordingly to maximize engagement on behalf of the person with aphasia. The effects of such actions on behalf of a partner or instructor were evidenced in positive flow experiences during instructor – led writing as evidenced by the participant attributing her success to the supports present during the task: *"Oh yeah, cause I had a lot of. I, have, a lot of support. You know."*

Environmental Factors - Facilitators

Three categories of environmental factors facilitators were identified in this study. Participants described aspects of tasks and activities that supported flow (Task Characteristics), as well as aspects of the physical space (Physical Environment). Additionally, they described the impact of other people within the environment (Other People). Although partners may have a role in mediating task difficulty, dependence on a partner is not prerequisite to flow experiences. Just as the partner can mediate challenge of a task, so too can the individual with aphasia. Multiple examples were described in which a participant modified the difficulty of a task through a form of self-guided experience, such as taking more time on specific parts of a task (beading), adjusting physical performance (swimming class) or intuitively increasing the complexity of a task (card-making). In each of these examples, and in others the individual was able to adjust the complexity of a task to optimize the balance of skill and challenge. While this takes

certain personal characteristics, as discussed below, it also requires a task that is malleable or modifiable.

Tasks or activities that are modifiable appear to support flow. However, tasks or activities can be routine, mundane tasks and still provide flow experiences. Counter to "strong achievement" flow experiences such as surgery and rock-climbing, Schiepe-Tiska and Engeser (2012) describe non-achievement flow situations such as walking down the street or watching television. These flow experiences in non-achievement situations provide parallels and differences to achievement situations. In such situations, the skill involved may not be as high, relatively, as other situations. Csikszentmihalyi (1975) reported individuals who related flow experiences during relatively mundane tasks such as walking. Participants in the current study reported flow experiences during situations such as watching TV and cleaning the house. Whether these relate to achievement vs. non-achievement situations is not entirely clear, but certainly there was absorption in the task at hand while cleaning *("Uh, when I, uh, I'm, uh cleaning my bedroom, um and, uh I have a some music on and, um I get so much involved in it that uh, um all of sudden I miss my lunch And uh, it's uh, time to make a supper ready. Yeah.").* Such examples reinforce the opportunities for flow experiences in daily life activities.

Personal Factors – Supports

Just as there were certain characteristics of the environment that facilitated flow, so too were there characteristics of the individual that seemed to support flow. In the current study, there was a subset of individuals who overtly consider, face, and manage challenge. These participants were strategic thinkers who report facing challenges in an

intentional manner. Studies with individuals who do not have aphasia reference the autotelic state – a personality disposition more prone to flow experiences (Baumann, 2012; Csikszentmihalyi, 2008). Such a person actively seeks out challenge and pursues tasks for the sake of task completion, rather than secondary to some kind of requirement. Bauman (2012) wrote, "where non-autotelic individuals may see only difficulty, the deep sense of interest aids autotelic individuals to recognize opportunities to build their skills" (p. 2). Additional characteristics of the autotelic personality include perseverance, curiosity, and life interest (Nakamura & Csikszentmihalyi, 2002). Based on studies of individuals without aphasia, it appears that individuals with autotelic personality states possess a combination of a desire or need to seek out challenging situations as well as a degree of perquisite skill in such tasks (Baumann, 2012). Nakamura and Csikszentmihalyi (2002) found that, across multiple studies, participants described flow experiences as being part of a constant process of challenging, but manageable goals, processing feedback about progress toward goals and subsequently adjusting performance based on that progress, as illustrated in the following participant statement: *"Because you, you push yourself to get it right. Or as much as as you can."* Such descriptions are consistent with the autotelic personality state, and consistent with a subset of participants in this study.

There was evidence of overt mindfulness practices among participants in this study. Mindfulness is a state in which the individual has a heightened awareness of his or her own actions and perceptions (Reid, 2011). Reid (2011) reviewed similarities between flow and mindfulness, and while she concluded that no direct comparisons between flow and mindfulness can be made, she did posit two scenarios to highlight how the profession

of Occupational Therapy can apply concepts of mindfulness to facilitate engagement in their patient populations. Orenstein, Basilakos and Marshall (2012) studied Mindfulness Meditation among three individuals with aphasia and found no changes on measures of auditory divided attention tasks prior to and following direct mindfulness interventions. The authors noted, however, that participants reported increased feelings of positive states of relaxation and peacefulness following mindfulness training. The authors concluded that individuals with aphasia can successfully learn such meditative practices. One of the nine participants practiced mindfulness strategies extensively, and relayed how she utilized such strategies during daily life in order to facilitate presence in the moment.

Multiple participants described patterns of altruism and desire to assist others, both with and without aphasia. This subsequently resulted in participants' engagement in flow-inducing tasks such as making cards to give to people and volunteering to support others at aphasia groups. This finding of altruism/support of others is consistent with findings by Worrall, et al. (2011), who reported multiple participants with aphasia serving as mentors and volunteers. Altruism may be a motivator and facilitator to further flow experiences.

Personal Factors – Hindrances

Recall that personal factors are not coded within the ICF framework. However, personal factors that may impede or negatively impact an individual's behavior, response, or adjustment to a presenting situation may be considered hindrances. One such hindrance observed across multiple participants within this study was that of avoidance.

As discussed earlier, there appeared to be a subset of the participants who were more inclined to face a challenge (and may possess characteristics of the autotelic personality) and there also appeared to be a subset of the population that avoided such challenges. It is difficult, and perhaps unwise, to make assumptions about the participants' rationale and motivation for avoidance. The reasons behind that avoidance are not clear and are beyond the scope of this study. However, the avoidance of challenge did negatively impact the ability to experience flow. Flow is considered to be a result of optimal balance of high skill and high challenge, and avoidance of such challenges typically precludes flow experiences. Although there may be negative connotations to avoidance of challenge, perhaps as an implied or overt weakness, it is crucial to view this avoidance in light of the presence of aphasia. As Tanner (2003) emphasized, people with aphasia, like all human beings, protect themselves from discomfort or unpleasantness through use of psychological defenses, and the recurring aspect of avoidance may be evidence of this protection.

Implications for Practice

Implications of this study may be considered from the perspective of the clinician and from the perspective of the individual with aphasia. There is overlap between these two distinctions and they are not exclusive, but for the purpose of this paper, will be presented separately.

From the clinician perspective, it appears that gauging flow perspective has benefit in terms of the quality of the experience. This study did not intend to equate flow experiences with quality of experience. However, given the positive factors associated

with flow, and the positive comments associated with flow as related by participants, flow may be an indicator of quality of experience. In order to facilitate such experience, the proper balance of skill and challenge is necessary. Challenge is at the crux of the optimal skill/challenge balance. Although individuals reported frequent occurrences of excess challenge, we as practitioners must also be aware of the need for challenge in order to experience flow. Participants indicated a lack of challenge, some of which related to avoidance of challenge certainly, and it may behoove practitioners to consider increasing challenge (within reason) in the clinical and interactive aspects of service provisions. In the framework of the quadrant model of flow used in this study, absence of appropriate challenge is as detrimental to flow as excessive challenge. That is, without adequate challenge, flow as operationalized using the quadrant model, is inaccessible.

Descriptions of flow experiences, as reported in past literature, and in this current study, include changes in time passage, engagement in the task at hand, and positive emotions during and following such experiences. Tasks do not need to be novel, complex or unique (although they can be). Rather, flow can occur in daily experiences such as cleaning and making food, and can occur when language demands are low or high. Flow experiences may be motivating for future activity and may facilitate further participation on behalf of the individual with aphasia.

