A STRENGTHS-BASED COGNITIVE APPROACH TO ENHANCING OCCUPATIONAL PERFORMANCE AND SELF-EFFICACY IN INDIVIDUALS WITH SCHIZOPHRENIA

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERITY

SCHOOL OF OCCUPTIONAL THERAPY

COLLEGE OF HEALTH SCIENCES

BY

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DENTON, TEXAS

MAY 2020

DEDICATION

This dissertation is dedicated to the memory of my parents and especially to the memory of my sister, Cindy, who understood what "strengths-based" meant before it was even a thing.

ACKNOWLEDGMENTS

I am grateful to so many people for their contributions to this study and their support of my dissertation journey. First. I would like to thank my research mentor and committee chair, Dr. Cynthia Evetts. Dr. Evetts' guidance and ideas were invaluable in shaping this study and helping me to grow as both a researcher and an educator. I also thank the members of my dissertation committee: Dr. Patricia Bowyer, Dr. Shannon Scott, and Dr. Asha Vas. Their expertise and feedback strengthened this study and my research skills. I thank Dr. Paul Yeatts and Dr. Wanyi Wang for sharing their single-case design and statistical analyses expertise. I am grateful to the Center for Student Research at TWU for financial support of this study, and to Jaclyn Kliman of the Graduate School for her help with editing. I also want to thank Dr. Jim King for generously contributing his time and expertise to help with qualitative analysis.

I extend my heartfelt appreciation to the participants; their expertise and participation not only allowed this research to be done but also strengthened the study. I want to thank the research team members and my colleagues who supported this work. Finally, I am very grateful for the support of my family and friends, and especially want to thank my husband, Douglas Michali, whose love and support have been a constant light all through the graduate school and dissertation research process.

ABSTRACT

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OBJECTIVE: People with schizophrenia have functional challenges related to cognitive impairments and decreased self-efficacy. Strengths-based approaches to rehabilitation are recommended, but such approaches are not well-defined or widely researched. This dissertation study investigated a strengths-based cognitive prompting intervention to improve occupational performance and self-efficacy in people with schizophrenia. METHODOLOGY: Five members of a community-based psychiatric rehabilitation services (PRS) program participated in this mixed methods study. Their goals came from individual rehabilitation plans (IRPs). Strengths were gleaned from an assessment protocol guided by the cognitive functional evaluation (CFE) process. Tests included the BLERT, BRIEF-A, BPRS-E, CTMT, EFPT, GSE, HT, and SWL; results were analyzed using quantitative methods. Single-case design with multiple baselines used the MOHOST as the repeated measure of occupational performance. Qualitative methods included a focus group and individual interviews to understand participants' lived experience of the intervention and assessment protocol.

RESULTS: Single-case design showed an overall small intervention effect (*d* = .26) with varying results among individual participants and MOHOST domains. Analyses point toward relationships between variables of occupational performance, cognitive skills, and life satisfaction postintervention. Participants reported a positive experience of the intervention and of the assessment protocol, improved self-confidence, and increased use of strengths for more successful occupational performance.

CONCLUSION: Findings from this study showed initial support for the strengths-based cognitive prompting intervention. In addition, the study demonstrated that an assessment protocol that uses CFE guidelines and facilitates individuals' understanding of the relationship between functioning and assessment results is meaningful to individuals. This study has implications for further development of the intervention and assessment protocol and for integrating the intervention into cognitive remediation for people with schizophrenia spectrum disorders.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Schizophrenia is a serious mental illness (SMI) that causes functional impairments in the life domains of work, socialization, and everyday living (Strassnig et al., 2015). Although medications help to ameliorate positive symptoms, for example, hallucinations and delusions, people with schizophrenia continue to have difficulty with daily functioning (Green, 2016). These functional challenges are linked to cognitive impairments (Brown, 2011; Green, 2016) that have a greater impact on function than do positive symptoms (Kahn & Keefe, 2013). Executive function (Savla et al., 2011) and social cognition (Penn, Sanna, & Roberts, 2008) are two areas of cognition that have a strong connection with real life functioning in people with schizophrenia. In order to understand how cognitive impairments affect their functioning, neuropsychological cognitive assessment has been recommended for people with schizophrenia (Nuechterlein et al., 2008).

However, neuropsychological assessment results do not consistently align with real life functional performance (Bromley & Brekke, 2010). Furthermore, results from standardized performance-based tests administered in clinical environments are often not significantly related to functional outcomes (Heinrichs, Ammari, Miles, & Vaz, 2010). Both neuropsychological and clinic-based performance tests assess skill *capacities*, which are not necessarily related to real-world performance of daily living activities and social interactions (Green, Llerena, & Kern, 2015). The term *functional cognition* refers to the integration of cognitive skills with real-world activities and includes many aspects of cognition including executive function (Giles et al., 2020). Functional cognition is assessed by direct observation of occupational performance (Giles et al., 2020; Skidmore, 2017). Occupational performance, defined as “units of doing” (p. 107) , results from the interaction among the person’s volition and capacities, the activity (i.e., occupation), and the environment (de las Heras de Pablo, Fan, & Kielhofner, 2017).

The link between cognition and function in schizophrenia has been established (Bell, Tsang, Greig, & Bryson, 2009), but the path from cognitive skills to functional outcomes is not direct. There is a gap between individuals’ cognitive and performance capacities, and in their abilities to use these skills for successful functioning in multiple life domains (Gupta, Bassett, Iftene, & Bowie, 2012). In meta-analyses, cognitive skills explained only 25% of the variance in functional and community outcomes (Fett et al., 2011). Furthermore, findings from a meta-analysis of cognitive remediation interventions found that cognitive remediation did not significantly improve function, unless remediation was combined with psychiatric rehabilitation (Wykes, Huddy, Cellard, McGurk, & Czobor, 2011). These findings indicate that other factors, such as self-efficacy, interact with a person’s abilities to use cognitive skills for functioning. Self-efficacy, belief in one’s own abilities to be successful in tasks (Bandura, 1977), plays a significant part in recovery for people with schizophrenia (Bryce et al., 2018) and should be included in occupational therapy research (Synovec, 2014).

In contemporary mental health practice, recovery is often defined as a process by which people gain understanding of their condition, function well in daily activities, participate in the community, and have a sense of meaning and purpose in their lives, regardless of whether symptoms persist (Brown, 2011; Substance Abuse Mental Health Services Administration [SAMHSA], 2017). Therefore, recovery is influenced not only by the functional performance of skills, but also by the subjective experience of fulfillment, for example, satisfaction with life (Bellack et al., 2007). Recovery is enhanced by approaches that give opportunities for people to build on their strengths (Corrigan & Jones, 2015). However, few studies have investigated the efficacy of strengths-based approaches for people with mental illness (Ibrahim, Michail & Callaghan, 2014) or of interventions to help people put their strengths to use (Tse et al., 2016). A strengths-based approach is one of the recovery model's core principles (SAMHSA, 2017).

Statement of the Problem

Cognitive impairment contributes to decreased functioning in people with schizophrenia. However, mental health practitioners are now asked to utilize more strengths-based approaches, and not focus on deficits. Cognitive assessment is an essential part of the occupational therapy evaluation process for people who have mental illnesses (Scanlan & Still, 2013). Like other healing professions, occupational therapy traditionally targeted deficits in assessment and treatment; however, occupational therapists are now also called upon to use strengths-based approaches (Dunn et al., 2013a). The American Occupational Therapy Association (AOTA) proposed guidelines for strengths-based approaches for children and families (AOTA's School Mental Health Work Group, 2012) and people with developmental disabilities (Dunn et al., 2013b), but less attention has been given for working with people with SMI. Strengths-based approaches are discussed in the social work literature, but few studies have identified strengths-based interventions or investigated the efficacy of strengths-based approaches (Ibrahim et al., 2014; Tse et al., 2016).

In sum, both cognitive assessments and strengths-based approaches are important aspects of rehabilitation and recovery for individuals with schizophrenia. From this general statement, three specific problems emerge. First, no known research to date has sought to reconcile these two seemingly incompatible components of the therapeutic process. Second, a gap exists between individuals' cognitive and performance capacities and their occupational performance in actual daily living and social activities. Third, other factors such as self-efficacy and life satisfaction are important for recovery, but few studies have investigated them in conjunction with cognitive skills and occupational performance. A strengths-based intervention that helps individuals to understand and use both their cognitive and performance strengths may increase their self-efficacy and bridge the gap between skill capacity and occupational performance.

Statement of the Purpose

The purpose of this research was three-fold. The primary purpose was to pilot a strengths-based intervention for people with schizophrenia. The intervention identifies strengths through cognitive and performance-based assessments, and then, through prompting by psychiatric rehabilitation practitioners, facilitates individuals' use of their identified strengths to increase self-efficacy and enhance occupational performance.

Another purpose of the research was to examine the relationships among occupational performance, self-efficacy, cognition, and life satisfaction. Finally, this research explored the feasibility of using the selected array of assessments for evaluation in psychiatric rehabilitation. Participants were invited to share their lived experience of participating in the evaluation process and of using the strengths-based intervention.

Specific Aims

The strengths-based cognitive intervention was developed to increase self-efficacy and occupational performance in people with schizophrenia and schizoaffective disorder. The primary aim of the research was to study the efficacy of the intervention. Other aims were to examine the relationships among occupational performance, self-efficacy, cognition, and life satisfaction, and to explore the feasibility of the evaluation and intervention processes from the perspectives of the participants. Specific research questions included:

1. How does a strengths-based cognitive prompting approach affect occupational performance, self-efficacy, cognition, and life satisfaction in people who have schizophrenia or schizoaffective disorder?
2. What are the relationships among occupational performance, self-efficacy, cognition, symptomology, and life satisfaction?
3. What is the feasibility of using assessments from this study as part of an evaluation protocol?
4. What is the lived experience of participating in the strengths-based cognitive prompting intervention?

The chapters that follow present a review of the research that provided a foundation for this study, followed by the methodology, results, discussion, and conclusion of the study. Chapter II presents a review of the literature on core concepts as they relate to schizophrenia, including diagnostic information, neurophysiology, occupational performance, executive function, social cognitive skills, functional cognition, self-efficacy, recovery, and strengths-based intervention. Methods for the study are detailed in Chapter III, and results are presented in Chapter IV. Chapter

V provides a discussion of the study’s findings and implications for intervention and further research.

CHAPTER II

BACKGROUND AND SIGNIFICANCE

This chapter provides a review of the research literature on contemporary thinking about schizophrenia, cognition, and self-efficacy. Specifically, the chapter presents an overview of schizophrenia, related functional challenges, and associated neurobiology, and of executive function, social cognition, self-efficacy, recovery, and strength-based approaches as they relate to schizophrenia. The chapter also includes a summary of Kielhofner's model of human occupation (MOHO; Taylor, 2017) as applied to the current study.

Schizophrenia: Incidence, Prevalence, and Economic Impact

The following section describes the incidence, prevalence, and economic impact of schizophrenia. Schizophrenia is a low-prevalence mental illness (Baxter, Patton, Degenhardt, & Whiteford, 2013). However, because of the years lived with disability and the shortened lifespan associated with the diagnosis, schizophrenia is one of the most disabling conditions worldwide (Charlson et al., 2018).

Incidence and Prevalence

Schizophrenia is an SMI that affects thinking, perception, emotion, behavior, and self-concept, and can cause significant disability and functional impairment to the more than 21 million people affected worldwide (World Health Organization, 2018). Estimates of incidence and prevalence of schizophrenia vary by several factors, including geographic location, economic status, and research methodology (McGrath, Saha, Chant, & Welham, 2008).

Incidence. Incidence is a measure of the number of new cases in a year. Systematic review estimated the worldwide incidence of schizophrenia at 15.2 per 100,000 people (McGrath et al., 2008). Incidence of schizophrenia for age of onset varies by gender; for men, incidence peaks in the early 20s, whereas incidence for women peaks in the mid to late 20s (Jackson et al., 2013).

Prevalence. Prevalence refers to the number of people who have a condition in a specific time period (McGrath et al., 2008). An estimated 3.03 million people are diagnosed with schizophrenia in the United States (Desai, Lawson, Barner, & Rascati, 2013). Lifetime prevalence has been reported as 0.3-0.7% (American Psychiatric Association [APA], 2013). While estimates of schizophrenia vary by country, approximately 1% of the population worldwide has schizophrenia (Laursen, Nordentoft, & Mortensen, 2014).

Although the prevalence of schizophrenia is relatively low, the disabling effect of the condition is great (Charlson et al., 2018). The Global Burden of Disease Study (Salomon et al., 2012) quantified health lost due to 220 physical and mental health conditions worldwide by calculating disability weights for each condition. Weights are essentially scores that range from 0 to 1, with 0 equivalent to full health and 1 equivalent to death. Acute schizophrenia was rated at 0.76—the highest disability score of any physical or mental health condition (Salomon et al., 2012).

Economic Impact

The financial burden of schizophrenia in the United States, including both direct and indirect costs, is estimated at $23 billion annually (Desai et al., 2013). The costs related to schizophrenia are disproportionately high when compared to costs associated with other chronic health conditions (Desai et al., 2013). Direct costs include medications, hospitalizations, emergency room visits, and therapy or rehabilitation; the mean direct cost is estimated at $5,984 annually for people with schizophrenia who live in the community (Desai et al., 2013). However, average direct costs for people with schizophrenia who experience mental health crises are significantly higher, estimated at $22,704 per person annually (Zhu et al., 2008).

The mean annual indirect cost per person is estimated at $24,664, which includes caregivers' costs, premature death, and lost productivity or reduced employment (Desai et al., 2013). The Social Security Administration (2018) reported that 391, 571 people with schizophrenia and other psychotic disorders received Social Security Disability Insurance (SSDI) benefits in December 2017, which accounted for 4.5% of the total number of disabled workers in the United States who received SSDI benefits.

Diagnostic Criteria, Mortality, and Comorbidity

Schizophrenia is one of the schizophrenia spectrum disorders, which also include schizoaffective disorder. The following section summarizes the diagnostic criteria for schizophrenia and for schizoaffective disorder, which is also a schizophrenia spectrum disorder. Presentation of diagnostic criteria and a commonly used tool to assess symptomology is followed by a brief discussion of cognitive impairment as related to both disorders. The last paragraphs of this section summarize the mortality rate and comorbidities associated with schizophrenia.

Schizophrenia Spectrum Disorder Diagnostic Criteria

As per the *Diagnostic and Statistical Manual of Mental Disorders, fifth edition* (DSM-5; APA, 2013), schizophrenia spectrum disorders are defined by symptoms in at least one of the following areas: hallucinations, delusions, disorganized thinking, abnormal motor behavior, and negative symptoms. Hallucinations are perceptive experiences that occur without apparent stimuli; auditory hallucinations are the most common. Delusions are fixed beliefs that are not easily changed when challenged with contradictory evidence, for example, delusions of persecution, religiosity, or grandeur. Disorganized thinking is reflected in a person's speech, which may present, for example, as loosely associated or tangential. Abnormal motor behavior may range from excessive and purposeless to rigid or catatonic. Negative symptoms are associated with functional difficulties in people with schizophrenia and include decreased expression of emotion (facial or speech), avolition (decreased motivation), alogia (decreased speech), anhedonia (decreased pleasure), and asociality (lack of interest in social interaction).

Schizophrenia diagnostic criteria. The DSM-5 (APA, 2013) describes criteria for the diagnosis of schizophrenia. Figure 1 provides a summary of diagnostic criteria for schizophrenia. First, at least two symptoms must be present a great deal of the time during a one-month period; at least one of the symptoms must be hallucinations, delusions, or disorganized thinking (as evidenced by disorganized speech). The second criterion relates to functioning. A person's level of functioning in at least one life domain (e.g., work, relationships, self-care) must be significantly decreased compared to the level of functioning prior to the onset of the condition.

Main Diagnostic Criteria

A. Two or more symptoms, present for a significant portion of time during a 1-month period (or less if person is being successfully treated). At least one of the symptoms must be (1), (2), or (3):
   1. Delusions
   2. Hallucination
   3. Disorganized speech
   4. Grossly disorganized or catatonic behavior
   5. Negative symptoms (e.g., avolition, diminished emotional expression)

B. Level of functioning in at least one area is markedly below the level achieved before the onset of the condition. Examples of life areas include:
   - Work
   - Interpersonal relations
   - Self-care

C. Continuous signs of the disturbance continue for at least 6 months, including 1 month of symptoms that meet criterion A.
   - The 6-month period may include prodromal or residual periods, during which the conditions manifests in only negative symptoms or in 2 or more Criterion A symptoms in a lesser form (e.g., odd beliefs).

Associated Features Supporting Diagnosis

The following symptoms and signs (selected) are included in DSM-5 as associated with schizophrenia and supporting diagnosis:

- inappropriate affect
- depersonalization
- dysphoric mood
- cognitive impairments: executive function, declarative memory, working memory, language function, processing speed
- anxiety and phobias
- sensory processing dysfunction
- decreased attention
- social cognitive impairments (e.g., theory of mind)
- lack of insight about the condition
- interpreting irrelevant events as meaningful

Adapted from APA (2013), DSM-5

Figure 1. Schizophrenia Diagnostic Criteria

Third, signs of schizophrenia, that is, negative symptoms, must be present for at least 6 months, with at least one month of active symptoms of hallucinations or delusions. Negative symptoms as per the DSM-5 are conceptualized as being of two main types: reduced emotional expression and avoltion, that is, lack of motivation. However, other negative symptoms are also considered, including anhedonia (decreased pleasure), alogia (decreased language), and asociality (decreased socialization; Strauss et al., 2019). For a diagnosis of schizophrenia, signs and symptoms cannot be attributable to substance use or schizoaffective disorder.

Schizoaffective disorder diagnostic criteria. As per the DSM-5 (APA, 2013), schizoaffective disorder is a schizophrenia spectrum disorder. Schizoaffective disorder is diagnosed when a mood disorder and schizophrenia symptoms occur simultaneously, and hallucinations or delusions occur 2 weeks immediately before or after the mood disorder. Schizoaffective disorder is specified as either bipolar type (depressive and manic symptoms) or depressive type (depressive symptoms only).

Brief Psychiatric Rating Scale–Expanded (BPRS - E; Lukoff, Nuechterlien, & Ventura, 1986). The BPRS (Overall & Gorham, 1962), with its subsequent revisions, is the most widely used symptomology outcome measure for serious mental illness (Burlingame et al., 2005) and is sensitive to change (Burlingame et al., 2006). The BPRS-E has 24 items that are rated on a 1-7 scale (*not present—extremely severe*). Scores range from 24-168; higher scores indicate greater symptomology. The BPRS-E's four component subscales demonstrated eigen values greater than 1.5, indicating internal consistency: positive symptoms (4.99), depression-anxiety (2.52), negative symptoms (2.46), and agitation-mania (1.61; Kopelowitz, Ventura, Liberman, & Mintz, 2008). Rater reliability is afforded by using a published semi-structured interview (Crippa, Sanches, Hallak, Loureiro & Zuardi, 2001).

Cognitive impairment. Although not currently part of diagnostic criteria, cognitive dysfunction is a core feature of schizophrenia (APA, 2013; Green & Harvey, 2014; Kahn & Keefe, 2013). Cognitive deficits are included in the DSM-5 (APA, 2013) as commonly associated features of schizophrenia that are significantly related to impaired functioning. Cognitive impairments inherent in the diagnosis have a greater impact on functioning than do hallucinations or delusions (Brown, 2011; Green, 2016; Green & Harvey, 2014; Kahn & Keefe, 2013). Executive function is one of the main cognitive domains often impaired in schizophrenia (Savla et al., 2011). The National Institute of Health's Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) workgroup identified seven specific areas of cognition affected by schizophrenia: attention, processing speed, verbal memory, visual memory, reasoning, problem-solving, and social cognition (Nuechterlein et al., 2008). People with schizophrenia and schizoaffective disorder have comparable cognitive functioning (Savla et al., 2011).

Mortality and Comorbidity

People with schizophrenia have a high mortality rate compared to that of the general public (Laursen et al., 2014; Olfson, Gerhard, Huang, Crystal, & Stroup, 2015). A recent systematic review of life expectancy and schizophrenia studies found that on average, people with schizophrenia live 15-21 fewer years compared to people without the condition (Hjorthøj, Stürup, McGrath, & Nordentoft, 2017). A retrospective study using Medicaid claims from the years 2001-2007 found that adults with schizophrenia in the United States (*N* = 1,138,853) had a standardized mortality ratio (SMR) of 3.7 (Olfson et al., 2015). SMR compares the mortality rate of a given population (e.g., adults with schizophrenia) to the expected mortality rate of the general population. Thus, adults with schizophrenia were 3.7 times more likely to die than people in the general population during the years 2001-2007. The most common cause of death for people with schizophrenia was cardiovascular disease; individuals with the condition were also at increased risk of dying from chronic obstructive pulmonary disease (COPD), cancer, pneumonia, influenza, accidents, and suicide.

Comorbidities. People with schizophrenia are more likely to experience cardiovascular disease, diabetes, weight gain, and respiratory illnesses than the general public (APA, 2013). Approximately two-thirds of deaths of people with schizophrenia are caused by cardiovascular disease, Type 2 diabetes, and respiratory illness related to smoking (Strassnig, Clarke, Mann, Remington, & Ganguli, 2017). Schizophrenia also has a high rate of comorbidity with anxiety, obsessive-compulsive, and substance use disorders (APA, 2013). The gap in life expectancy for people with schizophrenia is related to these comorbidities and has been attributed to four factors: metabolic syndrome related to anti-psychotic medications, unhealthy lifestyle choices, higher rates of suicide and accidents, and physical illnesses that are not treated appropriately (Laursen, Munk-Olsen, & Vestergaard, 2012). The following paragraphs describe these factors.

Cardiovascular disease, diabetes, and metabolic syndrome. Some medications (i.e., atypical anti-psychotics, especially Clozapine and Olanzapine) that are used to treat schizophrenia and schizoaffective disorder have side effects of weight gain and insulin resistance, and increase persons' risk of developing metabolic syndrome—often a precursor to cardiovascular disease and diabetes (Strassnig et al., 2017). The International Diabetes

Federation defined metabolic syndrome as a condition that includes central obesity (i.e., weight gain with increased waist circumference and body fat) and at least two of the following: raised blood pressure (hypertension), raised fasting glucose (hyperglycemia), raised triglycerides (hyperlipidemia), and reduced high density lipoprotein (HDL) cholesterol (Alberti, Zimmet, & Shaw, 2005).

Suicide and accidental death. Deaths resulting from suicide are significantly higher among people with schizophrenia compared to the general public (Olfson et al., 2015). Accidental death occurs twice as often as suicide in people with schizophrenia, although whether death is accidental—for example, by poisoning or drug overdose—or results from suicide may not be clear (Olfson et al., 2015). Meta-analysis found that an estimated 5% of people with schizophrenia die by suicide (Palmer, Pankratz, & Bostwick, 2005). Suicide risk is highest in the first few years after onset of the condition (Palmer et al., 2005).

Lifestyle factors. Lifestyle style factors such as cigarette smoking, poor diet, and decreased physical activity are contributing factors to comorbidity and early death in people with schizophrenia (APA, 2013; Heald et al., 2017; Laursen et al., 2014). More than half of people with schizophrenia smoke tobacco regularly (APA, 2013) and lung cancer is the most common cancer-related cause of death for people with schizophrenia (Olfson et al., 2015). Compared to the general population, people with schizophrenia are at greater risk of neither eating a healthy diet nor having enough physical activity (Manu et al., 2015; Nyboe, Moelleer, Vestergaard, Lund, & Videbech, 2016). Some of the increased risk of comorbidity and early death due to lifestyle choices is associated with the low socioeconomic status of individuals living with an SMI (Heald et al., 2017).

Functional Impairment

Although the worldwide prevalence of schizophrenia is relatively low, the disabling effect of schizophrenia is quite large (Charlson et al., 2018). People with schizophrenia experience difficulties in most life domains, including employment (Carmona, Gómez-Benito, Huedo-Medina, & Rojo, 2017), socialization (Schwartz & Gronemann, 2009), occupational engagement (Eklund, Leufstadius, & Bejerholm, 2009), and community integration (Heinrichs et al., 2010).

Employment

The employment rate for people with schizophrenia in the United States was estimated at 17.2% (Salkever et al., 2007), far below the overall employment rate (Carmona et al., 2017). Vocational performance among people with schizophrenia is often impeded by difficulty with social interaction (Lexén & Bejerholm, 2016). Difficulties with social interaction in the workplace experienced by people with schizophrenia are related to impairments in social cognitive skills (Bell et al., 2009). People with schizophrenia also have cognitive challenges in areas such as attention, memory, and executive function skills that get in the way of vocational functioning (Tan, 2009).

Supported employment, also known as Individual Placement and Support, is an evidence-based rehabilitation practice that has demonstrated positive vocational outcomes for people with serious mental illness, including schizophrenia (Noyes, Sokolow, & Arbesman, 2018; Twamley, Jeste, & Lehman, 2003). However, a recent meta-analysis found that although participation in vocational intervention, especially supportive employment, was effective for helping people with schizophrenia obtain employment, rehabilitation was less helpful for keeping jobs (Carmona et al., 2017). Carmona et al. suggested that supportive employment be combined with interventions that address cognitive and social skills.

Socialization and Relationships

People with schizophrenia often have difficulty with social functioning (Robertson et al., 2014). Social challenges negatively affect community participation and lead to social isolation (Schwartz & Gronemann, 2009). Maintaining relationships and connections is often difficult (Ogden, 2014; Pentland, Miscio, Eastabrook & Krupa, 2003). A qualitative study of older adults with schizophrenia found that participants experienced relational losses and voids that they attributed to their diagnosis, for example, not having had a family of their own (Ogden, 2014). Participants in another study reported the pain of not being able to raise their own children (Pentland et al., 2003). People with schizophrenia who live in the community have identified loneliness as a problem, even during times when symptoms are managed (Beebe, 2010).

Many people with schizophrenia experience social anxiety disorder, which often goes undiagnosed (Achim et al., 2013). A meta-analysis found that diagnosed social anxiety disorder had a prevalence rate of 14.9% in people with schizophrenia (Achim et al., 2011), a rate that is substantially above the 7% prevalence rate for the United States general population (APA, 2013). A more recent study found a social anxiety disorder prevalence rate of 44.1% in a sample of individuals with schizophrenia (Achim et al., 2013). Social phobia was diagnosed in 31% of a sample of individuals with first-episode psychosis (Voges & Addington, 2005). Studies on the relationship between social anxiety and functioning in people with schizophrenia have had mixed results. Some studies demonstrated a relationship between social anxiety and functioning (Pallanti, Quercioli, & Hollander, 2004), while others found that social anxiety is related to negative symptoms, with negative symptoms having a stronger relationship to functioning (Achim et al., 2013). Social anxiety affects quality of life in people with schizophrenia and warrants further study (Pallanti, Cantisani, & Grassi (2013).

Community Living and Occupational Engagement

Community life and independent living are often challenging for people with schizophrenia (Heinrichs et al., 2010). People with schizophrenia may have difficulty with instrumental activities of daily living (IADLs) such as preparing and cooking meals (Semkovska, Bedard, Godbout, Limoge, & Stip, 2004), paying bills (Lipskaya, Jarus, & Kotler, 2011), shopping (Rempfer, Hamera, Brown, & Cromwell, 2003; Semkovska et al., 2004), and daily tasks (Iampietro, Giovannetti, Drabick, & Kessler, 2012).

People with schizophrenia also experience decreased occupational engagement, and spend more time engaged in sleeping and self-care and less time participating in activities that are meaningful to them (Eklund et al., 2009). Individuals with mental illness experience occupational deprivation, that is, decreased access to participation in meaningful activities (Brown, 2009). Decreased occupational engagement has been associated with diminished quality of life in individuals with both physical and mental health conditions (Ay-Woan, Pei-Ying, LyInn, Tsyr-Jang, & Ping-Chuan, 2006; Goldberg, Brintnell, & Goldberg, 2002; Silvestri, 2017; Sleight, 2017). A recent exploratory study found that decreased occupational engagement in people with schizophrenia was related to cognitive impairments in attention, processing speed, memory and executive function (Lexén & Bejerholm, 2018).

Executive Function

The functional challenges experienced by people with schizophrenia are associated with impairments in executive function (Holt, Wolf, Funke, Weisbrod, & Kaiser, 2013; Iampietro, et al., 2012; Semkovska et al., 2004). Executive function is discussed and investigated extensively in the literature. This section begins with a brief overview, provides descriptions of principal models, and concludes with a summary of executive function as conceptualized for this study.

Executive function has been defined as higher order cognitive processing that allows individuals to behave optimally in unpredictable circumstances (Gilbert & Burgess, 2010; Logue & Gould, 2014). Rather than being a single skill, executive function is comprised of many cognitive capacities and processes (e.g., attention, flexibility) that come together to form a construct related to control—the ability to exercise control over the self and interact effectively with the environment (Stuss & Alexander, 2000; Gilbert & Burgess, 2010). Executive function allows individuals to complete goal-directed activities, and therefore includes the abilities to come up with goals, make plans to achieve them, and successfully implement those plans (Lezak, 1982). The prefrontal cortex (PFC), the area of the brain associated with executive function, has many distinct regions (e.g., anterior cingular cortex, dorsolateral orbital cortex, pre- and infralimbic cortices) and receives input from several neurotransmitter systems including dopamine, serotonin, norepinephrine and acetylcholine. Several researchers have proposed theories and models of executive function, including Luria (1973, 1980), Lezak (1982), Norman and Shallice (1980), and Stuss and Alexander (2000).

Luria and Executive Function

Luria provided foundational work on the neural basis of executive function. His theory is that the brain is organized into functional "units" that control cognitive processes (Languis & Miller, 1992). Luria (1973) described the brain as comprised of three main functional units, one unit for each of the following processes:

1. regulating tone, waking, and mental states (arousal and attention);
2. receiving, analyzing, and storing information (sensory input and integration); and
3. programming and regulating activity (executive planning and organizing).

Luria's functional units are hierarchical and correspond to functional areas of the brain. The first unit corresponds to the reticular formation and includes the spinal cord, brainstem, midbrain, diencephalon, and cortex. The second unit, which involves perception and coding of information, is in sensory and association areas of the brain where the temporal, occipital, and parietal lobes come together. The third unit, located in the frontal and prefrontal cortices, is the unit that controls executive function. Luria (1980) described this unit as responsible for a process of intention creation, plan formation, and action programming, followed by performance inspection, behavior regulation, and then verification that actions align with intentions/plans and correction of any mistakes.

Because different parts of the brain receive afferents from other regions, the units are interrelated (Luria, 1980). For example, Luria (1980) stated that the frontal lobes have close connections with the reticular activating system and integrate information about the outside world and the body's internal state, regulate the overall being, and direct its actions. Luria

(1980) noted the PFC's connections with the limbic structures and the brainstem suggested that arousal, attention, affective state, and memory affect executive function. Luria was also interested in the third unit's (i.e., PFC) role in verbal production, and suggested that speech is linked with ability to organize and complete actions (Luria, 1973).

Norman and Shallice

Norman and Shallice (1980) further developed Luria's construct of executive function by focusing on attention as the mechanism for the control of purposeful behavior. Norman and Shallice (1980) proposed two levels of control that facilitate productive behaviors: a contention scheduling mechanism and a supervisory attentional mechanism. The contention scheduling mechanism selects the relevant schema and controls the relatively minimal attention needed for tasks that are automatic, that is, tasks than can be performed without direction or heightened awareness. The supervisory attentional mechanism provides control when activities are novel, difficult, dangerous, important, or require decision-making, that is, when attention must be intentional in order to successfully complete actions. Norman and Shallice noted that the supervisory attentional system is also used during planning and that most attentional challenges occur when actions are being initiated rather than when they are being implemented (Norman & Shallice, 1980).

In the model proposed by Norman and Shallice (1980), the researchers acknowledged that motivation affects the activation of performing an action. They argued, however, that the most important influence on purposeful behavior is the deliberate application of attention. "Will" is another important concept in their model, which is defined as attentional control that is deliberately directed toward completing an action and is controlled by the supervisory attentional mechanism. Norman and Shallice (1980) suggested that the function of the supervisory attentional mechanism may be attributed to the PFC.

Lezak and Executive Function

Lezak (1982) defined executive functions as a group of capacities that allow individuals to formulate, plan, and implement their goals. Lezak built on Luria's construct of executive function by expanding on the function of goal formulation and execution. As per Lezak (1982), executive functions comprise four classes of mental capacities: formulating goals, planning, carrying out activities, and performance. These capacities are summarized in the next four paragraphs.

Formulating goals. Goal formulation requires self-awareness, understanding of environmental constraints and opportunities, intention to act, and motivation. Individuals who have motivational impairments may be able to take care of themselves, but "may wander aimlessly or just sit" (Lezak, p. 287) and need intervention to engage in new activities or resume activities that they enjoyed at one time (Lezak, 1982). Lezak noted that self-awareness and environmental awareness are best assessed through observation and report.

Planning. Lezak (1982) described planning as consisting of the abilities to sustain attention, conceptualize a plan framework (e.g., environment, materials, steps), compare alternatives, and make decisions. Individuals who have impairments in planning may have goals, but have difficulty coming up with plans to implement them. They may know, and even be excited about, the activities that they want to do but may be unable to conceptualize the plans to do them. Lezak noted that self-regulation challenges such as impulsivity may also impede the ability to plan.

Carrying out activities. Lezak (1982) described the purposeful implementation of activities to activate a plan as requiring several organized and integrated capacities—initiating, maintaining, switching, and stopping sequences—and referred to Luria's behavioral programs. Lezak noted that programming impairments are most evident in unstructured tasks and may be at least partially assessed in tests that include verbal fluency and free drawing or writing. Shifting attention may be assessed through tests that ask participants to alternate patterns motorically or cognitively. However, as Lezak stated, assessment of purposeful activity is challenging because most tests ask participants to follow directions rather than plan and carry out unstructured activities. Neuropsychological test scores of individuals with executive function impairments may not reflect their functioning; these individuals may score within normal ranges on neuropsychological tests but have difficulty engaging in purposeful activities (Lezak, 1982).

Effective performance. Effective performance refers to how an individual carries out an activity, and includes capacities to monitor, self-correct, and regulate a task's tempo and intensity. Lezak (1982) stated that executive function impairment is marked by erratic performance. Individuals with executive function impairment may not be aware of their errors and so not self-correct or may be aware of errors and still not be able to correct them. Lezak (1982) suggested that observing drawing tasks may be helpful to assess a person's abilities to monitor and self-correct.

Stuss and Alexander

Stuss and Alexander (2000) focused on the PFC as the area of integration for emotion, perception, and action. They proposed a model of executive function that hearkened back to

Luria's work on neural circuitry, which linked other brain areas (limbic system, thalamus, striatum, and cerebellum) to the PFC (Stuss & Alexander, 2000). Stuss and Alexander's model of executive function has a hierarchy of four levels: arousal-attention, perceptual-motor, executive mediation, and self-awareness. The researchers posited that the PFC may be responsible for allowing individuals to construct a conceptual understanding of the self, of others, and of experiences (e.g., to process information or conceptualize situations). Executive function impairments, then, can cause difficulties with planning, interacting with others, and using memories to construct a sense of self (Stuss & Alexander, 2000).

Executive Function as Conceptualized for this Study

For the purposes of this study, executive function was defined as higher order cognitive functioning that allows individuals to conceptualize and perform occupations, including social interactions, while adapting to environmental stimuli. The construct of executive function as conceptualized for this study was most influenced by Lezak's model, while also incorporating Luria's (and Stuss and Alexander's) work on the neurobiology of executive function.

As discussed below, the PFC is the area of the brain most affected in people with schizophrenia, who often have executive function impairments. Luria's work provides a foundation upon which to understand how changes in prefrontal circuity can affect executive function. Luria, as well as Stuss and Alexander, highlighted the importance of the prefrontal cortex as a place of integration for input from limbic and associated cortices that allowed emotional and environmental stimuli to influence decision making, planning, and performance. Identifying emotions and understanding the intentions of others are skills that are often impaired in people with schizophrenia (Savla, Vella, Armstrong, Penn, & Twamley, 2013).

In her model of executive function, Lezak (1982) identified the challenges that can result from executive function impairments. Many of these impairments align with challenges that are observed in people with schizophrenia. For example, people with schizophrenia may lack self-awareness (Lysaker, Whitney, & Davis, 2006) and have difficulty with planning (Holt et al., 2013). Individuals with schizophrenia may also have difficulty with volition, that is, decreased motivation, which impedes functioning (Katz, Tadmor, Felzen, Hartman-Meier, 2007; Luther et al., 2017; Yamada, Lee, Dinh, Barrio, & Brekke, 2010). Along with volition, Lezak included aspects of task performance, such as initiation and tempo, that underlie successful task performance. Lezak's model reflects activity analysis—breaking down an activity to understand an individual's challenges and strengths in task performance—and therefore suggests alignment with an occupational therapy perspective where activity analysis is an essential tool for facilitating adaptation.

Neurobiology of Schizophrenia

The neuroanatomy, neurophysiology, and history of individuals who were either at risk of developing schizophrenia or had the disorder have been studied throughout the lifespan and postmortem (Marenco & Weinberger, 2000; Rapoport, Giedd, & Gogtay, 2012). The following section summarizes key points about the neurobiology and etiology of schizophrenia as understood from current research. The first part of the section discusses schizophrenia as a neurodevelopmental disorder. This discussion is followed by a summary of risk factors for the development of schizophrenia. The next paragraphs describe the changes in the brain (loss in synaptic connectivity and decrease in brain volume) that are believed to cause schizophrenia and the associated impairments in cognitive and occupational functioning.

Schizophrenia as a Neurodevelopmental Disorder

Schizophrenia is increasingly seen as a neurodevelopmental disorder that stems from an interaction of genetic and environmental factors that affect the developing brain in utero (Faludi & Mirnics, 2011; Rapoport et al., 2012). Schizophrenia is a polygenetic disorder, meaning that many different genes play a role in its development; more than 145 related genetic areas have been identified (Rosato et al., 2019). The development of schizophrenia is triggered by environmental risks that interact with genetic vulnerabilities, causing impairments in the genetic expressions (proteins) that regulate neurotransmitters, which in turn control synaptic connections (Horvath & Mirnics, 2009). Recent research has identified three genes, Tcf4, Tbr1, and Top3b, that come together to cause dysregulation on one protein pathway that affects neurotransmitter release, ultimately leading to synaptic and dendritic changes in the brain (Rosato et al., 2019). Decreased dendritic spine density causes dysconnectivity in the brain and the resulting changes in cognition, behavior, and emotion that typify schizophrenia (Glausier & Lewis, 2013).

Because schizophrenia is a neurodevelopmental disorder, the psychosis that marks the onset of schizophrenia typically in late adolescence or early adulthood arises from changes in the brain much earlier (Marenco & Weinberger, 2000; Rapoport et al., 2012). There may be early signs; children with cognitive, perceptual, behavioral, motor, verbal, and social differences may then be diagnosed with schizophrenia years later (Dickson, Laurens, Cullen, & Hodgins, 2012; Marenco & Weinberger, 2000). One model proposed a two-stage neurodevelopmental progression: early environmental and genetic vulnerability followed by brain changes during adolescence, when myelination in the temporal prefrontal cortices increases and dendritic pruning decreases (Fatemi & Folsom, 2009). Schizophrenia used to be considered a neurodegenerative illness in adulthood; however, the course of illness is now recognized as one in which symptoms stabilize within about five years and then, in at least half of affected individuals, decrease, although cognitive changes remain stable and functional challenges may persist (Marenco & Weinberger, 2000).

Risk factors for the development of schizophrenia include environmental stressors and external prenatal, perinatal, and postnatal influences. For example, babies born of mothers who experienced malnutrition while pregnant were at increased risk of developing schizophrenia (Rapoport et al., 2012). Other risk factors include prenatal infection (Brown & Derkits, 2010), complications of pregnancy and childbirth (Marenco & Weinberger, 2000), childhood trauma (Morgan & Fisher 2007), living in an urban environment (van Os, Kenis & Rutten, 2010), and having minority status (van Os et al., 2010). Cannabis use is a risk factor for young people who are already at a higher genetic risk and may cause affected individuals to be more prone to relapse (Sami & Bhattacharyya, 2018).

Dendritic Spine Pathology and Schizophrenia

Decreased density of dendritic spines, resulting in fewer synaptic connections and disrupted neural pathways, is believed to underlie the cognitive, behavioral, and emotional changes related to schizophrenia. The following section provides a summary of dendritic spine pathology related to schizophrenia.

Dendritic spines and dysconnectivity. Dendritic spines provide the scaffolding for synaptic connections in the brain (Glausier & Lewis, 2013). Dendritic spines are protrusions that extend from the dendrites of some neurons, including pyramidal cells in the neocortex, Purkinje cells of the cerebellum, and medium spiny neurons of the striatum (Rochefort & Konnerth, 2012). Most of the excitatory synaptic connections in the central nervous system (80-95%) take place on dendritic spines (DeFelipe & Fariñas, 1992). Decreased density of dendritic spines is one of the most common findings in postmortem studies of neuropathology related to schizophrenia (Moyer, Shelton, & Sweet, 2015). Figure 2 provides a comparison of dendritic spines in the dorsolateral prefrontal cortex (DLPFC) of people with and without schizophrenia. Abnormalities in dendritic spines underlie, at least in part, the impairments characterized by schizophrenia by causing dysconnectivity both within and between different regions of the brain (Glausier & Lewis, 2013). Schizophrenia, therefore, may be conceptualized as a disorder of brain connectivity (Schmitt, Hasan, Gruber, & Falkai, 2011).

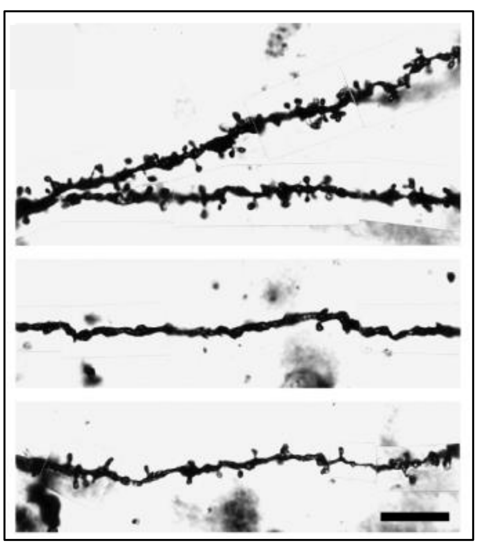


Figure 2. Decreased Density of Dendritic Spines in Layer 3 of the DLPFC in Postmortem Study of Schizophrenia. The top example is from the brain of a person without schizophrenia; the bottom two are from people with schizophrenia. (From Lewis & González-Burgos, 2008; used with permission.)