Explicitly identifying such experiences as goals for participants in aphasia programs may be beneficial, as may monitoring progress or experiences of such experiences. This could be done utilizing the experience sampling method (Chapter 3) with a variety of signaling designs such as review at the end of the day, or at the end of

certain activities, and could be done low-tech using paper/pencil, or high-tech utilizing mobile technology or email.

Multiple supports impact flow and may facilitate or inhibit flow. Such supports range from human supports to logistical supports. The role of partners in the lives of individuals with aphasia cannot be underestimated. Just as there has been emphasis on communication partner training, and the benefits of such trainings and programs, so too might there be benefit in partner training as it relates to enhancing flow. It may be that such programs already in existence, by the nature of their training, already indirectly promote the potential for flow experiences. However, such programs may be ideal for explicit promotion of flow concepts and maximizing such opportunities.

Finally, the clinician can consider modifying the environment to facilitate flow experiences, modifying skills of the individual with aphasia to facilitate flow, or some combination of both. Keeping principles of optimal skill and challenge in mind, the clinician can provide an environment that challenges, but does not overwhelm. The clinician can also observe and identify skill refinements that may support a more optimal balance of skill and challenge as well.

From the perspective of the individual with aphasia, an overt focus on one's own skill and challenge may enhance metacognitive awareness of flow. Participants in this study indicated a low awareness of flow, and some participants reported that they will consider aspects of flow in more detail in the future following the study. Using experience sampling methods (Chapter 3) to chart skills and challenges, as well as the interactions of these two, may be beneficial to those with aphasia. It may highlight potential aspects of their daily life they may address in order to facilitate flow.

The concept of the autotelic personality state emerged from this study somewhat unexpectedly. It appears that such a personality may be more likely to experience flow, or pursue activities which may result in flow, and this type of personality was evident during this study. Similarly, there are many anecdotal clinical experiences in which similar situations were managed quite differently by people with aphasia, and the influence of the autotelic personality may have been a factor. What is not entirely clear is whether there are effective means to facilitate flow directly via training and/or awareness. However, increased awareness of such characteristics and how these characteristics may or may not align with the individual may support increased flow experiences.

Future Research

Further exploration of awareness and understanding of flow concepts among people with aphasia would be beneficial. The potential complexity of flow and the linguistic confounds inherent in the concept support presenting flow concepts in alternate modalities. A better understanding is needed regarding how people with aphasia comprehend the flow construct, and what communication supports are optimal to support comprehension and expression of flow. Assessing flow perspectives in a variety of manners, such as other flow scales and journaling, may be beneficial as well. Such means of gathering flow perspectives may be more efficient than using qualitative semi-structured interviews to assess flow experiences. Matching individuals with aphasia with peers without aphasia may provide additional insights into flow experiences. Additionally, exploring flow perceptions among partners of those with aphasia may

provide additional insights into flow experiences of the partner as well as the individual with aphasia.

Individuals in this current study reported minimal awareness of the concept of flow prior to the onset of the study. While their awareness of flow increased throughout the course of the study, some participants requested further clarification on flow concepts that were to some extent unclear. It is intriguing to consider the possibilities of increasing the frequency of flow via individualized awareness training. Mindfulness training has been reported with individuals with aphasia, but no such interventions have been reported with regard to facilitating flow among people with aphasia. This appears an area ripe with potential for practitioners working with individuals with aphasia.

Limitations of the Study

Operationalizing the concept of flow is difficult, and there is no consensus on how best to do so when studying flow among individuals who do not have aphasia. Adding the language difficulties inherent in aphasia creates an additional layer of challenge. Not only is it difficult to fully comprehend the concepts of flow, but it is difficult for participants to describe their own flow experiences. It is extremely challenging to discern flow experiences from other experiences that may have been positive, but not consistent with flow. Thus there is high degree of interpretive challenge when coding. The sample was relatively small and consisted of individuals with mild aphasia and mild-moderate motor impairments. Expanding the participant criteria would provide a broader view of flow as it relates to the wider population of those with aphasia. Additionally, providing

an additional interview opportunity, rather than just the single interview, may have provided for richer descriptions and content regarding flow experiences.

Conclusion

Although there remains debate regarding the implications of flow experiences, there appears to be beneficial, intriguing and positive aspects of flow experiences. Flow experiences may be opportunities for optimal engagement despite the presence of aphasia. Such experiences may lead to further skill enhancement and social interaction, and may result in periods of time when the individual does indeed forget about aphasia. Participants in this study experienced flow, and did so in a manner similar to those without aphasia. Flow may be influenced by environmental factors and/or personal factors, and is unique to each individual. No single environment will facilitate flow experiences, just as no single personal factor will either. However, careful observation and consideration of environmental and personal factors should be considered as means to provide opportunities for potential flow experiences among people with aphasia.

References

Bauman, N., & Scheffer, D. (2010). Seeing and mastering difficulty: The role of affective change in achievement flow. *Cognition and Emotion, 24*(8), 1304-1328.

Baumann, N. (2012). Autotelic personality. In *Advances in flow research* (pp. 165-186). Springer.

Brinkmann, S. (2013). *Qualitative interviewing.* New York: Oxford University Press.

Bronken, B., & Kirkevold, M. (2013). Between the Lines: Generating good qualitative data in studies involving persons with aphasia. *Advances in Nursing Science, 36*(2), E14-E28.

Brown, E., & Jemmott, L. (2002). HIV prevention among people with develomental disabilities. *Journal of Psychosocial Nursing and Mental Health Services, 11*, 14-21.

Brown, K., Worrall, L., Davidson, B., & Howe, T. (2012). Living successfully with aphasia: A qualitative meta-analysis of the perspectives of individuals with aphasia, family members, and speech-language pathologists. *International Journal of Speech-Language Pathology, 14*(2), 141-155.

Brown, K., Worrall, L., Davidson, B., & Howe, T. (2013). Reflection on the benefits and limitations of participant-generated phtography as an adjunct to qualitative interviews with participants with aphasia. A*phasiology, 27*(10), 1214-1231.

Chwalisz, K., Shah, S., & Hand, K. (2008). Facilitating rigorous qualitative research in rehabilitation psychology. *Rehabilitation Psychology, 53*(3), 387-399.

Creswell, J. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (3rd Edition ed.). Thousand Oaks: Sage.

Cruice, M., Hill, R., Worrall, L., & Hickson, L. (2010). Conceptualising quality of life for older people with aphasia. *Aphasiology, 24*(3), 327-347.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (2008). *Flow: The psychology of optimal experience.* New York: Harper Perennial.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal experience.* Cambridge: Cambridge University Press.

Curtin, M., & Fossey, E. (2007). Appraising the trustworthiness of qualitative studies: Guidelines for occupational therapists. *Australian Occupational Therapy Journal, 54*(2), 88-94.

Dalemans, R., deWitte, L., Wade, D., & van den Heuvel, W. (2010). Social participation through the eyes of people with aphasia. *International Journal of Language and Communication Disorders, 45*(5), 537-550.

Damico, J., & Simmons-Mackie, N. (2003). Qualitative research and speech-language pathology: A tutorial for the clinical realm. *American Journal of Speech-Language Pathology, 12* (2), 131-143.

Delle Fave, A., Massimini, F., & Bassi, M. (2011). Instruments and methods in flow research. *Psychological Selection and Optimal Experience Across Cultures, 2*, 59-87.