Dendritic spines and development. Dendritic spine formation, proliferation, and pruning follow a developmental pathway in the brain (Glausier & Lewis, 2013). In general, spines begin to develop in utero, are overproduced in infancy and early childhood, are pruned through later childhood and adolescence, and are stabilized in adulthood (Petanjek et al., 2011). However, dendritic spines are the most “overproduced” in the DLPFC, where spine development continues into the third decade of life (Petanjek et al., 2011). Research indicates that the decreased dendritic spine density that is evident in schizophrenia results from an overabundance of the normal neurophysiological dendritic pruning process in the PFC (Glausier & Lewis, 2013). Decreased dendritic spine density evident in the PFC is especially relevant for schizophrenia for two reasons. First, the PFC does not mature until early adulthood, in the same developmental period when schizophrenia is usually diagnosed (Petanjek et al., 2011). Second, development of the PFC is associated with cognitive development, as the PFC is the center for executive function and higher order cognitive skills, which are impaired in schizophrenia (Lesh, Niendham, Minzenberg, & Carter, 2011). Therefore, current research indicates that the neurobiological causes of schizophrenia are associated with the cognitive impairments experienced by individuals with the condition. For example, weakened connectivity between the medial temporal and medial prefrontal areas was evident in people with schizophrenia who had difficulty with perspective-taking, a social cognitive skill (Eack, Wojtalik, Newhill, Keshavan & Phillips, 2013).

Brain Volume Loss and Schizophrenia

Magnetic resonance imaging (MRI) has demonstrated that in people with schizophrenia, brain volume is decreased and ventricle size is increased (Marenco & Weinberger, 2000). Brain volume loss is heterogeneous, meaning that there is variation among people with schizophrenia both in total brain volume loss and in the brain regions that are affected (Haijma et al., 2013). Overall, higher gray matter volume and smaller ventricles in fronto-limbic areas of the brain (and the cerebellum) are associated with better functioning (Wojtalik, Smith, Keshavan, & Eack, 2017). More recently, voxel-based morphometry (VBM) has been used to investigate differences in whole brain and regional brain volumes (Kim, Kim, & Jeong, 2017). The medial temporal lobe, which includes the hippocampus, was found to have the most consistent pattern of reduced volume in schizophrenia (Honea, Crow, Passingham, & Mackay, 2005). Total brain matter loss has been reported at 2-3% compared to people who do not have schizophrenia, with more loss in gray matter than in white matter (Haijma et al., 2013; Kim et al., 2017).

Gray matter loss. Gray matter loss has been found in several brain structures of people with schizophrenia, including the PFC, temporal lobe, parietal lobes, basal ganglia, and thalamus (Kim et al., 2017). Gray matter loss is associated with both symptom severity and functional outcomes. For example, the superior temporal gyrus (STG), which is involved in the processing and production of language, is the most commonly reported site of gray matter loss in schizophrenia (Kim et al., 2017). Gray matter loss in the STG is associated with auditory hallucinations and thought disorder (Kim et al., 2017). Decreased volume of gray matter in the hippocampus, a part of the limbic system that has an important role in memory function, was found to occur in the early (rather than chronic) stages of schizophrenia (Murakami et al., 2011).

Continuity in the pattern of gray matter loss provides evidence of schizophrenia as a developmental disorder (Rapoport et al., 2012). Gray matter loss seen in the brains of young adolescents with childhood-onset schizophrenia continues into young adulthood, when the loss becomes more prominent in the prefrontal and temporal cortices (Greenstein et al., 2006). However, sibling studies suggest that these early changes in the brain do not always result in the development of schizophrenia (Gogtay et al., 2007). Some brains "normalize," and gray matter loss in the temporal and prefrontal cortices—a marker for schizophrenia development—may resolve by adolescence (Mattai et al., 2011).

White matter loss. White matter loss has also been found in adolescents and adults with schizophrenia, mainly in the PFC (Walterfang, Velakoulis, Whitford, & Pantelis, 2011). For example, white matter loss in the STG was associated with longer duration of symptomatic schizophrenia (Kim et al., 2017). Decreased growth of white matter was evident in the brains of young people with childhood onset schizophrenia (Gogtay et al., 2008).

In sum, schizophrenia is a neurodevelopmental disorder that affects the developing brain, resulting in loss of synaptic connections and brain volume. Parts of the brain that are most affected include the PFC and temporal lobes. The temporal lobes house structures associated with the limbic system, including the hippocampus and amygdala, which serve functions related to memory and emotion processing, respectively. The PFC is highly involved in executive function, an area of cognition that is often impaired in people with schizophrenia. The next section reviews executive function in schizophrenia.

Executive Function and Schizophrenia

Executive function in schizophrenia has been widely researched (Savla et al., 2011) and impairments in executive function have been documented in the literature (Iampietro et al., 2012). Executive function impairments adversely affect instrumental activities of daily living (IADL) and community functioning (Green, Kern, Braff & Mintz, 2000; Josman, Klinger, Schenirderman & Shevil, 2009). Executive function impairment in schizophrenia is heterogenous, meaning that individuals with the disorder have a range of strengths and impairments (Iampietro et al., 2012).

Executive Function Skills and Schizophrenia Research

People with schizophrenia and schizoaffective disorder have demonstrated impaired executive function skills on neuropsychological tests of executive function when compared to neurotypical participants (Savla et al., 2011). As a higher order process, executive function is dependent upon lower order cognitive skills including processing speed, working memory, reasoning (abstract thinking), and problem-solving (Gilbert & Burgess, 2010; Lipskaya et al., 2011; Savla et al., 2011). Each of these cognitive skills may be impaired in people with schizophrenia (Nuechterlein et al., 2008). The next section provides a brief summary of skills related to executive function as they have been studied in people with schizophrenia, followed by a discussion of executive function assessment.

Cognitive flexibility (set shifting). Savla et al. (2011) found that the trail-making set-switching task was the only task related to executive control in which people with schizophrenia and schizoaffective disorder performed significantly worse than neurotypical controls, after accounting for impairment in processing speed. In addition, participants with schizophrenia and schizoaffective disorder had more difficulty with the set-switching task than with any other task of the Delis-Kaplan Executive Function System assessment (D-KEFS), which indicates the great degree of impairment in this executive function skill (Savla et al., 2011).

Processing speed. Processing speed underlies cognitive flexibility as assessed by the number-letter switching task of the trail-making test (Savla et al., 2011). Savla et al. suggest that in schizophrenia impaired processing speed may be the chief underlying cognitive skill impairment that adversely affects executive function, although having to keep track of complex information may be another factor.

Working memory. Functionally related to the DLPFC, working memory is the ability to hold in mind and manipulate information to successfully guide thoughts or actions (Lewis & González-Burgos, 2008). Like processing speed, working memory underlies cognitive flexibility as measured by the number-letter switching (part B) of the trail-making test (Savla et al., 2011). Participants must hold in their minds the sequences of letters and numbers, remember to switch back and forth between letters and numbers, and inhibit responses to connect their trail to incorrect stimuli (Savla et al., 2011). People with schizophrenia often have difficulty with working memory (Lewis & González-Burgos, 2008). Impaired verbal working memory in children and young adolescents may be a risk factor for development of schizophrenia (Dickson et al., 2018).

Verbal memory. Verbal memory consists of two types: verbal learning, which is the encoding of information, and verbal memory retention (Leeson et al., 2009). Impaired verbal learning is associated with executive function impairment in schizophrenia, although deficits in retention may also be present (Leeson et al., 2009). Impairments in verbal memory are related to decreased functional outcomes in schizophrenia (Green et al., 2000).

Summary of Executive Function in Schizophrenia

In summary, executive function has been established as an area of cognitive impairment that affects functional daily living tasks for people with schizophrenia spectrum disorders. This is consistent with neuroimaging that shows decreased dendritic spine density and decreased brain volume in areas of the brain related to executive function, that is, the prefrontal cortex and temporal lobes. The next section discusses executive function assessment.

Executive Function Assessment

Executive function (EF) is assessed in a variety of ways and many different types of instruments are available. The following section gives examples of three types of executive function assessment: objective, subjective, and functional.

Objective EF assessment. Trail-making tests, commonly used neuropsychological tools to assess EF (Mahurin et al., 2006), typically include two parts; participants first draw lines to connect a sequence of numbers, and then connect a sequence of alternating numbers and letters. The second part captures cognitive flexibility (set shifting); EF-related skills also include sequencing, attention, and processing speed (Salthouse, 2011). The Comprehensive Trail-Making Test (CTMT; Reynolds, 2002) is one example of a trail-making test. The CTMT has five trails: numbers, numbers with distractors (empty circles), numbers with more complex distractors (circles with figures), numerals to number words, and alternating numbers and letters with distractors (circles). The five trail-making tasks have demonstrated adequate internal consistency ($\alpha = .70$ to $\alpha = .77$) and test–retest reliability ($\alpha = .70$ to $\alpha = .78$; Reynolds, 2002). The CTMT distinguished between neurotypical individuals and those with mild cognitive impairments (Smith et al., 2008). A two-factor model (set switching/inhibition and attention/sequencing) rather than a single composite score demonstrated a better fit and more validity in assessing EF (Riccio, Blakely, Yoon & Reynolds, 2013).

Subjective EF assessment. The Behavioral Rating Inventory of Executive Function-Adult Version (BRIEF-A; Roth, Isquith & Gioia, 2005) may be completed by an informant or by the participant. In its self-report form, the BRIEF-A is a subjective measure that may help people with schizophrenia understand how EF affects their everyday functioning (Bulzacka et al., 2013**).** Participants respond *Never* (0), *Sometimes* (1), or *Often* (2) to 75 behaviors, factored to nine scales (Emotional Control, Inhibit, Initiate, Organization of Materials, Plan/Organize, Self-Monitor, Shift, Task Monitor, and Working Memory). Scales are added to yield two indices, Metacognition (MI) and Behavioral Regulation (BRI). The MI and BRI indices are added to yield a total Global Executive Composite (GEC) score. The BRIEF-A demonstrated internal consistency (α = .96 - .98) and convergent validity with EF tests (Roth et al., 2005). The BRIEF-A also showed moderate correlation (r = .59, p < .05) with a measure of social behaviors in people with schizophrenia in an inpatient setting (Power, Dragovic & Rock, 2012).

Functional EF Assessment. Functional EF is assessed with performance-based tests that help to identify EF deficits that may not be evident in typical neuropsychological testing, but do affect daily living tasks (Baum et al., 2017). The Executive Function Performance Test (EFPT; Baum & Wolf, 2013) assesses EF using four daily life tasks: making oatmeal, using the telephone, taking medication, and paying bills. The purpose of the EFPT is to determine which executive functions are impaired, the individual’s capacity to function independently, and the amount of assistance needed for successful task completion. The EFPT uses a standardized system to identify types of cues needed for the person to be successful; cues are related to levels of cognitive impairment. For each subtest, cues are scored from 0 (*independent*) to 5 (*do for participant*) in each of five EF constructs: initiation, execution, organization, judgment and safety, and completion. Each subtest receives a score of 0-25; subtest scores are added to yield a total EFPT score that ranges from 0-100. Higher scores indicate greater assistance needed and more difficulty with EF skill constructs.

The EFPT demonstrated reliability and validity in people with schizophrenia (Katz et al., 2007). High Internal consistency reliability (α = .88) indicated that the six EF skills hold together as an overall construct of EF. Concurrent validity with the Behavioral Assessment of the Dysexecutive Syndrome (BADS***;*** Wilson, Alderman, Burgess, Emslie & Evans, 1996) was established for people with schizophrenia in both acute and chronic stages (r =.433 to .764; $p <$ .017 to .000). Most EFPT cue and skill construct scores were significantly higher for individuals with acute symptoms of schizophrenia (p = .045 to .000), which supported construct validity.

A single subtest, bill-paying, was used in an earlier study with a single-case design; the study investigated an intervention to improve EF and performance in people with traumatic brain injury (Toglia, Johnston, Goverover, & Dain, 2010). For the bill-paying task, seven pieces of mail (including two bills), checks, a balance sheet, pen, and calculator are placed in a plastic bag. The participant is asked to open the bag, find the bills, and pay them with checks using the register. One of the checks is overdue and the other is due upon receipt. An alternate form of the EFPT was validated (Hahn et al., 2014) and can be used as an outcome measure. In the alternate form, the Bill-paying subtest is a task in which the participant orders an item from a mail-order catalog by completing an order form and paying for the item with a check.

Social Cognition and Schizophrenia

The section immediately below provides a brief introduction to social cognitive theory and skills related to social cognition. The introduction is followed by a summary of social cognition as it is currently discussed and measured in research related to schizophrenia.

Social Cognitive Theory

The concept of "agency" is at the heart of Albert Bandura's social cognitive theory, which centers on the idea that humans are agents of their own actions (Bandura, 2001). Social cognitive theory asserts that human behavior is not just a response to environmental stimuli or inner psychological influences, but instead is also influenced by cognition, including skills related to abstraction (e.g., symbolically assigning meaning to situations or conceptualizing social interactions, self-regulation, self-reflection, and communication). Social cognition is about having personal control, so intention, planning, and problem-solving are also components. Social cognitive theory provides a framework for human learning in which people learn through observation. There are four processes that contribute to learning: attention, retention, production, and motivation. Bandura stated that self-efficacy, the belief in one's ability to have control over one's functioning and life events, is at the core of agency (Bandura, 1997, 2001). Self-efficacy will be addressed in a section below.

Bandura's contribution to the understanding of human behavior is vast. His theory that humans possess cognitive skills that allow them to respond rather than just react to their environments has influenced current research on social cognition as it applies to people with mental health and neurobiological challenges. The next section summarizes social cognition as conceptualized and investigated in current research on neurobiological conditions, with emphasis on schizophrenia.

Social Cognitive Skills and Schizophrenia Research

Social cognition has been defined differently by researchers in different areas of psychology, psychiatry, and research, but all definitions share that social cognition is a group of cognitive skills and processes that enable people to recognize, understand, process, and use social information and cues for real world functioning (Couture, Penn, & Roberts, 2006; Penn, Corrigan, Bentall, Racenstein, & Newman, 1997). Thus, current research on the social cognition of people with neurobiological disorders focuses more narrowly on social cognitive skills, especially as they affect functioning, rather than on Bandura's broad construct of social cognition. Social cognitive skills have been studied in people with a variety of neurobiological conditions including autism spectrum disorder (Cheung, Siu, Brown & Yu, 2018), stroke (Nijsse, Spikman, Visser-Meily, de Kort, & van Heugten, 2019), traumatic brain injury (Westerhof-Evers et al., 2017), and schizophrenia (Penn et al., 2008). In people with schizophrenia, social cognition predicts functioning above and beyond non-social cognitive skills such as attention and memory (Fett et al., 2011), and social cognitive impairments are related to decreased functional outcomes and community participation (Savla et al., 2013). In people with first-episode schizophrenia, social cognitive skills predicted function in domains of work, independent living, and socialization 12 months later (Horan et al., 2012).

Social cognition in schizophrenia research was further defined in a meeting sponsored by the National Institute of Mental Health (NIMH) as the mental processes needed to perceive and understand the emotions, intentions, and actions of others and to respond adaptively (Green et al., 2008). These mental processes include four core social cognitive skills: emotion processing (perceiving, understanding, and using emotions), theory of mind (ability to represent the mental state of others and infer their intentions, beliefs, or emotions), social perception (understanding social roles, rules, and contexts), and attributional style (the way in which people infer the causes of negative and positive events); any or all of these skills may be impaired in people with schizophrenia (Green et al., 2008; Savla et al., 2013). Social cognitive skills in individuals with schizophrenia are significantly decreased compared to neurotypical people and, without intervention, these impairments tend to be stable from first episode and throughout chronic course of the condition (Green et al., 2012). The NIMH definition of social cognition for schizophrenia research guided the current study. Theory of mind and emotion perception, which is part of emotion processing, served as variables and are described more fully in the next paragraphs.

Emotion perception. As defined for this study, emotion perception is the ability to identify emotions based on non-verbal cues of facial expression, tone of voice, and body language (Penn et al., 2008). People with schizophrenia and schizoaffective disorder have impaired emotion perception compared to people with a neurotypical presentation; emotion perception impairment is not associated with education level or nonsocial cognitive skills (Kohler, Walker, Martin, Healey & Moberg, 2010). Studies of people with schizophrenia demonstrated relationships between emotion recognition ability and social competence, daily functioning, community participation, and personal relationships (Kalin et al., 2015; Poole, Tobias & Vinogradov, 2000). In addition, meta-analyses found that emotion perception is associated with community functioning in people with schizophrenia (Couture et al., 2006; Fett et al., 2011).

Emotion perception based on facial expression was found to be significantly correlated with independent living and work functioning (Kee, Green, Mintz, & Brekke, 2003). Bell et al. (2009) found that decreased social cognition in people with schizophrenia, as indicated by impairments in emotion processing and theory of mind, was associated with increased social discomfort in the workplace. The social cognitive impairments experienced by people with schizophrenia negatively affect not only their abilities to communicate with coworkers and perform job duties, but also the job responsibilities that they were assigned and the number of work hours that they were allocated (Bell et al., 2009).

Theory of mind. Theory of mind, also referred to as mentalizing, is defined for this study as the ability to represent the mental state of others and to infer their intentions or beliefs (Green et al., 2008; Pinkham et al., 2014). Theory of mind is significantly decreased in people with schizophrenia compared to neurotypical individuals (Corcoran & Frith, 2003). One study found that although individuals with schizophrenia were overall able to attribute intentions in theory of mind tasks, they took significantly longer than neurotypical people (Roux, Brunet-Gouet, Passerieux, & Ramus, 2016). The researchers noted that this processing delay was not explained by executive function (or intellectual functioning) and could contribute to functional difficulties in real-life social situations when information must be processed quickly for successful performance (Roux et al., 2016).

People with schizophrenia have a wide range of mentalizing skills; a recent study found that individuals with poor theory of mind skills also had greater nonsocial cognitive challenges (e.g., working/verbal memory, attention, executive function) and lower quality of life (Bechi et al., 2018). Brüne (2005) found that theory of mind performance in people with schizophrenia was significantly related to observer-rated social skills, while emotion perception and executive function were not, and that decreased theory of mind predicted severely impaired social behavior. Mentalizing was also found to be related to psychiatrist-rated occupational and social functioning (Achim et al., 2013). In people in the early course of schizophrenia, theory of mind moderated the relationship between nonsocial cognitive skills (e.g., attention, working memory) and clinician-rated role functioning (relationships, work, school, independent living) and was related to symptomology—more to negative than positive symptoms (Ventura et al., 2015). Theory of mind deficits have also predicted conversion to schizophrenia in individuals at high risk of developing the disorder (Bora & Pantelis, 2013). Finally, theory of mind impairment in people with schizophrenia has been associated with impaired autobiographical memory; difficulty with maintaining mental constructs of events in one's own life may be linked to difficulty forming constructs of the mental states of other people in their life situations (Corcoran & Frith, 2003).

The following section provides a brief summary of the neurobiology of social cognition in schizophrenia. Emphasis will be given to the neurobiological underpinnings of impairments in emotion perception and theory of mind.

Neurobiology of Social Cognition in Schizophrenia

Tudusciuc and Adolphs (2013) note that because the processes that allow humans to understand the emotions and intentions of others are very similar to the processes that allow people to develop self-concepts and regulate their own behaviors, social cognition involves many of the same brain areas and processes. The PFC includes neurons needed for coding, processing, evaluating, storing, and retrieving social information. However, neural circuitry from other brain areas are integrated in the PFC, and therefore play a role in executive function. The same is true for social cognition. Information from other structures such as the temporal lobe, cingulate gyrus, and somatosensory cortex are integrated in the PFC and influence social cognition. The amygdala, for example, which is located in the temporal lobe, is often associated with processing of fear and negative emotion; however, the amygdala is also involved in identifying the emotions of others from their facial expressions, especially of negative but also of positive emotions (Adolphs, 2001; Tudusciuc & Adolphs, 2013). The amygdala has a significant functional role in assigning social and emotional meaning to situations and connecting these perceptions to cognition and behavior (Adolphs, 2001).

Amygdala and emotion perception in schizophrenia. Studies of the amygdala in people with schizophrenia demonstrated abnormalities in amygdala volume (Pinkham, 2013). For example, some studies have found reduced volume in the amygdala bilaterally (Whitworth et al., 2005), while others found reduced volume on the left side in individuals who experienced paranoia (Sumich et al., 2002). Reduced amygdala volume has also been found in people with early course schizophrenia when compared to individuals at high risk or considered to be typical (Rich et al., 2016). Schizophrenia has a wide range in its presentation; differences in neural structures and functions among people who have the disorder may correspond to differences in social functioning (Pinkham, 2013).

Along with reduced amygdala volume, people with schizophrenia have also demonstrated differences in the functioning of the amygdala when compared to neurotypical individuals (Pinkham, 2013). Takahashi et al. (2004) used functional magnetic resonance imaging (fMRI) to identify a neural circuit activated in neurotypical adults looking at pictures with affective content (unpleasant, pleasant, neutral); the identified circuit included the amygdala—hippocampus region, medial PFC (MPFC), thalamus, basal ganglia, cerebellum, midbrain, and visual cortex. Participants with schizophrenia demonstrated less activation of this circuit; the researchers made special note of less activation in the MPFC and the right amygdala

(Takahashi et al., 2004). Takahashi et al. (2004) hypothesized that challenges with functioning related to emotion could be explained by disruptions in this circuit. Similarly, people with schizophrenia showed less activation of the amygdala and hippocampus compared to neurotypical people during a task that asked them to identify emotions associated with facial expressions (Gur et al., 2002). However, amygdala function differs among people with schizophrenia and varies based on activity (Pinkham, 2013). Pinkham (2013) noted a meta-analysis by Anticevic et al. (2012) that found that people with schizophrenia showed hypoactivation of the amygdala with negative emotional stimuli, but increased activation when presented with neutral stimuli. Increased activation of the amygdala also occurred when people with schizophrenia incorrectly attributed the emotion of fear to a facial expression (Leitman et al., 2008).

The MPFC also showed decreased activation when people with schizophrenia performed emotion perception tasks in which they attributed emotions based on speech (Razafimandimby et al., 2016). The researchers suggested that the skill of emotion perception based on language likely overlaps with theory of mind (Razafimandimby et al., 2016).

MPFC and theory of mind in schizophrenia. The MPFC, along with the superior temporal sulcus (STS), temporal gyrus, and temporoparietal junction are involved in theory of mind performance (Amodio & Frith, 2006). Reduced volume of the MPFC has been associated with decreased theory of mind skill in people with schizophrenia (Koelkebeck et al., 2013). Decreased activation of the MPFC has been also been linked with decreased theory of mind performance (Benedetti et al., 2009). For example, hypoactivity of the MPFC, and decreased connectivity between the MPFC and the medial temporal area, were observed among people with schizophrenia during a theory of mind perspective-taking task (Eack et al., 2013).

However, hyperactivation of the MPFC also occurs in schizophrenia, and has been observed when participants were engaged in tasks in which intention was not involved; researchers theorized that hyperactivation may have been due to overmentalizing—ascribing intention when none was present (Pinkham, 2013; Walter et al., 2009). More recently, imaging of people with schizophrenia revealed hyperconnectivity between the MPFC and other parts of the brain (e.g., the precuneus, which has a role in self-reflection, episodic memory, visuospatial processing, and motor coordination), which was associated not only with theory of mind but also with positive symptoms (Mothersill et al., 2017). Overmentalizing has been associated with symptoms of paranoia in people with schizophrenia (Abu-Akel & Shamay-Tsoory, 2011).

Social cognitive skills and the neurobiology of social cognition as they relate to schizophrenia and functioning are robust areas of research. The following section provides a brief summary of social cognitive assessment in schizophrenia research and descriptions of assessments for this dissertation study's two social cognitive variables: emotion perception and theory of mind.

Assessment of Social Cognitive Skills in Schizophrenia

The Social Cognition Psychometric Evaluation study (SCOPE) included five phases of investigation to evaluate the psychometric properties of the most commonly used social cognitive measures in schizophrenia research (Pinkham et al., 2014). The first two phases surveyed experts in the field and developed consensus regarding the main social cognitive skills (Pinkham et al., 2014). Phase 3 evaluated measures that assess social cognitive skills in people with schizophrenia; participants were individuals diagnosed with schizophrenia or schizoaffective disorder and neurotypical adults (Pinkham, Penn, Green, & Harvey, 2016). The Hinting Task (HT; Corcoran, Mercer, & Frith, 1995), which assesses theory of mind, and the Bell-Lysaker Emotion Recognition Task (BLERT; Bryson, Bell, & Lysaker, 1997) had the strongest psychometric properties and were recommended for use in schizophrenia research; both instruments demonstrated acceptable psychometric properties and were "pleasant" (p. 500) for participants (Pinkham et al., 2016). Phase 4 modified some widely used instruments that had not demonstrated strong psychometric properties (Pinkham, Harvey, & Penn, 2018).

Phase 3 also included correlational analyses of social cognitive instruments with three functional measures, representing different aspects of function. The UCSD Performance-Based Skills Assessment, Brief (UPSA-B; Mausbach, Harvey, Goldman, Jeste, & Patterson, 2007) measured functional capacity, the Social Skills Performance Assessment (SSPA; Patterson, Moscona, McKibbin, Davidson, & Jeste, 2001), measured social competence, and the informant-rated version of the Specific Level of Functioning Scale (SLOF; Schneider & Struening, 1983) measured "real-world" functioning. Practicality was measured by administration time (*practical* = less than 10 minutes) and tolerability by a participant rating scale of 1 (*very unpleasant*) to 7 (*very pleasant*); 4 = *neither unpleasant nor pleasant* (Pinkham et al., 2018).

In phase 5, new instruments were evaluated and several previously evaluated measures, including the BLERT and HT, were improved (Pinkham et al., 2018). Along with evaluation of psychometric properties, social cognitive instruments were analyzed for relationships with functional and nonsocial cognitive measures. Practicality and tolerability were also measured. A total of three instruments emerged as psychometrically sound and ready for use in research:

the Penn Emotion Recognition Test (ER-40; Kohler et al., 2003), BLERT and HT. Descriptions of the BLERT and HT and summaries of their respective SCOPE findings are provided in the next paragraphs.

BLERT. The BLERT (Bryson et al., 1997) assesses emotion perception. The BLERT has 21 short video clips, in which an actor portrays one of seven emotional states: happiness, sadness, anger, disgust, fear, surprise, or no emotion. The actor portrays emotion using facial expression, tone of voice, and upper body movement (Pinkham et al., 2018). The score is the total number of correctly identified emotions, ranging from 0 – 21; scores less than 15 indicate impairment in emotion perception (Bryson et al., 1997). The BLERT demonstrated good test-retest reliability ($r = .699$), discriminant validity ($t = -6.38$, $p < .001$), internal consistency ($\alpha = .737$), and utility as a repeated measure ($t = 2.87$, $p = .005$; Pinkham et al., 2016).

In SCOPE phase 5, the BLERT was expanded to include measurement of response time (RT) and confidence rating (CR), that is, the participant's level of confidence in his or her response (Pinkham et al., 2018). In the updated BLERT, the total scores are the number of correctly identified emotions (0 – 21), mean RT, and mean CR. Psychometric testing results of the BLERT in phase 5 were as follows: good test-retest reliability ($r = .809$), discriminant validity ($t = 5.70$, $p < .001$; $d = .58$), and internal consistency ($\alpha = .778$); practice effects were a concern as performance improved significantly on the second trial ($t = 5.82$, $p = .001$; Pinkham et al., 2018). Compared to the other instruments that were evaluated, the BLERT was the most strongly related to the SLOF, which measures functioning in several domains ($r = .208$, $p < .05$; Pinkham et al., 2018). The BLERT also demonstrated moderate correlations with the UPSA-B ($r = .368$, $p < .001$) and SSPA ($r = .415$, $p < .001$). The BLERT had a mean administration time of 9.86

minutes and a mean tolerability rating of 5.42, indicating that it was a practical and pleasant assessment (Pinkham et al., 2018).

Hinting Task. The HT (Corcoran et al., 1995) assesses theory of mind. The evaluator reads aloud 10 descriptions of interactions between two people; the participant is asked to infer a character's intention from hints given in the narrative. A total of two points are given for each correct response; if the participant responds incorrectly, the administrator gives a hint and the participant can then earn one point if correct on the second try. Scores range from 0 – 20. The HT demonstrated discriminant validity (t = -9.14, p < .001) with large effect size (d = 1.04), good test-retest reliability (r = .639), acceptable internal consistency (α = .729), and utility as a repeated measure (t = 2.46, p = .02; Pinkham et al., 2016).

In SCOPE phase 5 the HT was revised to have more rigorous scoring criteria; the researchers reported that the HT had shown ceiling effects in other studies but that after the scoring modification, ceiling effects were no longer evident (Pinkham et al., 2018). Psychometric testing results for the HT in phase 5 were as follows: adequate test-retest reliability (r = .695), good discriminant validity (t = 6.05, p < .001; d = .62), and good internal consistency (α = .681); the HT also had small practice effects (Pinkham et al., 2018). The investigators noted that the regression model showed that the HT uniquely contributed to functional capacity (UPSA-B; p < .01) and social competence (SSPA; p < .001) when controlling for other social cognitive measures (Pinkham et al. 2018). The HT had a mean administration time of 6.85 minutes and a mean tolerability rating of 5.35, indicating that the HT is a practical and pleasant assessment (Pinkham et al., 2018).

Functional Cognition

The term "functional cognition" refers to the integration of cognition (thinking and processing skills) with occupational performance, that is, functioning in daily activities (Giles et al., 2020; Skidmore, 2017). Neuropsychological tests of cognitive skills do not consistently align with performance of real-life tasks (Bromley & Brekke, 2010; Green, Llerena, & Kern, 2015). For example, in people with schizophrenia, the best way to assess strengths and challenges for independent living is to observe functional performance (McKibbin, Brekke, Sires, Jeste, & Patterson, 2004). Functional cognition, therefore, is measured through observation of occupational performance (Brown, 2011; Skidmore, 2017; Wesson, Clemson, Brodaty, & Reppermund, 2016). Because of the established relationship between function and cognition, cognitive assessment is an essential part of the occupational therapy evaluation process for people with mental illness (Scanlan & Still, 2013), including those with schizophrenia (Hartman-Maeir, Katz, & Baum, 2009).

Cognitive Functional Evaluation

The discipline of occupational therapy outlined recommendations for cognitive functional evaluation (CFE) of clients who may have cognitive deficits (Hartman-Maeir et al., 2009). CFE may include six different types of assessments (AOTA, 2013). Assessment types include interview with the client and significant others, cognitive screening and/or baseline assessment, measures of cognition and executive function in occupation, cognitive tests for specific cognitive domains, measures of occupational performance integrated with cognitive skills, and environmental assessment (AOTA, 2013; Hartman-Maeir et al., 2009).

The CFE recommendations served as guidelines in choosing assessments for this review. The Complex Task Performance Assessment (CTPA; Wolf, Morrison, & Matheson, 2008) is an example of an assessment of functional cognition. The CTPA is a performance-based assessment that simulates the experience of working in a library and requires multi-tasking and responding to unexpected circumstances (Wolfe et al., 2008). The CTPA requires a 60-minute completion time making it a less practical and potentially less pleasant choice to assess executive function than the EFPT.

The CFE process also includes cognitive screening (Hartman-Maeir et al., 2009). The Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005) is an example of a cognitive screening that could be used in the CFE process. The MoCA (Nasreddine et al., 2005) is a s 30-item screening tool that assesses cognitive skills in the areas of executive function, attention, short-term and working memory, verbal fluency/language, visuospatial skills, abstract thinking, and orientation. Each correct response receives one point, with an additional point given when respondents have fewer than 12 years of education; scores less than 26 indicate cognitive impairment. The MoCA demonstrated greater sensitivity to mild cognitive impairment than the Mini-Mental State Examination (MMSE) in people who had experienced strokes (Pendlebury, Cuthbertson, Welch, Mehta, & Rothwell; 2010). There are three versions of the MoCA; tests 1 and 2 demonstrated strong test-retest reliability (intraclass correlation [ICC] = .81; Wu, Dagg, & Molgat, 2017).

The MoCA demonstrated validity as a cognitive screening tool for people with SMI; scores significantly correlated with the Brief USCD Performance-based Skills Assessment (USPA-B; Mausbach et al., 2007; $r = .51$, $p < .001$), a measure of functional capacity (Yang et al., 2018).

In people with schizophrenia, the MoCA demonstrated concurrent validity with the Brief Assessment of Cognition in Schizophrenia (BACS; Keefe et al., 2004; $r = .61$, $p < .001$), a 30-minute assessment that requires implementation by a neuropsychologist or trained administrator (Yang et al, 2018). The MoCA was sensitive to severe (AUC = .81, $p < .001$) and mild (AUC = .81, $p < .001$) cognitive impairment in people with schizophrenia (Musso, Cohen, Auster, & McGovern, 2014).

Self-Efficacy and Schizophrenia

While cognitive skills, including social cognition, affect functioning in people with schizophrenia (Bell et al., 2009), cognition does not account for all the variance in functional outcomes (Fett et al., 2011). Self-efficacy, that is, beliefs about what one can do, is being studied as a contributing factor (Cardenas et al., 2013). People with schizophrenia have lower self-efficacy than neurotypical people (Bentall et al., 2010; Ventura et al., 2014). Self-efficacy may affect functioning in people with schizophrenia through a pathway in which low self-efficacy leads to negative symptoms—especially avolition, that is, lack of motivation—which leads to decreased functioning (Bentall et al., 2010; Luther et al., 2018; Ventura et al., 2014). Researchers build on Bandura's work on self-efficacy to frame studies of the effect of self-efficacy on motivation, cognition, and functioning. This section describes Bandura's work on self-efficacy, summarizes the research on self-efficacy and schizophrenia, and reviews a self-efficacy assessment.

Bandura and Self-Efficacy Theory

Bandura (1977) defined self-efficacy as the belief in one's own abilities to be successful in tasks and to master the environment (Bandura, 1977). Bandura placed self-efficacy at the center of his social cognitive theory, which posited that agency—that is, having a sense of control over one's actions and environments—is fundamental to being human, and that people learn within the context of interacting with and observing others (Bandura, 1997, 2001). Motivation is linked to self-efficacy; when people have challenges, they have little motivation to persist unless they believe that they can be efficacious (Bandura, 1997, 2001). People are motivated to act when they have positive beliefs about their abilities to perform in given circumstances (Bandura, 1997). Individuals can increase self-efficacy by experiencing successes. Supportive relationships support the development of self-efficacy, as does focusing on what is familiar or achievable in activities and situations; focusing on deficiencies or what is difficult supports development of personal inefficacy (Bandura, 1997).

Bandura posited that interventions that target increasing self-efficacy could promote health (Bandura, 2004). Self-efficacy has been associated with changes in behaviors and thinking patterns that lead to more positive health outcomes. For example, in a study of people with cardiovascular disease, self-efficacy and illness perception mediated the relationship between illness severity, depression, and life satisfaction (Stecaa et al., 2013). Self-efficacy was related to goal setting and increased physical exercise in a study of people with serious mental illness (Zechner & Gill, 2016). Overall, decreased self-efficacy is associated with increased depression and anxiety (Bandura, 1997; Luszczynska, Scholz, & Schwarzer, 2005). Interventions that increase self-efficacy may be effective to improve outcomes related to mental health (Andersson, Moore, Hensing, Krantz, & Staland-Nyman, 2014).

Schizophrenia and Self-Efficacy

In schizophrenia research, self-efficacy is usually defined by Bandura's definition of belief in ability to successfully complete a specific task, but the literature also acknowledges a more general definition of having the self-confidence to successfully complete new or challenging tasks or to solve problems (Luther et al., 2018; Ventura et al., 2014). This aligns with the assertion of Eccles and Wigfield (2002) that self-efficacy may be more general and not specific to particular domains. In their study of the relationship between self-efficacy and functioning in different life domains, Kurtz, Olfson, and Rose (2013) found that beliefs about abilities to be successful were often not domain-specific in people with schizophrenia. The next paragraphs summarize schizophrenia research related to cognition, symptomology, and functioning and describe an instrument that assesses self-efficacy.

Personal beliefs, negative symptoms, and cognition. Self-efficacy and defeatist beliefs are two related but distinct concepts of personal belief that have been studied in schizophrenia research, with the latter receiving more attention to date (Luther et al., 2018). "Defeatist beliefs" are negative beliefs about oneself related to general activities and goals, for example, "if I fail partly, it is as bad as being a complete failure" (Grant & Beck, 2009, p. 805).

In schizophrenia research, both self-efficacy and defeatist beliefs are related to negative symptoms, especially experiential symptoms such as avolition, anhedonia, and asociality (Couture, Blanchard, & Bennett, 2011; Grant & Beck, 2009; Luther et al., 2018). Studies have investigated how the dynamic between negative symptoms and beliefs affects functioning (Green et al., 2015; Ventura et al., 2014). Ventura and colleagues (2014) found that in people who had recently been diagnosed with schizophrenia, both defeatist beliefs and self-efficacy were related to functioning, and that experiential negative symptoms mediated the relationship for both. Simply put, negative beliefs about one's abilities or chances for success lead to decreased motivation (avolition) or unwillingness to participate socially (asociality), which leads to decreased functioning. However, only self-efficacy, not defeatist beliefs, significantly contributes to cognition, which in turn influences functioning. Figure 3 illustrates the model based on the work of Ventura et al. (2014). Ventura and colleagues (2014) posit that the relationship between self-efficacy and cognition is likely due to the increased effort that individuals with higher self-efficacy give to cognitive tasks because they believe they can succeed. Increased cognitive functioning leads, in turn, to better functional outcomes.

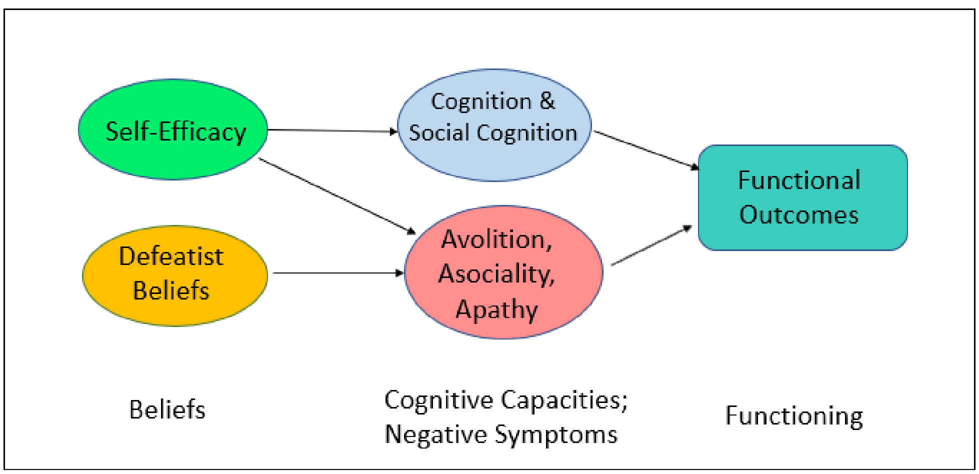


Figure 3. Beliefs Affect Cognition, Which in Turn Affects Functioning. Adapted from Ventura et al. (2014). In people with schizophrenia, self-efficacy and defeatist beliefs affect negative symptoms, which in turn influence functioning. Only self-efficacy affects cognitive skills, which leads to increased functioning.

Self-efficacy and functioning. Self-efficacy mediated the relationship between functional capacity and community functioning in a study of people with schizophrenia

(Cardenas et al., 2013). In another study, motivation impairment, defined as negative beliefs about abilities and associated decreased motivation to act, was related to poorer vocational, family, independent living, and social outcomes (Green, Hellemann, Horan, Lee, & Wynn, 2012). However, self-efficacy may only be a factor in functioning when individuals with schizophrenia have insight about their conditions (Kurtz et al., 2013).

Social self-efficacy in schizophrenia has also been studied. Vaskinn, Ventura, Andreassen, Melle, and Sundeta (2015) found that social self-efficacy was related to social functional capacity but not to non-social functional capacity or to non-social cognitive skills. In another study, interpersonal self-efficacy, beliefs about one's abilities to interact successfully, was associated with interpersonal functioning (Morimoto, Matsuyama, Ichihara-Takeda, Murakami, & Ikeda, 2012). In alignment with Ventura et al.'s (2014) model of the relationship between self-efficacy and cognition as they relate to functioning, Hill and Startup (2013) found that belief in ability to successfully complete a social cognitive theory of mind task was positively related to social functioning.

General Self-Efficacy scale. The General Self-Efficacy scale (GSE; Schwarzer & Jerusalem, 1995) is a standardized tool that measures individuals' perceptions of their abilities to cope with challenges and successfully complete their goals (Luszczynska et al., 2005). Participants use a 1-4 scale to indicate agreement level with 10 statements. Statements focus on beliefs about ability to solve problems and successfully complete unfamiliar or challenging tasks. Scores range from 10-40; higher scores reflect greater self-efficacy. The GSE measures a unidimensional construct of self-efficacy (Scholz, Doña, Sud, & Schwarzer, 2002), demonstrated internal consistency (N = 19120, α = .86) with a large international sample (Scholz et al., 2002), and has been used with people who have mental illness (Fukui, Davidson, Holter, & Rapp, 2010). Estimated administration time is 5-10 minutes.

Recovery and Strengths-Based Intervention

The recovery model has become the guiding model of practice for individuals who have SMI; Clossey & Rowlett, 2008). SAMHSA published a working definition of recovery for people with SMI, which states, “recovery is a process of change through which people improve their health and wellness, live self-directed lives, and strive to reach their full potential” (SAMHSA, 2017, para. 2). The recovery paradigm represents a departure from the more traditional deficit-based medical model and aligns well with the principles of occupational therapy (Stoffel, 2011) and psychiatric rehabilitation (Glynn, 2014). The definition of recovery includes 10 guiding principles, one of which is that an individual’s strengths and responsibility provide the foundation for personal recovery (SAMHSA, 2012).

Strengths-based approaches have been developed in several disciplines, including psychotherapy (Fluckiger, Caspar, Holtforth, & Willutzki, 2009), counseling (Davidson, 2014), and case management (Rapp & Goscha, 2012). The strengths-based approach in case management assumes that individuals have capabilities to meet daily living challenges and that focusing on the person’s deficits prevents them from accessing these inner strengths (Brun & Rapp, 2001). Although developed separately, these approaches reflect principles of positive psychology, a field that studies positive experiences and traits (for example, wisdom and courage) with the aim of enhancing happiness and well-being (Duckworth, Steen, & Seligman, 2005; Rapp & Goscha, 2012). No known rehabilitation research to date has focused on skill-based strengths, (e.g., an individual's ability to organize a task or to identify a partner's emotional state) rather than the trait-based strengths associated with positive psychology.

Strengths-based approaches have also been recommended for occupational therapy (Dunn, 2017; Synovec, 2014). AOTA's School Mental Health Work Group (2012) promoted a strengths-based approach for youth to increase occupational participation by focusing on young people's abilities and interests rather than on their impairments. As a recovery-oriented service, occupational therapy in mental health practice can help individuals to gain insight into their condition, increase occupational engagement, identify personal goals, and develop a greater sense of personal control (Synovec, 2014). The literature offers a few examples of the implementation of strengths-based approaches within the context of occupational therapy services (Hatfield, Falkmer, Falkmer, & Ciccarelli, 2018; Holland, Begin, Orris, & Meyer, 2018). A retrospective analysis found that occupational therapists, psychologists, and speech-language pathologists used deficit-based language significantly more often than strengths-based or neutral language in their documentation of services for children and families affected by autism spectrum disorders (Braun, Dunn, & Tomchek, 2017). No known studies in occupational therapy, and few in other disciplines, have applied strengths-based approaches to functional outcomes related to everyday living.

Studies of the efficacy of strengths-based approaches have had mixed results. A meta-analysis found no difference in functional and quality of life outcomes between strengths-based and other approaches in mental health treatment; the researchers also noted that strengths-based approaches were not well-defined (Ibrahim et al., 2014). A critical review of seven mental health services was more positive and found that services that used strengths-based approaches had positive effects on clients' sense of hope and self-efficacy (Tse et al., 2016). Both studies stated the need for more research on strengths-based approaches. Evaluation of strengths-based case management suggests that the model can be effective when steps to ensure fidelity to the model are in place (Fukui et al., 2012). Fidelity is important, as providers do not consistently utilize clients' strengths, even when working in programs that use strengths-based models (Harbin, Gelso, & Pérez Rojas, 2014). Consumers of mental health services noted the importance that hope plays in their rehabilitation and stated that one way that providers can enhance hope is by focusing on what consumers can rather than cannot do (Lietz, Lacasse, Hayes, & Cheung, 2014).

Strengths-based approaches may also be considered from the perspective of enhancing self-efficacy. In people with schizophrenia, decreased self-efficacy has been associated with perceived or internalized stigma (Hill & Startup, 2013; Kleim et al., 2008). Psychiatric rehabilitation staff may have stigmatizing perceptions of their clients, which must be addressed by supervisors (Nemec, Swarbrick, & Legere, 2015). Supervision that focuses on strengths may be especially important for staff of psychiatric rehabilitation programs, who tend to have varying levels of training, education, and experience (Rapp, Goscha, & Fukui, 2015).

Psychiatric Rehabilitation

Psychiatric rehabilitation is a distinct field with its own philosophy, values, and interventions and may be utilized by practitioners from a variety of disciplines in their work with people who have mental illnesses (Farkas & Anthony, 2010). The overall purpose of psychiatric rehabilitation is recovery, defined as the person's lived experience of the journey from the onset of mental illness to a meaningful life (Deegan, 2002; Farkas & Anthony, 2010). The focus of psychiatric rehabilitation is to support individuals in developing role functioning, that is, to develop the skills and supports that they need to engage in the life roles that they want in their chosen environments (Anthony, Cohen, Farkas, & Gagne, 2002).

Psychiatric rehabilitation focuses on developing skills, modifying environments, and accessing supports in order to realize a life role (Farkas & Anthony, 2010). Guided by a psychiatric rehabilitation practitioner, an individual identifies the life role that they want to develop, participates in a functional assessment, and creates a rehabilitation plan (Anthony & Farkas, 2009). The functional assessment and rehabilitation plan typically address five life domains: living, learning, working, socializing, and wellness. The rehabilitation plan names skills that are important to the individual and identifies specific interventions that the individual and practitioner will work on together to develop those skills (Anthony & Farkas, 2009).

Occupational therapy shares with psychiatric rehabilitation its focus on recovery and client-centered service (Brown, 2009; Lipskaya-Velikovsky, Kotler, & Krupa, 2016). Occupational therapists in mental health practice understand life roles as they relate to quality of life (Hachey, Boyer, & Mercier, 2001) and use interventions to help individuals develop skills for engagement in daily occupations and meaningful activities (Brown, 2009). In psychiatric rehabilitation, occupational therapists collaborate with other providers and share expertise in many areas including cognition, activity analysis, sensory processing, and occupational performance (Brown, 2009). One important way that occupation therapy can contribute to the psychiatric rehabilitation process is by providing assessment in these areas as they relate to the individual's functioning (Brown, 2009).

Satisfaction With Life

While functional recovery, that is, the ability to engage in activities, is vital, the overall goal of psychiatric rehabilitation is for people to experience well-being and life satisfaction (Chan, Mak, Chio, & Tong, 2018). Subjective feelings of hope and fulfillment are often more important to clients than are functional outcomes (Bellack, 2006). A positive relationship between life satisfaction and overall functioning has been demonstrated in people with schizophrenia, but not necessarily in the specific domains of socialization and work (Edmondson, Pahwa, Lee, Hoe, & Brekke, 2012). The inclusion of individuals' subjective experiences as an outcome, for example, satisfaction with life, is implicit in and an important part of the recovery model (Bellack, 2006). Quality of life is another nonclinical outcome; however, quality of life may measure functional outcomes (Test, Greenberg, Long, Brekke, & Burke, 2005) or health status (Fervaha, Agid, Takeushi, Foussias, & Remington, 2013) rather than individuals' subjective experiences. The Satisfaction with Life scale (Test et al., 2005) focuses on individuals' subjective experiences as an outcome.

The Satisfaction with Life scale (SWL; Test et al., 2005) is an 18-item instrument that measures the subjective life satisfaction in four areas: living situation, social relationships, work, and self and present life. Respondents receive a total score for each domain; a summation score of the entire scale is not considered valid (Test et al., 2005). This may be important when measuring outcomes related to intervention; for example, in one study individuals' improved social functioning did not lead to improved satisfaction with life in the social domain (Edmondson et al., 2012). However, researchers have used the total score in studies of people with schizophrenia. Negative relationships were found between life satisfaction and loneliness (Eglit, Palmer, Martin, Tu, & Jeste, 2018); and with depression, anxiety, positive symptoms, psychosocial functioning, and attitudes towards medication (Fervaha et al., 2013). Researchers found positive relationships among life satisfaction and verbal memory, objective quality of life, and verbal skills (Kurtz, Bronfeld, & Rose, 2012).

Test et al. (2005) reported on psychometric properties of the SWL with people with schizophrenia. Internal reliability was demonstrated in two samples for three of the four subscales: Cronbach's alphas for living situation were $\alpha = .74$ and $\alpha = .76$; for social relationships, $\alpha = .80$ and $\alpha = .81$; and for self and present life, $\alpha = .83$ and α =. 82. The work subscale has only two items and had lower internal reliability: $\alpha = .61$ and $\alpha = .74$. Lee, Brekke, Yamada, & Chou (2010) used measurement invariance to show that the construct validity of the SWL scale remained stable over the course of one year, suggesting that the instrument's subscale scores can be used as outcome measures and compared over time.

Model of Human Occupation (MOHO)

Kielhofner's model of human occupation (MOHO; Taylor, 2017) offers a framework for assessment and intervention that served as the theoretical model for this study. This section provides a general overview of MOHO and a discussion of the model's application to this study.

MOHO Overview

MOHO is a client-centered and occupation-focused model that describes the process by which people motivate toward, acclimate to, and engage in occupations within the context of social and physical environments; MOHO also conceptualizes how individuals adapt and create fulfilling lives (Taylor & Kielhofner, 2017). The person is conceptualized as having three parts: volition, habituation, and performance capacity (Yamada, Taylor, & Kielhofner, 2017). Volition includes values, interests, and personal causation, that is, the person's perception of capacities and self-efficacy. Habituation includes roles and internalized habits that support engagement with environments. Environments are assessed for the supports, constraints, demands, and opportunities that they provide. Performance capacity is the ability to do activities, as determined by underlying mental and physical capacities and by the person's subjective experience (Yamada et al., 2017). Performance capacities—neurological, cognitive, musculoskeletal, and perceptual—are the foundations for functional skills (Parkinson, Forsyth, & Kielhofner, 2006).

Occupational skills are observable goal-directed actions (de las Heras de Pablo et al., 2017), and consist of three types: motor skills, process skills, and communication and interaction skills. For example, skills related to the occupation of cooking a meal might include following a recipe (process skills), chopping vegetables (motor skills), and working with a partner (communication and interaction skills). Skills differ from performance capacities in that capacities are underlying abilities, while skills are the functional actions that reflect the interaction between the person and the environment (de las Heras de Pablo et al., 2017).

The environment encompasses social, physical, and occupational contexts that both offer opportunities and make demands (Fisher, Parkinson, & Haglund, 2017). The physical environment includes objects and spaces, both natural and human-made. The social environment includes both relationships and interactions and encompasses the community and broader societal attitudes. The occupational environment includes occupations and activities, and encompasses an overarching occupational context that includes supports (e.g., adaptations, healthcare services), funding and policies (e.g., government/economic support for participation, available resources to initiate and maintain occupations), and participation (opportunities to make decisions, role development; Fisher et al., 2017).

Participation in occupations leads to occupational adaptation, a process by which people develop and change to meet challenges or to experience well-being (de las Heras de Pablo et al, 2017). Occupational adaptation comprises three elements: occupational identity, occupational competence, and environmental impact (de las Heras de Pablo et al., 2017). To summarize de las Heras de Pablo et al. (2017), occupational identity refers to a self-concept that includes personal causation, interests, values, volitional choices, and anticipation of environmental supports and demands. Occupational competence is a person’s ability to maintain a pattern of occupations that supports an occupational identity. Environmental impact refers to the dynamic interaction between the person and the many-faceted environment that presents both opportunities and constraints—an interaction that changes both the person and related physical, social, cultural, political, and economic facets of the environment (de las Heras de Pablo et al., 2017). Figure 4 illustrates MOHO and the occupational adaptation process.

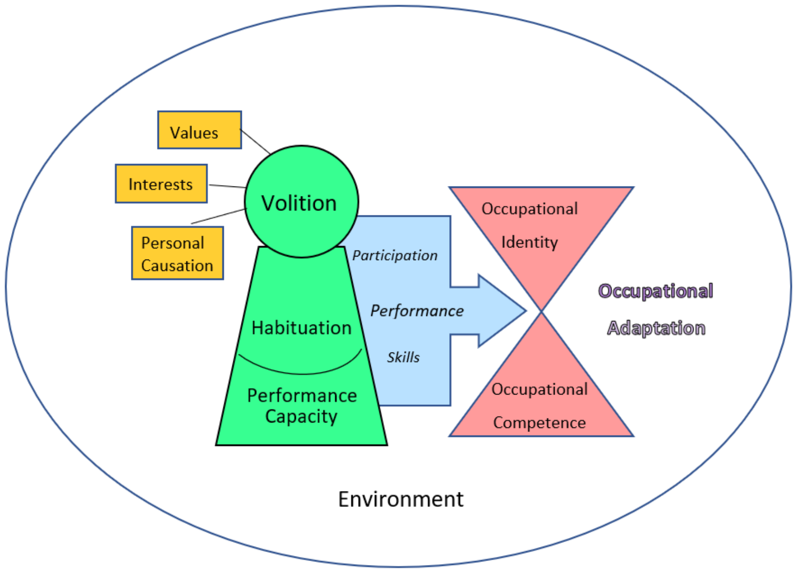


Figure 4. MOHO and the Process of Occupational Adaptation. The person—as influenced by volition, habituation, and performance capacities—interacts with the environment via participation, occupational performance, resulting in occupational competence and occupational identity (adapted from de las Heras de Pablo et al., 2017).

Relevant MOHO Concepts

MOHO provides a theoretical framework for this study through its conceptualization of how occupational identity and occupational competence support occupational adaptation, resulting in personal change and increased well-being. Put more simply, self-efficacy is part of personal causation, which directly affects a person's occupational identity—a view of the self as an occupationally competent and effective agent in one's environments. The next section highlights three aspects of MOHO as they relate to this study: performance capacity, personal causation, and the volitional process.

Performance capacity. Performance capacity is the ability to perform activities, as determined by underlying mental and physical capacities and by the person's subjective experience (Yamada et al., 2017). This study considered mental capacities related to executive function and social cognition as they affect occupational performance. Specifically, this study explored the potential of increasing individuals' awareness of performance capacity strengths, thereby affecting subjective experience of their own capacities (that is, making beliefs more positive, i.e., increasing self-efficacy) to promote the transformation of these capacities into process and communication/interaction skills. These skills may then be used for the occupations that support occupational identity.

Personal causation. Volition has three components: values, interests, and personal causation; personal causation is highlighted here because of this study's focus on self-efficacy. Personal causation has two elements: sense of personal capacity and self-efficacy (Lee & Kielhofner, 2017).

***Sense of personal capacity*.** Sense of personal capacity refers to the person's self-assessment of their own capacities. People with disabilities may have difficulty appraising their capacities, which can lead to over- or under-rating their abilities and thereby impeding successful and satisfying occupational performance (Lee & Kielhofner, 2017). A negative sense of personal capacity that causes personal shame or fear of failure leads to decreased motivation to engage in occupations or learn new skills. On the other hand, a positive sense of personal capacity provides the individual with motivation to act, which then provides feedback that they are indeed capable (Lee & Kielhofner, 2017). The assessment process can be used to appraise participants from a strengths-based perspective, apprise them of their strengths, and increase their understanding of how strengths contributed to their occupational performance.

Self-efficacy. MOHO defines self-efficacy as beliefs about personal self-control and ability to effectively use capacities (Lee & Kielhofner, 2017). Self-control allows people to manage emotions and thoughts and to control behaviors and actions. Feeling out of control makes goal-directed actions difficult, while self-control enables the ability to adapt (Lee & Kielhofner, 2017). Self-efficacy refers to a sense of control over the environment. Impairments may lead people to believe that they have very little control over their environment or over what happens to them and that they cannot take care of themselves; decreased self-efficacy may even lead to a sense of helplessness (Lee & Kielhofner, 2017). A strengths-based prompting intervention could be used to reinforce participants' use of their capabilities and of strategies to address difficulties, allowing them to experience control over their environment through successful and satisfying occupational performance.

Volitional process. The volitional process in MOHO describes the interaction of values, interests, and personal causation as they occur in everyday life (Lee & Kielhofner, 2017). The volitional process includes anticipation, making choices, experience, and interpretation. People anticipate their actions based on their interests, values, and personal causation. In this study, identifying strengths served to initiate the volitional process by allowing participants to anticipate actions from a strengths-based lens. After anticipating, people make choices about their activities and occupations (Lee & Kielhofner, 2017).

Lee and Kielhofner (2017) stated that experience influences people's feeling of anxiety or confidence, which in turn affects quality of life. Life satisfaction is important as an outcome that is based on lived experience and is separate from functional outcomes. Finally, people interpret their actions and experiences through the lenses of their values, interests, and personal causation. An increased sense of performance capacity or self-efficacy can affect how people see their occupational performance (Lee & Kielhofner, 2017).

MOHO Application to this Study

MOHO is a person-centered dynamic model that conceptualizes how people engage in occupations with their environments and, through a process of occupational adaptation, move toward occupational competence and occupational identity (Taylor, 2017). The model is holistic and as such, MOHO is complex and has many components. The preceding section summarized the components most relevant to the current study. Figure 5 presents a graphic visualization of MOHO as a framework that integrates the study's concepts. In this framework, executive function and social cognition affect functioning in people with schizophrenia, but the path from cognitive performance capacity to occupational performance is not direct. Beliefs about abilities and efficacy affect how individuals use capacities. Decreased self-efficacy, which is associated with negative symptoms (e.g., avolition), impedes individuals' abilities to make use of their performance capacities. Helping individuals to understand and use their strengths may change their beliefs and promote transformation of capacities to skills, thereby improving occupational performance. Individuals' beliefs in their abilities and subsequent experience of successfully using skills to reach personal goals may improve their life satisfaction and lead to recovery.

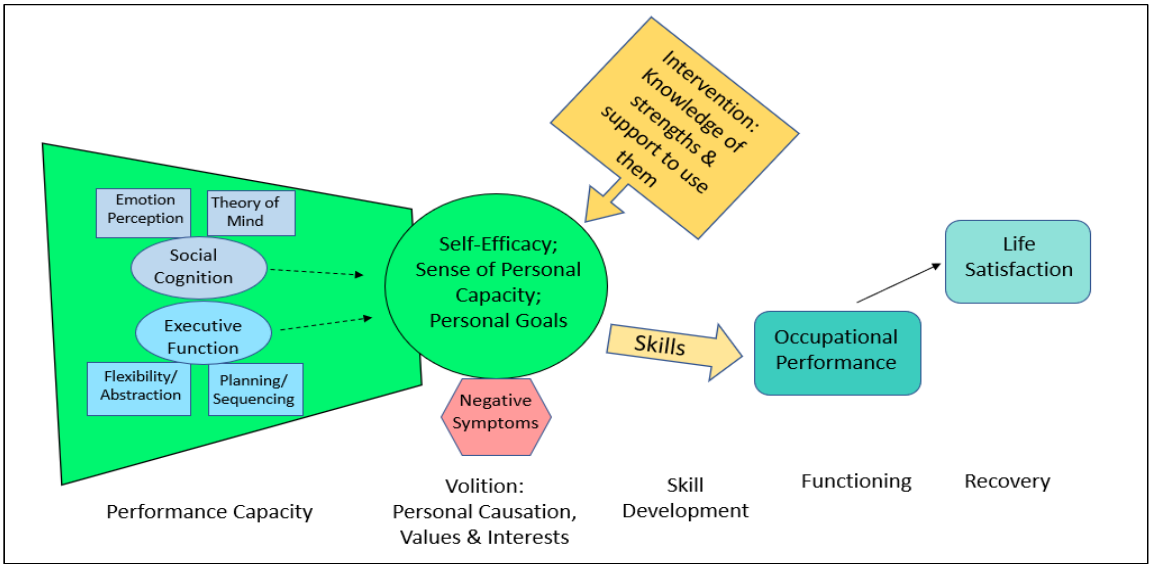


Figure 5. MOHO as a Framework for Using Strengths to Increase Self-Efficacy and Functioning, Leading to Recovery.

MOHO includes a variety of instruments that evaluate many aspects of the model. In the current study, the Model of Human Occupation Screening Tool (MOHOST v.2.0; Parkinson et al., 2006) was used to identify performance strengths, to collect observational data and to serve as an outcome measure of occupational performance. The following section describes the MOHOST and the development of a video-based training tool.

Model of Human Occupation Screening Tool (MOHOST)

The MOHOST v.2.0 (Parkinson et al., 2006) is a non-invasive observational assessment of occupational performance that is based on MOHO and was originally developed for mental health practice. In the present study, the MOHOST was utilized to identify participants' performance strengths, to collect data (repeated measures) on occupational performance, and to serve as an outcome measure of occupational performance. The following discussion describes the MOHOST.

The MOHOST can be used in home, community, and clinical environments. The tool integrates multiple observations and may include information from different sources; however, it can also be completed following a single observation (MOHOST-SOF, Parkinson, Chester, Cratchley, & Rowbottom, 2008). The MOHOST is helpful in treatment planning (Parkinson et al., 2008), and useful as an outcome measure (Kramer, Kielhofner, Lee, Ashpole, & Castle, 2009).

The MOHOST (Parkinson et al., 2006) is a measure of occupational participation and performance that consists of six sections, each a MOHO factor: volition (motivation for occupation), habituation (pattern of occupation), communication and interaction skills, process skills, motor skills, and environment. Each section contains four items, for a total of 24 items. The MOHOST supports an assessment process that is client-centered and occupation-focused (Maciver et al., 2015). Occupational therapists (raters) observe individuals as they engage in occupations, and rate performance on a 4-point scale that specifies whether the factor facilitates (F, 4), allows (A, 3), inhibits (I, 2) or restricts (R, 1) occupational participation. Raters may also consider knowledge about occupational performance in other contexts, including information from other team members. The MOHOST functions as a comprehensive summary that integrates multiple observations and information from different sources; however, the tool can also be completed following a single observation (Parkinson et al., 2008). The MOHOST, therefore, may be used as a full assessment completed with multiple observations and data sources, or, when time and efficiency are concerns, as a measure of occupational performance following a single observation (Maciver et al., 2015, 2016).

MOHOST practice settings and populations. The MOHOST was originally developed for use in mental health practice (Parkinson et al., 2006) and is commonly used in England in adult psychiatric practice settings (Parkinson et al., 2008). However, the MOHOST has been used with a variety of practice settings, including: forensic clients in low and medium-security settings (Fan, Morley, Garnham, Heasman, & Taylor, 2016; Fitzgerald, 2011); elders with chronic conditions (e.g., stroke) in an independent living program (Dugow, Connolly, & Yuen, 2012); elders with mental health concerns (Maciver et al., 2016); people with learning (i.e., intellectual) disabilities (Hawes & Houlder, 2010); adults with physical rehabilitation needs (Taylor, Bowyer, Tran, Carithers, & Muñoz, 2013); people with dementia living in the community (Swinson et al., 2016); and people at the first episode stage of psychosis (Lee et al., 2011). In mental health practice, the MOHOST has been used in both acute psychiatric inpatient (Kramer et al., 2009; Mitchell & Neish, 2007) and psychiatric rehabilitation (Maciver et al., 2016) settings. Maciver et al. (2015) developed a protocol for assessment of clients with mental illness that uses the MOHOST-SOF as an initial assessment, as a tool to guide goal-planning and intervention, and as an outcome measure.

Psychometric properties of the MOHOST. Rasch analysis of the initial version of the MOHOST (version 1.0) demonstrated evidence of the tool's reliability and validity, including that the MOHOST has internal validity as an assessment of occupational participation (Forsyth et al., 2011). The MOHOST demonstrated concurrent validity with the MMSE, Volitional Questionnaire, and Assessment of Communication and Interaction Skills (Pan et al., 2011). Interrater reliability refers to the extent to which raters assign the same score to the same assessment item or variable (McHugh, 2012). Interrater reliability was demonstrated in a study of the MOHOST as an outcome measure; rater interchangeability over multiple observations served as an indication of interrater reliability (Kramer et al., 2009). Occupational therapists can administer the MOHOST reliably and validly by reading the manual; no formalized training is required (Kramer et al., 2009).

Clinical utility of the MOHOST was also demonstrated. Occupational therapists have described the MOHOST as not only having a strong theoretical framework, but also as a tool that helped them to think critically about clients' occupational participation (Forsyth et al., 2011). Occupational therapists who work with people with mental illnesses have said that they were able to implement the tool quickly and unobtrusively (i.e., that the MOHOST is not invasive; Parkinson et al., 2008). Occupational therapists in several studies have found the MOHOST to be a useful assessment that is easy to administer (Forsyth et al., 2011; Hawes & Houlder, 2010; Mitchell & Neish, 2007), and to be helpful in treatment planning (Parkinson et al., 2008). The MOHOST was also found to detect change over time, and therefore to be useful as an outcome measure (Kramer et al., 2009).

The MOHOST can be used in two ways—single observation during one activity or intervention, or comprehensive summary following multiple observations incorporating information from different contexts and sources (Maciver et al., 2016; Parkinson et al., 2008). While both versions are widely used clinically, the psychometric properties of the MOHOST have mainly been conducted using the comprehensive version. Study of psychometric properties using the single observation form (MOHOST-SOF) revealed that the tool's ratings represented true differences among participants' functioning and that the MOHOST-SOF reliably detected change over time (Maciver et al., 2016).

Rasch analysis confirmed that MOHOST items were scaled properly, that is, that items that are more challenging were more likely to have lower ratings. Furthermore, items in five of the categories demonstrated fit, meaning that they held together as a construct within that category. The environment category had items that did not fit, which was consistent with prior research on the full MOHOST (Kramer et al., 2009). Maciver et al. (2016) reported that they agreed with prior researchers' opinion that misfit was a function of the wide variety of client environments, and the varying effects of environment on occupational performance; however, Maciver et al. recommended further research in this area. The researchers found that for therapists in clinical practice, the MOHOST-SOF is a sound instrument that has adequate validity and reliability and can be used to measure change; the tool is especially useful when time is an issue. Since psychometric testing of the MOHOST-SOF was limited, Maciver et al. (2016) recommended that the full version of the MOHOST be used when data accuracy is paramount.

Development of a Video-based Training for MOHOST Administration in this Study

Formal training is not required to administer the MOHOST reliably in clinical practice (Kramer et al., 2009). However, since clinical research requires evidence of consistency among raters, rater training can help to ensure interrater reliability (McHugh, 2012). To enhance interrater reliability of the MOHOST and to ensure that the instrument is used to validly measure occupational performance, the principal investigator for this dissertation and her mentor developed a video-based training tool for this study. The procedure for developing the tool is summarized in the paragraphs that follow.

The principal investigator and her mentor chose three video clips from television and film, which were downloaded from YouTube. Each video was a clip from a recent television show or movie, and featured characters engaged in occupations. Clips were chosen based on the opportunities that they provided for assessments of occupational performance in a variety of life domains with individuals of varying capacities and skills. The researchers used the MOHOST-SOF to assess the occupational performance of seven characters, resulting in seven assessments. Occupations that were assessed included: hosting a brunch (two characters), socializing as a brunch guest, completing a homework project, facilitating homework/parenting, preparing to go for a run (including attempting to use the bathroom), and serving as a caregiver. Table 1 provides a list of the video clip titles, characters, and occupations.

Table 1

MOHOST Training Video Clips with Characters and Occupations

Character	Occupation	Source
Sheldon	Co-hosting a brunch	*Big Bang Theory*[1]
Amy	Co-hosting a brunch	*Big Bang Theory*[1]
Stuart	Being a brunch guest	*Big Bang Theory*[1]
Lily	Completing homework (science fair project)	*Modern Family*[2]
Cameron	Facilitating daughter's homework (science fair project)	*Modern Family*[2]
Alice	Preparing for a run (including toileting)	*Still Alice*[3]
John	Caregiving; being a partner	*Still Alice*[3]

[1]Lloyd et al., 2017; [2]Lorre et al., 2016; [3]Georges et al., 2014

The process for developing the MOHOST training tool for increased interrater reliability was as follows. Both researchers were occupational therapists and educators with experience in mental health practice. Researchers viewed each clip independently and then together agreed upon the target characters and their occupations. Researchers then independently assessed each character's occupational participation using the MOHOST-SOF. Following assessment, researchers met via phone conference and discussed their ratings. Researchers agreed with most of each other's ratings; they discussed ratings that were not identical reached agreement in all instances. MOHOST-SOF forms were then collaboratively completed for all the characters. Comments were noted on all items to provide evidence for ratings and to be used in training.

Single-Case Experimental Design

Single-case experimental design (SCED), one of the methods that was used in this study, will be briefly described in this section. Because of the variation in executive function impairment and differences in daily functioning, studies that take an individualized approach to investigating patterns of functioning in people with schizophrenia are important to include in the research (Iampietro et al., 2012). Single case design allows the researcher to focus on individual participants (Kazdin, 2011).

Single-case research is useful to investigate the effectiveness of interventions, as well as to study interactions between individual characteristics (e.g., symptoms and skills) and functional outcomes; single-case research is also appropriate for clinical settings (Kazdin, 2011; Portney & Watkins, 2009). One of the advantages of using single-case designs in clinical settings is that changes to the intervention (or design) can be made during the study if deemed to be in the best interest of participants (Kazdin, 2011). Designs used in single-case research are known by several names: single-subject design (SSD; Johnston & Smith, 2010; Portney & Watkins, 2009), single-case design (SCD; Kazdin, 2011; Shadish et al., 2014), SCED (Tate, Perdices, Rosenkoetter, McDonald, et al., 2016), and N-of-1 trials (Shamseer et al., 2016). The latter term, used in both behavioral and medical research, is more commonly associated with physical and pharmacological medicine, and typically includes withdrawal of an intervention (Shamseer et al., 2016). The term "SCED" was used for this study, as "single-case" is the more accepted term

(Kratochwill & Levin, 2010) and “experimental” indicates that a variable was introduced (the intervention) with participants serving as their own controls (Tate, Perdices, Rosenkoetter, McDonald, et al., 2016).

This study followed guidelines for SCED research as per the *Single-Case Reporting Guideline in BEhavioural Interventions* (SCRIBE; Tate, Perdices, Rosenkoetter, McDonald, et al., 2016; Tate, Perdices, Rosenkoetter, Shadish, et al., 2016). A study that utilizes SCED is considered quasi-experimental when there are two phases—an AB design—without randomization, as not including an additional phase (with withdrawal of the intervention or introduction of a new intervention) limits the study’s internal validity (Tate, Perdices, Rosenkoetter, Shadish, et al., 2016). However, internal validity is strengthened by using statistical analyses, by measuring participant outcomes, by including randomization, and by including variations in the start times of the intervention phases, observation settings, observed activities, or number of observations per phase, that is, by having multiple baselines (Kratochwill & Levin, 2010). “Multiple baselines” may refer to inclusion of multiple participants, phases, timeframes, settings, and/or interventions (Kratochwill & Levin, 2010; Kratochwill et al., 2013). A study with a multiple-baseline SCED requires a minimum of six individual phases—for example, three participants with two phases each, with at least five observations per participant in each phase (Kratochwill et al., 2013). SCED guidelines also recommend using fidelity forms to ensure that interventions are implemented appropriately (Tate, Perdices, Rosenkoetter, McDonald, et al., 2016).

Analyses in Single-Case Research

Visual inspection to compare graphically presented data is the main technique for single-case research analysis (Kazdin, 2011). However, the utilization of both visual and statistical methods is recommended (Brossart, Vannest, Davis, & Patience, 2014; Kazdin, 2011).

Visual analysis. Data in single-case research are graphically presented so that observations may be seen across baseline and intervention phases and analyzed for clinically significant outcomes (Kazdin, 2011). There are four data characteristics that are considered in visual analysis: two related to the magnitude of data (mean and level) and two related to rate (trend and latency; Kazdin, 2011). Change in mean refers to comparing the overall means of data points in each phase. Change in level refers to an upward or downward shift in data magnitude when an intervention is introduced or withdrawn. Trend refers to change in the data as reflected by an upward or downward slope in the data trend line. Latency refers to the time period needed for data to show change; the closer to the introduction of intervention that the data shifts, the less latency there is and the greater the likelihood that change resulted from the intervention (Kazdin, 2011). Kratochwill et al. (2013) suggest a step-by-step method of visual analysis and specify that three visual indicators must be present in the data for a causal relationship between intervention and dependent variables to be inferred.

Statistical analysis. Statistical testing is controversial in single case research (Johnston & Smith, 2010). This is because the statistical procedures typically used in between-groups quantitative analyses (e.g., *t* and *F* tests) depend on *unrelated* data (e.g., from different participants), whereas SCED uses repeated measures that are related to each other; this results in serial dependence and autocorrelation that precludes the usual statistical analyses (Brossart et al., 2014; Johnston & Smith, 2010; Kazdin, 2011). However, statistical analysis can play a vital role in single-case research, as change that results from intervention may be difficult to see, especially when there is a trend in baseline data or variability in any phase (Kazdin, 2011). There is agreement that calculating effect size is important (Brossart et al., 2014; Hedges, Pustejovsky, & Shadish, 2013; Shadish et al., 2014). Effect size offers an objective measure that is less sensitive to autocorrelation, and to the subjective bias inherent in visual analyzers' understanding of the *meaning* of graphically presented data (Brossart et al., 2014).

Several statistics to measure effect size in single-case studies have been proposed. Shadish et al. (2014) developed a standardized *d*-statistic for SCED based on Cohen's *d*, which is typically used in between-groups research. This new *d*-statistic is useful for single-case studies with multiple baselines (Hedges et al., 2013).

Summary

This chapter presented a literature review of schizophrenia—including its neurobiology, related cognitive sequelae, and implications for occupational performance—as the condition relates to concepts that are central to the present study. Along with neurobiology/ neurodevelopment and occupational performance, these concepts include executive function, social cognition, functional cognition, strengths-based approaches, self-efficacy, recovery, life satisfaction, psychiatric rehabilitation, MOHO, and single-case design.

The literature notes the importance of addressing cognition and using strengths-based approaches in rehabilitation but acknowledges that strengths-based approaches are neither well-defined nor well-researched and that cognitive remediation does not unilaterally lead to improved functioning; other factors, including self-efficacy may play a role. Chapter III presents the methodology for a study that utilized SCED to investigate a strengths-based cognitive intervention to improve occupational performance and self-efficacy in individuals with schizophrenia spectrum disorders.

CHAPTER III

METHODOLOGY

Chapters I and II provided an overview of the dissertation and a review of the literature on schizophrenia as related to neurophysiology, executive function, social cognitive skills, self-efficacy, recovery, psychiatric rehabilitation, and occupational performance. SCED, MOHO, and MOHOST were also reviewed along with development of a training protocol for the MOHOST. This chapter describes the methods that were used for implementing the dissertation study.

Purpose

The purpose of this study was to investigate the effects of a strengths-based cognitive prompting intervention on the occupational performance, self-efficacy, and cognition of adults with schizophrenia or schizoaffective disorder. Strengths-based cognitive prompting was defined for the purposes of this study as activities aimed at enhancing individuals' understanding and use of strengths, as well as their understanding and use of strategies to mitigate challenges. The study's secondary purpose was exploratory, and examined the relationships among occupational performance, self-efficacy, cognition (including executive function, social cognitive skills, and global cognition), symptomology, and life satisfaction in people with schizophrenia or schizoaffective disorder. A final purpose of the study was to gain an understanding of the participants' experiences of the intervention and assessment process, in order to assess the feasibility of implementing the intervention and assessment protocol.

Research Questions

The following research questions guided this study:

1. How does the strengths-based cognitive prompting approach affect occupational performance (functioning), self-efficacy, and cognition?
2. What are the relationships among self-efficacy, cognition (including executive function and social cognition), symptomology, life satisfaction, and occupational performance?
3. What is the feasibility of using assessments from this study as part of an evaluation protocol?
4. What is the lived experience of using the strengths-based cognitive prompting intervention?

Hypotheses

This study tested the following hypotheses:

1. The intervention is related to improved functioning, self-efficacy, and subjective executive function.
2. The independent variables are related to different domains of occupational performance.
3. The assessments are mostly well-tolerated and add information for directing intervention.
4. Participants express increased self-confidence in occupational performance, that is, activity performance and participation.

The study received approval from the Institutional Review Board (IRB) of Texas Woman's University and was granted an extension. In addition, following a presentation by the PI to the Ethics Committee of a community behavioral health organization, approval was given for the study to be implemented in the organization's Psychiatric Rehabilitation Services (PRS) program. Appendix A includes the study's approval forms. The following section provides descriptions of the research design, participants, research team, and study procedures for data collection and analyses.

Research Design

This mixed-methods study incorporated SCED, quantitative methods, and qualitative methods. The following paragraphs briefly summarize each of the three methods as they pertain to this study.

Multiple-baseline SCED investigated the effect of the strengths-based cognitive prompting intervention on the dependent variables. The study was quasi-experimental because it lacked randomization, although it met SCED criteria. The PI attempted randomization by planning to randomly assign participants to either intervention or control (waitlist) conditions if there were more than eight participants; however, six individuals expressed interest and gave informed consent. Settings, activities, and times could not be randomly assigned as the person-centered nature of psychiatric rehabilitation required that these be dictated by participant preference and need. However, the variety of goals, activities, and environments chosen by participants, and the differences in their phase start times and session frequencies, strengthened the internal and external validity of this multiple-baseline study.

Quantitative methods were used for data related to assessment scores. Quantitative analyses compared assessment scores pre- and postintervention and explored relationships among study variables. The dependent variables were functional EF, objective EF, subjective EF, emotion perception, theory of mind, self-efficacy, life satisfaction (including satisfaction with domains of living situation, self and present life, social relationships, and work), and symptomology. Quantitative analyses also included occupational performance scores.

Qualitative methods included a focus group and brief interviews at the end of the intervention phase to understand participants' perspectives of the intervention and the assessment protocol. These methods reflect a phenomenological approach. In qualitative research, phenomenology is an approach that seeks to understand the participants' experiences (Creswell & Poth, 2018). The study's qualitative aspect highlights participants' lived experience, which aligns with the recovery model and the person-centered natures of occupational therapy and psychiatric rehabilitation. Qualitative analysis addressed research questions related to participants' perspectives of the intervention and the feasibility of the assessment protocol.

Research Team

The PI served as the director of the PRS program and was the author of this dissertation. The PI was credentialed as a certified psychiatric rehabilitation practitioner (CPRP) and had over 7 years of experience working with people with SMI. Research assistants (RAs) included two level II fieldwork occupational therapy students and four PRS staff members. The PI and four PRS staff members each provided intervention for one of the study participants, for whom they served as the primary PRS practitioner. This was part of the study design, so that the intervention could be incorporated into regular PRS activities. In addition, the research team included two PRS clinical supervisors so that their supervisees who served as RAs could discuss their clients as part of their work as PRS practitioners. Table 2 provides a list of research team members and their roles in the study.

The occupational therapy fieldwork students served as observers in the study until completion of their internships, at which time the PI trained three of the PRS RAs to use the MOHOST as observers. Due to scheduling constraints inherent in the day-to-day operations of a clinical setting, PRS staff who worked with a participant needed to complete the MOHOST observation form for some sessions. The PI provided training for all RA observers to reliably implement the MOHOST, as per the training protocol described in Chapter II.

Table 2

Research Team

Study Role	Position	Credentials
Principal Investigator	Director of Psychiatric Rehabilitation Services (PRS)	MS, OTR/L, CPRP*; PhD Candidate
RA (data collection)	OT Level II Intern	OT Master's Student
RA (data collection)	OT Level II Intern	OT Clinical Doctorate Student
RA (intervention/data collection)	PRS worker	BA Psychology
RA (intervention/data collection)	PRS worker	BA Psychology
RA (intervention/data collection)	PRS worker	BA Religious Studies
RA (intervention)	PRS worker	BA; Master's student in Community Counseling
Research team	PRS Clinical Supervisor	BA Psychology, CPRP*
Research team	PRS Clinical Supervisor	BA Psychology, CPRP*

*Certified Psychiatric Rehabilitation Practitioner

Participants

The five participants who completed this study were members of a voluntary community-based PRS program in the middle Atlantic region of the United States. Participants were observed and received intervention during their regular sessions in the PRS program, within the context of their self-identified goals and action steps on their rehabilitation plans. In the PRS program that was the setting of the current study, the rehabilitation plan was called an "Individual Rehabilitation Plan" (IRP) and was developed collaboratively by the individual and the psych rehab practitioner. The IRP specified an overall goal in the form of a life role that the individual wanted to obtain or further develop (e.g., employee, parent, housemate), a preferred environment (office, current apartment, house in a safe neighborhood), and a timeframe (e.g., by April 2020). The IRP had objectives, often written as skills to be developed, that addressed the goal and corresponded to one of the five domains. Each objective had its own timeframe (e.g., 90 days) and included interventions or action steps that described what the person and the practitioner would do to meet the objective. Success was measured by achieving objectives and the overall life role goal, which aligns with the definition of recovery as living a life that has meaning and purpose for the individual.

As per usual implementation in the PRS program, services were provided both individually and in groups: at individuals' homes, in the community, and at the PRS site, depending on the preferences of the individuals. The following section describes inclusionary and exclusionary criteria and recruitment procedures.

Inclusionary and Exclusionary Criteria

Participants in this study met the following inclusionary criteria:

- Diagnosed with schizophrenia or schizoaffective disorder. Diagnosis was confirmed through chart review. Participants' charts had evidence (e.g., psychiatric evaluation) of diagnosis made by a qualified medical professional.
- Fluent in English. This criterion was included as difficulty with understanding or speaking English could affect ability to respond to intervention and participate in assessments, which would have confounded study results.
- Willing to participate in PRS twice weekly most weeks during the study period. This criterion was suggested by the Stairways' Ethics Committee to highlight that regular participation in PRS aligns with the frequency of service needed for data collection.

The study's exclusionary criteria were as follows:

- Diagnosis of intellectual disability (ID) or autistic spectrum disorder (ASD). Cognitive challenges related to ID and ASD could affect responses to intervention and to cognitive assessment, which could confound study results.
- History of neurological disorders, e.g., dementia, stroke, head injury (loss of consciousness > 30 min.). Cognitive impairments associated with these diagnoses could affect responses to testing and intervention.
- Alcohol/ substance abuse within one month of enrollment. Recent abuse of substances/alcohol could affect cognitive functioning, thereby confounding study results.

Participant Recruitment

A total of 26 clients in the PRS program met inclusionary criteria at the time of recruitment and were mailed an invitation to attend an informational meeting about the study.

The PRS program's administrative assistant and clients' PRS staff members followed up on the flyer by answering questions about the meeting and helping to arrange for transportation if needed. The PI talked with individuals who wanted to know more about the research. The meeting was hosted by the PI at the PRS facility and included a light lunch. Appendix B includes the recruitment materials: the invitational flyer and outline of the informational meeting.

A total of six individuals attended the informational meeting. After learning about the study and hearing the consent form read aloud, all six stated that they wanted to participate in the research and then signed informed consent forms that had been approved by the IRB (Appendix A). The participants made appointments with the PI for the preintervention assessment protocol and expressed their understanding that the pretesting procedure included observation of a usual PRS activity (up to 60 minutes). One participant had to leave the study after the third observation because of illness that affected ability to participate in the PRS program. A total of five participants completed the study, and this dissertation will refer to them by aliases that are not gender-specific: Angel, Casey, Dana, Jamie, and Sam.

As compensation, participants received gift cards worth $10.00 each at three points: upon completion of the pre- and postintervention assessment protocols and after the focus group. Therefore, the individual who left the study received one gift card worth $10.00; those who completed the study received three gift cards—a total of $30.00 for each of the five participants. The PI chose the vendor for the gift cards based on the participants' unanimously expressed preference.

Study Procedures

This section presents the study's procedures. The paragraphs that follow describe data collection procedures for each of the study's three methods—single-case, quantitative, and qualitative—followed by a summary of each method's respective data analysis procedures.