Dunn, D., & Brody, C. (2008). Defining the good life following acquired physical disability. *Rehabilitation Psychology, 53*(4), 413-425.

Ellis-Hill, C., Payne, S., & Ward, C. (2000). Self-body split: Issues of identify in physical recovery following a stroke. *Disability and Rehabilitation, 22*(16), 725 - 733.

Elo, S., Kaariainen, M., Kanste, O., Polkki, T., Utriainen, K., & Kyngas, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 1-10.

Graneheim, U., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today, 24*, 105 - 112.

Greig, C., Harper, R., Hirst, T., Howe, T., & Davidson, B. (2008). Barriers and facilitators to mobile phone use for people with aphasia. *Topics in Stroke Rehabilitation, 15*(4), 307 - 324.

Hays, D., & Singh, A. (2012). *Qualitative inquiry in clinical and educational settings.* New York: The Guilford Press.

Hefferon, K., & Ollis, S. (2006). 'Just clicks': an interpretive phenomenological analysis of professional dancers' experience of flow. *Research in Dance Education, 7*(2), 141-159.

Hektner, J., Schmidt, J., & Csikszentmihalyi. (2007). *Experience sampling method: Measuring the quality of everyday life.* Thousand Oaks: Sage Publications.

Hersh, D. (2001). Experiences of ending aphasia therapy. *International Journal of Language and Communication Disorders, 36 (supp)*, 80-85.

Hoepner, J., & Turkstra, L. (2013). Video-based administration of the La Trobe Communication Questionnaire for adults with traumatic brain injury and their communication partners. *Brain Injury, 27*(4), 464 - 472.

Holland, A. (2007). Counseling/Coaching in chronic aphasia. Getting on with life. *Topics in Language Disorders, 27*(4), 339-350.

Howe, T. (2006). "I know it can change for people with what I've had": Environmental factors that influence the community participation of adults with aphasia. *(Doctoral dissertation).*

Howe, T. (2008). The ICF Contextual factors related to speech-language pathology. *International Journal of Speech-Language Pathology, 27*(4), 27-37.

Howe, T. (2008). The ICF Contextual factors related to speech-language pathology. *International Journal of Speech-Language Pathology, 10*(1-2), 27-37.

Howe, T., Worrall, L., & Hickson, L. (2004). What is an aphasia-friendly environment? *Aphasiology, 18*(11), 1015-1037.

Howe, T., Worrall, L., & Hickson, L. (2008a). Interviews with people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22* (10), 1092-1120.

Howe, T., Worrall, L., & Hickson, L. (2008b). Observing people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22* (6), 618-643.

Jackson, S., Eklund, B., & Martin, A. (2010). *The FLOW Manual: The Manual for the Flow Scales.* Mindgarden, Inc. Secured online 12/7/10.

Kagan, A. (1998). Supported conversation for adults with aphasia: Methods and resources for training conversation partners. *Aphasiology, 12*(9), 816-830.

Kagan, A., Black, S., Duchan, J., Simmons-Mackie, N., & Square, P. (2001). Training volunteers as conversation partners using supported conversation for adults with aphasia: A controlled trial. *Journal of Speech, Language, and Hearing Research, 44*(3), 624 - 638.

Kertesz, A. (2007). *Western Aphasia Battery - Revised.* San Antonio: Harcourt Assessment, Inc.

Koskinen, S., Hokkinen, E., Sarajuuri, J., & Alaranta, H. (2007). Applicability of the ICF checklist to traumatically brain-injured patients in post-acute rehabilitation settings. *Journal of Rehabilitation Medicine, 39*(6), 467-472.

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry.* Beverly Hills: Sage.

Lloyd, V., Gatherer, A., & Kalsy, S. (2006). Conducting qualitative interview research with people with expressive language difficulties. *Qualitative Health Research, 16*(10), 1386 - 1404.

Luck, A., & Rose, M. (2007). Interviewing people with aphasia: Insights into method adjustments from a pilot study. *Aphasiology, 21*(2), 208-224.

Lyon, J. (1999). *Coping with aphasia.* San Diego: Singular Publishing Group.

Lyon, J., Cariski, D., Keisler, L., Rosenbek, J., Levine, R., Kumpula, J., . . . Blanc, M. (1997). Communication partners: Enhancing participation in life and communication for adults with aphasia in natural settings. *Aphasiology, 11*(7), 693-708.

Mertens, D. (2015). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative and mixed methods* (4th ed.). Thousand Oaks: Sage.

Milne, J., & Oberle, K. (2005). Enhancing rigor in qualitative description: A case study. *Journal of Wound, Ostomy and Continence Nursing, 32,* 413-420.

Nakamura, J., & Csikszentmihalyi, C. (2002). The concept of Flow. In C. Wright, & S. Lopez (Eds.), *Handbook of positive psychology.* Oxford University Press.

Neergaard, M., Olesen, F., Andersen, R., & Sondergaard, J. (2009). Qualitative description - the poor cousin of health research? *BMC Medical Research Methodology, 9*(52), 1-5.

Orenstein, E., Basilakos, A., & Marshall, R. (2012). Effects of mindfulness meditation on three individuals with aphasia. *International Journal of Language and Communication Deficits, 47*(6), 673 - 684.

Parr, S. (2001). Psychosocial aspects of aphasia: Whose perspectives? *Folia Phoniatrica et Logopaedica, 53*, 266-288.

Rauch, A., Escorpizo, R., Riddle, D., Eriks-Hoogland, I., Stucki, G., & Cieza, A. (2010). using a case report of a patient with spinal cord injury to illustrate the application of the International Classification of Functioning, Disability and Health during multidisciplinary patient management. *Physical Therapy, 90*(7), 1039-1052.

Reid, D. (2011). Mindfulness and flow in occupational engagement: Presence in doing. *Canadian Journal of Occupational Therapy, 78*, 50-56.

Reynolds, F., & Prior, S. (2006). Creative Adventures and Flow in Art-Making: A Qualitative Study of Women Living with Cancer. *British Journal of Occupational Therapy, 69*(6), 1-8.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing and Health, 23*, 334 - 340.

Sandelowski, M. (2010). What's in a name? Qualitative description revisited. *Research in Nursing and Health, 33*, 77-84.

Schiepe-Tiska, A., & Engeser, S. (2012). Flow in nonachievement situations. In S. Engeser (Ed.), *Advances in flow research* (pp. 87 - 107). Heidelberg: Springer.

Seidman, I. (2013). *Interviewing as Qualitative Research: A guide for researchers in education and the social sciences.* New York: Teachers College Press.

Sicilia, M., & Ruiz, S. (2007). The role of flow in website effectiveness. *Journal of Interactive Advertising, 8*(1), 33-44.

Suqiyama, T., & Inomata, K. (2005). Qualitative examination of flow experience among top Japanese athletes. *Perceptual Motor Skills, 100*(3 (Pt 2)), 969-982.

Tanner, D. (2003). Eclectic perspectives on the psychology of aphasia. *Journal of Allied Health, 32*(4), 256 - 260.

Tempest, S., & Mcintyre, A. (2006). Using the ICF to clarify team roles and demonstrate clinical reasoning in stroke rehabilitation. *Disability and Rehabilitation, 28*(10), 663-667.

Threats, T. (2007). Access for persons with neurogenic communication disorders: Influences of Personal and Environmental factors of the ICF. *Aphasiology, 21* (1), 67-80.