SCED Data Collection Procedures

This single-case study used an AB design. The baseline phase (A) consisted of observation-only of participants' usual participation in PRS program sessions. The intervention phase (B) included implementation of the strengths-based cognitive prompting intervention with observations during PRS program sessions. The MOHOST-SOF v.2.0 (Parkinson et al., 2006) served as the repeated measure to collect observational data and will be referred to as the MOHOST for this dissertation. The MOHOST collected data for variables of overall occupational participation and component performance domains: motivation, pattern of occupation, interaction and communication skills, process skills, motor sills, and environment. The study planned for the baseline and intervention phases to include six to eight sessions over a duration of approximately 4 weeks, in order to accommodate for the schedules of both the participants and the RAs. Table 3 presents an outline of the study's phases and procedures. The section that follows provides more detail for the study's phases and describes the strengths-based cognitive prompting intervention.

Table 3

Single-case Experimental Design Procedures

Phase	Research activities	Description
Pre-Phase A	• RA training • Recruitment • Pre-test assessment	Prior to start of the study, PI trained RAs, recruited participants, and conducted assessments. RAs were blind to assessment results until the end of the study.
Phase A: Baseline (PRS as usual, Observation only)	• Baseline data collection	RAs used MOHOST form to assess occupational performance (and record data) during PRS sessions. The study planned for phases to last approximately 4 weeks with 6-8 observations per participant, depending on participants' schedules.
Pre-Phase B	• Identification of strengths and strategies for implementation of strengths-based cognitive prompting intervention	PI prepared summaries of participants' strengths, which included strategies to apply strengths to IRP objectives and actions steps. PI met individually with participants and their RA/PRS practitioner who would be providing intervention.
Phase B: Intervention (PRS with Intervention)	• Intervention and data collection	RAs provided strengths-based cognitive prompting intervention during PRS activities and completed fidelity forms. Ideally, other RAs observed and collected data via MOHOST forms. PI met weekly with RAs as a group to discuss intervention and provide mentoring.
Post-Phase B	• Post-test assessment • Qualitative data collection: interviews and focus group	At the end of the study, PI conducted post-test assessments and met individually with participants for semi-structured interviews (planned for RA present to take notes). PI also conducted focus group at the end of the study.

Summary of procedures by phase. Prior to the baseline phase, all participants met with the PI, who conducted preintervention assessments. During the baseline phase (A), RAs observed participants during usual PRS sessions; RAs completed a MOHOST single observation form following each observation. Based on results from assessments and the first two MOHOSTs, the PI developed individualized strength summary sheets for each participant that defined their strengths and described how they could apply those strengths to the objectives and action steps on their IRPs. Prior to the start of the intervention phase, the PI met with each participant and their PRS practitioner, who also served as an RA, and went over the strength summary sheet. At the end of the intervention phase, the PI met again with each participant to conduct post-test assessments, as well as conduct semi-structured interviews to obtain their feedback about the intervention. Finally, the participants met with the PI as a focus group and shared their lived experience of the strengths-based cognitive prompting intervention and the assessment protocol. The following paragraphs provide more detail about the phases.

PrePhase A (Pretesting). Prior to the start of intervention, the PI trained the research team, and recruited and tested the participants. The PI trained RAs to use the MOHOST if they were going to conduct observations, and trained RAs to use the cognitive strengths-based approach if they were going to provide the strengths-based intervention. The PI conducted the MOHOST training as per the training protocol described in Chapter II of this dissertation. The intervention and related documents that the PI developed to support the RAs are described in the description of the strengths-based cognitive prompting intervention below. RAs were not all trained at the same time, as some were trained to use the MOHOST when the occupational therapy Level II fieldwork students completed their internships.

During PrePhase A, the PI also conducted the preintervention assessments. There was some overlap between this phase and the baseline (A) phase. Participants began the study at different times; two participants began the study earlier than the others, and so began baseline observations before other participants were tested. Also, because of scheduling conflicts, one participant had preintervention testing a few days after the first baseline observation.

Phase A (Baseline: Rehabilitation as usual, observation only). The RAs used the MOHOST to record observations of participants during their usual PRS sessions. Care was taken so that observations were not intrusive; the PI trained the RAs to document after observing so that they did not take notes during PRS sessions. The PI met frequently with RAs to monitor their use of the MOHOST and provide feedback. The PI also continued to provide training on the intervention to RAs during this phase. Approximately 4 weeks and five to eight sessions were planned for the baseline phase; however, participant scheduling and PRS staffing in the day-to-day operations of the PRS program required a baseline period of 6-9 weeks and six to nine sessions, depending on the participant. Generally, individuals who participated in both individual and group PRS sessions had more observations. Table 4 summarizes individual participants' number of sessions and weeks of study participation during baseline and intervention phases.

Table 4

Participant Session and Week Totals in Baseline and Intervention Phases

Participant (Alias)	Baseline Approximate weeks	Baseline # of sessions	Intervention Approximate weeks	Intervention # of sessions
Angel	8	9	6	6
Casey	6	8	6	9
Dana	6	7	6	7
Jamie	8	6	2	5
Sam	8	9	4	7

PrePhase B (Knowledge of strengths). Each participant met individually with the PI who reviewed skill strengths gleaned from their baseline assessment results, including the first two MOHOSTs. The PI provided a summary sheet that defined the participant's strengths and suggested ways in which the strengths could be used to promote each of the objectives on the individual's IRP. The RA/PRS provider who worked with the individual participated in the meeting, so that the provider was aware of strengths and ways to apply them to the individual's self-identified objectives.

Phase B (Intervention). The intervention phase was planned to last for approximately 4 weeks and include five to eight sessions. The intervention time period varied by participant and included five to nine sessions with a range of approximately 2-8 weeks, depending on participants' availability and the constraints of day-to-day operations of the PRS program. Originally, the plan was for PRS clinical supervisors who were part of the research team to provide the strengths-based cognitive prompting intervention and for other RAs to conduct observations using the MOHOST. However, staff changes and administrative duties in the PRS program precluded clinical supervisors' direct service with participants. Instead, the PI trained three new staff members to be RAs and the clinical supervisors provided their regular supervisory duties, along with their understanding of the intervention. During Phase B, the PI met with the RAs weekly as a group and individually as needed. The PI provided supervision on the MOHOST and on the intervention as it applied to participants' IRP goals and objectives.

PostPhase B (Posttesting, interviews, and focus group). The PI conducted post-test assessments and then met with each participant, focusing on strengths but sharing results per their preferences. The PI also conducted individual interviews with each participant. The five participants attended a focus group to share their feedback and perceptions (lived experience) of the strengths-based cognitive prompting intervention and of the assessment protocol.

Strengths-based cognitive prompting intervention. *Strengths-based cognitive prompting* was defined as an intervention to prompt individuals to intentionally use their strengths, as identified from cognitive and performance-based assessments, to achieve their self-identified personal objectives. Prior to the start of the intervention phase, the PI provided participants and their RA/PRS practitioners with individualized summaries that identified and defined participants' strengths and suggested ways to use their strengths to address their IRP objectives. Appendix C is an example of a strengths summary sheet with its IRP applications. In addition, if the participant so chose, the PI also discussed a skill that assessment revealed to be difficult for the participant (i.e., an impairment or deficit), and suggested a strategy that could be used to ameliorate the challenge; the individual and provider then referred to this *strategy* as one of the individual's *strengths*. During the intervention phase, the PRS provider/RA who worked with the individual prompted them to use their strengths and strategies.

The activities that participants engaged in during the intervention phase (and also during the baseline phase) were chosen by the participants, based on their individual goals and objectives. That means that the activities that provided the context for the strengths-based intervention varied among participants. Client-centeredness is a cornerstone of psychiatric rehabilitation and was an important aspect of the study design. The intervention was provided within the context of the participants' regular psychiatric rehabilitation; sessions could be in the community or at the PRS facility and delivered individually or in groups.

Intervention fidelity. Intervention fidelity was addressed through use of a Strengths-based Prompting Checklist (Appendix D) that was developed by the PI for this study. For each session, RAs indicated on the checklist the activity that was the focus of the session, strength(s) that were applied, level of prompting provided (with an example), participant's perception of performance and satisfaction, and RA's satisfaction with intervention; space was also provided for comments. Following discussion with participants and RAs, the PI added a simple self-confidence scale; participants indicated on a line their confidence levels about activities prior to beginning them. The simple self-confidence scale was printed on the reverse side of the checklist.

Intervention resources for RA/psych rehab providers. During the RAs' training on the intervention, the PI gave them a chart with examples of strengths-based prompting (Appendix E) to illustrate how they could use strengths-based language when prompting participants during activities and avoid focusing on deficits. The chart gave examples of strengths with ways to apply them for enhanced occupational performance, as well as examples of strategies to turn cognitive or performance challenges into strengths. For clarity, all examples were for a participant in a PRS cooking group, which typically addressed skills other than cooking. The PI also trained the research team to use a prompting hierarchy and to provide the lowest level of prompting needed for participants to apply their strengths and strategies. The PI developed the prompting hierarchy based on the hierarchy used in the EFPT (Baum & Wolf, 2013). However, the RAs requested that the numbering of prompt levels be reversed so that the highest level (5) be associated with least prompting; this was more intuitive for them as less prompting meant that a participant had a higher awareness of strengths and was functioning at a "higher level." The prompting hierarchy with examples of level-specific prompts (Appendix E) was included for RAs as page 2 of the Strengths-based Prompting Examples Chart.

SCED Data Analysis

While visual analysis was the main analysis method for single-case data, statistical analysis was also used, consistent with recommendations in the literature (Brossart et al., 2014; Kazdin, 2011). The next two paragraphs summarize visual and statistical analyses for single-case data, that is, MOHOST scores measuring occupational performance domains and overall total scores.

Visual. The PI created a master graph for of participants' pre- and postintervention MOHOST domain scores, including the activities observed and their environments. This allowed scores to be viewed within the context of occupational participation. Graphs that compared each participant's preintervention (T1) and postintervention (T2) MOHOST domain and total scores were also made, resulting in seven pairs of MOHOST graphs for each participant. Graphs were visually analyzed for changes in four data characteristics: mean, level, latency, and trend (Kazdin, 2011). Change in mean refers to comparing the means of data points in the baseline and intervention phases. Higher mean in the intervention phase, in combination with other visual indicators, potentially suggests a positive intervention effect. Change in level refers to the change in data magnitude when the intervention began compared to when the baseline phase ended. Theoretically, greater magnitude of change could suggest a stronger intervention effect. Trend refers to change in the data as reflected by an upward or downward slope in the data trend line. Trendlines are compared; an intervention trendline with a positive slope, for example, could suggest a positive intervention effect. Latency refers to the time period needed for data to show change; the closer to the beginning of the intervention that the data shifts, the less latency there is and the greater the likelihood that change resulted from the intervention. Visual analysis takes into account each of the four data characteristics individually, but also considers the overall visual pattern of the data (Kazdin, 2011).

Statistical. The PI calculated effect sizes for changes in pre- to postintervention MOHOST scores. Calculating effect size as an adjunct to visual analysis helps to mitigate bias (Brossart et al., 2014). A *d*-statistic similar to Cohen's *d* was calculated for this study using a formula provided by Shadish et al. (2014). The PI entered the formula into an Excel spreadsheet with the MOHOST data. Cohen (1992) posited an effect size index: .20 (small), .50 (medium), and .80 (large). Shadish et al. (2014) suggested a more conservative approach, with a minimal effect size of .50. However, Kazdin (2011) noted that in single-case research, interventions may have small effects that lead to functional changes, and that these effects may be easily missed. Therefore, a *d*-score of .20 was used as the minimal effect size for this study.

Quantitative Data Collection

Quantitative data consisted of preintervention (Time 1) and postintervention (Time 2) assessment scores, as well as MOHOST domain and total scores. The previous section included description of MOHOST data collection. This section describes the assessment protocol conducted at Time 1 (T1) and Time 2 (T2) and the instrumentation used during the study.

Assessment protocol. The PI conducted the assessment protocol prior to the start of the study (PrePhase A) and at the study's end (PostPhase B). Participants chose the setting for their assessment protocols—either in their homes or in the PI's office at the PRS site. Three participants chose their homes (Casey, Dana, and Sam) and two chose the PI's office (Angel and Jamie). The PI offered snacks (fruit, granola bars, etc.) during a break in the assessments. There were no departures from the protocol. Table 5 lists the instruments in the order in which they were implemented for both the pre- and postintervention protocols and includes their approximate administration times.

Table 5

Assessment Protocol with Administration Times

Instrument	Minutes
Satisfaction with Life Scale (SWL)	5-10
Montreal Cognitive Assessment (MoCA)	10
Behavioral Rating Scale of Executive Function-Adult (BRIEF-A)	15-20
Hinting Task (HT)	7
Comprehensive Trail-Making Test (CTMT)	15
(Break)	5-10
General Self-Efficacy Scale (GSE)	5-10
Executive Function Performance Test (EFPT); Bill-paying task	10
Brief Psychiatric Rating Scale—Extended (BPRS-E)	15-20
Bell-Lysaker Emotion Recognition Task (BLERT)	8
Total administration time	95 - 120 minutes

Instrumentation. The paragraphs that follow provide a summary of the assessment tools used in this study. Chapter II included descriptions of the instruments and their psychometric properties, so they are only briefly described here. The instruments are listed in the order in which they were administered.

Satisfaction with Life Scale (SWL; Test et al., 2005). The independent variables for subjective life satisfaction in each of four areas—living situation, self and present life, social relationships, and work—and overall were the total scores for each of the subscales of the SWL and the SWL total score. Score ranges are as follows: living situation (4-16), social relationships (6-30), work (2-10), self and present life (6-30), and SWL total score (18-90). Administration time of the SWL is 5-10 minutes.

Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005). The MoCA total score was the independent variable for overall cognition. Scores range from 0-30; scores of 26 and above indicate overall cognitive strength. The memory index score of the MoCA was also an independent variable. The PI was certified to administer the MoCA and received permission from the author to use the MoCA in this study. MoCA Test 1 (version 8.1) was used for preintervention and MoCA Test 2 (version 8.2) was used for postintervention assessment. Administration time for the MoCA is 10 minutes.

Behavioral Rating Inventory of Executive Function—Adult Version (BRIEF-A; Roth et al., 2005). The independent variable for overall subjective EF was the BRIEF-A Global Executive Composite (BRIEF) *T*-score; MI and BRI *T*-scores served as independent variables for subjective EF components of metacognition and behavior regulation, respectively. The PI administered the BRIEF by reading the items aloud. The nine scales—Emotional Control, Inhibit, Initiate, Organization of Materials, Plan/Organize, Self-Monitor, Shift, Task Monitor, and Working

Memory—were used to identify participant relative strengths. Higher scores indicate greater self-rated difficulty with executive function. Time needed for the BRIEF-A is 10-15 minutes.

Hinting Task (HT; Corcoran et al., 1995). The HT total score was the independent variable for the social cognitive variable theory of mind. Scores range from 0-20; higher scores reflect greater theory of mind skill. For this study, the PI received permission from the first author (Bell) to administer the HT revision that uses American English (Bell, Fiszdon, Greig, & Wexler, 2010). The PI used the more rigorous HT scoring criteria as recommended by Pinkham et al., 2018. Administration time for the HT is approximately 7 minutes (Pinkham et al., 2016).

Comprehensive Trail-Making Test (CTMT; Reynolds, 2002). The CTMT Composite Score (CTMT-Total) for processing speed and the *T*-scores for set switching (Trail 5) and attention/sequencing (Trail 1) served as the objective EF variables. Higher scores indicate greater skill. Scores less than 40 indicate mild-moderate impairment; scores less than 30 indicate moderate-severe impairment. This study included administration of all five trails of the CTMT, which takes approximately 15 minutes.

General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995). The GSE total score was the independent variable for self-efficacy. Scores range from 10-40; higher scores reflect greater self-rated general self-efficacy. Estimated administration time is 5-10 minutes.

Executive Function Performance Test (EFPT; Baum & Wolf, 2013). The independent variable for functional EF was the total score for the bill-paying task. The alternate form (aEFPT) for bill-paying was administered postintervention to control for learning effects. EFPT bill-paying scores range from 0-25, with higher scores indicating greater level of cueing needed, related to increased EF deficit. Time needed is 10 minutes.

Brief Psychiatric Rating Scale–Expanded (BPRS–E; Lukoff et al., 1986). The independent variable for symptomology was the overall BPRS-E score. Subscale scores for Positive Symptoms, Negative Symptoms, Depression/Anxiety, and Agitation/Mania also served as independent variables. Higher scores indicate greater symptomology. The PI used the published semi-structured interview to ensure reliability. Administration time for the BPRS-E is 15-20 minutes (Targum et al., 2015).

Bell-Lysaker Emotion Recognition Task (BLERT; Bryson et al., 1997). The BLERT overall score was the independent variable for emotion perception. The PI received permission from the author (Bell) to use the BLERT for this study. BLERT scores may range from 0-21; higher scores indicate better emotion perception skill. Scores less than 15 indicate impaired emotion perception. The BLERT was also used to identify participants' relative strengths in identifying positive or negative emotions. Administration time for the BLERT is approximately 8 minutes.

Model of Human Occupation Screening Tool (MOHOST v.2.0; Parkinson et al., 2006). The dependent variable for occupational performance was the MOHOST total score, ranging from 6-24, as has been the practice in previous research (Fan et al., 2016). For the purposes of this study, total MOHOST scores of 72 and above indicated overall strength in occupational participation. Scores of 12 and above in any of the six MOHOST domains—motivation, pattern of occupation, communication and interaction skills, process skills, motor skills, and environment—indicated strength in that domain; domains also served as dependent variables. In addition, individual MOHOST items were used to identify occupational performance strengths that could be used in the strengths-based intervention; consistent baseline item scores of 3 (allows performance) and 4 (facilitates performance) indicated performance strengths. The MOHOST-SOF form was used for data collection in this study.

Quantitative Data Analysis

Quantitative data, including assessment scores and MOHOST ratings, were put into an Excel spreadsheet for data management and then imported into SPSS statistical package Version 25 for analysis. Descriptive statistics described and compared participants' assessment scores. Individual participants' assessment results were also compared from pre- to postintervention by presenting data graphically; the PI used Excel to make all graphs. Nonparametric tests, Spearman's rho Correlation Coefficient (r_s) and the Wilcoxon matched-pairs signed-ranks test (Z), explored relationships among assessment score variables and differences between pre- and postintervention assessment scores, respectively. Interrater reliability was calculated using the Intraclass Correlation Coefficient (ICC).

To quantify participants' confidence ratings for individual sessions, a ruler with 20 equal sections was made to fit the length of the confidence scale line that was printed on the back of session fidelity forms. The place on the line where the participant made their mark was assigned a corresponding score of 1-20, with higher scores signifying more confidence in their ability to participate in or successfully complete the activity.

Qualitative Data Collection

The PI gathered qualitative data in two main ways: focus group and individual interviews. The purpose was to understand participants' lived experiences of the intervention and the study, including the assessment protocol. In addition, raters' comments on MOHOST score sheets and fidelity forms served as qualitative data to inform single-case analysis. Focus groups can be useful in program evaluation to elicit participants' perceptions of their experiences (Patton, 2015). Strengths of focus groups include that they can be fun and may provide higher quality data than individual interviews; however, group members who do not share the opinions of other participants may be less inclined to talk or to say what they really think (Patton, 2015). The sections that follow describe the focus group and interviews, data analysis process, and trustworthiness criteria implementation.

Individual interviews. At the end of the intervention phase, the PI met individually with each participant to conduct the follow-up interviews. All interviews except for Jamie's took place in participants' homes; Jamie preferred to meet in the PI's office at the PRS facility. The PI followed the individual interview guide (Appendix F), a semi-structured interview with open-ended questions, to ask participants about their experiences with the study. She used a conversational style and offered snacks at all interviews. Ideally participants' RA/PRS providers would have attended to take notes; however, in most cases RAs were not available and the PI took notes. Interviews lasted approximately one hour. The PI conducted the interviews before the day of the focus group so that each individual participant's responses would not be affected by what other participants said in the focus group.

Focus group. At the end of the intervention phase and after participants had completed postintervention assessments and interviews, the PI conducted the focus group in the multi-purpose room of the PRS facility. All participants were familiar with the space. Participants sat around a large table. The PI established a relaxed environment to put participants at ease. She offered beverages (coffee, tea, juice, and soft drinks) when participants arrived, and served a lunch of soup and sandwiches. The PI started by going over the purpose and format of the focus group. She showed the participants the audio recorder and reminded them that it was their choice whether to participate in the focus group or not, and either way was okay. All participants confirmed that they did want to participate. One participant, Jamie, arrived after the focus group had already started due to transportation issues. Jamie joined the focus group and then met with the PI afterward to respond to the questions that had been missed. The PI followed the focus group interview guide (Appendix F) and asked follow-up questions when helpful to understand participants' perspectives. The PI encouraged social interaction among the participants and invited them to ask questions. The focus group lasted approximately 90 minutes.

Qualitative Data Analysis

Following the focus group, the PI transcribed the audiotaped focus group data using the participants' aliases; the audiotape was then erased. Following individual interviews, the PI typed out the handwritten notes, also using participants' aliases. The PI then began a process of phenomenological data analysis: a structured process of developing understanding of participants' lived experience by identifying and defining themes in the data, and then constructing meaning by using the data to describe those themes (Creswell & Poth, 2018). Themes are patterns that give meaning to the data as they relate to the research questions (Braun & Clarke, 2006). As described by Braun and Clarke (2006), the data corpus, that is, the entirety of qualitative data, may be divided into data sets. For this study, the data corpus consisted of three data sets: raters' comments on MOHOST score sheets and fidelity forms, the focus group and individual interviews. Raters' comments are included in single-case analysis.

Qualitative analysis methods began with focus group data and followed a process of open coding, cross coding, and axial coding.

Open coding. Open coding, an inductive method of identifying patterns in the data without attempting to fit data into preconceived themes (Braun & Clarke, 2006; Patton, 2015), served as preliminary qualitative analysis. In open coding, the researcher is "open" to ideas suggested by the data (Patton, 2002, p. 453) and themes are data-driven (Braun & Clarke, 2006). However, open-ended interview questions may also contribute to the codes (Patton, 2015). After reading the transcribed focus group data several times to get a feel for the content and its themes, the PI used an open coding procedure (Braun & Clarke, 2006; Patton, 2015) of noting ideas for themes and giving them codes (abbreviations). The PI then wrote codes in the margins and on the text where they corresponded to ideas. She assigned a color to each theme, and then manually coded the focus group data using colored pencils. After coding, the PI chunked data by cutting and pasting coded sections into categories, which allowed coded data to be seen together and themes to be clearer. Throughout the process of open coding, the PI moved between the focus group text, chunked data, themes, and her written notes; comparison and writing are both part of the qualitative analysis process (Braun & Clarke, 2006; Creswell & Poth, 2018).

Cross coding. A PhD-level occupational therapist experienced in qualitative analysis, but not familiar with the study or the PI's preliminary qualitative analysis, also coded the transcribed focus group data. Having another person code data independently and then work with the researcher to compare codes can elicit valuable insights about the data (Patton, 2015) and provide opportunity for an objective perspective. The PI and coder compared their respective thematic analyses and found an overall similarity in themes but also some differences in coding. For example, the coder identified participants' discussion of using skills as "adaptation," which the PI acknowledged was a useful and accurate way to describe participants' experiences.

Axial coding. During axial coding, data may be rearranged according to an emergent paradigm after open coding has been completed (Strauss & Corbin, 1990). This next step of qualitative analysis included finalizing themes and then recategorizing the uncoded transcribed data from the focus group and individual interviews. The PI considered the coder's themes, as well as the individual interview questions. She used a reflexive process that considered relationships among her original themes, coder's themes, research questions, literature themes, and theoretical framework for the study. The PI constructed a new thematic paradigm that blended her original categories with the coder's categories. This analysis process was deductive and relied upon the researcher's reflection and constant comparison of data (Strauss & Corbin, 1990). The PI continued this process until saturation was reached, meaning that all data were coded and captured in a theme or subtheme. Table 6 presents the finalized codebook.

Trustworthiness criteria. Shenton (2004), expanding on the work of Guba (1981), described four trustworthiness criteria to safeguard the rigor of qualitative research. The four trustworthiness criteria align with similar criteria in quantitative research (included in parentheses): credibility (internal validity), transferability (external validity/generalizability), dependability (reliability), and confirmability (objectivity). The paragraphs that follow define each of the criteria and describe how the current study addressed them.

Table 6

Qualitative Data: Themes and Definitions

Themes	Definitions
1) Responses to the intervention	Participants' perceptions of the strengths-based cognitive prompting intervention
a. General responses	Participants' general reactions to the intervention
b. Differences from other approaches	Reported differences from other approaches
c. Enhancement and continuation	Responses related to improving or extending the intervention
2) Adaptation: Development and use of strengths for occupational performance	Evidence of: Increased awareness of strengths, use of strengths and strategies, or enhanced occupational performance
a. Strengths awareness	Strategies to heighten awareness of strengths
b. Strength usage	Occupational competence: Using strengths for occupational performance
c. Strengths as strategies to mitigate challenges	Stated interest in or use of strategies to mitigate areas of non-strength
3) Responses to the assessment protocol	Participants' reactions to the assessment protocol or specific assessments
4) Self-efficacy and self-concept	Evidence of participants' beliefs in their abilities or statements related to self-confidence or self-concept

Credibility. Credibility refers to a study's authenticity. The PI employed several practices during both qualitative data collection and analysis to ensure the authenticity of the study. First, triangulation of data, that is, using different methods to gather information lends credibility to a study. Quantitative measures of occupational performance and self-efficacy reinforced qualitative data. The current study included both a focus group and participant interviews to learn about participants' perceptions of the intervention and assessment protocol.

Second, participants had the option to not participate in the focus group or interviews, which contributed to more honesty in reporting. Third, the qualifications and experience of the PI are considerations that contribute to a study's credibility. The PI was an experienced PRS practitioner with the CPRP credential, an occupational therapist, an adjunct university instructor, and a PRS program director. The PI was familiar with the culture of the PRS program, and trust was established among the PI, RAs, and participants. Fourth, a PhD-level occupational therapist skilled in qualitative research methods but unfamiliar with the current study coded the de-identified focus group transcript, which allowed for an objective perspective and contributed to triangulation of data analysis. Fifth, the PI utilized "member checking" (Shenton, 2004, p. 68) by having a study participant look at the transcribed focus group data and verify the authenticity of the themes that emerged. Finally, the PI engaged in reflection throughout the research process to be aware of biases that might cloud the research and engaged in regular peer debriefing with a research mentor.

Transferability. Transferability refers to the generalizability of findings. This dissertation fully describes the participants, intervention, assessments, and environments. Readers have relevant information to determine how the study and its findings apply to various study populations and research interests.

Dependability. Dependability refers to the replicability of a study and congruence between data and findings. Qualitative studies address dependability by thoroughly describing the research process, including data collection, analysis, and interpretation. This dissertation provides information about qualitative data collection (e.g., focus group and interview questions and procedures) and data analysis (e.g., coding). Qualitative studies also use peer review to enhance dependability; a peer separately coded data as part of data analysis.

Confirmability. Confirmability refers to maintaining objectivity and limiting bias. The PI tried to monitor her own thoughts about the study and not influence participants' responses. The PI's mentor, a researcher with experience in qualitative methods, provided feedback on study processes. A peer contributed to development of themes that resulted from data analysis. The PI verified authenticity of themes by "member checking" (Shenton, 2004, p. 68). The PI reviewed the themes, and corresponding quotations with one of the study participants, confirmed the validity of the themes. As a final step, after reviewing the themes, codebook, and chunked data, the research mentor suggested revised names for the themes that better captured the spirit of the participants' feedback while incorporating the study's theoretical foundation. The final themes will be presented as part of qualitative results in Chapter IV.

Summary

A total of five individuals with schizophrenia or schizoaffective disorder who were members of a PRS program at a community behavioral health organization completed this study. This chapter described the study's mixed methodology for data collection and analyses. The study utilized SCED and included qualitative and quantitative methods to investigate a strengths-based cognitive prompting intervention to improve occupational performance and self-efficacy. SCED with multiple baselines included a baseline and an intervention phase. Occupational performance was assessed using repeated measures of the MOHOST. The PI administered measures of executive function, social cognition, self-efficacy, and life satisfaction pre- and postintervention to explore relationships among variables and effects of the intervention. Qualitative methods included a focus group and individual interviews to understand participants' experience of the intervention and the assessment protocol. The next chapter presents the results of this study.

CHAPTER IV

RESULTS

This chapter presents the results of the current study that investigated a strengths-based cognitive prompting intervention to enhance occupational performance and self-efficacy in people with schizophrenia and schizoaffective disorder. The study also explored an assessment protocol and relationships among variables of executive function, social cognition, self-efficacy, and life satisfaction. Chapter III described the study's three methods: SCED, quantitative, and qualitative. This chapter will begin with descriptive findings about the participants, and continue with quantitative, single-case, and qualitative results.

Participants

Research participants are identified by aliases in this dissertation. Aliases are used to both honor a person-centered approach that views clients and research participants as individuals, and to facilitates readers' ease in following each participant in quantitative, single-case, and qualitative results. In order to strengthen protection of participants' identities, aliases are gender-neutral; pronouns are avoided as much as possible, and when needed for sentence integrity are also gender-neutral. Demographics will be presented for the sample as a whole, rather than for individuals. This section includes summaries of participants' demographics, participation in the PRS program, and life roles and rehabilitation objectives.

Participant Demographics

Participants in this study were individuals with schizophrenia spectrum disorders (*N* = 5) who were members of a PRS program at a community behavioral health organization in a small mid-Atlantic city. A total of three participants were female; two were male. Participants' ages ranged from early 30s to late 40s. A total of three participants were Caucasian; two were African American. Participants lived independently—alone, with a partner, or with housemates. All participants received Social Security Disability Insurance (SSDI) benefits; one participant had part-time employment. Table 7 presents participants' education levels and diagnoses. All participants were diagnosed with schizophrenia or schizoaffective disorder as young adults and were in chronic (as opposed to acute or first-episode) phases of their conditions. Participants all regularly took medications to treat symptoms of schizophrenia or schizoaffective disorder; some also took medications to treat anxiety.

Table 7

Participants' Education Levels and Diagnoses

Participant (Alias)	Education Level	Diagnosis
Angel	College	Schizophrenia
Casey	Some college	Schizoaffective disorder, depressive type
Dana	Some high school	Schizoaffective disorder, bipolar type
Jamie	High school	Schizoaffective disorder, bipolar type
Sam	Some technical school	Schizophrenia

Participation in PRS Program, Life Roles, and Goals

The strengths-based cognitive prompting intervention was provided in the context of participants' usual PRS sessions, which occurred in the community, in participants' homes, and at the PRS facility. All individuals participated in 1:1 PRS sessions; four participants also participated in group PRS sessions for at least part of the study.

As members of the PRS program, each participant collaborated with their primary PRS provider to complete an IRP. The IRP identified the individual's overall rehabilitation goal including the life role that was the individual's primary focus of rehabilitation for the current IRP period; IRPs were updated every 3 months. The IRP also included objectives, each related to one of the PRS domains—Living, Learning, Working, Socializing, and Wellness—with action steps or interventions to meet the objectives. As a group, participants had objectives in all five of the domains addressed by PRS. For example, Living and Socializing domains include cooking and communication skills, respectively. Table 8 summarizes areas of intervention included in participants' objectives and participants' primary life roles during the study time period.

Table 8

Participants' Life Roles and Areas of PRS Intervention

Participant (Alias)	Primary Life Roles	Areas of Current PRS Interventions (Goals and Objectives)
Angel	<u>friend</u>, worker, family member	have a friend, community engagement, wellness, social skills
Casey	<u>student</u>, fiancé	cooking, physical activity, school strategies, increased comfort in situations
Dana	<u>tenant</u>, partner	cook independently, communication and relationship skills
Jamie	parent, community member, sibling	coping strategies for social anxiety, community engagement
Sam	<u>well person</u>, adult child, artist, friend, sibling	increased comfort in social situations, feel more at peace, cooking, exercise

Note. <u>Underlining</u> indicates life role that was included in overall goal on participant's IRP.

Quantitative Results

This section presents findings from quantitative analyses. Results that are shared include interrater reliability, descriptive statistics of assessment results, comparisons of preintervention (T1) and postintervention (T2) assessment scores, correlations between assessment score variables, correlations between MOHOST domains and assessment score variables, combined MOHOST domain scores, and participants' self-confidence ratings.

Interrater Reliability

The PI used the MOHOST training protocol described in Chapter II to train all raters to observe participants and reliably use the MOHOST to rate occupational performance. Interrater reliability was calculated using the ICC, which has been identified as a useful method to demonstrate interrater reliability in clinical studies (Portney & Watkins, 2009). A total of 17 observations were included in the interrater reliability analysis with two, three, or four raters for any one observation. ICC estimates and their 95% confidence intervals were calculated using an average-rating (k = 3), consistency-agreement, 2-way random effects model. Interpretive guidelines for the ICC vary. For this study, an ICC greater than .75 indicated good interrater reliability, in alignment with the recommendation by Portney and Watkins (2009).

Interrater reliability was demonstrated, with ICC(2,3) = .868, p = .002, 95% CI [.509, .975]. Koo and Li (2016) suggested that researchers report both single-rating and average-rating analyses; the single measure gives an ICC for a single rater, while the average measure takes the mean for all raters. The single-rating ICC was .687, which falls in the upper end of the fair range. Table 9 presents ICC interrater reliability results using both ICC measures.

Table 9

Interrater Reliability: Intraclass Correlation Coefficient (ICC)

	Intraclass	95% Confidence Interval		F Test with True Value 0	
	Correlation	Lower Bound	Upper Bound	Value	Sig.
Single Measure	.687	.257	.930	7.590	.002
Average Measures	.868	.509	.975	7.590	.002

Note. Two-way random effects model where both people effects and measures effects are random.

Descriptive Statistics and Graphed T1 and T2 Assessment Scores

Statistical analyses of pre- and postintervention data have less meaning when sample sizes are small (Toglia et al., 2010) but descriptive data provide some general information about the participants. Table 10 provides descriptive statistics for preintervention (T1) and postintervention (T2) assessment scores. Mean scores suggest some characteristics of the participant sample. For example, BLERT and MoCA mean scores at T1 (preintervention) are below cut-off scores for emotion recognition and cognition, respectively, which suggests that participants as a group had challenges in those areas. Score ranges for the CTMT suggest that executive function was impaired in some participants.

Mean assessment scores were graphed to more clearly show changes from T1 (preintervention) to T2 (postintervention). With this small sample, graphic depictions help to give meaning to descriptive data. The next section briefly summarizes aggregate data for many of the study's assessments and presents graphed comparisons of pre- and postintervention assessment scores.

Table 10

Assessment Score Means, Standard Deviations, and Ranges

Assessment	*M* Time 1	SD Time 1	Range Time 1	*M* Time 2	SD Time 2	Range Time 2
BPRS-E	42.00	6.40	35-50	39.60	10.53	31-53
GSE	27.60	4.56	20-31	30.00	5.00	22-35
SWL-L	15.00	2.45	12-18	14.80	2.39	12-18
SWL-S	20.20	4.55	15-25	21.80	3.19	18-26
SWL-W	6.40	1.82	4-9	6.00	2.35	2-8
SWL-S&L	21.00	5.36	16-29	21.80	5.54	16-27
SWL-Total	62.80	12.17	50-79	64.40	10.24	53-79
BRIEF-A[1]	56.20	12.88	44-73	57.80	11.37	44-71
BLERT[2]	14.00	1.87	12-17	16.00	2.74	13-20
CTMT-Sw[3]	32.60	11.63	22-49	34.80	10.71	23-48
CTMT-Attn/Seq[3]	39.00	6.71	32-50	40.20	4.92	34-46
CTMT-CI[3]	35.80	7.40	24-43	37.40	7.20	30-46
EFPT	7.40	3.05	2-9	4.60	2.07	2-7
HT	14.20	2.95	9-16	16.00	2.92	11-18
MoCA[4]	21.20	3.42	18-27	25.00	2.55	21-27

Note. Time 1 and Time 2 refer to preintervention and postintervention, respectively. On all tests except BRIEF, EFPT, and BPRS, higher scores indicate more positive outcomes. [1]BRIEF *T*-score > 65 indicates executive dysfunction. [2]BLERT score < 15 indicates impaired emotion perception. [3]CTMT *T*-scores < 30 indicates severe executive function impairment; 30-40 indicates mild-moderate impairment. [4]MoCA scores < 26 indicates impaired cognition.

GSE, BLERT, and HT scores. Figure 6 presents mean assessment score comparisons for the GSE, BLERT, and HT. Participants' mean scores for general self-efficacy, emotion perception, and perspective-taking improved from T1 to T2. Graphed depictions of scores also help to clarify differences between participants. For example, compared to their peers' scores, Dana's score for general self-efficacy (GSE) and Angel's score for theory of mind (HT) are relatively low, while Casey's score for emotion recognition (BLERT) is relatively high. Graphed data also clearly show that BLERT postintervention scores for two participants, Jamie and Angel, crossed into the range of competence for emotion perception skill. Figure 6 also includes mean scores for the SWL-Total, which are discussed in the next paragraph.

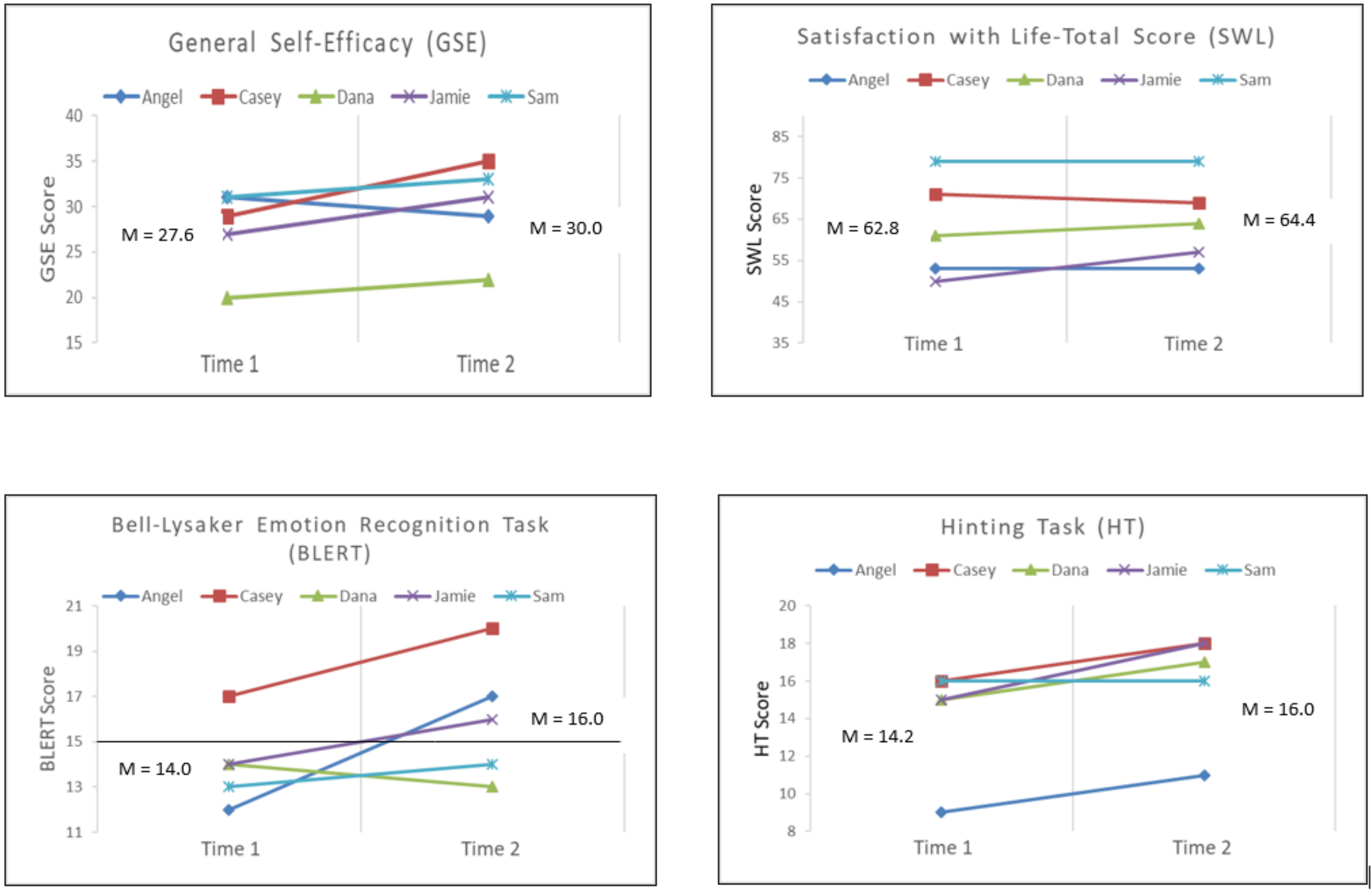


Figure 6. Graphed Comparisons of T1 and T2 Mean GSE, SWL-Total, BLERT, and HT Scores.

SWL scores. Figure 7 depicts graphed mean scores for the Satisfaction with Life (SWL) subscales: Living Situation (SWL-Living), Self and Present Life (SWL-S&L), Social Relationships (SWL-S), and Work (SWL-W). Mean SWL-Total and SWL-S scores both rose by 1.6 points. The positive change in SWL-S score appeared to be affected by Jamie's score, which increased by 5 points. There were notable individual differences in several domains. Casey's SWL-Living score decreased by approximately 2 points, while Sam's increased by 2 points. Dana's SWL-S&L score increased by 5 points and Casey's by 3 points, while Angel's and Sam's both decreased by 2 points. Casey's SWL-W scores were the lowest of the group and decreased by 2 points at T2. Sam's scores were relatively high in all domains at both T1 and T2.

MoCA and CTMT scores. Figure 8 presents graphed mean scores for the MoCA (general cognition) and the CTMT (objective EF), including the CTMT-Total (processing speed), CTMT-Attn/Seq (attention and sequencing), and CTMT-Sw (switching, i.e., cognitive flexibility). All MoCA scores except Casey's improved from T1 to T2; however, all scores except for Casey's suggest cognitive impairment at T1. Sam's score improved at T2; Sam's and Casey's scores are above the threshold score. Casey and Sam also have the only CTMT scores that consistently do not indicate impaired processing speed, attention/sequencing and cognitive flexibility. However, Dana's CTMT-Attn/Sw score improved, no longer indicating impairment at T2.