Turner, S., & Whitworth, A. (2006). Conversational partner training programmes in aphasia: A review of key themes and participants' roles. *Aphasiology, 20*(6), 483 - 510.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences, 15*, 398 - 405.

Wallace, G. (2010). Profile of life participation after stroke and aphasia. *Topics in Stroke Rehabilitation, 17*(6), 432 - 450.

Weibull, A., Olesen, F., & Neergaard, M. (2008). Caregivers' active role in palliative home care - to encourage or to dissuade? A qualitative descriptive study. *BMC Palliative Care, 7*(15), NP.

Worall, L., Sherratt, S., Rogers, P., Howe, T., Hersh, D., Ferguson, A., & Davidson, B. (2011). What people with aphasia want: Their goals according to the ICF. *Aphasiology, 25*(3), 309-322.

World Health Organization. (2002). *Towards a common language for functioning, disability and health - ICF*. Geneva: World Health Organization.

CHAPTER 5

A SUMMARY OF FLOW EXPLORATION AMONG PEOPLE WITH APHASIA

Flow has been described as a state of engagement during which there is a change in passage of time, a loss of self-consciousness and an optimal balance of skill and challenge (Csikszentmihalyi, 1997; Delle Fave, 2009). Flow has been studied in multiple geographic populations, ages, occupations, and situations (Bassi & Delle Fave, 2012; Graham, 2008; Macdonald & Byrne, 2006), but there are no formal studies to date regarding flow experiences among people with aphasia. A better understanding of whether or not individuals with aphasia experience flow and of the factors that may contribute to flow could potentially lead to enhanced opportunities for life participation through increased engagement and activity.

This dissertation incorporates three studies that evaluated flow experiences among individuals with aphasia. In Study One, an established flow assessment measure, the Short Flow State Scale – 2 (SFSS-2) (Jackson, Eklund, & Martin, 2010), was used to evaluate flow experiences among people with aphasia at a rustic aphasia camp, after which participants were asked to rank activities in which they felt most in flow. In Study Two, environmental factors were studied in relation to of flow experiences. This study employed the experience sampling method (ESM), which was conducted with the FlowAphasia application (app) designed specifically for the study. As far as I am aware, Study Two is the first study to date in which ESM is used as a data gathering method

among multiple participants with aphasia. In Study Three, flow experiences, environmental factors and personal factors were derived from semi-structured interviews.

Experiences of Flow

The collective results of these three studies support a conclusion that people with aphasia did experience flow. They experienced flow in a variety of settings, including at the aphasia camp, as shown in Study One, as well as within the context of their typical daily lives, as shown with quantitative data in Study Two and qualitative data in Study Three. They provided ratings consistent with flow, as measured in multiple ways.

While at aphasia camp, ratings indicated a frequent presence of flow during activities. These ratings occurred both immediately following an activity and also at the end of the camp weekend, indicating a stability of the flow construct across the time period of aphasia camp. There was variability noted as well among the ratings at aphasia camp. Individuals discerned experiences consistent with flow from those that were not consistent with flow. There was no evidence that flow was more or less likely in sedentary versus physically active tasks. During the course of a typical week (not at aphasia camp), participants using the FlowAphasia app presented ratings consistent with apathy (31.6%) followed by flow (27.3%), boredom (23%) and anxiety (18.1%). These ratings were based on a quadrant model in which quadrants were operationally defined based on whether ratings of challenge and skills were above or below the average for the person. Apathy was defined as low challenge and low skill; flow was defined as high challenge and high skill; boredom was defined as low challenge and high skill; and anxiety was defined as high challenge and low skill. Participants explicitly mentioned in

semi-structured interviews that they had experiences consistent with flow despite having aphasia. Flow experiences occurred during times where there were communication demands, as well as during times where there were little or absent communication demands. Flow as described by individuals with aphasia had characteristic components consistent with flow descriptions by those without aphasia.

Some participants related difficulty fully grasping the concept of flow, and others made conflicting statements regarding the presence or absence of flow. While flow is generally considered a positive experience, it was evident that at times, participants seemed to consider *flow* and *enjoyment* synonymously, which is not consistent with how experts have characterized flow. Some discussions focused on a task as being enjoyable, and thus a flow experience, when this is not consistent with the flow construct.

Environmental Factors

Environmental factors were of interest throughout the three studies and were built into the research design and measured directly in Study Two. Environmental factors that had been identified as significant in earlier studies with people with aphasia also were probed qualitatively with questions in Study Three.

In Study Two, the relation of environmental factors to flow experiences was explored via the FlowAphasia app. Four environmental factors were specifically evaluated using the FlowAphasia app (Communication Support; Knowledge of Aphasia; Time Pressure for Communication; and Complexity of Communication). They were identified for each rating occurrence as either a barrier or facilitator for the individual. During quadrant experiences of flow, Communication Support and Knowledge of

Aphasia were identified as facilitators more often than during non-flow experiences. However, Time Pressure for Communication and Complexity of Communication were identified as facilitators less often during quadrant experiences of flow than during non-flow experiences. Additionally, Time Pressure for Communication and Complexity of Communication were most often identified as facilitators during the quadrant experiences of apathy and boredom. That is, in those quadrant experience situations, participants identified a relatively low sense of time pressure for communication and a relatively low degree of communication complexity. Whereas on first glance having Time Pressure for Communication and Complexity of Communication as facilitators during apathy and boredom situations may seem counterintuitive, it does highlight the need for some degree of challenge to support flow. However, given that anxiety is also a high challenge situation, this reinforces the potential for inopportune matching of skill and challenge to evolve into anxiety (high challenge, low skill) situations, and highlights the subtlety of differentiating flow among other quadrant experiences.

The physical environment was considered a facilitator when there were aspects of controllability and the location was conducive. Additionally, other people within the environment were identified as facilitators during situations such as aphasia groups and when demonstrating effective partner interactions. This is consistent with the FlowAphasia app ratings that identified Communication Support and Knowledge of Aphasia as facilitators occurring more frequently during flow than non-flow. It may be that during aphasia groups, for example, there is an increased knowledge of aphasia and communication support, and that those involved in aphasia groups are more likely to be effective partners.

However, barriers were also identified relating to people with whom participants had interactions, including partners as well as instructors and activity leaders. These people were often identified as presenting information at a pace incongruent with the participant's learning and abilities. The presentation may have been too slow or too fast. Certain task characteristics were identified as barriers to flow experience as was the physical environment. A mismatch of demands including physical, place, communication and attentional demands was also identified as a barrier. This mismatch of demands likely reflects an imbalance between skill possessed by the individual and challenge presented within the environment.

Personal Factors

Just as there were characteristic aspects of the environment observed to impact flow experiences, so too were there observed personal factors that appeared to support or hinder flow experiences. Information about personal factors was derived mostly from semi-structured interviews in Study Three, as the questions presented on the FlowAphasia app from Study Two did not address components of personal factors. One of the limitations of Study One was the lack of qualitative information about personal factors that might have been associated with flow state ratings that were produced after each activity. Although personal factors may have impacted flow ratings and flow experiences in Study One, it was impossible to know the extent of such influence as that was not overtly studied.

One interesting finding was evidence of an autotelic personality. That is, there were participants in this study who reported strategic planning, goal setting and who

explicitly faced challenge. These characteristics were consistent with the *autotelic* personality, as described by Csikszentmihalyi (1988). Rather than shy away from challenge, some individuals in Study Three faced challenging situations and reported not only on the difficulties of such situations, but also on the benefits of addressing challenges. Additionally, there were personal factors identified that indicated a motivation to help others, and by doing so, the participants themselves subsequently engaged in flow experiences.

Conversely, personal factors that were hindrances to flow experiences were identified. In some respect, many of these factors reflected characteristics opposite the autotelic personality state. Avoidance was a personal factor hindrance frequently reported by participants. This avoidance may have been avoidance of situations, of tasks, of challenge, or some combination.

Clinical Implications

People with aphasia have expressed an interest in returning to quality life activities, and have emphasized the importance of quality of activity over quantity of activity (Dalemans, deWitte, Wade, & van den Heuvel, 2010). Characteristics of flow experiences appear consistent with such desires. Experiences of increased control, distortion of time passage, and loss of self-awareness are all inherent in flow. They occur during situations of optimal challenge and skill. These experiences require environmental facilitators coupled with personal factors that combine for potential flow experiences. Increased opportunities to experience flow should fall within the realm of clinicians working with individuals with aphasia. Flow, and the positive emotions that

may be associated with it, have potential to foster motivation for further flow-seeking opportunities among people with aphasia. Thus, there should be an increased focus on providing such experiences, across multiple settings and multiple opportunities to increase the opportunities for participation in such activities. Skilled clinicians can structure the environment in a way that supports communication and increases knowledge of aphasia while still providing challenge to the individual with aphasia. Through such opportunities, people with aphasia can experience flow. These opportunities can be provided within traditional clinical settings such as rehabilitation facilities, and within community environments, such as aphasia groups and aphasia camps.

Utilizing the quadrant model in discussion with individuals with aphasia may provide a concrete discussion anchor and foster increased individual effort to reduce sub-optimal quadrant experiences and enhance flow experiences. Clinical providers might encourage individuals with aphasia to reflect on their own flow experiences. Reflections may include components of both environmental factors as well as personal factors. Such self-reflections might increase awareness of situations and factors that are conducive to flow experiences.

Recommendations for Further Study

Flow is a complex, abstract concept that may not operationalize well from a quantifiable standpoint. Binary measures that indicate flow or no-flow may over-simplify the concept of flow. The statistics used in the experience sampling method ideally involve hierarchical linear modeling (HLM). The use of *z*-scores, although used

judiciously during this study, may over- or under-estimate the presence of flow or the other quadrant experiences. The concept of solitude (flow when alone vs. flow when with someone) provides many gray area situations that do not lend themselves well to a binary yes/no response. Finally, the small number of participants was a limitation, as was the presence of only mild aphasia, rather than more extensive aphasia. Future studies might explore operationalizing flow in other ways, and the advantages and disadvantages of such operationalization. These future studies could also incorporate HLM as an analysis technique to identify contributing factors to flow experiences, although the importance of qualitative aspects of flow should not be overlooked. There is a need for further studies that incorporate participants with more extensive aphasia and/or motoric involvement, and that also incorporate partners of those with aphasia. Additionally, further investigation should be considered regarding whether increased awareness of flow might impact one's own flow experiences, and how individuals with aphasia may structure their own environments to facilitate flow experiences.

Conclusions

Evidence supported a conclusion that people with aphasia experienced flow across all three studies in this dissertation. Participants reported flow experiences in semi-structured interviews, via skill/challenge ratings, and via scale ratings. Flow experiences were noted by participants during times of communication interaction as well as during times of solitude, and were consistent with prior literature of flow among populations without aphasia. Environments that were rich in challenge, without being overwhelming, and were coupled with communication support and aphasia knowledge

were facilitators to flow experiences. Personal factors that supported flow experiences include goal-directed, strategic behavior.

Considering the balance of skill and challenge in life activities, and the impact that can be made by adjusting the environment to facilitate flow, an explicit approach to fostering flow experiences may in turn support an ongoing re-engagement in life. Measures should be implemented that specifically address participant perceptions regarding the presence of flow, as well as environments that support or inhibit flow experiences. Supporting flow experiences through a careful balance of personal and environmental factors, coupled with optimal balance of skill and challenge, should be an explicit goal of providers working with individuals with aphasia.

References

Bassi, M., & Delle Fave, A. (2012). Optimal experience among teachers: New insights into the work paradox. *The Journal of Psychology: Interdisciplinary and Applied, 146* (5), 553-557.

Chapey, R., Duchan, J., Elman, R., Garcia, L., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2001). Life participation approach to aphasia: A statement of values for the future. In R. Chapey (Ed.), *Language intervention strategies in aphasia related neurogenic communication disorders, 4th Edition.* Philadelphia: Lippincott, Williams and Wilkins.

Csikszentmihalyi, M. (1997). *Finding flow. The psychology of engagement with everyday life.* New York: Basic Books.

Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988). *Optimal experience.* Cambridge: Cambridge University Press.

Csikszentmihalyi, M., & Nakamura, J. (2009). Flow Theory and Research. In C. Snyder, & S. Lopez (Eds.), *Oxford Handbook of Positive Psychology.* New York: Oxford University Press.

Dalemans, R., deWitte, L., Wade, D., & van den Heuvel, W. (2010). Social participation through the eyes of people with aphasia. *International Journal of Language and Communication Disorders, 45*(5), 537-550.

Delle Fave, A. (2009). Optimal experience and meaning: Which relationship? *Psychological Topics, 18*(2), 285-302.

Graham, J. (2008). Self-expansion and flow in couples' momentary experiences: An experience samplying study. *Journal of Personality and Social Psychology, 95*(3), 679-694.

Jackson, S., Eklund, B., & Martin, A. (2010). *The FLOW Manual: The Manual for the Flow Scales.* Mindgarden, Inc. Secured online 12/7/10.

Macdonald, R., & Byrne, C. (2006). Creativity and flow in musical composition: an empirical investigation. *Psychology of Music, 34*(3), 292-306.

Appendix A

Short Flow State Scale – 2 (Jackson, Eklund & Martin, 2010)

Questionnaire – Short Flow State Scale 2 (SFSS 2) (Jackson, et al., 2010)

In order to maximize comprehension, each of the original questions on the S-FSS will be provided along with a single sentence of further clarification.

	Original S-FSS Statement	**Clarification Statement**	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I felt I was competent enough to meet the demands of the situation.	I felt able.	**1**	**2**	**3**	**4**	**5**
2	I did things spontaneously and without having to think.	I just did it	**1**	**2**	**3**	**4**	**5**
3	I had a strong sense of what I wanted to do.	I knew what I wanted.	**1**	**2**	**3**	**4**	**5**
4	I had a good idea about how well I was doing while I was involved in the task/activity.	I knew how I was doing	**1**	**2**	**3**	**4**	**5**
5	I was completely focused on the task at hand.	I was focused.	**1**	**2**	**3**	**4**	**5**
6	I had a feeling of total control over what I was doing.	I was in total control.	**1**	**2**	**3**	**4**	**5**
7	I was not worried about what others may have been thinking of me.	I didn't care what others thought.	**1**	**2**	**3**	**4**	**5**
8	The way time passed seemed to be different from normal.	Time passed differently.	**1**	**2**	**3**	**4**	**5**
9	I found the experience extremely rewarding.	It was rewarding	**1**	**2**	**3**	**4**	**5**

Appendix B

Wallace Motor Screening Scale (WMSS)