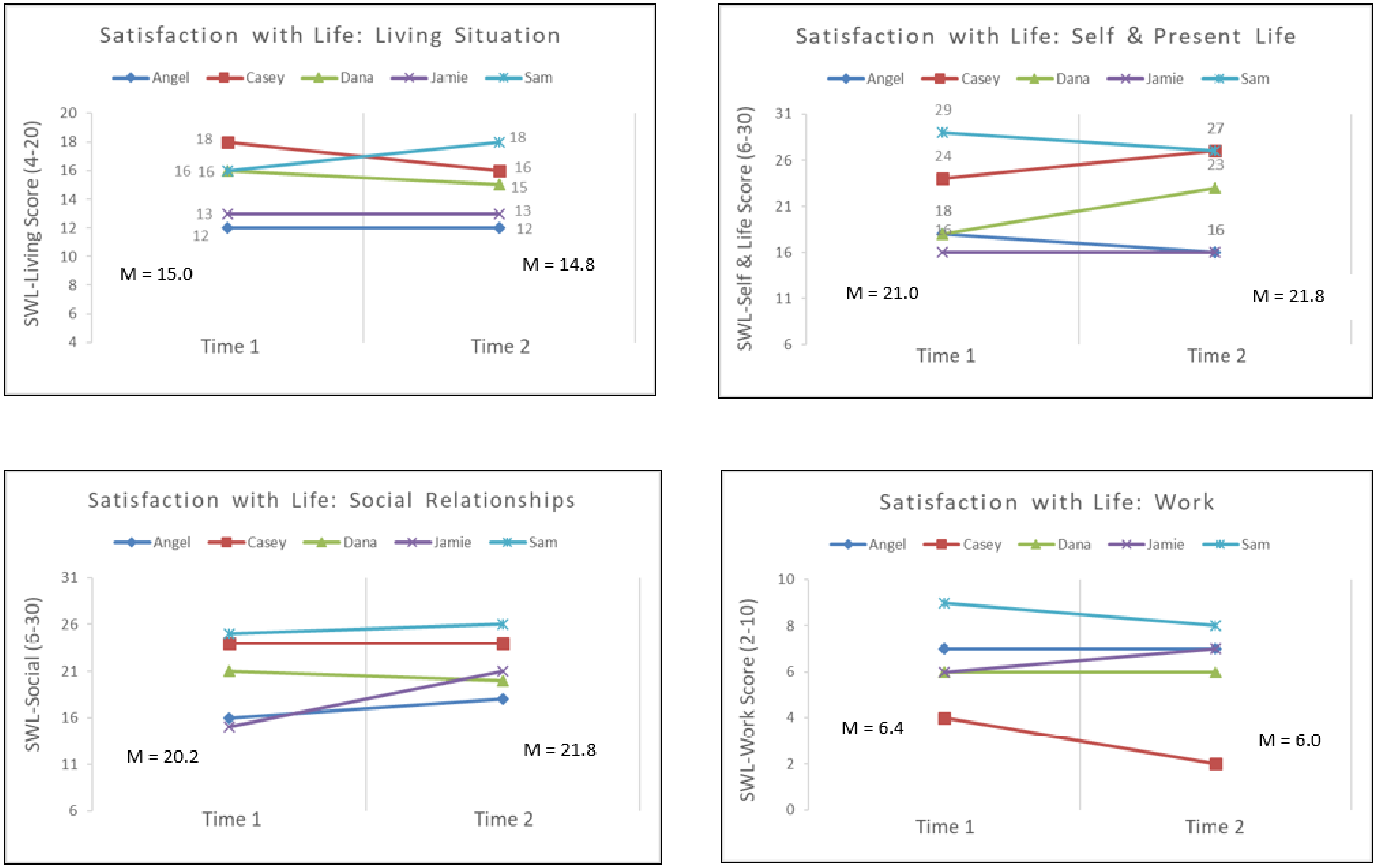


Figure 7. Graphed Comparisons of T1 and T2 Mean *Satisfaction with Life* Subscale Scores.

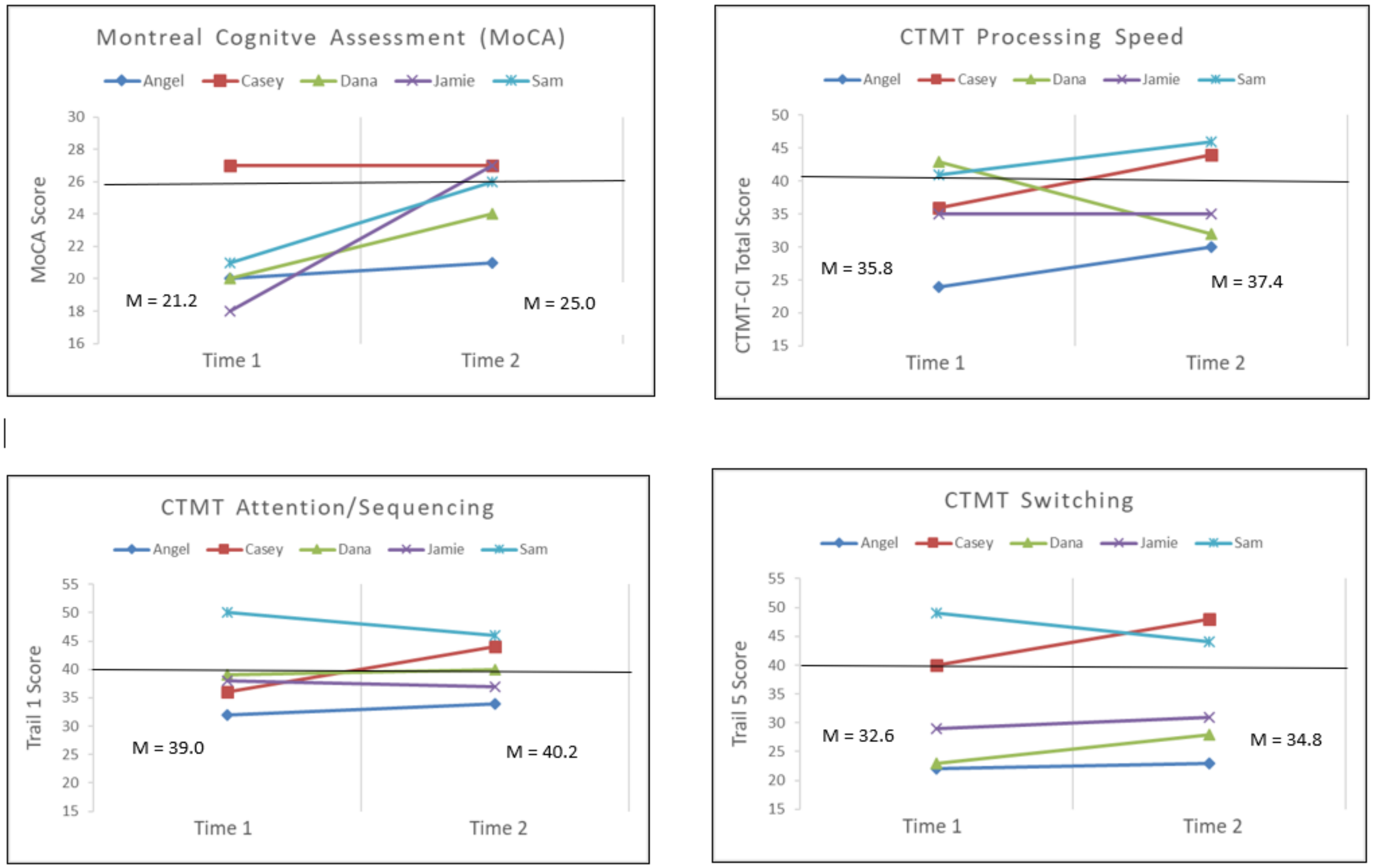


Figure 8. Comparison of T1 and T2 Mean Scores for MoCA and CTMT with Subscales. MoCA score < 26 indicates impaired cognition. CTMT score ≤ 40 signifies mild-moderate executive function (EF) impairment and ≤ 30 signifies moderate-severe EF impairment.

EFPT and BRIEF scores. Figure 9 presents graphed mean scores for the EFPT (functional executive function) and the BRIEF - A, including the BRIEF-Total, BRIEF-BRI (behavior regulation index) and the BRIEF-MI (metacognition index). All participants' scores on the EFPT except for Casey's improved at T2; Casey's score was already low, indicating better EF, and increased by only one point. On the EFPT, participants generally needed less cueing to use skills related to EF for successful completion of the bill-paying task. On the self-rated BRIEF, the measure of subjective executive function, Casey, Sam, and Angel scored in the adaptive range for overall executive function (BRIEF-Total). There was a similar pattern for BRIEF-BRI and BRIEF-MI; Angel, Casey, and Sam rated their behavior regulation and metacognitive skills in the adaptive range at T1 and T2. Jamie's BRIEF-MI scores moved into the moderately impaired range at T2. Dana's BRIEF-MI scores were in the moderate impairment range at T1; at T2, Dana rated metacognitive skills in the severely impaired range.

BPRS-E Scores. Figure 10 presents graphed scores for the BPRS-E and subscales. Total scores on the BPRS-E decreased from T1 to T2, apart from Dana's score. Dana presented with increased symptomology at T2, including self-report of more positive symptoms. Dana and Jamie experienced more positive symptoms and depression/anxiety compared to the rest of the group. All participants' scores on the agitation/mania subscale decreased from T1 to T2.

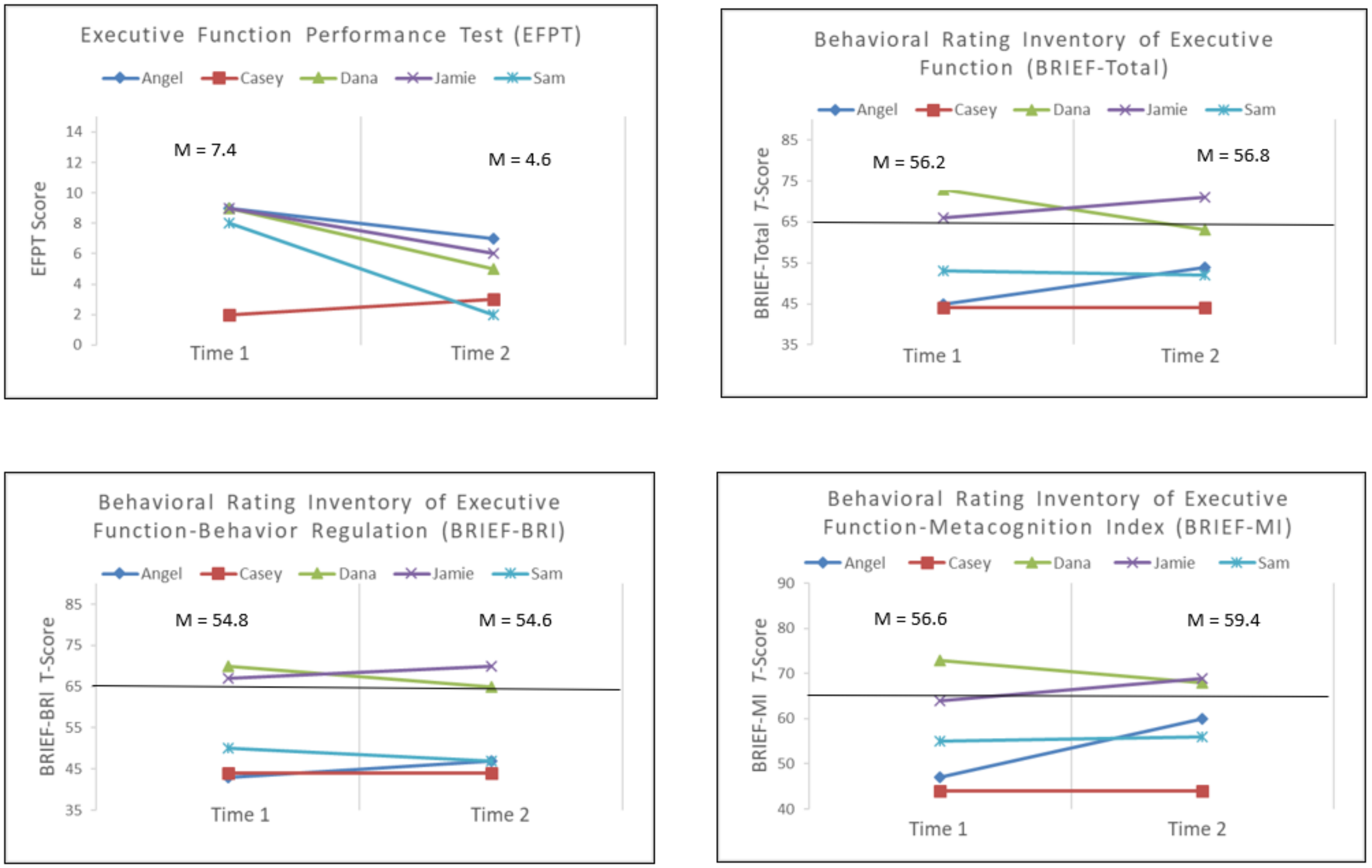


Figure 9. Comparison of T1 and T2 Mean Scores for EFPT and BRIEF with Subscales. Lower scores on the EFPT and BRIEF indicate better executive function (EF) skills. BRIEF scores ≥ 65 signifies moderate EF impairment and ≥ 80 signifies severe EF impairment.

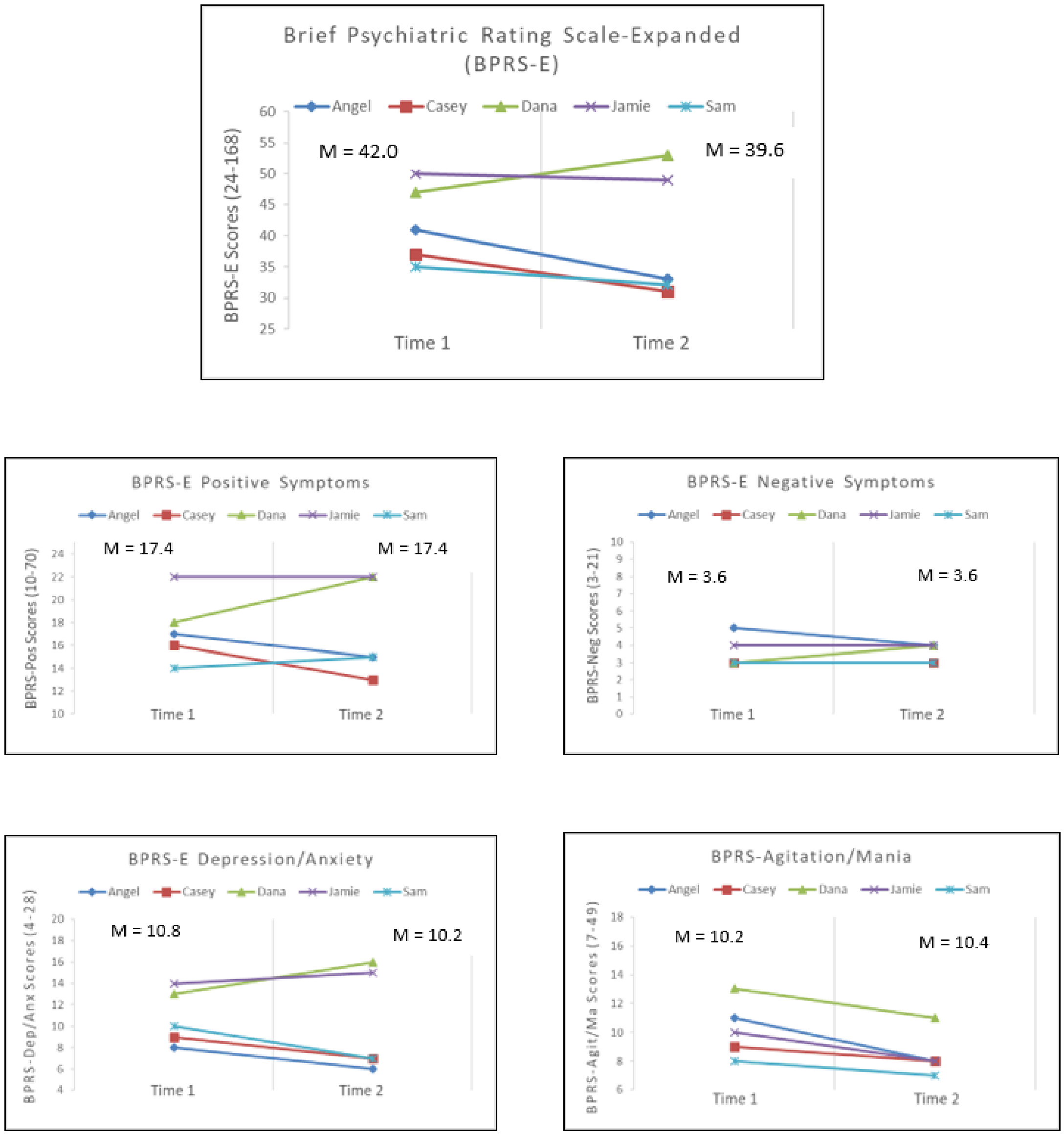


Figure 10. Graphed Comparison of T1 and T2 Mean Scores for BPRS-E and Subscales. Higher scores indicate greater symptomology. Score ranges are provided on y-axes. Casey's scores on the BPRS-Neg are obscured by Sam's scores; their scores are the same.

Statistical Analysis of Changes in Assessment Scores from T1 to T2

To determine whether changes in test scores were statistically significant, the PI first checked for normality in the data. The Shapiro-Wilk test found that four assessments had significance levels indicating that data were not normally distributed at either T1 or T2: EFPT (W = .644, p = .002), HT (W = .688, p = .007), BPRS-Neg (W = .771, p = .006), and BPRS-Agit/Ma (W = .768, p = .044). The PI, therefore, used the Wilcoxon matched-pairs signed-ranks test to determine significance of score changes; Table 11 presents the results. The Agitation/Mania subscale of the BPRS-E was the only assessment score to demonstrate a statistically significant change (Z = -2.041, p = .041). Scores of three tests showed a trend toward significance: MoCA (Z = -1.826, p = .068), BRIEF-MI (Z = -1.826, p = .068), and HT (Z = -1.890, p = .059).

Relationships Between Assessment Score Variables

Correlational analysis explored relationships between study variables. The Spearman's rho Correlation Coefficient (r_s) was chosen because some of the assessment data were not normally distributed, and because of the small sample size. Correlations were interpreted using criteria from Dancey and Reidy (2004): strong (.70 - .90), moderate (.40 - .60) and weak (.10 - .30). Correlations were conducted using three data sets: (1) assessments of life satisfaction, symptomology, and self-efficacy; (2) assessments of executive function, cognition, and self-efficacy; and (3) MOHOST domains and assessments. Each data set was analyzed separately at T1 and T2. This section shares the results.

Table 11

Statistical Comparisons Between T1 and T2 Assessments Scores

Assessment	Abbreviation	*Z*	*p*
Bell-Lysaker Emotion Recognition Task	BLERT	1.625[b]	.104
Brief Psychiatric Rating Scale—Expanded	BPRS--E	1.084[a]	.279
• Positive Symptoms	BPRS-Pos	.000[c]	1.000
• Negative Symptoms	BPRS-Neg	.000[c]	1.000
• Depression/Anxiety	BPRS-Dep/Anx	.544[a]	.586
• Agitation/Mania	BPRS-Agit/Ma	2.041[a]	**.041***
Behavioral Rating Inventory of EF—Adult	BRIEF-Total	-.552[b]	.581
• Behavior Regulation Index	BRIEF-BRI	-.184[a]	.854
• Metacognition Index	BRIEF-MI	-1.826[b]	.068
Comprehensive Trail-Making Test	CTMT-Total	-.365[b]	.715
• Attention & Sequencing	CTMT- Attn/Seq	-.542[b]	.588
• Switching	CTMT-Sw	-1.084[b]	.279
Executive Function Performance Test	EFPT	-1.753[a]	.080
General Self-Efficacy Scale	GSE	-1.511[b]	.131
Hinting Task	HT	-1.890[b]	.059
Montreal Cognitive Assessment	MoCA	-1.826[b]	.068
Satisfaction with Life (Total)	SWL	1.069[b]	.285
• Living situation	SWL-Living	.272[a]	.785
• Self and present life	SWL-S&L	.736[b]	.461
• Social relationships	SWL-Social	1.289[b]	.197
• Work	SWL-Work	.816[b]	.414

Note. Two-tailed Wilcoxon matched-pairs signed-ranks test analyzed changes between T1 and T2 assessment scores. [a]Based on positive ranks, median score went down. [b]Based on negative ranks, median score went up. [c]Sum of positive ranks equals sum of negative ranks: no change in median scores. On all tests except BRIEF, EFPT, and BPRS, higher scores indicate more positive outcomes. *Change in score is significant at the .05 level; significant change is in bold.

Life satisfaction, symptomology, and self-efficacy. Table 12 presents correlations between variables related to life satisfaction, symptomology, and general self-efficacy. General self-efficacy was not significantly related to any life satisfaction or symptomology variables at T1. At T2, general self-efficacy was positively related to satisfaction with social relationships (r_s = .80, p = .104). Positive symptoms had a strong and significant inverse relationship with satisfaction with social relationships and with satisfaction with self and present life at T1;

negative symptoms were related to satisfaction with living situation. At T2, the relationship between symptomology and life satisfaction domains had weakened. Positive symptoms were not strongly correlated with life satisfaction domains. Negative symptoms were significantly correlated only with satisfaction with self and present life.

Table 12

Preintervention (T1) and Postintervention (T2) Correlations of SWL, BPRS-E, and GSE Scores

Time 1	BPRS-E Total	BPRS Positive Symptoms	BPRS Negative Symptoms	BPRS Depression Anxiety	BPRS Agitation Mania	General Self-Efficacy (GSE)
SWL-Total	**-.90**	**-.90***	-.78	--	--	--
SWL-Living	--	--	**-.92***	--	--	--
SWL-Self & Life	**-.98****	**-.98****	--	--	--	--
SWL-Social	**-.90***	**-.90***	-.78	--	--	--
SWL-Work	--	--	--	--	--	--
GSE	-.72	-.72	--	-.72	--	
Time 2						
SWL-Total	--	--	-.87	--	--	--
SWL-Living	--	**--**	-.87	--		--
SWL-Self & Life	--	--	**-.91***	--		--
SWL-Social	--	--	-.87	--	--	.80
SWL-Work	--	--	--	--	--	--
GSE	**-.90***	-.74	-.87	--	--	

Note. Two-tailed Spearman's correlation (r_s) determined relationships between variables. Table includes only correlations ≥ .70. Significant correlations are in bold print. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level. – Correlation < .70. Higher scores on the BPRS-E and its subscales indicate greater symptom severity.

Executive function, cognition, and self-efficacy. Correlations of assessment score variables related to executive function, social cognition, general cognition, and self-efficacy at T1 and T2 are presented in Tables 13 and 14, respectively. At T1, the EFPT, which measured functional EF was strongly and significantly correlated with the MoCA (r_s = -.92, p = .028) and the HT (r_s = -.88, p = .047). The CTMT-Sw was strongly correlated with the HT (r_s = .95, p = .014).

At T2, GSE scores were strongly and significantly related to scores on the BRIEF-MI (r_s = -.90, p = .037) and the CTMT-SW (r_s = .90, p = .037), measures of subjective EF (metacognition) and objective EF (cognitive flexibility), respectively. Finally, the EFPT had strong correlations with CTMT-Total scores (r_s = .90, p = .037), CTMT-Attn/Seq (r_s = -1.00, p = .000), and CTMT-Sw (r_s = -.80, p = .104). Overall, at T2, there were stronger relationships among functional and objective executive function, and between general and social cognition. General self-efficacy was more strongly related with objective and subjective EF and general cognition at T2 than at T1.

Table 13

Correlations of Preintervention (T1) Assessment Scores for Executive Function, Cognition and General Self-Efficacy

Time 1: Pre-Intervention Assessments	BLERT	BRIEF Total	BRIEF BRI	BRIEF MI	CTMT Total	CTMT Attn/ Seq	CTMT Switch	EFPT	GSE	HT	MoCA	MoCA Mem
BLERT		--	--	--	--	--	--	--	--	--	--	--
BRIEF-Total	--		**.90***	**1.00****	--	--	--	--	--	--	--	--
• Behavior Regulation (BRI)	--	**.90***		**.90***	.70	.70	--	--	-.82	--	--	--
• Metacognition (MI)	--	**1.00****	**.90***		--	--	--	--	--	--	--	--
CTMT-Total	--	--	.70	--		.80	--	--	--	--	--	--
• CTMT-Attn/Seq	--	--	.70	--	.80		--	--	--	--	--	--
• CTMT-Switching	--	--	--	--	--	--		-.78	--	**.95***	--	--
EFPT	--	--	--	--	--	--	-.78		--	**-.88***	**-.92***	--
GSE	--	--	-.82	--	--	--	--	--		--	--	--
HT	--	--	--	--	--	--	--	**-.88***	--		.73	--
MoCA	--	--	--	--	--	--	--	**-.92***	--	.73		--
• Memory	--	--	--	--	--	--	--	--	--	--	--	

Note. Two-tailed Spearman's correlation (r_s) determined relationships between variables related to pre-intervention assessments. Table includes only correlations ≥ .70. Significant correlations are in bold print. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level. – Correlation < .70.

Table 14

Correlations of Postintervention (T2) Assessment Scores for Executive Function, Cognition and General Self-Efficacy

Time 2: Post-Intervention Assessments	BLERT	BRIEF Total	BRIEF BRI	BRIEF MI	CTMT Total	CTMT Attn/ Seq	CTMT Switch	EFPT	GSE	HT	MoCA	MoCA Mem
BLERT		--	--	-.70	--	--	--	--	--	--	--	--
BRIEF-Total	--		**.98****	**.90***	--	--	--	--	-.70	--	--	--
• Behavior Regulation (BRI)	--	**.98****		.87	--	--	--	--	--	--	--	--
• Metacognition (MI)	-.70	**.90***	.87		--	--	-.70	--	**-.90***	--	--	--
CTMT-Total	--	--	--	--		**.90***	**.90***	**-.90***	.80	--	--	.70
• CTMT-Attn/Seq	--	--	--	--	**.90***		.80	**-1.00****	--	--	--	--
• CTMT-Switching	--	--	--	-.70	**.90***	.80		-.80	**.90***	--	.82	**.90***
EFPT	--	--	--	--	**-.90***	**-1.00****	-.80		--	--	--	--
GSE	--	-.70	--	**.90***	.80	--	**-.90***	--		--	.72	.80
HT	--	--	--	--	--	--	--	--	--		**.90***	.87
MoCA	--	--	--	--	--	--	.82	--	.72	**.90***		**.98****
• Memory	--	--	--	--	.70	--	**.90***	--	.80	.87	**.98****	

Note. Two-tailed Spearman's correlation (r_s) determined relationships between variables related to preintervention assessments. Table includes only correlations ≥ .70. Significant correlations are in bold print. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level. --Correlation < .70.

MOHOST Domain and Assessment Score Correlations

Tables 15 and 16 present correlations between mean MOHOST domain and assessment scores at T1 and T2, respectively. At T1, executive function scores had limited correlations with MOHOST domains. There were strong and significant correlations between CTMT-Attn/Seq and *Process Skills* (r_s= .98, p =.005) and between CTMT-Sw, the variable for cognitive flexibility, and *Pattern of Occupation* (r_s = 1.00, p = .000). Cognitive flexibility was significantly related to the MOHOST total score (r_s = .90, p = .037) and also strongly (but not significantly) related to *Motivation* (r_s = .80, p = .104), as were the BRIEF-MI and BRIEF-Total (r_s = -.70, p = .118). *Communication & Interaction Skills* was strongly (but not significantly) related to both the CTMT-Attn/Seq and CTMT-Sw (r_s = .82, p = .089). The EFPT was strongly related to *Motivation* (r_s = .89, p = .041) and strongly but not significantly related to *Pattern of Occupation* (r_s = -.78, p = .118) and *Environment* (r_s = -.78, p = .118). Symptomology was related to some MOHOST domains. Agitation/Mania was strongly and significantly related to *Motivation* and *Pattern of Occupation* (r_s = -.90, p = .037), and strongly but not significantly related to Environment (r_s = .70, p = .118) and the MOHOST mean total score (r_s = -.80, p = .104). Finally, *Environment* was significant correlated with the mean SWL score (r_s = -.90, p = .037) and two SWL domains: Self and Present Life (r_s = .98, p = .005) and Social Relationships (r_s = .90, p = .037).

At T2, correlations between MOHOST and life satisfaction domains were stronger. Total MOHOST scores, *Process Skills*, and *Environment* had strong and significant correlations with almost all SWL domains except Work. *Communication & Interaction* and *Motor Skills* were strongly (but not significantly) correlated with SWL total score and domains of Living and Self & Present Life. Functional and Objective EF were also more strongly related to MOHOST domains; related assessments had strong and significant correlations with *Process Skills*, *Environment*, and MOHOST Total, and strong but not significant correlations with *Communication & Interaction* and *Motor Skills*. *Motivation* was correlated (but not significantly) with CTMT-Total (r_s = .70, p = .118), SWL-Social (r_s = .70, p = .188), MoCA (r_s = .82, p = .089), and Memory (r_s = .70, p = .188). Memory was also correlated with *Environment* (r_s = .70, p = .188). Finally, symptomology was less related to MOHOST domains at T2. Negative symptoms had strong correlations with *Process Skills*, *Environment*, and MOHOST Total that approached significance (r_s = -.87, p = .058). Overall, at T2 MOHST domains were more strongly related to functional and objective EF and to satisfaction with life, and less strongly related to symptoms.

Table 15

Correlations between Baseline MOHOST Domain Mean Scores and T1 Assessments

MOHOST Domain / Pre-Intervention Assessment (T1)	Motivation	Pattern of Occupation	Comm. & Interaction Skills	Process Skills	Motor Skills	Environment	MOHOST Total
BLERT	--	--	--	--	--	--	--
BPRS—E	--	--	--	--	--	**-1.00****	--
Positive Symptoms	--	--	--	--	--	**-1.00****	--
Negative Symptoms	--	--	--	-.80	--	--	--
Depression/Anxiety	--	--	--	--	--	--	--
Agitation/Mania	**-.90***	**-.90***	--	--	--	-.70	-.80
BRIEF-Total	-.70	--	--	--	--	--	--
BRIEF-BRI	--	--	--	--	--	--	--
BRIEF-MI	-.70	--	--	--	--	--	--
CTMT-CI Total	--	--	--	.87	--	--	--
CTMT- Attn/Seq	--	--	.82	**.98****	--	--	.70
CTMT-Switching	.80	**1.00****	.82	--	--	--	**.90***
EFPT	**-.89***	-.78	--	--	--	-.78	--
GSE	--	--	--	--	--	.72	--
HT	.79	**.95***	--	--	--	--	.74
MoCA	--	--	--	--	-.76	.87	--
SWL-Total	--	.70	--	--	--	**.90***	--
SWL-Living	--	--	--	--	-.76	--	--
SWL-Self & Life	--	--	--	--	--	**.98****	--
SWL-Social	--	.70	--	--	--	**.90***	--

Note. Two-tailed Spearman's correlation (r_s) determined relationships between mean MOHOST domain scores and assessment variables. Only correlations ≥ .70 are included. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level.

Table 16

Correlations Between Intervention Phase MOHOST Domain Scores and T2 Assessments

MOHOST Domain / Post-Intervention Assessment (T2)	Motivation	Pattern of Occupation	Comm. & Interaction Skills	Process Skills	Motor Skills	Environment	MOHOST Total
BLERT	--	--	--	--	--	--	--
BPRS—E	--	--	--	--	--	--	--
Positive Symptoms	--	--	--	--	--	--	--
Negative Symptoms	--	--	--	-.87	--	-.87	-.87
Depression/Anxiety	--	--	--	--	--	--	--
Agitation/Mania	--	--	--	--	--	--	--
BRIEF-Total	--	--	--	--	--	--	--
BRIEF-BRI	--	--	--	--	--	--	--
BRIEF-MI	--	--	--	--	--	--	--
CTMT-CI Total	.70	--	--	**.90***	--	**1.00****	**.90***
CTMT- Attn/Seq	--	--	.80	**1.00****	-.70	**.90***	**1.00****
CTMT-Switching	--	--	--	.80	-.70	**.90***	.80
EFPT	--	--	-.80	**-1.00****	.70	**-.90***	**1.00****
GSE	--	--	--	--	--	.80	--
HT	--	--	--	--	--	--	--
MoCA	.82	--	--	--	--	--	--
SWL-Total	--	--	.80	**1.00****	-.70	**.90***	**1.00****
SWL-Living	--	--	.80	**1.00****	-.70	**.90***	**1.00****
SWL-Self & Life	--	--	.79	**.95***	-.79	.79	**.95***
SWL-Social	.70	--	--	**.90***	--	**1.00****	**.90***

Note. Two-tailed Spearman's correlation (r_s) determined relationships between mean MOHOST domain scores and assessment variables. Only correlations ≥ .70 are included. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level.

Participants' Combined MOHOST Total and Domain Scores

The MOHOST had two functions in this study: identifying participants' strengths (along with assessment results) and serving as the repeated measure in the single-case design. Consistent MOHOST item scores of 4 (facilitates performance) or 3 (allows performance) indicated that the item was a strength. Scores of 12 and above in any of the six MOHOST domains indicated strength in that domain. Table 17 summarizes repeated measures data by presenting the means scores for each of the six MOHOST domains during baseline (T1) and intervention (T2) phases, along with *d*-scores, which will be used below in discussion of single-case design results. Figure 11 presents graphed MOHOST total scores for both baseline and intervention phases for all participants, including means and *d*-scores.

Table 17

MOHOST Domain Mean Scores with Effect Sizes

MOHOST Mean Scores	Angel	Casey	Dana	Jamie	Sam
Motivation T1	10.22	12.13	10.14	11.50	11.89
Motivation T2	9.83	11.56	11.00	12.00	11.71
Motivation *d*	**-.23**	**-.34**	**.51**	**.30**	-.10
Pattern of Occupation T1	10.89	12.89	11.43	12.33	13.00
Pattern of Occupation T2	12.33	12.44	13.14	11.20	12.57
Pattern of Occupation *d*	**.81**	-.24	**.96**	-.64	-.24
Communication & Interaction T1	11.67	12.00	12.00	13.50	14.40
Communication & Interaction T2	12.17	12.78	13.14	11.20	14.00
Communication & Interaction *d*	**.27**	**.42**	**.62**	**-1.24**	**-.24**
Process Skills T1	9.22	10.50	10.57	10.50	12.11
Process Skills T2	8.83	11.22	11.14	10.80	12.00
Process Skills *d*	**-.25**	**.46**	**.37**	.19	-.07
Motor Skills T1	15.00	12.50	14.14	15.17	15.00
Motor Skills T2	15.83	14.18	14.43	15.20	14.86
Motor Skills *d*	**.57**	**1.15**	**.20**	.02	-.10
Environment T1	12.33	13.00	12.29	12.00	14.00
Environment T2	11.12	14.64	12.43	13.80	15.43
Environment *d*	**-.64**	**.90**	.08	**.99**	**.78**
MOHOST Total T1	69.33	73.00	70.57	75.67	80.44
MOHOST Total T2	70.17	77.38	75.29	73.50	80.57
MOHOST Total *d*	.13	**.67**	**.72**	**-.33**	.02

Note. T1 and T2 refer to Time 1 (preintervention) and Time 2 (postintervention, respectively. *d*-scores of .20 and above suggest small intervention effect and are in bold.

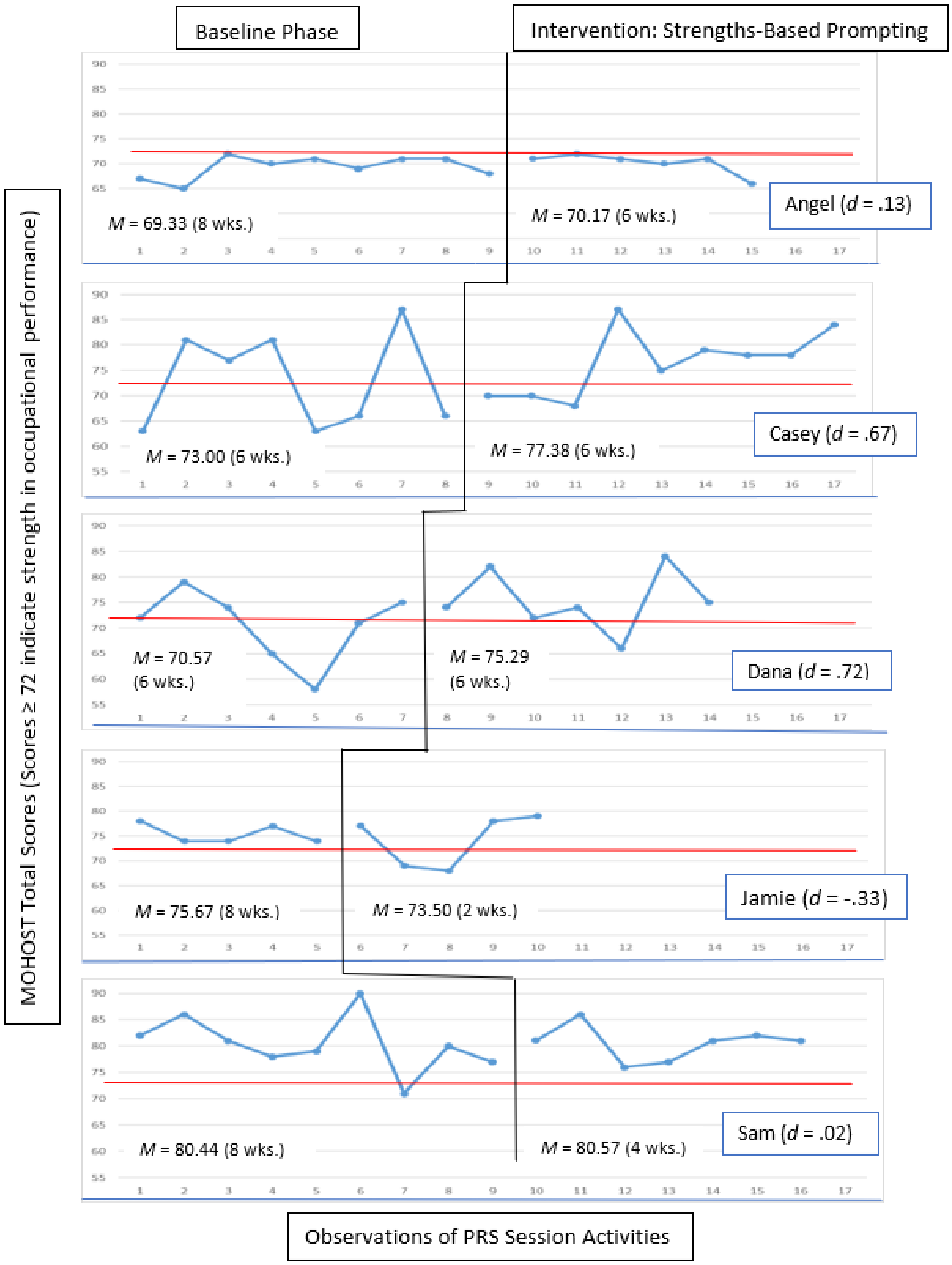


Figure 11. Graphed MOHOST Total Scores for All Participants. The solid black line separates MOHOST scores for baseline and intervention phases. A score of 72 or above, indicated by the red lines, designated overall strength in occupational participation.

Participants' Self-Confidence Ratings

Before beginning their PRS intervention session activities, participants marked a line to indicate how confident they felt about their participation or performance in the session's activities. Figure 12 provides a graphic depiction of participants' self-confidence ratings. This rating was an indicator of self-efficacy, since participants were being asked about their beliefs in their abilities to be successful. Confidence ratings show positive trends for all participants to varying degrees. The first rating was very high for two participants. Based on a rating dip in the second rating, the participant may have responded with more insight at the next session. The other participant's ratings stayed high. Confidence ratings were conducted only during the intervention phase.

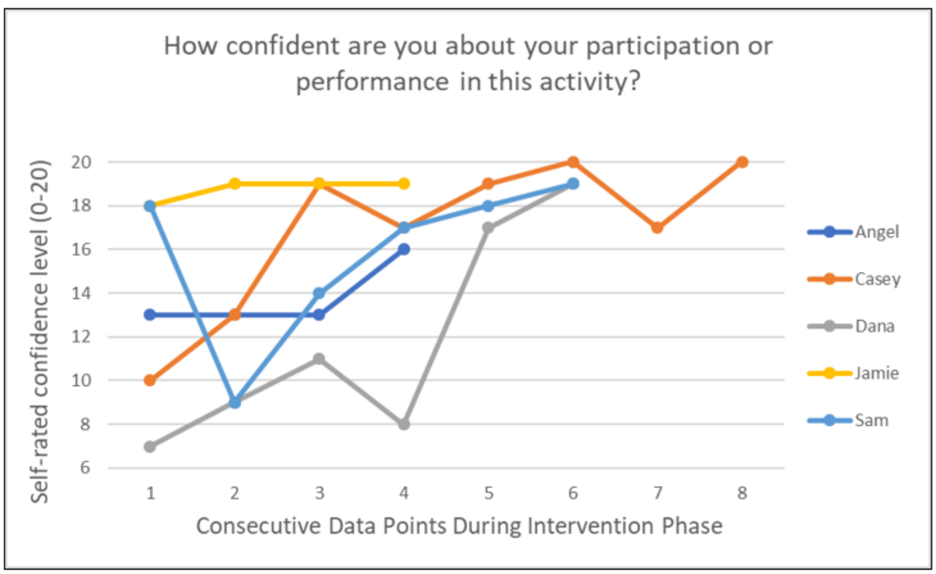


Figure 12. Participants' Self-Confidence Ratings. Participants indicated their level of confidence prior to beginning intervention activities. Ratings were not completed at every session, especially those with group activities. Sessions without confidence ratings are not indicated, but confidence ratings are graphed in chronological order.

Single-Case Experimental Design (SCED) Results

This section provides summaries of individual SCED results. Each of five participant summaries will begin with a brief description of the participant and their goals, followed by a summary of their assessment scores and description of their strengths. Results of single-case analysis, including both visual and statistical analysis will then be provided for the total MOHOST score and each of the six MOHOST domains.

Angel

Angel had a part-time job cleaning office buildings and took pride in doing good work. Angel's main goal was to have a friend. IRP objectives were to improve social awareness and skills for improved relationships, increase community engagement, meet new people and develop social skills, and maintain personal wellness for physical and emotional health. Angel lived independently in an apartment. The following paragraphs summarize Angel's assessment scores, strengths, and MOHOST scores.