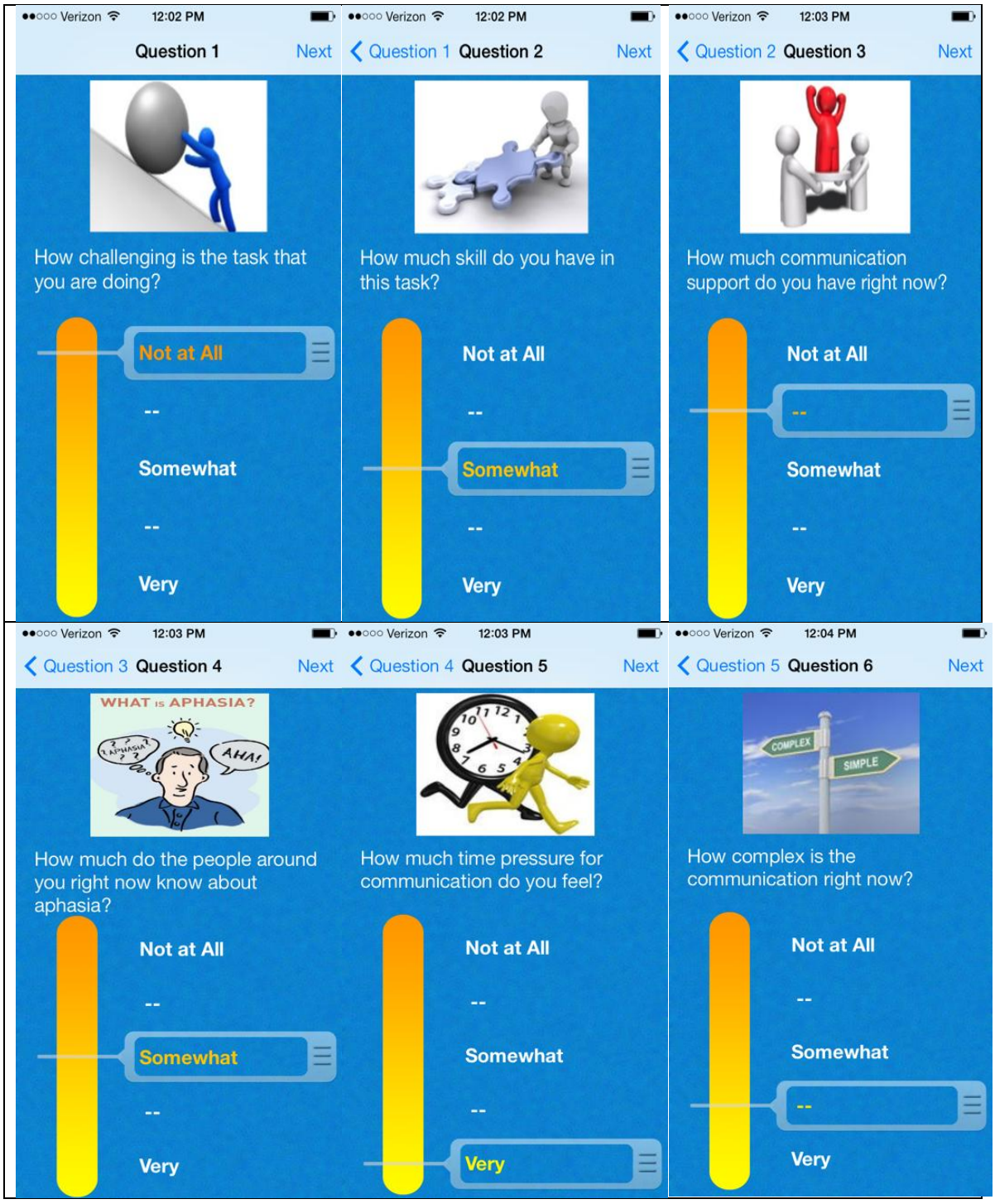
Wallace Motor Screening Scale (WMSS)

Lower extremity involvement/ mobility		Upper extremity involvement
	____1 = within functional limits (WFL)	
No discernible or reported difficulty	AND	No discernible or reported difficulty bilaterally
	OR	
Very mild difficulty	AND	Very mild difficulty
	____2 = mild involvement	
Walks unaided but with definite impairment, walks with standard cane, or reports difficulty with balance	AND/OR	Mild unilateral difficulty as noted from observation or case report
	____3 = moderate involvement	
Walks unaided but with definite impairment, walks with a standard cane, or reports difficulty with balance	AND	Moderate or very severe unilateral difficulty
	OR	
Uses crutch ____ walker ____ quad cane ____	AND	Difficulty regardless of severity (WFL, mild, moderate, severe, very severe)
	____4 = severe involvement	
Wheelchair bound	AND	Almost or almost totally INDEPENDENT (regardless of severity of involvement of upper extremity; WFL, mild, moderate, severe, very severe)
	____5 = very severe involvement	
Wheelchair bound	AND	Totally or almost totally DEPENDENT on others to move from place to place (regardless of severity of involvement of upper extremity; WFL, mild,

Appendix C

FlowAphasia App Display

FlowAphasia App Display

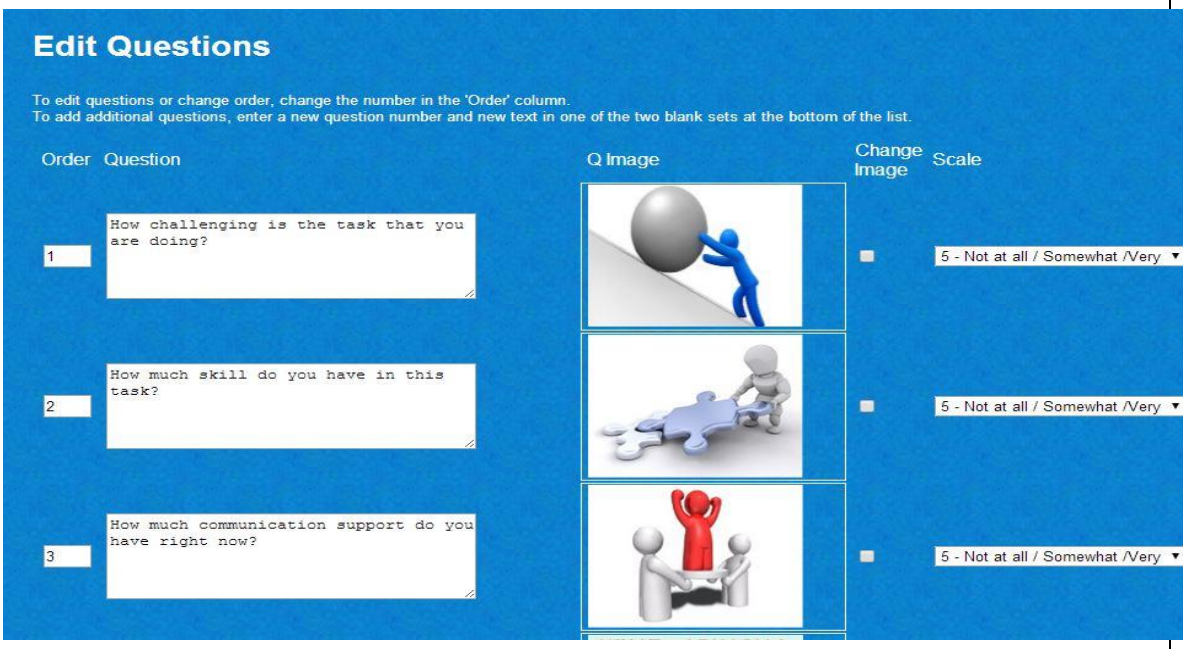



●●○○○ Verizon
12:04 PM
Question 6
Question 7
Next
Are you alone or with someone?
Alone
With Someone

Appendix D

FlowAphasia Dashboard

FlowAphasia app – editing questions and images



Appendix E

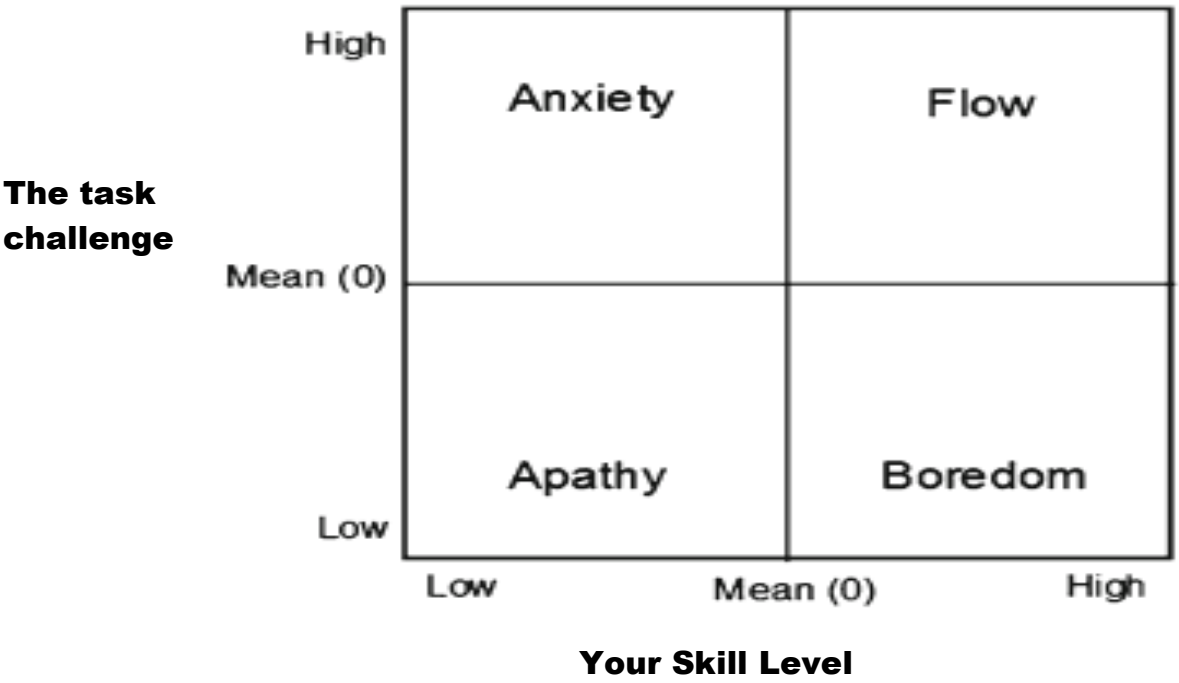
Semi-structured Interview Guide

Semi-structured interview guide

To begin the interview, the concept of flow will be explained as written using Walker (2010) as a guide. The questions following the description will be used as a guide.

Flow –

Flow is sometimes called "being in the zone." Being so into something that you lose track of time, or forget about things that were on your mind before starting the task. Flow doesn't necessarily mean that you're happy. It just means that you are very into whatever it is that you're doing at the time. Flow typically happens when there is a close balance of skill and challenge….when the task you are doing is somewhat difficult, but you have a fair amount of skill to do the task as well. It is challenging, but not so challenging that it is overwhelming. Also – it's not so easy that it becomes boring because it is too easy. Take a look at this diagram:



Flow experiences:

1. How would you describe flow experiences you had during the last week?
2. What were some times when you were in flow?
3. What were some times when you were not in flow?
4. What does it feel like when you are in flow?
5. How do you think your aphasia influences flow?

Facilitators to flow:

1. What were some of the things that helped you be in flow?
2. Who was around when you are in flow?
3. Where was flow likely to happen?
4. When was flow likely to happen?
5. What kinds of things were you doing when you were in flow?
6. What was going on around you when you were in flow?

Barriers to flow:

1. What were some things that prevented you from being in flow?
2. What kind of people were around when you were not in flow?
3. Where were you not likely to be in flow?
4. When were you not likely to be in flow?
5. What kinds of things were you doing when you were not in flow?
6. What was going on around you when you were not in flow?

Appendix F

HSIRB Approval letter

WESTERN MICHIGAN UNIVERSITY

Human Subjects Institutional Review Board

Date: June 5, 2014

To: Nickola Nelson, Principal Investigator
Mary Lagerwey, Co-Principal Investigator
Thomas Sather, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair Amy Naugle

Re: HSIRB Project Number 14-05-09

This letter will serve as confirmation that your research project titled "An Investigation of Flow Experiences among People with Aphasia" has been **approved** under the **expedited** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study"***)." Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: **June 4, 2015**

251 W. Walwood Hall, Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276

Western Michigan University
H.S.I.R.B.
Approved for use for one year from this date:

JUN 05 2014

HSIRB Office

Western Michigan University, PhD program in Interdisciplinary Health Sciences
Nickola W. Nelson, Ph.D., CCC-SLP, Faculty Advisor
University of Wisconsin-Eau Claire
Thomas W. Sather, MS, CCC-SLP, Faculty at UW-EC, and Ph.D. candidate at WMU

Title of Investigation: An Investigation of Flow Experiences among People with Aphasia

Name(s) of Principal Investigator(s): Nickola Nelson, Ph.D., Thomas W. Sather

You are invited to participate in a research project titled "An Investigation of Flow Experiences among People with Aphasia." This project will serve as Tom Sather's dissertation for completing the requirements of the doctor of philosophy degree (Ph.D.) at Western Michigan University. This consent document explains the purpose of this research project, the time commitments, the procedures, and the risks and benefits of participating. Mr. Sather will read this consent form with you. Please ask any questions if you need more clarification. Participation in this research project is voluntary and not a requirement or a condition for being the recipient of benefits or services from the University of Wisconsin-Eau Claire, Western Michigan University, or any other organization sponsoring the research project. The following is information regarding the nature of this research investigation.

What are we trying to find out in this study?
We are trying to learn more about how people with aphasia experience flow during activities. Flow is a concept used to denote absorption in an activity. It is used with athletes and other performers who are "in the zone." This means they feel engaged in what they are doing and there is an optimal balance of challenge and skill. To study this, we are asking people to rate different activities and what is going on around them during those activities. We will ask people to give a rating to things like challenges and barriers they feel in the activities they are doing.

What will you be asked to do if you choose to participate in this study?
If you choose to participate in this study, you will be asked to complete two language measures. This is done to see if your aphasia is like the kind of aphasia we are studying. Additionally, you will have the opportunity to try out an iPod Touch. You will be shown how to use the device and asked to demonstrate some basic ways of using the device after we show you how to use it. If you meet the requirements for the study, and wish to participate, you will be loaned an iPod Touch, and we will ask you to keep it with in whatever you are doing for one week. The iPod will have an application ("app") that will beep you at six different times spread throughout the day from 8:00 a.m. to 8:00 p.m. When you answer the beep, it will ask you to rate what you are doing at that moment. At the end of the week, you may be asked to do a follow-up interview with the researcher (Mr. Sather) to talk more about the experience. You can decide at that time whether you want to do the interview. You will not be expected to answer the beep if you are driving or choose not to do so for other reasons.