Angel's assessment scores. Table 18 presents Angel's assessment scores. From T1 to T2, Angel's scores improved on many assessments. BLERT score moved past the threshold for impaired emotion recognition, reflecting a positive change in social cognition; score on the HT (theory of mind) remained low but improved by 2 points. CTMT-CI score moved from the severely impaired range (< 30) to the mild to moderately impaired range (30-35) of EF. Likewise, Angel's improved EFPT score indicates improved functional EF. Angel's BPRS-E score also improved, indicating less psychiatric symptomology. MoCA scores indicated general cognitive impairment. Angel's T2 general self-efficacy score was 2 points lower than GSE score at T1. Total SWL score was stable, with 2 points higher for SWL-S and 2 points lower for SWL-S&L.

Table 18

Angel's Preintervention (T1) and Postintervention (T2) Assessment Scores

Assessment	Abbreviation	Time 1 (T1)	Time 2 (T2)
Bell-Lysaker Emotion Recognition Task	BLERT	12	17
Brief Psychiatric Rating Scale - Expanded	BPRS - E	41	31
• Positive Symptoms	BPRS-Pos	17	15
• Negative Symptoms	BPRS-Neg	5	4
• Depression/Anxiety	BPRS-Dep/Anx	8	6
• Agitation/Mania	BPRS-Agit/Ma	11	8
Behavioral Rating Inventory of Executive Function - Adult	BRIEF- A	45	54
• Behavior Regulation Index	BRIEF-BRI	43	47
• Metacognition Index	BRIEF-MI	47	60
Comprehensive Trail-Making Test	CTMT-Total	24	30
• Attention & Sequencing	CTMT- Attn/Seq	32	34
• Switching	CTMT-Sw	22	23
Executive Function Performance Test	EFPT	9	7
General Self-Efficacy Scale	GSE	31	29
Hinting Task	HT	9	11
Montreal Cognitive Assessment	MoCA	20	21
• Memory index score	MoCA - Memory	11	10
Satisfaction with Life (Total)	SWL - Total	53	53
• Living situation	SWL-Living	12	12
• Self and present life	SWL-S&L	18	16
• Social relationships	SWL-Social	16	18
• Work	SWL-Work	7	7

Note. BRIEF *T*-scores > 65 indicates self-reported (subjective) EF impairment. BLERT score < 15 indicates impaired emotion perception. CTMT-CI *T*-scores < 30 indicates severe objective EF impairment; 30-35 indicates mild-moderate impairment. MoCA scores < 26 indicates impaired cognition; BRIEF score > 65 indicates subjective EF impairment.

Angel's strengths. Angel's identified strengths at baseline mainly came from item scores of 3 and 4 on MOHOST observations, and one from the MoCA. Angel's identified strengths were *curiosity and interest*, *resources*, *cooperation*, *strength/effort*, *energy*, and attention (vigilance). Italics indicate MOHOST items.

Angel's MOHOST total scores. Figure 13 depicts graphed data for Angel's total MOHOST scores during baseline and intervention phases. The mean total MOHOST scores for baseline and intervention phases were 69.33 and 70.17, respectively. Although small, scores reflect positive changes on three of the four indicators for single case design: mean, level, and latency. Figure 13 shows a downward trend in total MOHOST scores in the intervention phase.

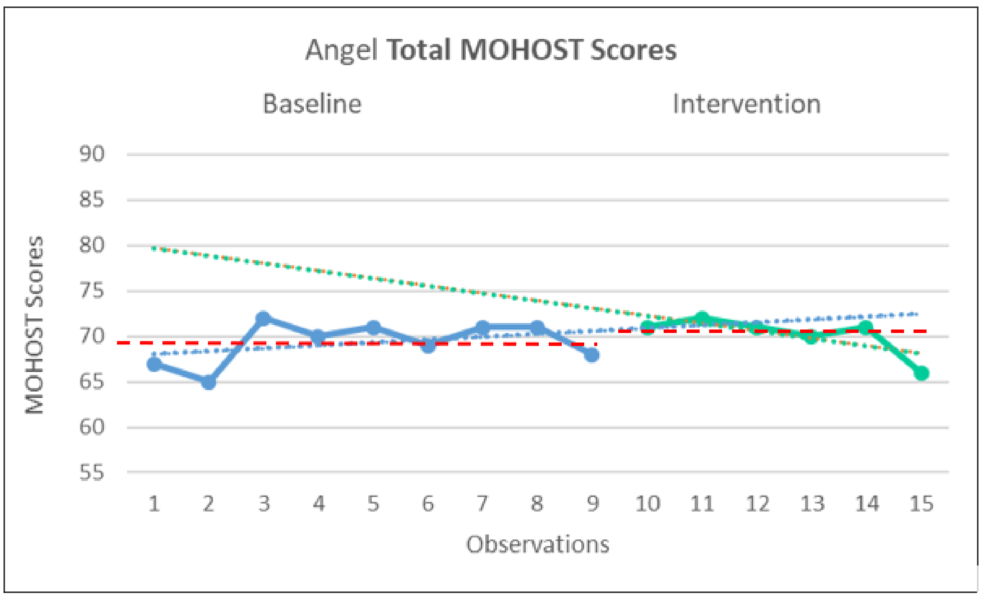
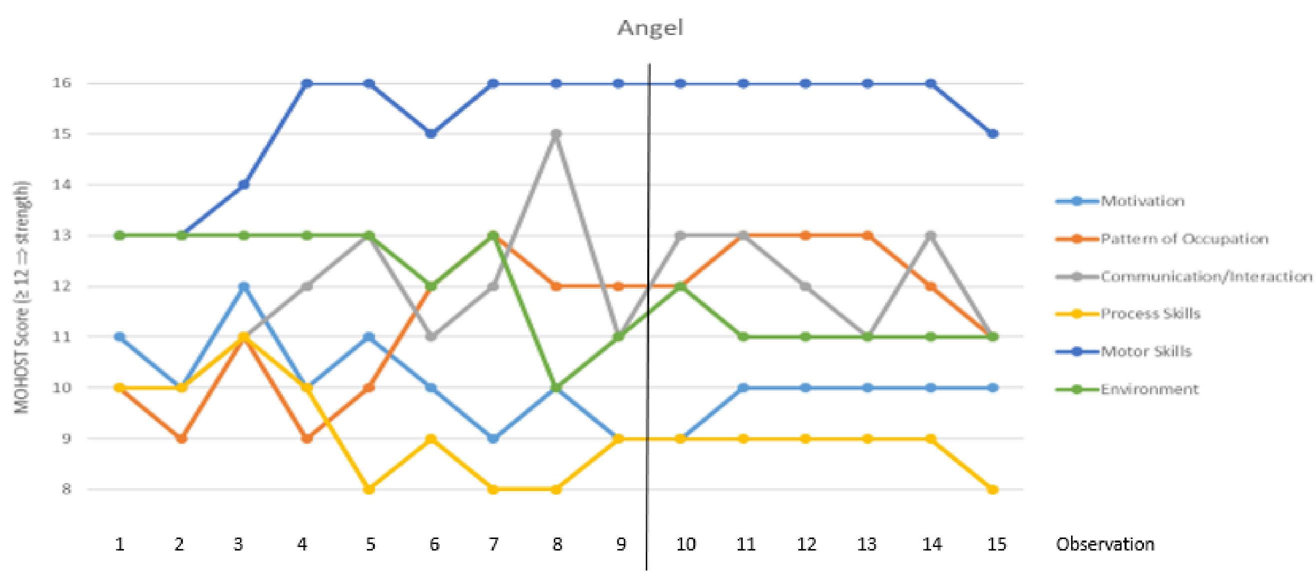


Figure 13. Angel's Graphed Total MOHOST Scores. Blue and green dotted lines show trends for preintervention and postintervention data, respectively. Red dashed lines show mean MOHOST total scores for each phase.

Angel's MOHOST domain scores. Figure 14 presents a graphed summary of Angel's MOHOST domain scores for each observed PRS session along with the activities observed and the occupational contexts for the sessions. Figures 15 and 16 focus on the individual MOHOST domains and depict Angel's baseline and intervention phase scores for each of the six domains. In Figure 14, the activities that are listed for each observation (that is, for each observed PRS session) correspond to the same observation numbers in Figures 15 and 16. The following section describes Angel's results by MOHOST domain and refers to these observation numbers and related session activities as they inform data (i.e., MOHOST scores) presented in Figures 14, 15, and 16.

Motivation. As seen in Figure 15, Angel's mean *Motivation* score decreased from baseline to intervention, although the change was small. However, there was a slight upward trend in the intervention phase. Latency and level were unremarkable. Notably, the *Motivation* score reached 12, the threshold score for a domain strength, at only one data point—when Angel was working with the PRS provider on a progress review (Observation 3, Figures 14 and 15). *Motivation* was not a strength at any other session. Angel's low *Motivation* scores were driven by challenges indicated by low scores on two *Motivation* items: *awareness of strengths and challenges* and *shows pride/seeks challenges*. *Identifies preferences/is goal-oriented* was rated at 3 or higher in approximately half of sessions in both baseline and intervention phases and *shows curiosity and interest* emerged as a consistent relative strength.



Baseline Phase

Session	Context	Occupation
1	PRS group, community	*Walk on the Wild Side*: trail-hiking
2	PRS group, community	hiking in woods, socializing
3	1:1 home	participating in Progress Review
4	1:1 home	planning: writing new IRP goals
5	home, with Barry's guest	being a host, socializing
6	1:1 home	planning for new IRP action steps
7	1:1 home	exploring friendship traits
8	1:1 home	processing social interactions
9	1:1 home; discussing socializing in context of skills, supports, diagnosis	

Intervention Phase

Session	Context	Occupation
10	1:1 home	exploring use of social and communication skills
11	1:1 home	identifying strengths & skills used last week; challenges
12	1:1 home	processing community social awareness and related skills
13	1:1 home	exploring volunteer work, for increased socialization
14	1:1 home	completing volunteer applications
15	1:1 home	planning for volunteer opportunities
16	1:1 home	discussing application of social/communication skills and strengths

Figure 14. Angel's MOHOST Domain Scores with Activities and Occupational Contexts.

Pattern of Occupation. From baseline to intervention, Angel's mean score rose to above the threshold score of 12, changing the *Pattern of Occupation* domain into an area of strength. The baseline phase does show an upward trend, as seen in Figure 15. Kazdin (2011) notes that baseline upward trends in single-case research are common and can confound data analyses. An overall understanding of visual and statistical indicators helps to clarify analyses. Kazdin (2011) further notes that statistical analyses help to clarify findings that may be obscured by variability or trends in single-case data. The large effect size (d = .81) suggests that the strengths-based intervention had a positive effect on the *Pattern of Occupation* domain. Positive change in this domain was driven by higher observation scores in two MOHOST items: *maintains routine habits* and *fulfills responsibilities in the session*.

Communication & Interaction Skills. Scores in this domain showed an increase in both mean and level, as shown in Figure 15. Although small, the change in mean was enough to move Angel's score past the threshold score (12), making the *Communication & Interaction Skills* domain an area of strength. Effect size (d = .27) also indicated that the intervention had a small effect. Figure 15 shows that the beginning of the intervention phase was associated with an immediate increase in scores; lack of latency also suggested that the intervention had a positive effect on this domain. Based on Angel's MOHOST item scores, the positive change was driven by improvement in *uses appropriate non-verbal expression*. Angel's scores also improved in social cognitive assessments. From pre- to postintervention, scores on the HT continued to be low but increased from 9 to 11; BLERT score increased from 12 to 17. Since BLERT scores below 15 indicate impaired emotion recognition, Angel's increased score indicated a move into the functional range of emotion perception capability.

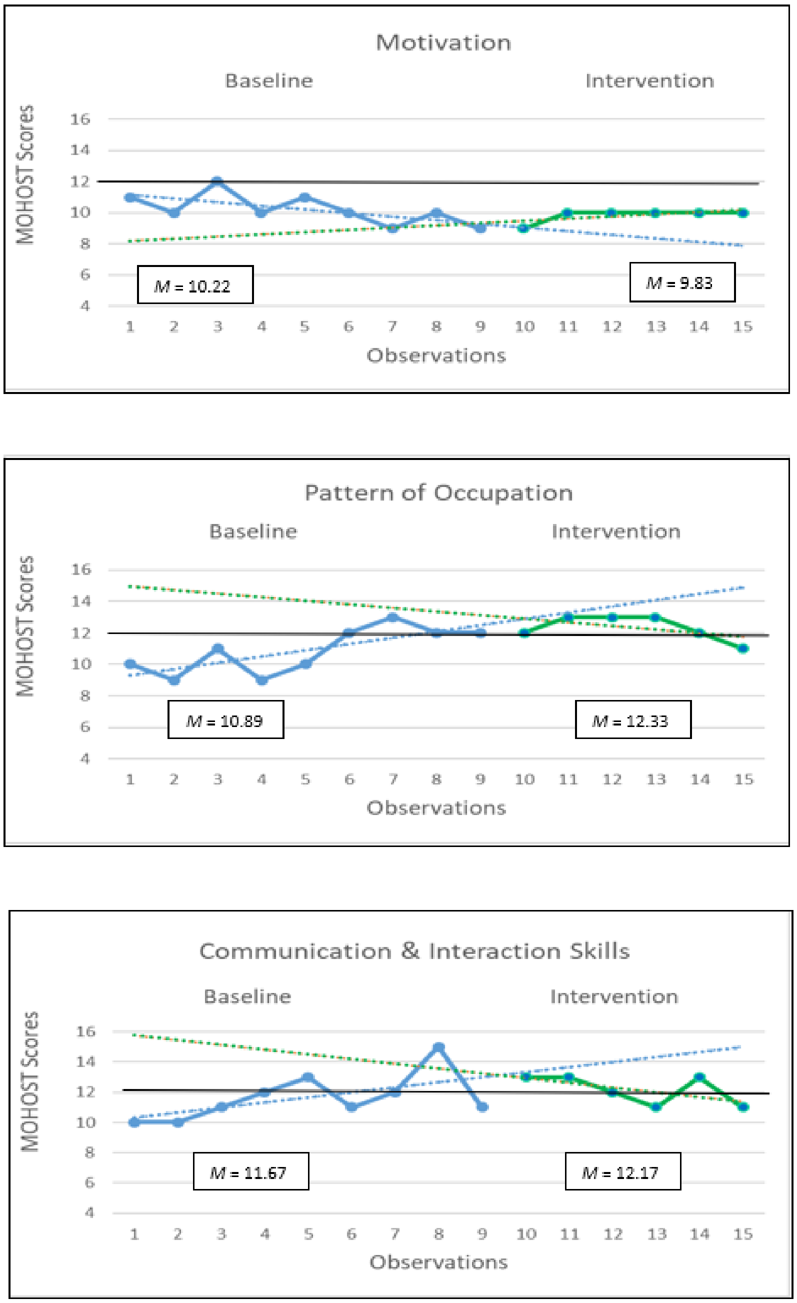


Figure 15. Angel's Observations for First 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines show trends for baseline and intervention data, respectively. Baseline and intervention phase means are included for comparison.

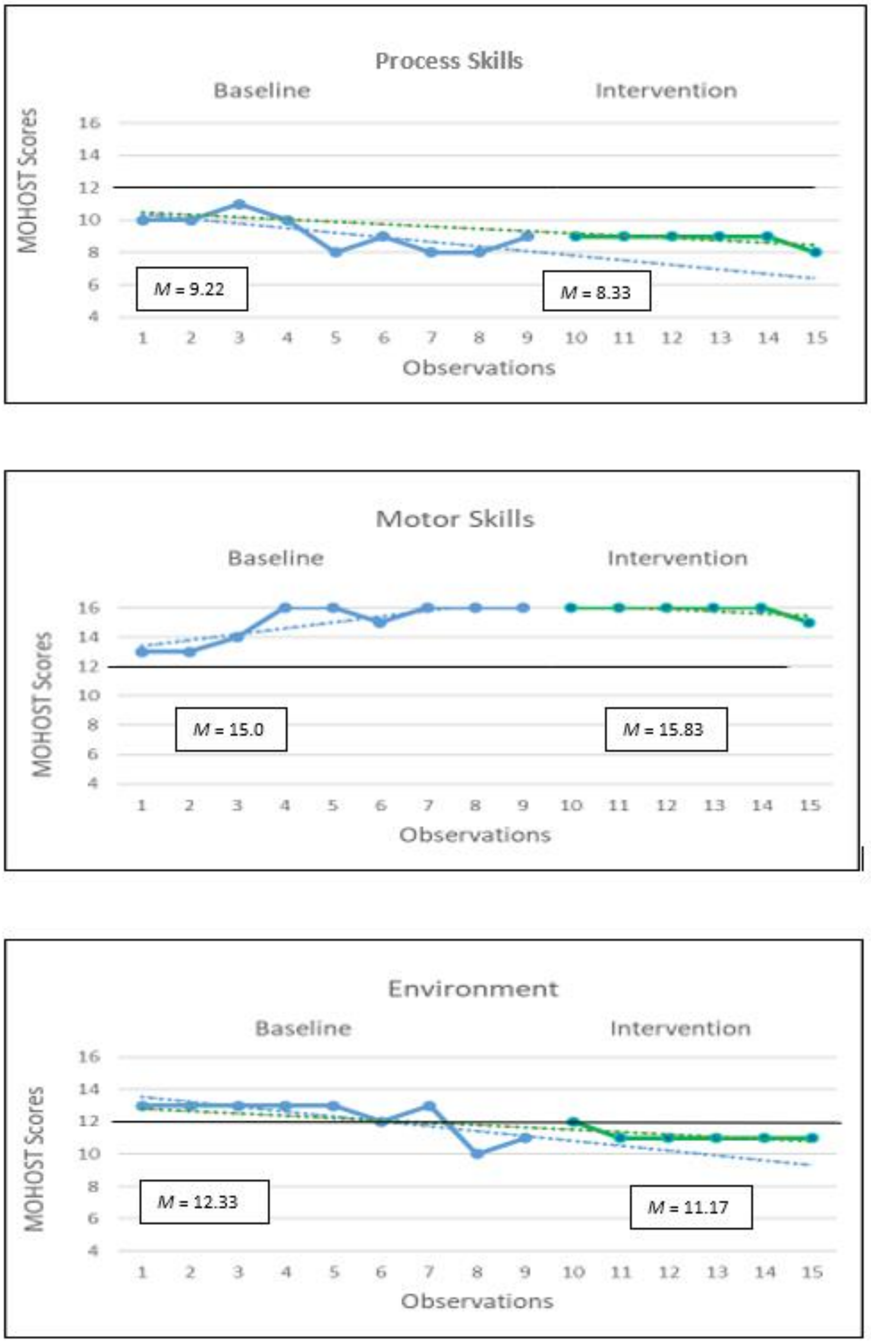


Figure 16. Angel's Observations for Second 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines show trends for baseline and intervention data, respectively. Baseline and intervention phase means are included for comparison.

Process Skills. Visual analysis of this domain indicates a decrease in mean from baseline to intervention, which is supported by a small negative effect size (*d* = -.25). As shown in Figure 16, there was no effect of level or latency. Scores did not reach the threshold for *Process Skills* to be considered a strength in either phase. Both phases showed a downward trend, although the slope of the trendline in the intervention phase is less and process skills appear to be more stable. The slight downward trend in the intervention phase is driven solely by the last session, during which Angel worked with the PRS provider on problem-solving ways to apply social and communication skills and strengths—an activity with a high cognitive demand. During the intervention phase, the only item in which Angel's scores indicated strength was *modifies actions to overcome problems*; Angel's performance was rated at 3 for all but the last session.

Angel's scores for objective EF (CTMT) and functional EF (EFPT) both improved from T1 to T2. The increase in Angel's overall CTMT score indicated a move from the severely impaired to the moderately impaired range. The subjective EF (BRIEF-A) score indicated that Angel perceived their EF skills to be lower at T2 than at T1; BRIEF-A score remained in a functional range subjective EF. Angel's score on the MoCA increased one point from T1 to T2 and remained in a range indicating cognitive impairment.

Motor Skills. Mean MOHOST scores increased from T1 to T2; visual analysis was supported by a medium effect size (*d* = .57). Figure 16 shows that there were no intervention effects suggested by visual analysis indicators of level or latency. The baseline phase showed a steep upward trendline and the intervention phase showed a slight downward trend. As seen in Figure 14, in the first two sessions Angel participated in group hiking activities, which had a relatively higher demand on motor skills. These two sessions appeared to drive the change in mean and trend. Overall, the *Motor Skills* domain was an area of strength during both baseline and intervention.

Environment. Scores showed a decrease in mean from T1 (M = 12.33) to T2 (M = 11.17) that also reflect an overall change in scores from strength to non-strength. Effect size was medium (d = -.64). As seen in Figure 16, there were downward trends in both phases, although the intervention phase trend was slight, and scores were mostly stable at 11. Based on MOHOST observation scores, Angel's low environment scores were driven by the items *resources allow safety and independence* and *social interaction provides support*. Raters' comments on MOHOST observation forms indicated that Angel's environment became less safe as the weather became colder and ice built up on outside steps. Raters' comments also suggested that Angel's lack of social supports and opportunities for social interaction were impediments in activities and on progress toward Angel's rehabilitation goal of having a friend. The strengths-based intervention appears to have contributed to an increased awareness of Angel's lack of social support.

Single-case summary for Angel. The strengths-based cognitive prompting intervention had a small but positive effect for Angel on two MOHOST domains: *Pattern of Occupation* and *Communication & Interaction Skills*. For the latter domain, visual analysis was supported by positive changes from T1 to T2 in scores on assessments that measured social cognition. The *Motor Skills* domain showed improvement with medium effect size, but this change was better explained by the higher motor challenges related to activities in the baseline phase. The intervention appeared to have a small negative effect on the *Process Skills* domain, although there was a slight upward trend in the intervention phase. This negative effect was at odds with a positive change in scores on assessments of EF, apart from self-rated EF. The *Environment* domain also showed a negative change from baseline to intervention. Data suggested increased awareness that Angel's lack of social support and opportunities for social interaction impeded Angel's occupational performance and progress toward personal goals.

Casey

Casey planned to go back to school to finish a bachelor's degree and intended to pursue a career working with struggling families. Casey was recently engaged to be married and expressed wanting the couple to have a child. The couple lived together in a house they rented with Casey's brother and two housemates. Casey enjoyed taking care of their two dogs. Casey's overall IRP goal was to be a student. IRP objectives were to cook one new healthy meal per week, exercise three times per week, implement two strategies to be successful in school, and develop coping strategies to feel comfortable in school-related and other social settings.

Casey's assessment scores. Table 19 presents Casey's scores from the pre- and postintervention assessment protocols. At T1 and T2, Casey's scores on assessments of general cognition, executive function, and social cognition suggested higher levels of functioning in those areas relative to the participant group. At T2, Casey's scores were relatively high on assessments of self-efficacy (GSE), emotion recognition (BLERT), theory of mind (HT), and subjective EF (BRIEF). Casey's assessment scores from T1 (preintervention) to T2 (postintervention) improved on several tests. Testing showed positive changes in general self-efficacy (GSE), satisfaction with self and life (SWL-S&L), objective EF (CTMT), emotion recognition (BLERT), and theory of mind (HT). Casey's BPRS-E score, a measure of psychiatric symptomology, decreased.

Table 19

Casey's Preintervention (T1) and Postintervention (T2) Assessment Scores

Assessment	Abbreviation	Time 1 (T1)	Time 2 (T2)
Bell-Lysaker Emotion Recognition Task	BLERT	17	20
Brief Psychiatric Rating Scale - Expanded	BPRS - E	37	31
• Positive Symptoms	BPRS-Pos	16	13
• Negative Symptoms	BPRS-Neg	3	3
• Depression/Anxiety	BPRS-Dep/Anx	9	7
• Agitation/Mania	BPRS-Agit/Ma	9	8
Behavioral Rating Inventory of Executive Function - Adult	BRIEF- A	44	44
• Behavior Regulation Index	BRIEF-BRI	44	44
• Metacognition Index	BRIEF-MI	44	44
Comprehensive Trail-Making Test	CTMT-Total	36	44
• Attention & Sequencing	CTMT- Attn/Seq	36	44
• Switching	CTMT-Sw	40	48
Executive Function Performance Test	EFPT	2	3
General Self-Efficacy Scale	GSE	29	35
Hinting Task	HT	16	18
Montreal Cognitive Assessment	MoCA	27	27
• Memory index score	MoCA - Memory	15	14
Satisfaction with Life (Total)	SWL - Total	71	69
• Living situation	SWL-Living	18	16
• Self and present life	SWL-S&L	24	27
• Social relationships	SWL-Social	24	24
• Work	SWL-Work	4	2

Note. BRIEF *T*-scores > 65 indicates self-reported (subjective) EF impairment. BLERT score < 15 indicates impaired emotion perception. CTMT-CI *T*-scores < 30 indicates severe objective EF impairment; 30-35 indicates mild-moderate impairment. MoCA scores < 26 indicates impaired cognition; BRIEF score > 65 indicates subjective EF impairment.

Casey's strengths. Casey's identified strengths at baseline came from positive findings on preintervention assessments and from item scores of 3 and 4 on baseline MOHOST observations. Casey's strengths were *curiosity and interest*, *remains settled/copes with disruption/change*, *manipulates tools and materials easily*, *uses appropriate non-verbal* *expression*, theory of mind, emotion perception, self-monitoring, task-monitoring, memory and attention, and emotional control. MOHOST items are italicized.

Casey's MOHOST total scores. Figure 17 depicts graphed data for Casey's total MOHOST scores during the baseline and intervention phases. Mean total MOHOST scores for baseline and intervention phases were 73.00 and 77.38, respectively. Total MOHOST scores reflect positive changes in indicators for visual analysis of single-case design including mean, trend, and level. There was a latency effect such that scores were slightly higher for the first three sessions in the intervention phase and then showed a steeper upward trend. Statistical analysis found that the strengths-based cognitive prompting intervention had a medium effect size (d = .67) that supported visual analysis.

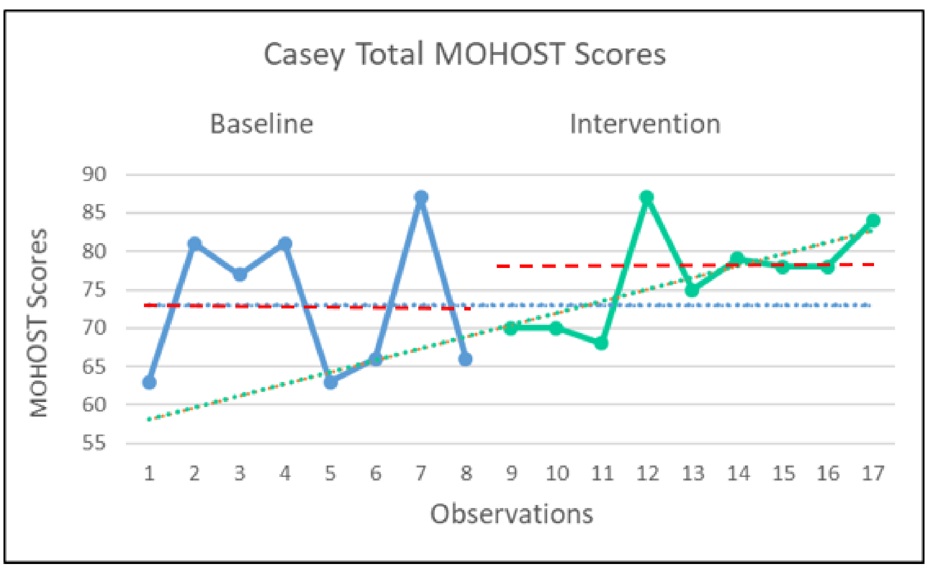
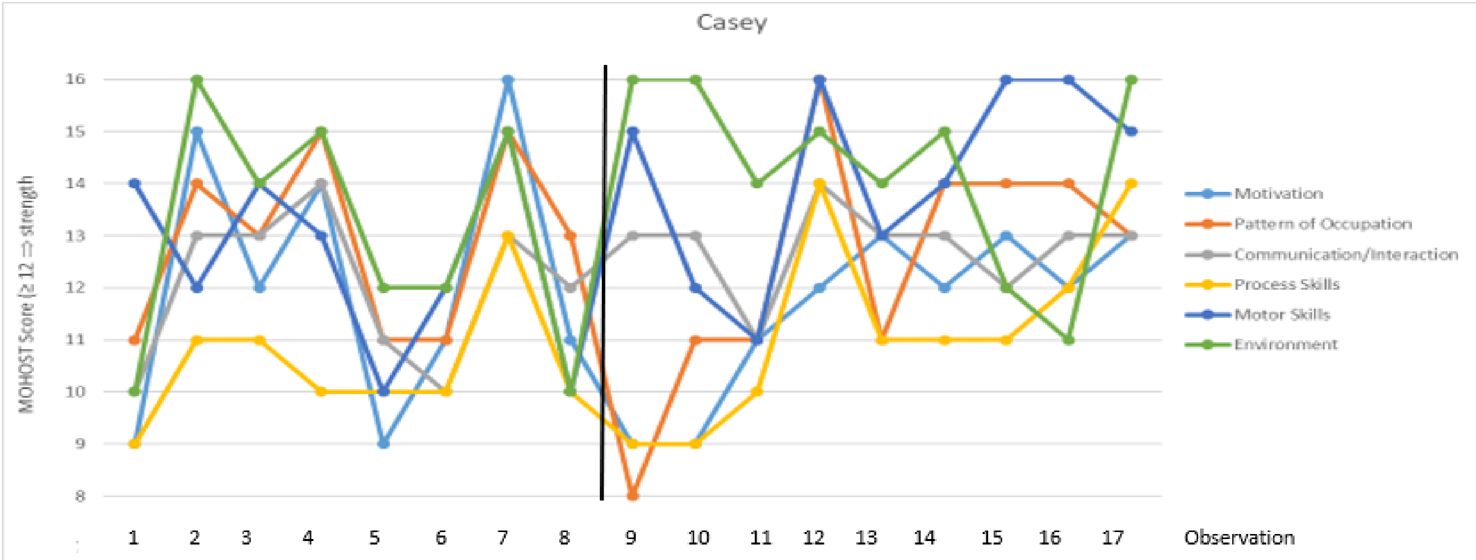


Figure 17. Casey's Graphed Total MOHOST Scores. Blue and green dotted lines show trends for baseline and intervention phase data, respectively. Red dashed lines indicate mean MOHOST total scores for each phase.

Casey's MOHOST total scores. Figure 18 presents a summary of the MOHOST domain scores for each session along with the activities (occupations) and the occupational contexts for the PRS session during which the activities were observed. Figures 19 and 20 focus on the individual MOHOST domains and present graphs of Casey's scores during the baseline and intervention phases for each of the six MOHOST domains. The activities that are listed for each PRS session (that is, for each observation) in Figure 18 correspond to the same observation numbers in Figures 19 and 20. The following section summarizes Casey's results for each MOHOST domain, and refers to these activities and observation numbers.

Motivation. Casey's mean *Motivation* score decreased from baseline to intervention. As shown in Figure 19, trendlines show an upward trend in both phases. Visual analysis shows a decrease in level in the first two sessions of the intervention phase. Figure 18 shows that cooking was the occupation in both sessions (Observations 9 and 10). Casey had expressed prior to starting the activities that their confidence level was relatively low. Raters' comments on MOHOST forms noted that Casey underestimated or overestimated own abilities, had difficulty making choices and showing preferences, shied away from challenges, and needed encouragement and direct verbal prompts. Casey's *Motivation* score shows great improvement for a cooking activity later in the intervention period (Observation 14); prior to starting the activity in this later session, Casey noted that confidence level was high. Overall, *Motivation* scores improved after the two initial cooking sessions and the third intervention session (researching study skills), and then stabilized as an area of strength.



Baseline Phase

Session	Context	Occupation
1	1:1 home	applying social coping skills
2	1:1 home, neighborhood	dog-walking; anxiety coping
3	1:1 home, fiancé present	Progress Review
4	1:1 home, neighborhood	IRP, OVR application, dog-walking
5	PRS group, community	*Walk on the Wild Side*, pedometer
6	PRS group, on-site	cooking; socializing
7	1:1 home, fiancé present	IRP update, identifying goals
8	PRS group, community	*Walk on the Wild Side*, hiking on trail as part of group

Intervention Phase

Session	Context	Occupation
9	1:1 home, fiancé present	cooking a meal activity
10	1:1 home, fiancé present	cooking activity, following recipe
11	1:1 home	researching study skill techniques
12	1:1, shopping mall	walking (exercise); mindfulness strategies
13	1:1 home	processing of cooking independently
14	1:1 home	cooking skills (prepping/cooking chicken)
15	PRS group, on-site	Client Advisory Meeting participant
16	PRS group, on-site	cooking (dessert pizzas), socializing
17	1:1 home, neighborhood	dog-walking for physical exercise

Figure 18. Casey's MOHOST Domain Scores with Activities and Occupational Context.

Pattern of Occupation. MOHOST scores in the *Pattern of Occupation* domain show a pattern like that of scores in the *Motivation* domain. Figure 19 illustrates that scores for the first three intervention phase sessions (Observations 9, 10, and 11) were lower than baseline scores. The rater's notes indicate that Casey had wanted to buy ingredients for the cooking activity prior to the visit but did not successfully get to the grocery store. Casey needed a high level of prompting to use the strength of *remains settled/copes with disruption/change* to adjust the planned dish to a recipe using ingredients already on hand. In the second cooking visit, Casey scored higher in *Pattern of Occupation* but continued to need support. Figurer 18 shows that the third visit focused on researching study skills. Casey used strengths of *curiosity/interest* and attention but needed direct questions to stay actively involved. *Pattern of Occupation* showed an overall positive trend that stabilized into a strength after the fifth session.

Communication & Interaction Skills**.** Casey's mean score increased from 12.00 in baseline to 12.83 in the intervention phase. Figure 19 shows a very slight positive trend in the baseline phase and a slight upward trend in the intervention phase. As seen in Figure 18, Casey participated in both individual and group PRS sessions. *Communication & Interaction* scores for two group sessions (Observations 5 and 6) in the baseline phase were below the threshold for strength in this domain; the third group session (Observation 8) received a score of 12. In the intervention phase, scores for both group sessions (Observations 15 and 16) were in the range of strength. Overall visual analysis showed that the intervention had a positive effect that approached a medium effect size (d = .42). Preintervention (T1) assessment revealed that Casey had a strength in emotion recognition. Casey's scores on social cognitive assessments of both emotion perception and theory of mind improved at T2.

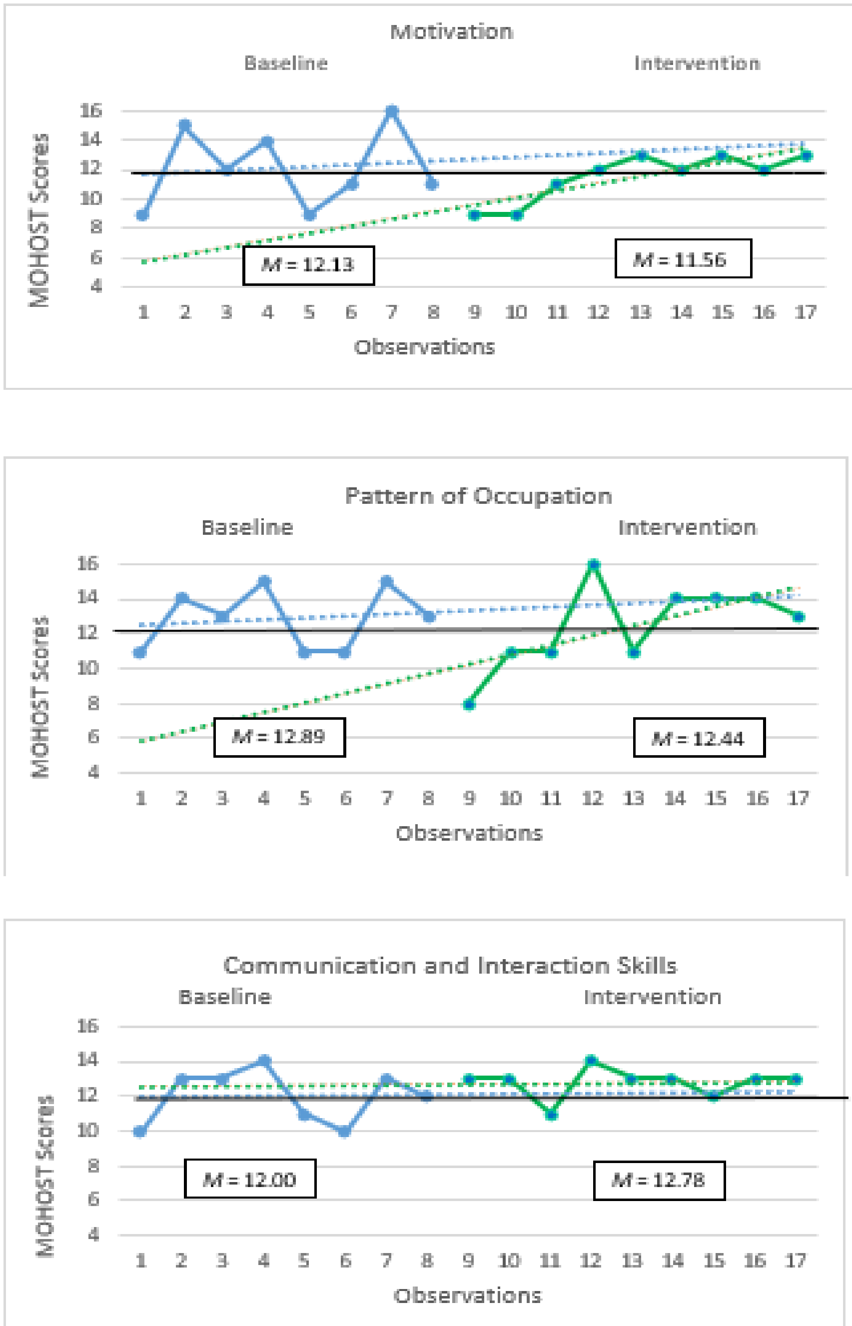


Figure 19. Casey's Observation Scores for First 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines show trends for preintervention and postintervention data, respectively.

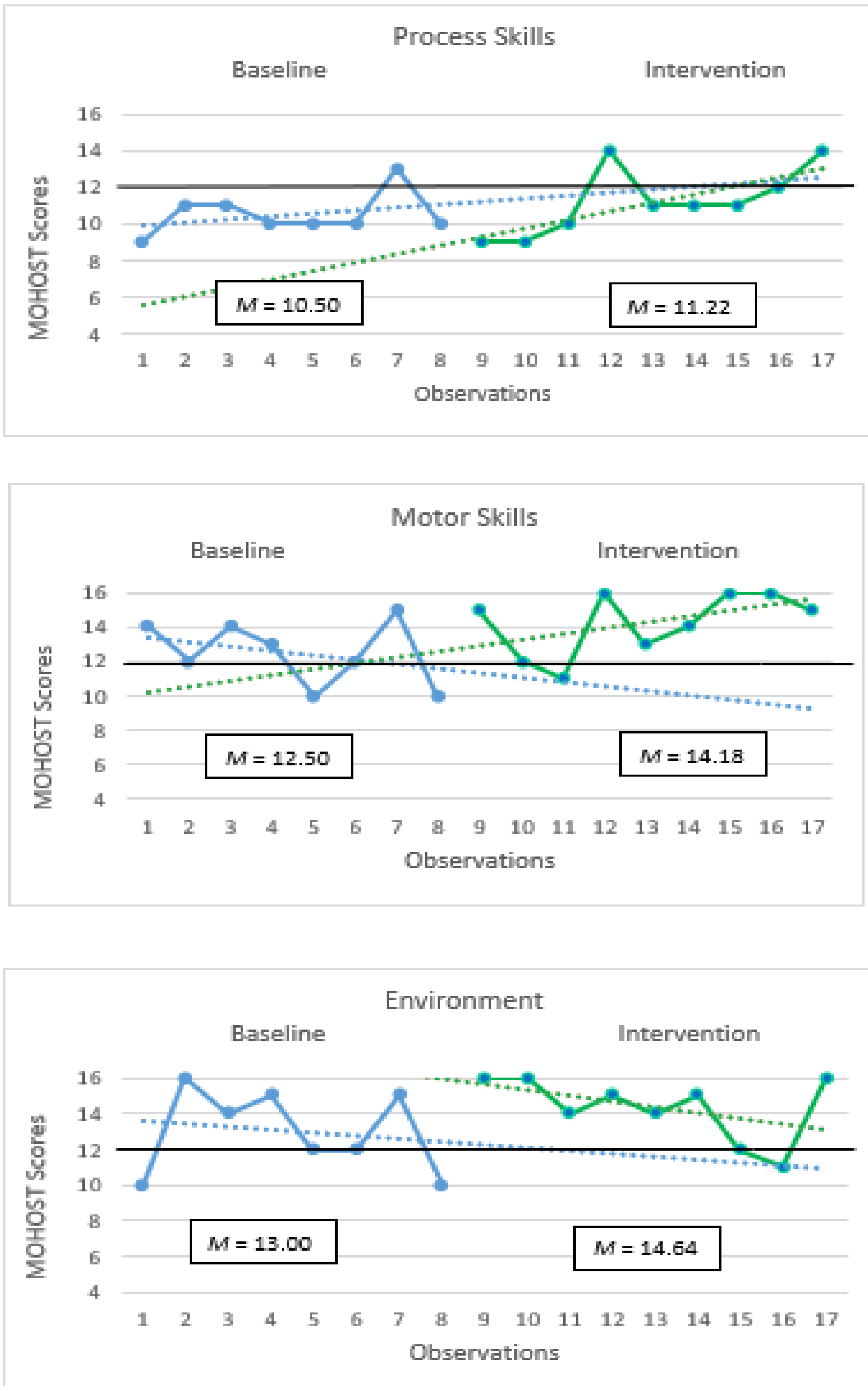


Figure 20. Casey's Observations for Second 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines show trends for T1 and T2 data, respectively.