Who will participate in this study?
This study is for adults (age 25 or older) who speak English and who have had a stroke and have aphasia (mild). People who have motor problems, such as hemiplegia (mild to moderate), may be in the study if they also have aphasia (mild). People will be given a chance to try out the app before deciding if it makes sense to them and if they want to participate.

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Where will this study take place?
We will ask you to do all the things you usually do in a week if you were not part of this study. So the study takes place wherever you are when the iPod app beeps you. If you are asked to do the follow-up interview and decide to do it, we will arrange it at a time and place that you choose, such as your home.

What is the time commitment for participating in this study?
We will ask you to keep the iPod Touch with you for seven days from 8:00 a.m. to 8:00 p.m. We would like you to have it for 12 hours a day. But if the proposed times are too early or late, we can adjust the times. It will take about three minutes to complete the ratings and you will be beeped six times a day. That makes about 20 minutes per day for seven days. Before beginning to use the iPod, we will give you a brief language test, show you how to use the device, and ask a few questions about your aphasia. That will take about 120 minutes. If you agree to conduct a follow-up interview at the end of the week, that will take approximately 60 minutes. We estimate that, totaling up these times, the total time commitment for this study is about 320 minutes or about 5-1/2 hours.

What information is being measured during the study?
We will be measuring your ratings of the activities you report on during the week. We will ask you to rate things like your level of skill in the activity, the difficulty of the activity, and things in the environment that make the activity easier or harder for you.

What are the risks of participating in this study and how will these risks be minimized?
There are almost no risks involved with this method of research. However, it is possible that you may be beeped while you are doing something you don't want to share with the researcher. Or you might feel stressed if it is not a good time to answer. The research will work best if the information is as complete as it can be. However, it will be okay if you make a choice at any time not to answer the beep. You should not respond to the beep if responding may create a distraction or hazard. Specifically **do not respond to any beeps while you are driving.** You have 15 minutes to respond to a beep. You are free to decline to answer any specific items or questions in interviews or questionnaires. {DELETED: As in all research…}

What are the benefits of participating in this study?
There are no direct benefits to you. Some people get a good feeling from knowing that they might be helping others who also have aphasia and the people who work with them.

Are there any costs associated with participating in this study?
There will be no monetary costs to you.

Is there any compensation for participating in this study?
You will not be paid for participating in this study.

Who will have access to the information collected during this study?
No one except the researchers on this study team will know your personal identity. You will not be identifiable in any scientific reports of the results. We will ask your permission to videotape the interview if you agree to be interviewed. The videotape will be used to fill in information from the interview when data collection is complete. Videos of the interview will be kept on a password protected computer drive.

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HSIRB Office

They will also be stored in a locked file cabinet in Tom Sather's office at the University of Wisconsin - Eau Claire. After analysis is finished, they will be kept in a locked cabinet in the office of Dr. Nickola Nelson, Ph.D. who is working on this project.

What if you want to stop participating in this study?
You can decide to stop being part of this study at any time for any reason. You will experience no penalty or negative consequences if you decide to stop.

Tom Suther is also a doctoral student at Western Michigan University. This consent document also has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) of Western Michigan University as indicated by the stamped date and signature of the board chair in the upper right corner. You may contact Dr. Nickola Nelson, faculty advisor at (269) 387-7990 or the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 at Western Michigan University if questions arise during the course of the study.

If you have any questions prior to or during the study, you can contact Tom Sather, faculty in the Department of Communication Sciences and Disorders, University of Wisconsin-Eau Claire, Eau Claire, WI 54702-4004, (715) 836-4186. If you have any questions about your treatment as a human subject in this study, you may contact Dr. Michael Axelrod, Chair, Institutional Review Board for the Protection of Human Subjects, Schofield 17, University of Wisconsin-Eau Claire, Eau Claire, WI 54702-4004, (715) 836-2373.

Do not participate in this study if the stamped date in the corner is older than one year.

Thank you for considering being a part of this research.

I have read this document. The risks and benefits have been explained to me. I agree to take part in this study. I am free to withdraw my consent and discontinue participation at any time. A copy of the procedures of this investigation and a description of any risks, discomforts and benefits associated with my participation has been provided and discussed in detail with me.

Please Print Your Name

Participant's signature Date

I, the undersigned, have defined and fully explained the investigation to the above subject.

Date Signature of Investigator

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Appendix G

Aphasia Institute Permissions

APHASIA INSTITUTE

over **30 years** *of* touching lives
and rebuilding conversation

9 June 2014

Thomas W. Sather
Assistant Professor
Communication Sciences & Disorders
120 Human Sciences and Service Building
University of Wisconsin – Eau Claire
~~Madison~~, Wisconsin
USA Eau Claire, WI

Founder:
Pat Arato

Patron:
Hon. R Roy McMurtry

Past Patrons:
Dr. Ian Scott
Dr. Roberta Bondar
Hon. Stanley Knowles

Aphasia is an acquired communication disorder caused by an injury to the brain that affects a person's ability to use language to communicate. It is most often the result of stroke or head injury.

USE OF WHAT IS APHASIA PICTOGRAPH
Letter Agreement between the
Aphasia Institute ("**TAI**")
and
Thomas W. Sather ("**Licensee**")
For the use of the
work entitled **"WHAT IS APHASIA PICTOGRAPH"**
(referred to herein as the **"THE WORK"**)

Dear **Thomas,**

This letter agreement sets forth the rights and obligations relating to Licensee's use of "The Work", as well as confirms TAI's exclusive right, title and interest in and to "The Work". The parties hereby agree as follows:

1. AI hereby grants to Licensee a non-exclusive, revocable, non-transferable license to use **"The Work"** for Licensee's internal operations and only with respect to the realization of the following purpose by Licensee:**for use in a study for a dissertation titled "Flow perceptions among individuals with aphasia".** The foregoing license may not be sublicensed or otherwise be exploited for the benefit of any third party.
2. Licensee acknowledges and agrees that TAI retains all right, title and interest in the "The Work", including, without limitation any and all copyrightable elements thereof, any trade-marks owned by or licensed to TAI that are shown therein and any inventions, procedures, processes and the like shown therein designs.
3. Licensee acknowledges and agrees that TAI reserves all rights not expressly granted hereunder and may request Licensee to discontinue the use of "The Work" or any part thereof at any time in its sole discretion upon providing Licensee with written notice.
4. Licensee shall not make any copy of "The Work" without the prior written permission of TAI. In the event such permission is granted, Licensee shall maintain a detailed and up-to-date inventory of all copies of "The Work" that it has made.
5. Upon termination of the license in this letter agreement, Licensee shall return or, if requested by TAI, destroy all copies of "The Work" in its possession.

(over)

APHASIA INSTITUTE
The Pat Arato
Aphasia Centre
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Toronto, ON
M3B 2R2 Canada

T 416 226-3636
F 416 226-3706
www.aphasia.ca

Charitable Reg. No.: 13305 5227 RR0001

If you are agreeable to the foregoing terms, kindly execute and return this letter agreement.

Yours truly,

Marisca Baldwin Education and Learning Coordinator
Aphasia Institute

I agree to the terms and conditions of this letter agreement. **Please sign and return one copy by mail, email or fax to the Aphasia Institute at 73 Scarsdale Rd., Toronto, ON, M3B 2R2 Canada, Fax: 416-226-3706, training@aphasia.ca**

Name: **Thomas W. Sather**
Title: Assistant Professor
Date: 6/10/14

I have authority to bind **Thomas W. Sather**