Process Skills. As seen in Figure 20, Casey's mean scores in this domain increased from 10.50 in the baseline phase to 11.22 in the intervention phase. Like scores in the domains of *Motivation* and *Pattern of Occupation*, low scores at the onset of the intervention period are attributable to the challenges of the cooking and study techniques activities. In one cooking session, (Observation 10), a rater noted that Casey had difficulty asking for help and needed direct prompts to initiate cooking tasks. When unable to open a bottle, Casey became frustrated and decided not to use the ingredient. Observation 14 is a cooking activity later in the intervention period. Although the rating does not rise to 12, the threshold for strength in a domain, the score is higher than scores of earlier cooking sessions. Casey reported a higher level of confidence than in the earlier cooking sessions, and as per MOHOST ratings, Casey showed improvements in focus, working in an orderly fashion, and problem-solving.

Casey's subjective EF score was unchanged from baseline to intervention. Objective EF scores, including attention and flexibility (switching) improved; functional EF was one point higher at T2 than at T1 (indicating slightly less EF proficiency). Visual analysis of this domain, including the markedly positive trend, suggests overall that the intervention had a positive effect in the *Process Skills* domain, approaching a medium effect size (d = .42).

Motor Skills. Figure 20 illustrates positive change in the *Motor Skills* domain in all visual analysis indicators. Mean scores increased from 12.50 during baseline to 14.18 during the intervention period, suggesting that the intervention had a large effect (d = 1.15). Scores rose by several points immediately upon initiating the intervention (positive change in level with no latency) and even though one intervention score dropped below a 12, intervention scores showed a positive trend. Figure 18 shows that Casey's lowest *Motor Skills* baseline ratings were during group sessions that included hiking (Observations 5 and 8); even though Casey engaged in walking activities during the intervention phase, none had the physical challenge of the hiking group. This suggests an inflated intervention effect. However, a group cooking activity during the baseline phase (Observation 6) scored 12, while a group cooking activity during the intervention period (Observation 16) scored 16. The rater's notes from Observation 6 suggested that Casey used kitchen tools slowly, seemed distracted, and worked at an irregular pace. A rater's comments on the fidelity form for Observation 16 noted that Casey was prompted to use several strengths, including task monitoring and manipulation skills; the rater also noted Casey's increasing confidence. Taken together, visual analysis indicators and raters' comments suggest that the intervention had a positive effect on the *Motor Skills* domain, although likely not as large as visual and effect size analyses indicate.

Environment. Mean scores in the *Environment* domain changed from 13.00 to 14.64, suggesting a large intervention effect (d = .90). Figure 20 shows that there was no latency effect; positive change in level occurred immediately upon initiation of the intervention. Figure 18 shows that Casey participated in PRS groups. Raters' notes suggest that lack of social support from peers in PRS groups underlaid the lowest scores in the baseline phase (Observations 1 and 8). Individual social support was also a factor in the *Environment* domain; on a baseline MOHOST form (Observation 3) the rater noted that Casey's fiancé was not supportive of Casey and used negative language. However, Casey's fiancé was also present for the first two sessions of the intervention phase, both of which received high scores. The rater noted that Casey's fiancé was "very supportive" (Observation 10). Group activities during the intervention phase (Observations 15 and 16) reflect that social interaction in the PRS group environment did not afford Casey optimal support. The group sessions late in the intervention phase drove the downward trend. However, group environment ratings improved from Sessions 1 and 8 in the baseline phase. Overall, visual, statistical, and rater note analyses suggest that the intervention had a positive effect on the *Environment* domain.

Single-case summary for Casey. In the first two sessions of the intervention phase Casey engaged in cooking activities that were challenging, resulting in lower scores that affected overall results. Still, the strengths-based cognitive prompting intervention demonstrated positive effects on Casey's total MOHOST score and in four MOHOST domains: *Communication & Interaction Skills*, *Process Skills, Motor Skills*, and *Environment*. The latter two domains showed a large intervention effect. Raters' notes on MOHOST and fidelity forms suggested that Casey's increased confidence may have helped Casey to apply strengths, including motor skills, and that Casey experienced increased social support during the intervention phase both from PRS peers and fiancé. Effect sizes for *Process Skills* and *Communication & Interaction Skills* both approached the medium effect level. In the *Motivation* and *Pattern of Occupation* domains, Casey's mean scores decreased in the intervention phase. However, the first three challenging sessions drove the decrease; after those sessions Casey's scores improved and stabilized above the threshold for strength in those domains. Overall, single-case analysis shows that the strengths-based cognitive prompting intervention had a positive effect for Casey.

Dana

Dana's overall goal was to take care of the home shared by Dana and Dana's partner; they lived together in an apartment. Dana enjoyed taking care of their two pets, a dog and a cat, and doing craft activities. IRP objectives were to cook meals independently and to learn communication skills that would allow Dana to rebuild and support healthy relationships. Table 20 presents Dana's scores from the T1 and T2 assessment protocols.

Table 20

Dana's Preintervention (T1) and Postintervention (T2) Assessment Scores

Assessment	Abbreviation	T1	T2
Bell-Lysaker Emotion Recognition Task	BLERT	14	13
Brief Psychiatric Rating Scale - Expanded	BPRS - E	47	53
• Positive Symptoms	BPRS-Pos	18	22
• Negative Symptoms	BPRS-Neg	3	4
• Depression/Anxiety	BPRS-Dep/Anx	13	16
• Agitation/Mania	BPRS-Agit/Ma	13	11
Behavioral Rating Inventory of Executive Function - Adult	BRIEF- A	73	65
• Behavior Regulation Index	BRIEF-BRI	70	65
• Metacognition Index	BRIEF-MI	73	68
Comprehensive Trail-Making Test	CTMT-Total	43	32
• Attention & Sequencing	CTMT- Attn/Seq	39	40
• Switching	CTMT-Sw	23	28
Executive Function Performance Test	EFPT	9	5
General Self-Efficacy Scale	GSE	20	22
Hinting Task	HT	15	17
Montreal Cognitive Assessment	MoCA	20	24
• Memory index score	MoCA - MIS	13	11
Satisfaction with Life (Total)	SWL - Total	61	64
• Living situation	SWL-Living	16	15
• Self and present life	SWL-S&L	18	23
• Social relationships	SWL-Social	21	20
• Work	SWL-Work	6	6

Note. BRIEF *T*-scores > 65 indicates self-reported (subjective) EF impairment. BLERT score < 15 indicates impaired emotion perception. CTMT-CI *T*-scores < 30 indicates severe objective EF impairment; 30-35 indicates mild-moderate impairment. MoCA scores < 26 indicates impaired cognition; BRIEF score > 65 indicates subjective EF impairment.

Dana's assessment scores. Dana's general self-efficacy score improved from T1 to T2, although GSE scores were lower than other participants' scores at both times. On the BRIEF, Dana's total and subscale scores were high but improved at T2; Dana had a relative strength in self-monitoring at T1. T2 scores reflected relative strengths in self-monitoring, emotional control, initiating, planning, and organizing. Decrease in EFPT score suggested that Dana's functional EF also improved, although CTMT suggested decreased objective EF skills. Dana's HT scores improved from T1 to T2, suggesting improved theory of mind capability. BLERT scores at T1 and T2 reflected impaired ability to read emotions. MoCA scores at T1 and T2 were in the range suggesting impairment in overall cognition. BPRS scores rose from T1 to T2, indicating increased symptomology; scores were at the high end of the group's range. Dana's satisfaction with life scores were close to the group's mean scores; SWL-S&L score improved from T1 to T2.

Dana's strengths. Dana's identified strengths at baseline came from both item scores of 3 and 4 on MOHOST observations and from preintervention assessment findings. MOHOST strengths (italicized) included *shows curiosity and demonstrates interest*, *actively involved with task/group*, *relates to and cooperates with others*, *remains settled/copes with disruption/ change*, and *uses appropriate nonverbal expression*. Dana's identified assessment strengths were attention (vigilance), recognizing negative emotions, and self-monitoring.

Dana's MOHOST total scores. Figure 21 presents Dana's graphed total MOHOST scores. The mean MOHOST total scores for baseline and intervention periods were 70.57 and 75.29, respectively. Visual analysis shows positive changes in mean and trend. The trendline in the baseline period has a negative slope and is flat in the intervention period. There is little change in level and a latency effect such that total MOHOST scores do not improve until after the first intervention session. Although only two indicators suggest that the strengths-based cognitive prompting intervention was associated with a positive change in functional performance, visual analysis of graphed data does indicate that data points in the intervention phase are overall in a more positive range than those in the baseline phase. Statistical analysis supports this observation and suggests that the strengths-based cognitive prompting intervention had a medium effect (*d* = .72).

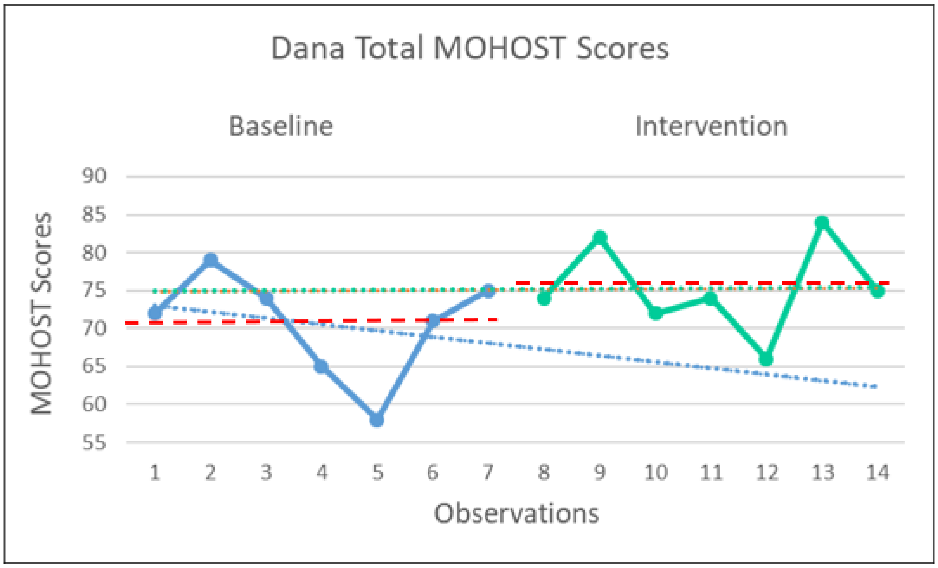
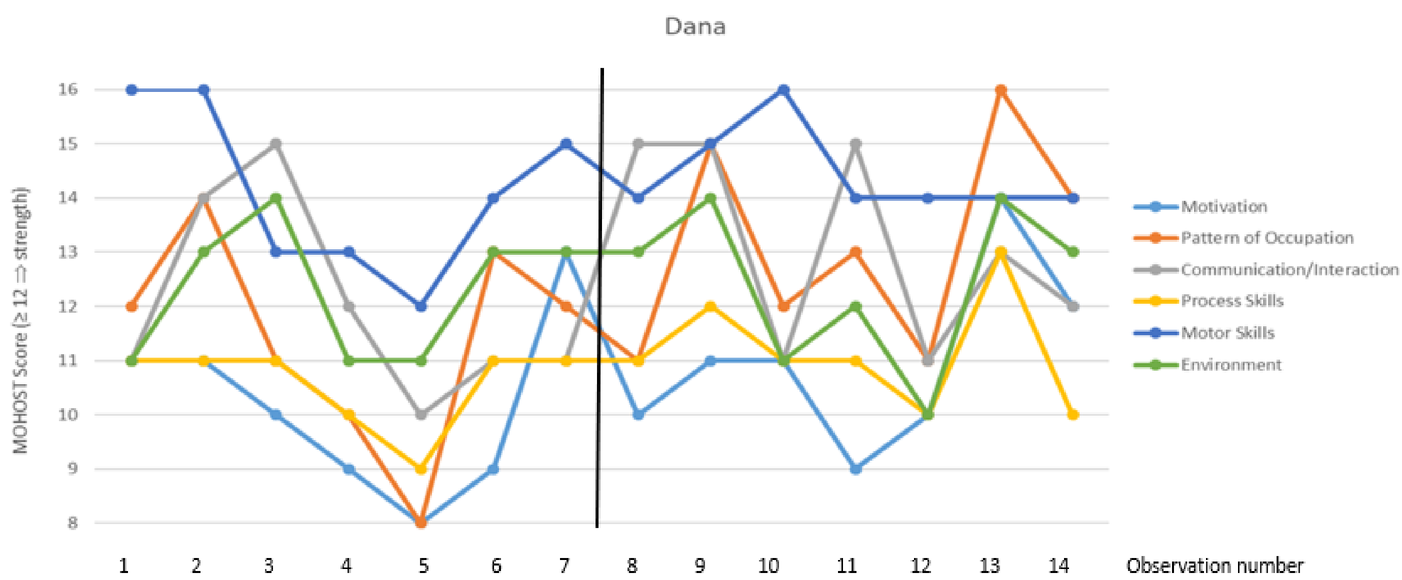


Figure 21. Dana's Graphed Total MOHOST Scores. Blue and green dotted lines are trendlines for preintervention and postintervention data, respectively. Red dashed lines show mean MOHOST total scores for each phase.

Dana's MOHOST domain scores. Figure 22 presents a graphed summary of Dana's MOHOST domain scores for each observed PRS session along with the activities observed and the occupational contexts for the sessions. Figures 23 and 24 focus on the individual MOHOST domains and depict Dana's baseline and intervention phase scores for each of the six domains. The activities that are listed for each numbered observation (that is, for each observed PRS session) in Figure 22 correspond to these same observation numbers in Figures 23 and 24. The following section describes Dana's results by MOHOST domain, and refers to these observation numbers and related session activities.



Baseline Phase

Session	Context	Occupation
1	PRS group, on-site	*Pottery with a Purpose*: kintsugi
2	1:1 home	learning about diagnosis; video
3	1:1 PRS site	Progress Review
4	1:1 home	updating IRP; setting new goals
5	PRS group, on-site	*Coping Creatively:* papermaking
6	PRS group, on-site	Cooking group; socializing
7	1:1 home	meal planning, recipe research

Intervention Phase

Session	Context	Occupation
8	1:1 home	identifying coping & communication skills
9	PRS group, on-site	*Coping Creatively:* making a "stress doll"
10	PRS group, on-site	making holiday wreath; social interaction
11	1:1 home	identifying healthy relationship qualities
12	Group, PRS site	Client Advisory meeting participation
13	1:1 home	developing new IRP with meaningful activities
14	1:1 home	craft activity for mood regulation: dream catcher

Figure 22. Dana's MOHOST Domain Scores with Activities and Occupational Contexts.

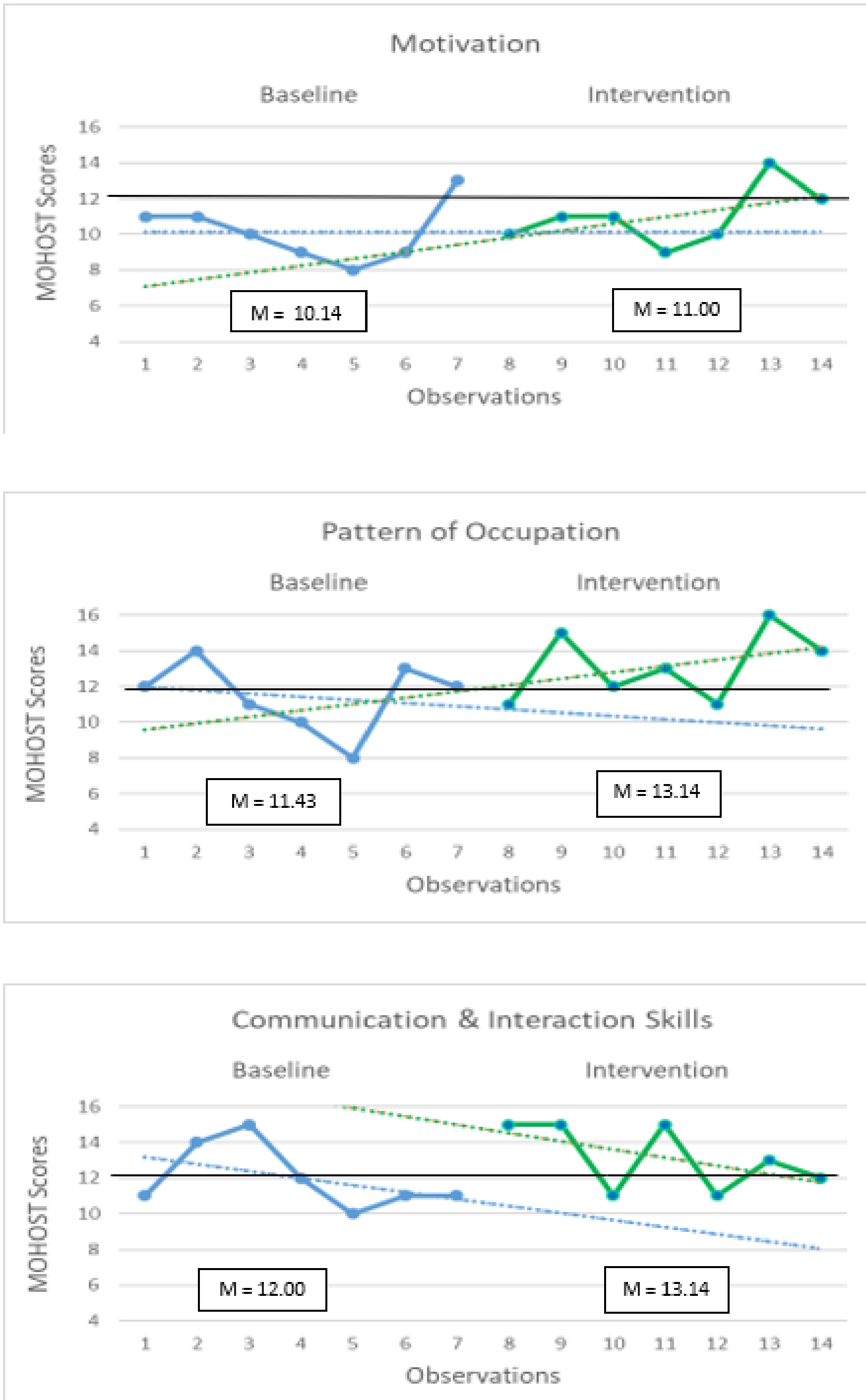


Figure 23. Dana's Graphed Data for First 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines are trendlines for T1 and T2 data, respectively.

***Motivation*.** Dana's mean *Motivation* score increased from 10.14 in the baseline phase to 11.00 in the intervention phase. As shown in Figure 23, trend also improved, with a flat trendline for baseline and a positive trend during intervention. Visual analysis indicators of level and latency do not appear to support a positive intervention effect. However, closer visual analysis suggests that Dana experienced unusually high motivation in the last session of the baseline phase, Observation 7, which affected these indicators. Figure 22 indicates that Observation 7 included meal planning and recipe searching—concrete activities in which Dana demonstrated goal-oriented behaviors. In Observation 8, the first session in the intervention phase, Dana and the PRS practitioner reviewed Dana's strengths and identified how they could be applied, a less concrete activity with greater cognitive demand.

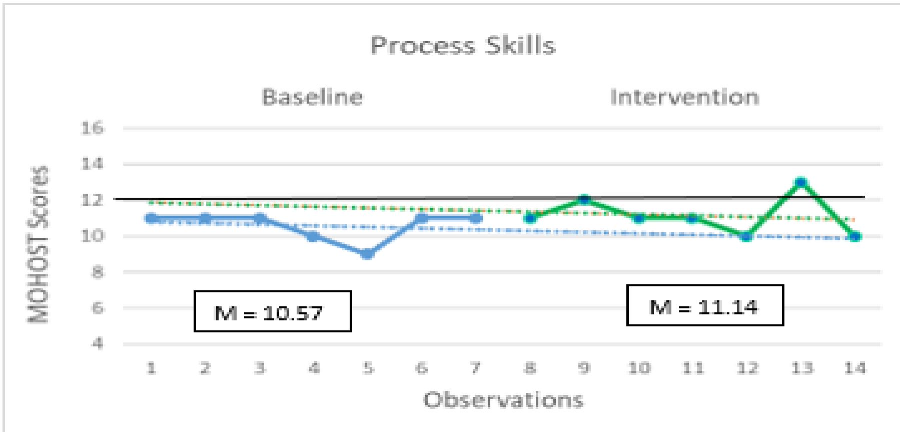
In the MOHOST notes for Dana's first session of the intervention phase (Observation 8), the rater noted that Dana was "unduly [self-]critical" and "easily discouraged." (The rater also noted that Dana was experiencing physical pain that day.) These comments typify observations during most baseline and early intervention phase sessions. Raters' notes stated that Dana was self-critical, had difficulty identifying strengths and challenges, and needed prompts to stay engaged. Changes in *Motivation* scores occur later in the intervention phase. Although Dana's struggles continue to be evident, raters' *Motivation* notes for later intervention phase sessions include more positive phrases such as "developing awareness [of strengths and limitations]" (Observations 10, 12, 13, and 14) and "reasonable expectation for success" (Observation 13). Notes on Prompting Checklists indicated that Dana continued to benefit from strengths-based prompting to be successful, but also reported increasing levels of confidence as the intervention phase progressed. Thus, although there was a latency effect, the intervention had a positive effect in the *Motivation* domain consistent with a medium effect size (*d* = .51).

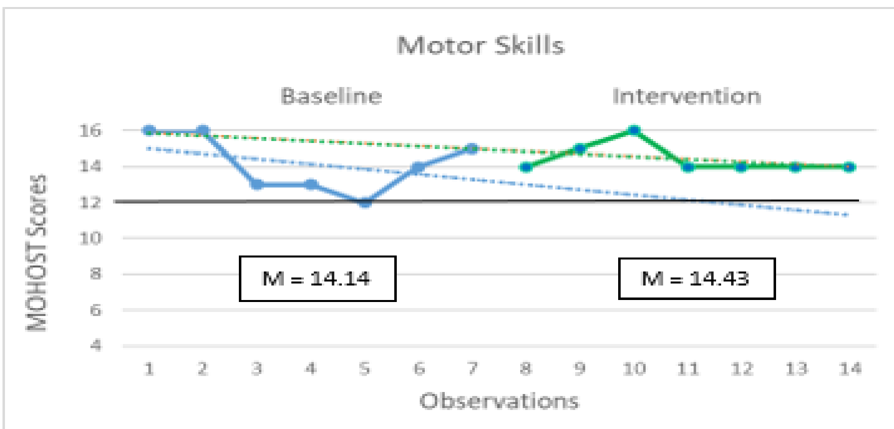
Pattern of Occupation. Dana's mean *Pattern of Occupation* score increased from 11.43 during baseline to 13.14 in the intervention phase. Although the MOHOST item *remains settled/ copes with disruption/change* was identified as a strength, the baseline mean score suggests that the overall domain of *Pattern of Occupation* was not a strength. As depicted in Figure 23, Dana's occupational performance in this domain followed a similar pattern to that of *Motivation*: positive trend in the intervention phase with a latency effect. Raters' notes indicated that during baseline and the early part of the intervention phase, Dana at times appeared "disheveled" (Observations 1 and 2) and that apparent difficulties with activities of daily living (ADL) were due to illness, pain, or insomnia (Observations 4, 7, 8, 10, and 11). Raters noted that Dana benefitted from prompts to stay engaged (Observation 3 and 5), left some sessions early (Observations 1 and 5), and sometimes had difficulty fulfilling session responsibilities (Observations 3 and 4). Raters also noted that Dana was "apologetic" (Observation 6, 7, and 8) and experienced "role overload" (Observation 8) due to a stressful family situation and the cognitive challenges of activities.

A shift occurred in the latter part of the intervention phase. Dana's scores on items related to actively engaging in tasks and fulfilling session responsibilities improved. During the intervention phase, the rater noted on Observation 11 that Dana was "developing awareness of responsibility" and for the final session (Observation 14), the rater noted that Dana "benefits from support but [is] capable without it." For Observation 13, Dana had a score of 4 for both the active engagement and fulfilling responsibilities items. Improvement in mean scores suggest a shift in Dana's *Pattern of Occupation* to an overall area of strength. Statistical analysis supports that the intervention had a large effect (d = .96) on this domain.

Communication & Interaction Skills. Visual analysis of data in this domain, as depicted in Figure 23, shows evidence of intervention effect on three indicators: mean, level, and latency. Dana's mean MOHOST score improved from 12.00 during baseline to 13.14 in the intervention phase. There was no latency and a large change in level from 11 in the last baseline session to 15 in the first intervention session. There was a negative trend in both phases; trendlines appear to have similar slopes. Dana had seven sessions in each phase; *Communication & Interaction Skills* scores were below a 12 (threshold for strength) in four baseline and two intervention phase sessions, which suggests improvement in functional performance. Figure 22 shows that except for one baseline session, all sessions in which *Communication & Interaction Skills* was an area of challenge were group rather than individual sessions. Statistical analysis supports visual analysis that the strengths-based intervention had a positive effect on the *Communication & Interaction Skills* domain, with a medium effect size (d = .62).

Dana demonstrated overall functional improvement in the *Communication & Interaction Skills* domain that was not related to pre- and postintervention assessment findings. Dana's BLERT score at T1 suggested impaired emotion perception; T2 score decreased marginally by one point. Relative strength in recognizing negative emotions was demonstrated at T1 but not at T2. Dana's T1 score on the HT indicated relative strength in theory of mind skill; score decreased by 2 points at T2.





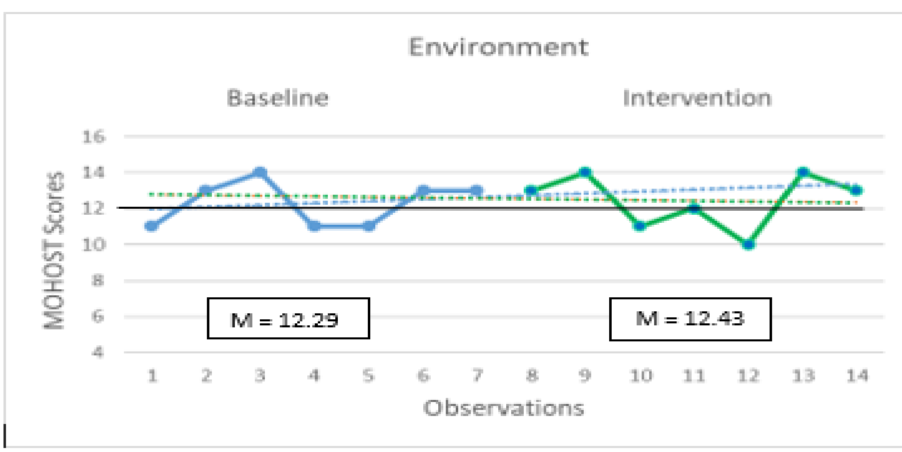


Figure 24. Dana's Graphed Data for the Second 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines are trendlines for T1 and T2 data, respectively.

Process Skills. Dana's mean score in the *Process Skills* domain increased from 10.57 during baseline to 11.14 in the intervention phase. However, as illustrated in Figure 24, visual indicators of level, latency, and trend do not appear to support an intervention effect. There was no change in level, a one-point score increase in the second intervention session, and similar slight downward trends in both phases. However, *Process Skills* scores reached the level for strength (12) twice in the intervention phase and not at all in the baseline phase, suggesting some improvement in process skills. Raters' notes during the baseline phase indicate that Dana needed help to follow directions to successfully complete activities, sometimes seemed distracted, and benefitted from prompts to stay focused. Intervention phase notes suggest that Dana continued to benefit from prompts to process information; for example, a rater stated on the fidelity form for Observation 9 that Dana "still benefits from explicit explanation and instruction." However, intervention phase notes also suggest that Dana was more frequently "on task" and more "efficient" in completing tasks. The activities that were observed in both phases, indicated in Figure 22, were of similar cognitive challenge.

Dana's assessment scores related to cognition showed some changes from T1 to T2. Functional EF as measured by the EFPT improved by 4 points. Dana's subjective EF also improved so that BRIEF score at T2 came within 3 points of the threshold to be out of the range of executive dysfunction. However, objective EF score (CTMT-CI) moved into the range for severe executive dysfunction at T2. This score is inconsistent with positive changes in self-reported and functional assessments. Taken together, changes in mean MOHOST scores, self-reported and functional EF, and raters' comments suggest that the strengths-based cognitive prompting intervention had a small positive effect on the *Process Skills* domain, which statistical analysis (d = .37) also supports.

Motor Skills. Dana's mean scores on the *Motor Skills* domain improved from 14.14 during baseline to 14.43 in the intervention phase. Figure 24 shows that other visual indicators—level, latency, and trend—are unremarkable. Ratings of items related to effort and energy/pace drove low scores for many sessions. Both Observations 1 and 2 have a score of 16, the highest possible rating; the raters for these two sessions did not rate any other session for Dana. Their ratings in this domain seem inconsistent with the rest of the sessions, which two other raters observed. Raters' notes for Observations 3-14 suggest a shift from baseline to intervention from "low" energy and/or effort (Observations 3, 4, 5) to "variable" or "inconsistent" energy and/or effort (Observations 6, 12, 13, 14) that "meets basic needs" (Observations 11, 12) or "doesn't impede occupations" (Observation 13). Raters' notes related to pace follow a similar pattern. Given that even with the high ratings of the first two observations there was still a positive change in mean that yielded a small statistical effect size (d = .20), the strengths-based cognitive prompting intervention appears to have had a positive effect on the *Motor Skills* domain.

Environment. Figure 24 includes Dana's graphed MOHOST scores for the *Environment* domain. Visual analysis indicators of mean, level, latency and trend all suggest that the intervention was not appreciably related to the *Environment* domain. Mean *Environment* scores during the baseline and intervention phases were 12.29 and 12.43, respectively, yielding no statistical intervention effect (d = .08).

This is not to say that Dana's occupational performance was not influenced by environmental factors. On MOHOST forms, raters noted that Dana had "only a few social opportunities" (Observation 2) and that in group sessions Dana experienced "support but not [by] group members (Observation 5), and social interaction support from peers that was "inconsistent" (Observation 6), "not . . . consistent" (Observation 10), or "unreliable" (Observation 12). Raters' notes indicate that although Dana's living space was small and had some "clutter" (Observation 4), physical resources were "mostly sufficient" (Observation 4) and "[met] basic needs" (Observation 10) for activities, independence, and safety. Match between activity demands and person's abilities/interests is another item in the *Environment* domain. Raters consistently noted that Dana often benefitted from PRS practitioner's support to meet the process demands of activities; however, scores on this item were less than a 3 for only three sessions (Observations 4, 11, and 12), indicating that only in these sessions were the demands of the activity such that Dana needed direct support.

Single-case summary for Dana. The strengths-based cognitive prompting intervention had a positive effect on Dana's occupational performance overall and in five of the six domains, as evidenced by visual analysis of graphed data and statistical analysis to determine effect sizes. Findings revealed positive changes with a small effect in domains of *Process Skills* and *Motor Skills*, medium effect in *Communication & Interaction Skills* and *Motivation*, and large effect in *Pattern of Occupation*. Limitations in Dana's social environmental factors may have affected occupational performance. Notes on fidelity forms indicate that Dana experienced increasing confidence in her abilities as the intervention phase progressed. For example, a rater noted on Dana's fidelity form for Observation 9 that "low self-esteem influences . . . expectation of success" and on Observation 11 that Dana "does not seem to have clear understanding of how . . . strengths function despite repeated review." A shift in Dana's self-confidence and awareness of abilities is evident in raters' fidelity form comments for the last two intervention sessions. For Observation 13, the rater noted that Dana "was very self-aware during this session, demonstrated a lot of confidence in redirecting efforts" and in Observation 14 that Dana "was immediately able to list strengths . . . used during the activity." The intervention had a latency effect for Dana; changes in occupational performance occurred well into the intervention period and aligned with increasing self-confidence and awareness of strengths. Assessment scores support Dana's apparent increase in self-confidence and self-efficacy. Dana's GSE score increased by 2 points from T1 to T2, and SWL-S&L score increased by 5 points.

Jamie

Jamie enjoyed spending time with family. Jamie's main goal for psychiatric rehabilitation was to increase participation in community activities and comfort level in social and community interactions. Jamie reported experiencing a great deal of social anxiety and stated that prior to beginning the PRS program, most social interaction was at home with family. Jamie reported rarely engaging in community activities such as going to the store; on the occasional visits to the store, Jamie did not go alone and experienced a great deal of anxiety. Table 21 presents Jamie's scores from the preintervention (T1) and postintervention (T2) assessment protocols.

Table 21

Jamie's Preintervention (T1) and Postintervention (T2) Assessment Scores

Assessment	Abbreviation	Time 1 (T1)	Time 2 (T2)
Bell-Lysaker Emotion Recognition Task	BLERT	14	16
Brief Psychiatric Rating Scale - Expanded	BPRS - E	50	49
• Positive Symptoms	BPRS-Pos	22	22
• Negative Symptoms	BPRS-Neg	4	4
• Depression/Anxiety	BPRS-Dep/Anx	14	15
• Agitation/Mania	BPRS-Agit/Ma	10	8
Behavioral Rating Inventory of Executive Function - Adult	BRIEF- A	66	71
• Behavior Regulation Index	BRIEF-BRI	67	70
• Metacognition Index	BRIEF-MI	64	69
Comprehensive Trail-Making Test	CTMT-Total	35	35
• Attention & Sequencing	CTMT- Attn/Seq	38	37
• Switching	CTMT-Sw	29	31
Executive Function Performance Test	EFPT	9	6
General Self-Efficacy Scale	GSE	27	31
Hinting Task	HT	15	18
Montreal Cognitive Assessment	MoCA	18	27
• Memory index score	MoCA - MIS	10	13
Satisfaction with Life (Total)	SWL - Total	50	57
• Living situation	SWL-Living	13	13
• Self and present life	SWL-S&L	16	16
• Social relationships	SWL-Social	15	21
• Work	SWL-Work	6	7

Note. BRIEF *T*-scores > 65 indicates self-reported (subjective) EF impairment. BLERT score < 15 indicates impaired emotion perception. CTMT-CI *T*-scores < 30 indicates severe objective EF impairment; 30-35 indicates mild-moderate impairment. MoCA scores < 26 indicates impaired cognition; BRIEF score > 65 indicates subjective EF impairment.

Jamie's assessment scores. Jamie's scores at T2 improved on all assessments except for the subjective and objective measures of executive function: the BRIEF and the CTMT, respectively. Change on the CTMT was slight and stayed within the range of mild-moderate impairment; change on the BRIEF moved the score to 2 standard deviations above the mean.

However, T2 score on the EFPT suggested improvement in functional EF. Scores on social cognitive measures suggested improvement from T1 to T2. Jamie's BLERT score no longer indicated impaired emotion perception and HT score improved by 3 points. Likewise, MoCA score improved and was no longer in the range of overall cognitive impairment. Jamie's BPRS-E score of at T1 indicated the highest symptomology of the group; Jamie reported recently experiencing hallucinations at T1 and T2. At T2 Jamie's self-efficacy score (GSE) improved by 4 points; SWL-S score improved by 6 points at T2, indicating increased satisfaction with social relationships.

Jamie's strengths. Jamie's strengths mainly came from baseline MOHOST items (italicized), and included *shows curiosity and demonstrates interest*, *manipulates tools and materials easily*, *initiates and sustains appropriate conversations*, *uses appropriate strength and effort*, *maintains energy and appropriate pace*, *social interaction provides support*, *uses appropriate nonverbal expression*, *resources allow safety and independence*, and *shows awareness of strengths and limitations*. One strength, task initiation, came from the EFPT at T1; self-report on the BRIEF also yielded relative strengths in self-monitoring and organization of materials. BLERT findings suggested that Jamie had a relative strength in perceiving positive emotions.

Jamie's MOHOST total scores. Figure 25 presents Jamie's graphed total MOHOST scores. Mean MOHOST scores for T1 and T2 were 75.67 and 73.75, respectively. Visual indicators of mean and latency do not indicate that the intervention had an effect; statistical analysis also does not support an intervention effect (d = -.02). However, there is a strong positive trend in the intervention period with no trend during baseline phase. Graphed data suggest that the negative change in the intervention period is due to low MOHOST scores for the second and third intervention sessions, Observations 8 and 9. Jamie had chosen challenging activities. In Observation 8, as indicated on Figure 26, Jamie worked on an activity to address social anxiety in preparation for community interaction and possible participation in a PRS group. The PRS practitioner noted on Jamie's fidelity form that Jamie "struggled with feeling confident going to groups." The MOHOST rater's notes indicate that Jamie was "eager" to participate but was also "nervous," "occasionally forgetful," had "fluctuating concentration," and "difficulty initiating conversation." Observation 9 was Jamie's first experience with a PRS group. Jamie observed the group with support from the PRS practitioner for as long as Jamie could tolerate. Jamie's last two sessions in the intervention phase, Observations 10 and 11, had the highest total MOHOST scores for sessions in either phase.

Jamie's intervention phase was shorter than that of other participants (2 weeks with a total of five sessions) and began later, for two reasons. First, Jamie experienced a transient ischemic attack (TIA) during the baseline phase, between Observations 2 and 3, and missed several PRS sessions. The PI, with her mentor, decided that Jamie would remain in the study if willing to do so, given that Jamie was feeling well and experiencing no apparent cognitive effects. Second, scheduling conflicts with RA raters, who also worked as practitioners in the PRS program, precluded beginning the intervention phase until after the sixth session. Jamie's PRS practitioner provided two more intervention sessions following Observation 11. However, the PRS practitioner was not trained as a rater, and no RA raters were available to observe either session.

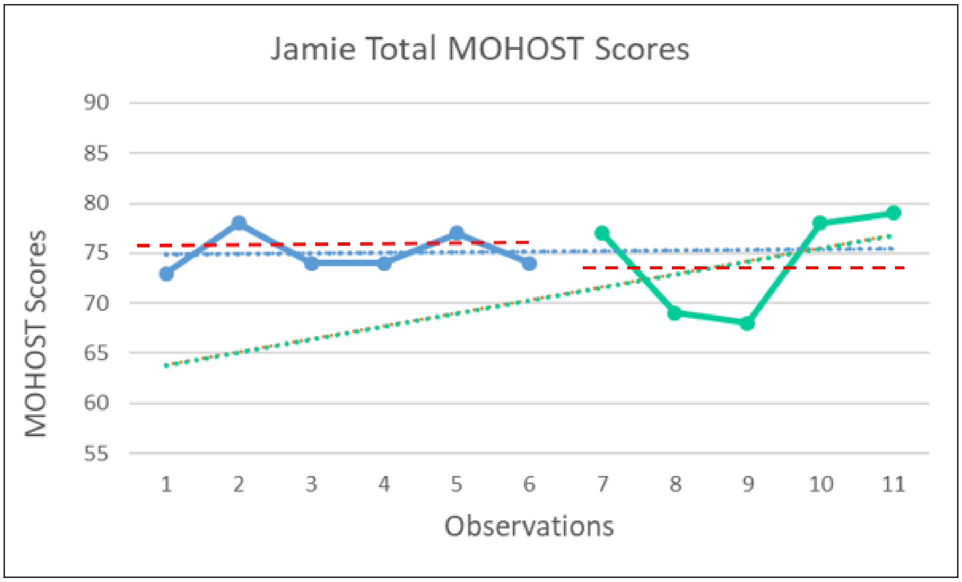
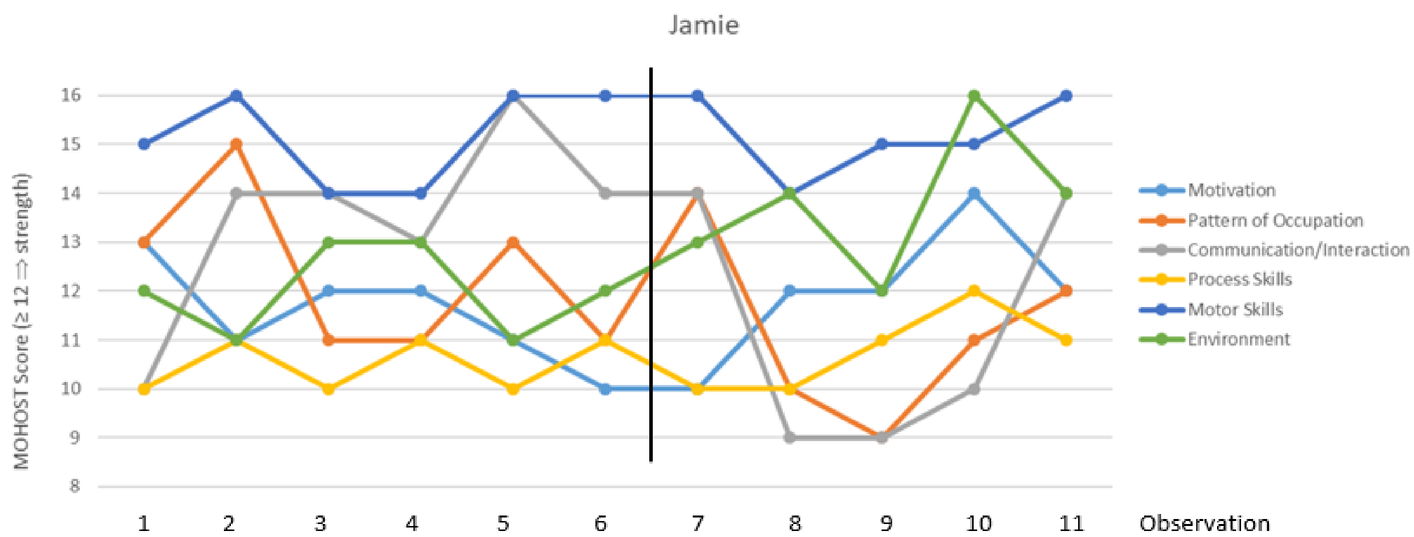


Figure 25. Jamie's Graphed Total MOHOST Scores. Blue and green dotted lines are trendlines for preintervention and postintervention data, respectively. Red dashed lines show mean MOHOST total scores for each phase.

Jamie's MOHOST domain scores. Figure 26 presents a graphed summary of Jamie's MOHOST domain scores for each observed PRS session along with the activities observed and the occupational contexts for the sessions. Figures 27 and 28 present individual graphs of baseline and intervention domain scores for each of the six MOHOST domains. The activities that are listed in Figure 26 for each numbered observation (that is, for each observed PRS session) correspond to the same observation numbers in Figures 27 and 28. The following section describes Jamie's results for each MOHOST domain, and refers to these observation numbers and related session activities



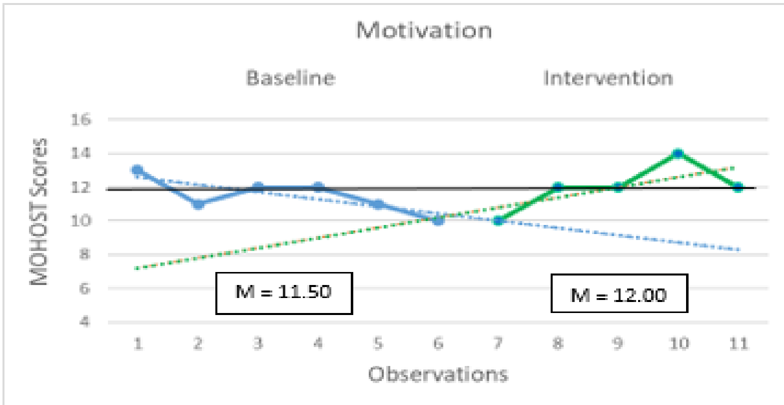
Baseline Phase

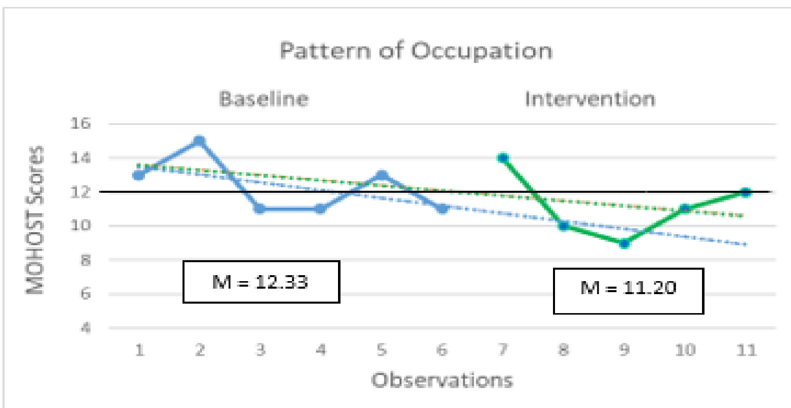
Session	Context	Occupation
1	1:1 UPMC hospital cafe	identifying strategies for anxiety
2	1:1 coffee shop	learning about diagnoses
3	1:1 novel coffee shop	going to new place in community
4	1:1 grocery store cafe	practicing coping skills in new place
5	1:1 Co-op cafe	planning; using anxiety strategies
6	1:1 St. V's hospital cafe	going to new place, using coping skills

Intervention Phase

Session	Context	Occupation
7	1:1 St. V's hospital cafe	identifying coping & communication skills
8	1:1 St. V's hospital cafe	*Fear Ladder* activity: making fears manageable
9	PRS group, on-site	observed part of group (1st group exposure)
10	1:1 PRS site	identifying red flags to prevent relapse
11	1:1 Pressed café (new place in community)	planning for coping with triggers in social and community settings

Figure 26. Jamie's MOHOST Domain Scores with Activities and Occupational Contexts.





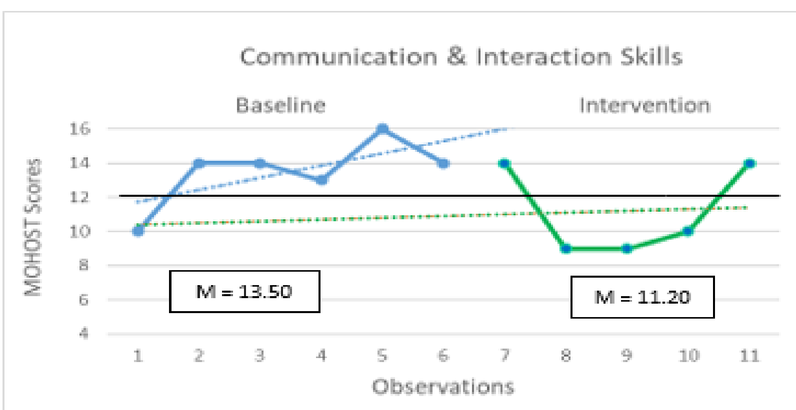


Figure 27. Jamie's Graphed Data for First 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines are trendlines for T1 and T2 data, respectively.

Motivation. Jamie's mean *Motivation* score increased from 11.50 during baseline to 12.00 in the intervention phase. Data as depicted on Figure 27 also show a positive change in trend. *Motivation* scores had been decreasing during baseline; after the first intervention session, which had the same score as the last baseline session, *Motivation* scores began an upward trend. Changes in two MOHOST items, *shows pride/seeks challenges* and *identifies preferences/is goal-oriented*, underlaid the shift in *Motivation* scores. During the baseline phase, raters noted that Jamie was "hesitant to seek challenges" (Observation 2), "had very low pride" (Observation 3), "needs help prioritizing" (Observation 4), and "doubts ability to cope with obstacles" (Observation 6). The first intervention session, Observation 7, has similar comments: "unduly self-critical" and "difficulty sustaining optimism."

Raters' comments overall begin to change with Observation 8, in which the rater of that session notes that Jamie is "eager to work on goals." In Observation 9, the session during which Jamie attended a PRS group for the first time, the rater noted that Jamie "underestimates . . . abilities," but assigned ratings of 3 for all items, yielding an overall *Motivation* score of 12. This session scored lowest for overall occupational performance, but *Motivation* overall was an area of strength, and continued to be so for the remainder of the intervention phase. Practitioner's notes on fidelity forms indicated that one of the strengths that Jamie often used during intervention activities was the *Motivation* item, *shows awareness & limitations*. On the last intervention session, during which a rater was not present, the practitioner documented use of only this strength and noted that Jamie used it with a Level 1 prompt, suggesting that Jamie needed little assistance to use the strength. Overall, single-case data analysis indicates that the strengths-based cognitive prompting intervention had a positive effect on the *Motivation* domain, supported by statistical analysis that yielded a small effect size (d = .30).

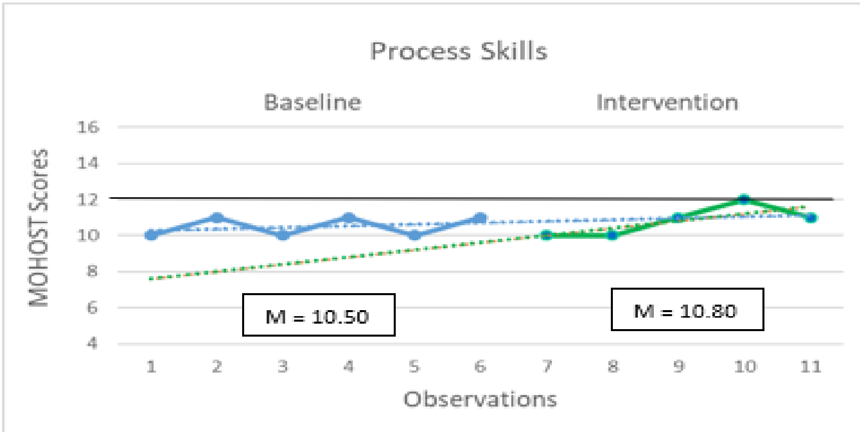
***Pattern of Occupation*.** Jamie's mean *Pattern of Occupation* score decreased from baseline (12.33) to intervention (11.20). Visual analysis indicators of trend and latency are unremarkable; Figure 27 shows a downward trend in both phases, slightly more pronounced in baseline. There is a positive change in level; score for the first intervention session (Observation 7) is 3 points higher than the last baseline session (Observation 6). In the last baseline session, the rater noted that Jamie "requires support" (to fulfill session responsibilities) and that Jamie was experiencing "role overload," that is, feeling overwhelmed. In the first intervention session, the rater said Jamie was "beginning to make changes" (to fulfill session responsibilities) and was "at risk for overload." Scores on items related to these comments both reflect a positive change.

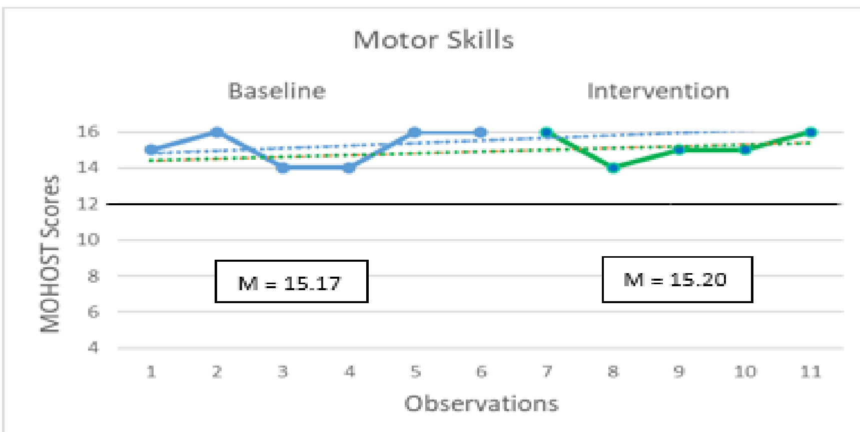
Jamie continued to be able to fulfill session responsibilities with support; however, raters' notes indicated that Jamie had difficulty remaining settled while trying to increase social interaction. Beginning with the second intervention session and continuing throughout the intervention period, Jamie consistently scored low (score of 2) on *remains settled/copes with disruption/change* and sometimes low on *maintains routine habits*. Raters' comments include: "difficulty adapting" (Observation 8), "trouble getting places on time" and "difficulty adapting to change" (Observation 9), "trouble . . . do[ing] the things . . . planned," "difficulty adjusting and needs time" (Observation 10), and "trouble adjusting to change" (Observation 11).

Jamie's motivation to make social changes was high; however, raters' comments and *Pattern of Occupation* scores suggest that working on ambitious social goals may have been stressful. Statistical analysis suggests that the intervention had a medium negative effect in this domain (d = -.64). Jamie's BPRS-E scored decreased by a point from T1 to T2, suggesting that overall symptomology was not associated with the decrease in *Pattern of Occupation.*

Communication & Interaction Skills. As shown in Figure 27, trend is the only visual indicator that suggested a positive intervention effect in this domain; scores followed a positive trajectory in both baseline and intervention phases. Mean scores were 13.50 and 11.20 in baseline and intervention phases, respectively. Just as in *Pattern of Occupation*, the *Communication & Interaction Skills* intervention phase mean score was strongly affected by low scores in Observations 8 and 9. In Observation 8, the rater noted that Jamie "was fidgety, appears nervous," had "difficulty initiating conversation," and only "related . . . well with primary [PRS practitioner]." Observation 9 rater notes stated that Jamie was "very fidgety and nervous" and "overly talkative with [PRS practitioner]." Notes for Observation 10 suggest improvement; Jamie "initiated and sustained conversation" and "related and cooperated well." Scores and notes provide evidence of improvement in the last observed intervention session (Observation 11). Jamie used "good eye contact and gestures," was "rarely off-topic," and "occasionally shy."

Although statistical analysis yielded a large negative effect (d = -1.24), it is not clear that the intervention itself brought about a negative change in the *Communication & Interaction Skills* domain. Occupational contexts may have affected Jamie's occupational performance. Jamie had social anxiety and was activity trying to learn coping skills, explore new community environments, and begin participating in PRS groups; scores may reflect how challenging this was. Jamie's scores improved on social cognitive measures, and notably on the SWL-S.





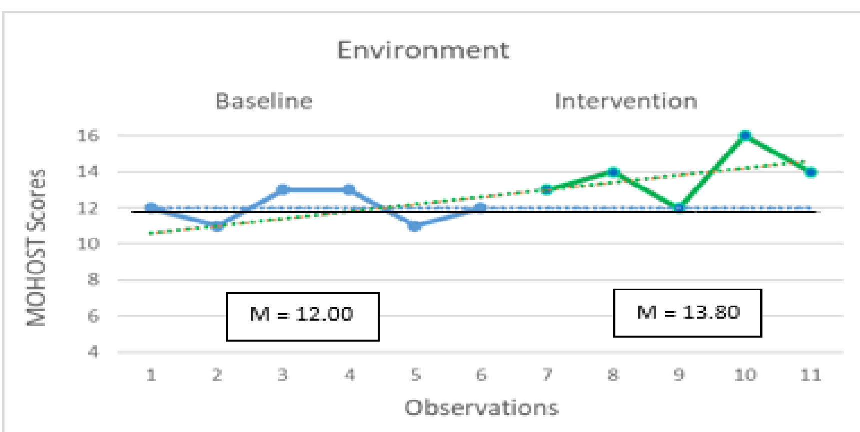


Figure 28. Jamie's Graphed Data for Second 3 MOHOST Domains. Scores of 12 and above indicate domain strength. Blue and green lines are trendlines for T1 and T2 data, respectively.

Process Skills. Jamie's mean scores for the *Process Skills* domain were 10.50 and 10.80 for baseline and intervention phases, respectively. On MOHOST forms in the baseline and early intervention sessions, raters noted that Jamie had difficulty with maintaining focus, working in an orderly fashion, and problem-solving. Figure 28 shows that the visual indicator of level initially drops in the intervention phase; however, scores do begin to increase. In Observation 10, the *Process Skills* domain score reaches 12, the threshold for strength, for the first time in either phase. The rater's notes for Observation 10 indicate that Jamie needed less support, "was able to refocus," and as an example of problem-solving, that Jamie "was able to calm [themselves] to enter building," thus applying the coping strategies that Jamie was learning. In Observation 11, a rater noted that Jamie "uses coping strategies independently" and has an "organized thought process," but "sometimes struggles with resiliency" (problem-solving).

Statistical analysis yielded a *d*-score (d = .19) that, while positive, did not reach the level of .20 that indicates a small intervention effect. However, improvements in assessment scores from T1 to T2 may support an intervention effect on occupational performance. On the EFPT, the assessment for functional EF, Jamie's score improved by 4 points. On the MoCA, the screening for overall cognition, Jamie's score moved into the range that indicates no cognitive impairment. These scores suggest an improved ability to use EF and cognitive skills. Score on the CTMT (objective EF) stayed within the range of mild-moderate impairment; score on the BRIEF, a self-report measure of EF, moved from the 91st to the 95th percentile. At T2, Jamie scored themselves lower on items related to initiating and planning/organizing tasks. This may reflect Jamie's heightened awareness of challenges, despite improved functional performance of process skills. Taken together, visual and statistical analyses and assessment scores suggest that strengths-based cognitive prompting may have had a small positive effect.

Motor Skills. Visual indicators of mean, level, latency, and trend all suggest that the intervention did not affect occupational performance in the *Motor Skills* domain, which aligns with statistical analysis (d = .02). The mean scores for the baseline and intervention phases were 15.17 and 15.20, respectively. Figure 28 shows that both phases had a similar slight upward trend. During baseline Jamie had strengths in manipulation/physical coordination and energy/effort that continued throughout the intervention period.

Environment. Jamie's mean *Environment* score improved from 12.00 during baseline to 13.80 in the intervention phase. In Figure 28, all visual analysis indicators—mean, level, latency, and trend—suggest a positive intervention effect, supported statistically by a large effect size (d = .99). Raters' comments during the baseline phase suggest that Jamie's increasingly adaptive responses to community and PRS facility environments, and improved match between activity demands and Jamie's abilities/interests, contributed to improvement in overall *Environment* domain scores. Raters' notes on baseline MOHOST forms include "other people around made [Jamie] anxious" (Observation 1), "lacks current ability to be independently social" (Observation 2), "a little too much stimulus" (Observation 3), "[resources] do not fully facilitate independence in occupation" (Observation 4), and "matching in ability more than interest" (Observation 5).

Raters' comments on intervention phase MOHOST forms reflect more positive scores: "expresses satisfaction" (Observation 7), "expressed that this activity will help" (Observation 8), "very interested" (Observation 9), "familiar environment" and "supports [are PRS practitioner] and family" (Observation 10), and "café comfortable" and "very interested in coping plan development" (Observation 11). In the intervention period, the only *Environment* score less than a 3 was in Observation 8, when Jamie attended a PRS group for the first time; PRS practitioner provided a great deal of support for Jamie to meet the social demands of the session. The strengths-based cognitive prompting intervention had a positive effect on the *Environment* domain.

Single-case summary for Jamie. Results of visual and statistical analyses were mixed. The strengths-based cognitive prompting intervention was associated with clear positive findings in MOHOST domains of *Motivation* and *Environment*. Findings for *Process Skills* were less robust but also positive and approached a statistical small effect size, consistent with positive changes in assessments of global cognition (MoCA) and functional EF (EFPT). There was no change in the *Motor Skills* domain; Jamie used strengths in coordination, effort, and energy throughout both baseline and intervention phases.

Findings for *Pattern of Occupation* and *Communication & Interaction Skills* domains both showed a negative change from baseline to intervention phase, with a medium and a large effect size, respectively. Jamie had chosen to directly address social anxiety by using PRS sessions to actively work on coping skills while in new community environments and to participate in PRS groups for the first time. Jamie also experienced a condensed intervention period. Scores for the last 3 intervention sessions followed a positive trajectory in both domains and reached the threshold for strength. Jamie's SWL-S score was 6 points higher at T2 compared to T1, the largest increase in a SWL subscale score for any participant, indicating increased satisfaction with social relationships. Jamie's global self-efficacy scored increased by 4 points.

Sam

Sam lived independently in an apartment and took pride in making it a comfortable and tidy home. Sam's main goal during this period of psychiatric rehabilitation was to live as a "well person" and "feel more at peace." Sam expressed no longer wanting to feel like being well was something to "work at;" Sam wanted roles of client and patient to be replaced by other life roles and activities. Sam was an artist but expressed no longer wishing to identify "artist" as a life role because of the pressure implied by that role to produce work and potentially display it publicly. Sam expressed a preference to engage in painting and drawing as pleasurable activities for relaxation and for sharing creativity with family and friends.

Sam experienced anxiety and said that discomfort with group social interactions made community activities uncomfortable; Sam wanted to feel a sense of connection with other people without having anxiety get in the way. Sam's IRP objectives included: cook meals from scratch, get regular exercise (2 times per week), be more at ease and feel more at peace (by exploring mindfulness, meditation, meaningful activity), and feel more at ease in social situations. Sam agreed to participate in PRS groups, especially groups that included creative activities, for the first time as part of the current study. Table 22 presents Sam's pre- and postintervention assessment scores.

Table 22

Sam's Preintervention (T1) and Postintervention (T2) Assessment Scores

Assessment	Abbreviation	Time 1 (T1)	Time 2 (T2)
Bell-Lysaker Emotion Recognition Task	BLERT	13	14
Brief Psychiatric Rating Scale - Expanded	BPRS - E	35	32
• Positive Symptoms	BPRS-Pos	14	15
• Negative Symptoms	BPRS-Neg	3	3
• Depression/Anxiety	BPRS-Dep/Anx	10	7
• Agitation/Mania	BPRS-Agit/Ma	8	7
Behavioral Rating Inventory of Executive Function - Adult	BRIEF- A	53	52
• Behavior Regulation Index	BRIEF-BRI	50	47
• Metacognition Index	BRIEF-MI	55	56
Comprehensive Trail-Making Test	CTMT-Total	41	46
• Attention & Sequencing	CTMT- Attn/Seq	50	46
• Switching	CTMT-Sw	49	44
Executive Function Performance Test	EFPT	8	2
General Self-Efficacy Scale	GSE	31	33
Hinting Task	HT	16	16
Montreal Cognitive Assessment	MoCA	21	26
• Memory index score	MoCA - MIS	7	12
Satisfaction with Life (Total)	SWL - Total	79	79
• Living situation	SWL-Living	16	18
• Self and present life	SWL-S&L	29	27
• Social relationships	SWL-Social	25	26
• Work	SWL-Work	9	8

Note. BRIEF *T*-scores > 65 indicates self-reported (subjective) EF impairment. BLERT score < 15 indicates impaired emotion perception. CTMT-CI *T*-scores < 30 indicates severe objective EF impairment; 30-35 indicates mild-moderate impairment. MoCA scores < 26 indicates impaired cognition; BRIEF score > 65 indicates subjective EF impairment.

Sam's assessment scores. Sam's assessment scores generally improved or stayed the same from T1 to T2. Score on the MoCA, a screening for general cognition, was in the range of cognitive impairment at T1 and at T2 moved to the threshold score indicating no cognitive impairment. Scores on the BRIEF indicated no self-perceived impairment in EF at T1 or T2;

CTMT scores indicated objective EF in the below average range at T1, and in the average range at T2. Functional EF scores on the EFPT improved by 6 points from T1 to T2. Findings from the HT and BLERT suggested that Sam had more difficulty with social cognition. Score on the BLERT indicated impaired emotion perception at T1; score improved by one point at T2 but stayed within the impairment range. Sam's score on the HT stayed the same from T1 to T2. SWL scores changed by only a point or two in each of the subscales, yielding a total SWL score that stayed the same. Sam's BPRS-E score decreased by 3 points at T2, suggesting improved symptomology. The largest change was in the Depression/Anxiety subscale, in which Sam's score decreased by 3 points. Sam's score on the GSE, the measure for general self-efficacy, increased by 2 points.

Sam's strengths. Sam's strengths came mostly from MOHOST items (italicized) with consistent baseline scores of 3 or 4, and from some preintervention assessments. Strengths included: *shows curiosity and demonstrates interest*, *becomes actively involved with task/group*, *relates to and cooperates with others*, *strength and effort*, *energy and pace*, *maintains routine habits*, self-monitoring, organization, and identifying positive emotions. Sam was also interested in understanding at least one challenge and using a strategy to address it. We identified memory (for example, steps of a recipe or of an activity) and decided to develop strategies using strengths in organization and self-monitoring to address memory challenges.

Sam's MOHOST total scores. Figure 29 depicts Sam's graphed total MOHOST scores. Mean MOHOST scores for baseline and intervention phases were 80.44 and 80.57, respectively. Visual indicators of level and latency hint at a positive intervention effect, in that the first intervention observation score is higher than the scores of the three preceding sessions. There are downward trends in both phases, but the trendline in the baseline phase is more steeply negatively sloped. However, given that the positive change in mean is slight and other visual indicators, although positive, are also slight, visual analysis does not support an intervention effect. Statistical analysis yielded an effect size (*d* = .02) that supports this finding.

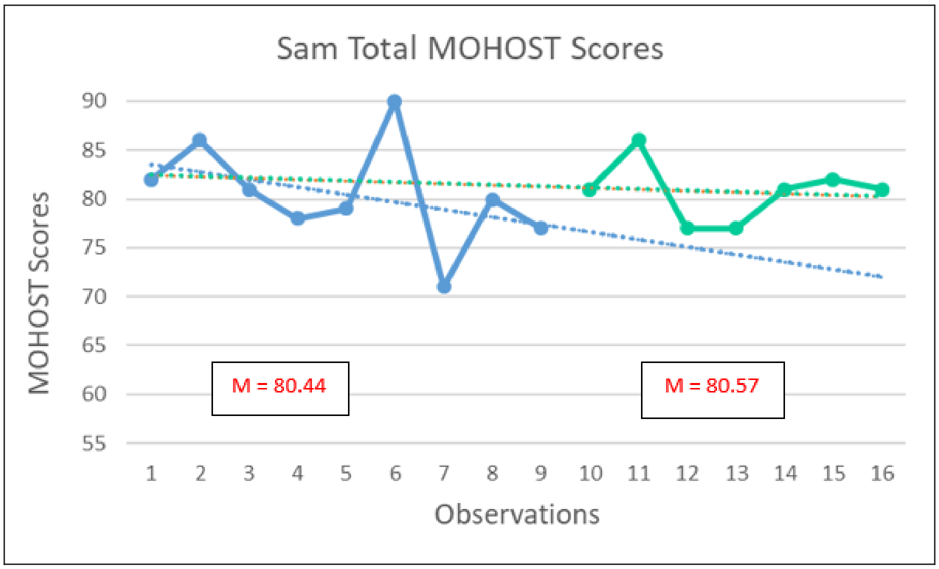
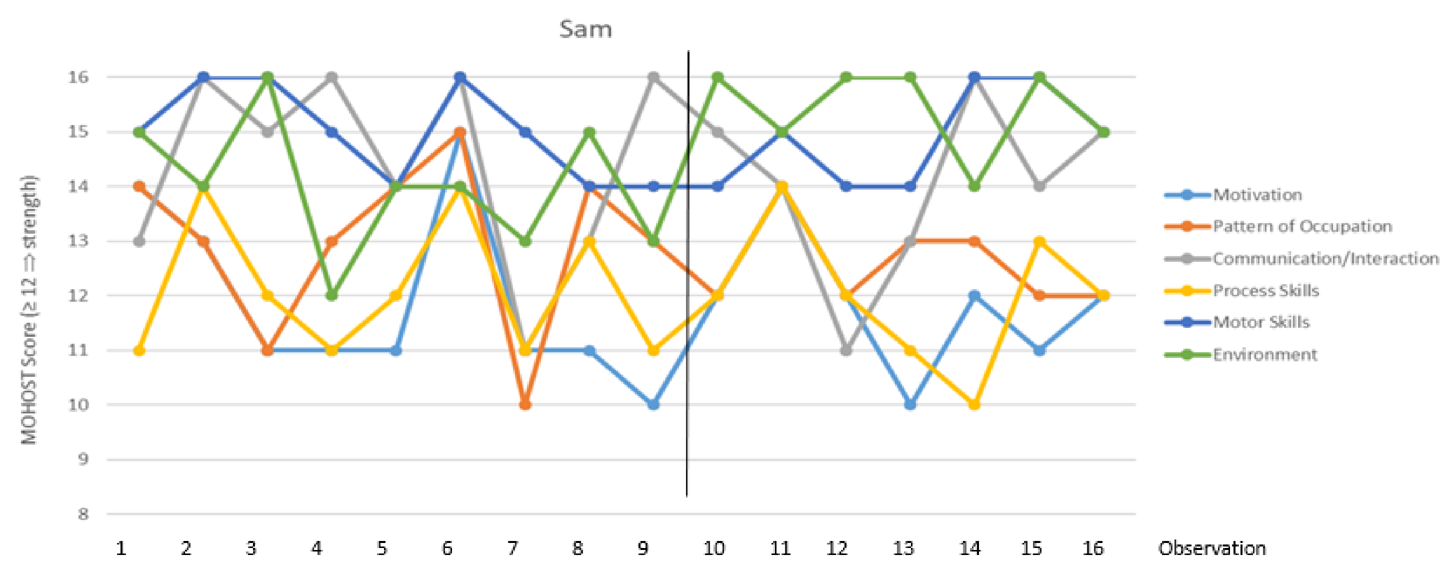


Figure 29. Sam's Graphed Total MOHOST Scores. Blue and green dotted lines are trendlines for preintervention and postintervention data, respectively.

Sam's MOHOST domain scores. Figure 30 is a graphed summary of Sam's MOHOST domain scores for each observed PRS session, including the activities observed and their occupational contexts. Figures 31 and 32 present individual graphs of baseline and intervention scores for each of the six MOHOST domains. The activities listed in Figure 30 for each numbered observation (that is, for each observed PRS session) correspond to the same observation numbers in Figures 31 and 32. The following section describes Sam's results for each MOHOST domain, and refers to these observation numbers and corresponding session activities.



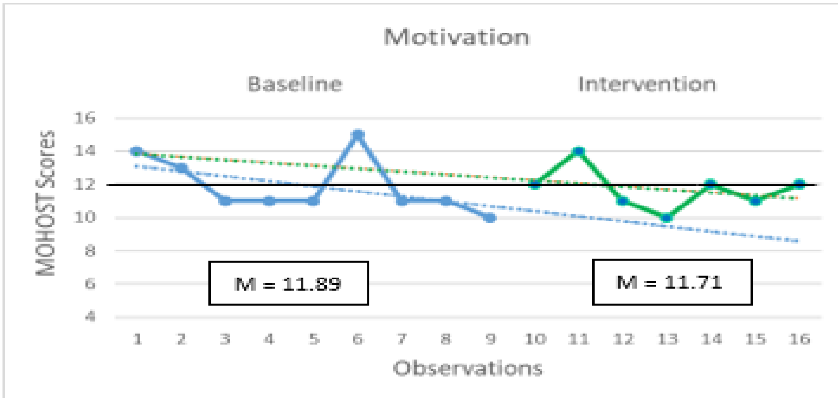
Baseline Phase

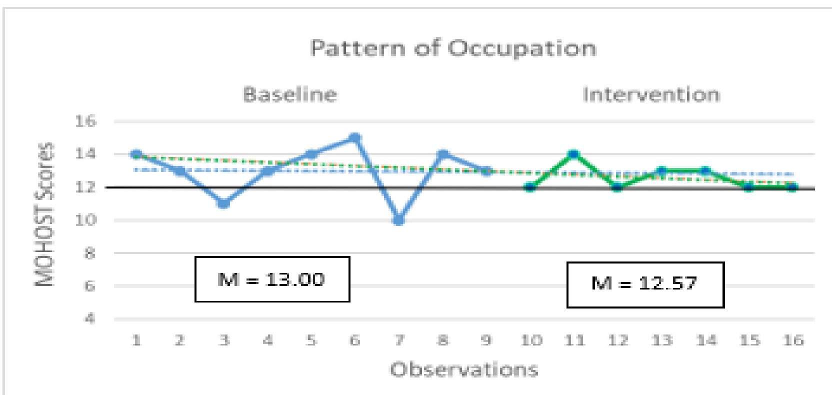
Date	Context	Occupation
1	1:1 home	planning meal to cook, processing his trip
2	PRS group, large	*Pottery with a Purpose*: kintsugi, wabi-sabi
3	1:1 home	processing self-care, motivation, coping
4	1:1 home	cooking activity
5	PRS group, 2 people	*Heavily Meditated* meditation group
6	PRS group, 2 people	*Heavily Meditated*, coping skills
7	1:1 home	cooking, processing social interactions
8	PRS group, small	*Heavily Meditated*
9	1:1 home	cooking a meal

Intervention Phase

Date	Context	Occupation
10	1:1 home	applying strengths to personal goals
11	PRS group, small	*Heavily Meditated* meditation group
12	PRS group, small	*Heavily Meditated*, drawing mandala activity
13	1:1 home	choosing recipe and planning for cooking
14	1:1 home	processing re: feeling less anxious, more at peace
15	1:1 home	strategizing to increase motivation, concrete steps
16	1:1 home	researching community art classes via internet

Figure 30. Sam's MOHOST Domain Scores with Activities and Occupational Contexts.





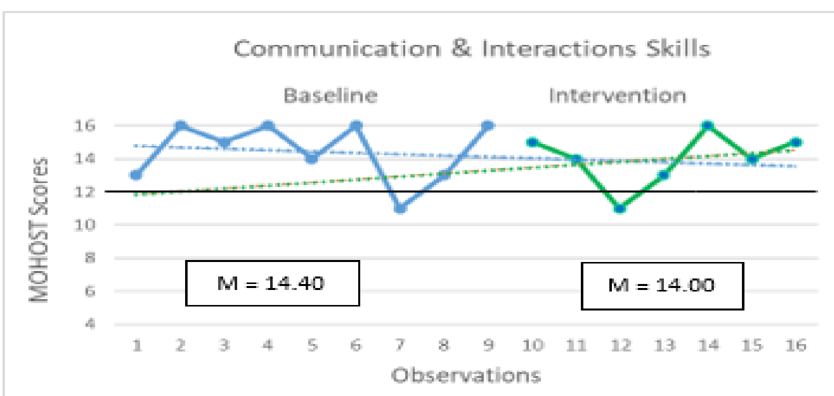


Figure 31. Sam's Graphed Data for First 3 MOHOST Domains. Scores ≥ 12 indicate domain strength. Blue and green dotted lines show trends for baseline and intervention, respectively.

Motivation. Sam's mean *Motivation* scores showed little difference between phases; mean scores were 11.89 and 11.71, respectively. Statistical analysis did not indicate an intervention effect (d = -.10). However, as shown in Figure 31, visual indicators of level and latency were positive. The first two intervention scores were higher than the previous three baseline scores and indicated that *Motivation* was a strength, whereas the previous three scores were less than 12, indicating that *Motivation* was not a strength. Overall, *Motivation* was a domain strength in 3 of 9 baseline sessions (33.3%) and 4 of 7 intervention sessions (57.1%).

Low *Motivation* scores were mostly driven by item scores on *shows awareness of strengths & limitations* and *identifies preferences/is goal-oriented*. Baseline raters noted that Sam demonstrated interest and identified goals, but "needed support to follow through" (Observations 3 and 4), was "uncertain about choices" (Observation 11), and "finds self-appraisal difficult" (Observation 8). In Observation 9, a cooking activity in the baseline phase, rater noted that Sam "does not appreciate extent of . . . limitations," was "self-critical," and "needs significant support putting plan into action." As indicated on Figure 30, Sam's first session in the intervention phase (Observation 10) focused on identifying strengths and strategies to apply them. A rater noted that Sam "was eager to see what to work on" but "very cautious" about identifying preferences. In a group session with an art activity (Observation 12), Sam "underestimated . . . ability to draw a mandala" and "was very self-critical but became more positive throughout task." The last session in which *Motivation* scored below the threshold for strength was a cooking planning activity. Sam "overestimated . . . abilities to be prepared" and "wanted to make mac & cheese but repeatedly tried to change when to make it."

Scores for the final three sessions suggested that *Motivation* was beginning an upward trend. Raters noted that Sam "has optimistic expectations" but "needs support to plan and act on goals" (Observation 14), "is looking into being more active in community" and "able to make choices but has difficulty following through" (Observation 15), and "with prompting . . . able to identify strengths," "very curious" and "very goal-oriented but needs direct prompting" (Observation 16). Comments on fidelity forms indicated that Sam continued to need direct prompts to use strengths. However, Sam's self-reported confidence levels increased overall as the intervention phase progressed. Taken together, Sam's *Motivation* scores and raters' comments suggest that the intervention sparked Sam's interest to engage in challenging activities (e.g., cooking, group social interaction) and positively influenced Sam's awareness of strengths; however, the intervention had little effect on the *Motivation* domain.

Pattern of Occupation. Figure 31 shows that all visual indicators—mean, level, latency, and trend—suggest that the strengths-based intervention did not positively affect the *Pattern of Occupation* domain. Mean scores for the baseline and intervention phases were 13.00 and 12.57, respectively; statistical analysis of effect size (d = -.24) supported a small negative intervention effect. However, two baseline phase observations were rated at less than 12, below the threshold of strength, while all intervention phase observations scored 12 or higher.

Figure 30 shows that Sam participated in both group and individual sessions. Overall, Sam's six group sessions (Observations 2, 5, 6, 8, 11, and 12) had higher *Pattern of Occupation* scores than did the individual sessions. Of the group sessions, four were during baseline and two were during the intervention phase. Differences in ratings were most pronounced in two items: *remains settled/copes with disruption/change* and *fulfills responsibilities in the session*.

Examples of raters' comments on group sessions included: "Didn't have pottery to work on, chatted with others" (Observation 2), "was able to continue meditating even though background noise was distracting" (Observation 5), "great group member" (Observation 6), "improving ability to cope with change" (Observation 8), and "copes well with change" (Observation 11). Several comments on the same item for individual sessions reflect difficulty: "anxiety about activity, so activity changed (Observation 3), "successfully cooked frittata, needed prompts" (Observation 4), "wasn't able to get groceries for occupation" (Observation 7), "needs active and frequent support" (Observation 9), "some possibility of role overload" (Observation 14), and "participates in limited number of activities; has difficulty adapting with change" (Observation 16). Data suggest that individual sessions placed a higher demand on Sam's *Pattern of Occupation*. Thus, occupational context may have played at least as great a role as the intervention in influencing *Pattern of Occupation* domain scores.

Communication & Interaction Skills. Mean scores for the *Communication & Interaction Skills* domain were 14.40 for baseline and 14.00 for intervention phases, respectively. As seen in Figure 31, latency and level also did not support a positive intervention effect; scores decreased in the first three sessions of the intervention period. However, the overall trend during intervention was positive, while the overall baseline trend was negative.

Sam scored less than 12, that is, below the level of strength, for only one baseline session (Observation 7) and one intervention (Observation 12) session. Raters' notes for both sessions were similar, stating that Sam "didn't have eye contact when others were talking" and "had . . . head down while talking" (Observation 7) and "had . . . head down most of the time" (Observation 12). Otherwise, raters' comments were positive and included: "asked questions," “offered to explain wabi-sabi” (Observation 2), “very friendly, polite” (Observation 3), “initiated but had trouble switching [conversation topic]” (Observation 5), “related to other group members very well” (Observation 8), “kept eye contact while others were talking” (Observation 13), and “appropriate tone and pace” (Observation 16).

Sam had verbalized that because anxiety caused social and community interactions to be stressful, Sam tended to avoid them. Sam’s social cognitive assessment scores were low; BLERT score indicated emotion perception impairment at both T1 and T2. However, MOHOST scores indicated that *Communication & Interaction Skills* was an overall domain strength. Raters commented to the PI that Sam presented well, was well-spoken, and was well-dressed; one rater said that she was surprised that Sam was in the PRS program. Except for Observation 2, the PRS group sessions that Sam participated in were highly structured and had at most three participants; two sessions in the baseline phase had two participants. Therefore, Sam’s interaction challenges may not have been readily observable. However, one rater who observed only Sam’s first session noted, “best 1:1 (copes best), mostly clear—word finding difficulty,” which suggests that the small group size and highly directive facilitation of the groups that Sam attended may have provided a great deal of support for communication and interaction skills. Therefore, the small negative effect size (d = -20) may not be clearly associated with the intervention. Furthermore, Sam’s BPRS-E subscale scores for Depression/Anxiety improved by 3 points at T2, and Social Relationships subscale score of the SWL improved by one point.

Figure 32. Sam's Graphed Data for Second 3 MOHOST Domains. Scores ≥ 12 indicate domain strength. Blue and green dotted lines show trends for baseline and intervention, respectively.

Process Skills. Sam's mean *Process Skills* score changed little from baseline to intervention phase, with mean scores of 12.11 and 12.00, respectively. As seen in Figure 32, visual indicators of level and latency hinted at a positive intervention effect for the first two sessions of the intervention phase, but scores then began a downward trend. Intervention phase scores showed a slight overall downward trend, while baseline scores hovered between strength and non-strength (that is, a score of 12); negative slope baseline phase trendline was very slight. Taken together, visual indicators suggest that the strengths-based cognitive prompting intervention did not influence the *Process Skills* domain, which aligns with statistical analysis of effect size (*d* = -.07).

MOHOST scores and raters' comments indicated that Sam experienced difficulties, and also demonstrated some strengths, related to all items in the *Process Skills* domain: using knowledge and equipment, maintaining focus, working in an orderly fashion, and problem-solving. Raters' comments include the following: "neat-organized, needs prompts to stay on track" (Observation 1), "thoughts were occasionally scattered" (Observation 3), "forgot to include ingredient—needed direct instruction" (Observation 4), "lost focus but was able to refocus" (Observation 8), "slow to respond to some environmental cues, does not respond to some problems, needs support" (Observation 9), "didn't remember things from last group but seeked [sic] out information" (Observation 11), "was able to decide to use multiple recipes with direct prompts" (Observation 13) , "loses track of what needs to be done" (Observation 14), generally able to adapt to smaller problems" (Observation 15), and "difficulty adapting in general, but problem-solved using computer in this activity" (Observation 16). However, Sam's assessment scores related to cognition and executive function improved overall from T1 to T2.

Objective EF (CTMT) scores improved and moved to the average range, subjective EF (BRIEF) scores stayed relatively the same, and functional EF score improved by 6 points. General cognition score (MoCA) improved to the threshold score indicating no cognitive impairment. Positive changes in EF and cognition assessment scores do not align with overall stability in the *Process Skills* domain of occupational performance as measured by the MOHOST.

Motor Skills. Mean scores for the *Motor Skills* domain were 15.00 for baseline and 14.86 for intervention phases, respectively. Visual indicators of level and latency also suggested little change. Trend, however, was indicative of intervention effect, as Figure 32 illustrates; baseline scores showed a negative trend and intervention scores showed a positive trend. Still, taken together, visual analysis and statistical analysis (d = -.10) indicate that the intervention did not substantially affect the *Motor Skills* domain of Sam's occupational performance. This domain, including mobilization, manipulation, strength/effort, and energy/pace, was a strength for Sam in both the baseline and intervention phases; no ratings were lower than 3.

Environment. Visual indicators of mean, level, and latency suggest that the intervention had a positive effect on the *Environment* domain. Mean scores were 14.00 and 15.43 for baseline and intervention phases, respectively. *Environment* scores increased with the first intervention session and scores stayed relatively high throughout the intervention period. Scores in both phases had a negative trend, although the trendline slope in the intervention phase was slight and mainly driven by one session. For Observation 14, the item *demands of activity match abilities/interests* was rated at 2; rater noted that Sam "needs active support" for processing in the activity. This was the only rating less than 3 in the intervention phase. In the baseline phase, raters' comments mainly focused on the "interests" aspect of this item.

Examples of raters' comments included "seemed to enjoy group a lot" (Observation 2), "seems able to cook to the level of his interests" (Observation 4), "very interested in group (Observation 6), "expresses satisfaction despite inconsistency" (Observation 9). These items, except for Observation 6, were rated at 3, suggesting that even though activities matched Sam's interests, Sam benefitted from support to be able to perform them. In the intervention phase, this item consistently received a 4 rating, with two exceptions; Observation 14 was the session in which *Environment* score dipped to 14. The item rated at 2 in Observation 16; rater noted that Sam was "very interested in taking an Art class."

In the baseline phase, the item *social interaction provides support* was rated at 2 for three sessions. Two were group sessions; rater commented that "group members were not very talkative . . . ." (Observation 5) and "facilitators give praise but difficult with [name of group member with social challenges]" (Observation 6). The third session, Observation 7, was an individual session in which PRS practitioner helped Sam to process a recent family visit. A rater noted that Sam was "not able to communicate well with father and brother." Scores may partially reflect that the social environment of group sessions, which were more frequent in the baseline phase, did not support occupational performance. However, activities and related prompting in the intervention phase may also have better matched Sam's abilities. Overall, visual analysis and raters' notes support that the strengths-based cognitive prompting intervention had a positive effect on the *Environment* domain, although the effect may not have been as influential as the medium effect size indicated by statistical analysis (d = .78).

Single-case summary for Sam. Visual analysis suggests that the intervention had little effect on Sam's occupational performance domains, except for *Environment*. Several factors may have contributed to the apparent lack of intervention effect. First, the PI was Sam's PRS practitioner in the year before the study began. Sam was already accustomed to a strengths-based approach, albeit in a general way, and to talking about "thinking skills." Second, one rater may have been biased toward rating Sam higher because Sam presented well. This rater was Sam's most frequent observer. Third, the context of group intervention activities may also have affected scores, as most groups that Sam attended were highly structured and had few participants, and so did not challenge social and interaction skills. However, the intervention clearly had a positive effect on the *Environment* domain. Data indicated that activities in the intervention phase were better matched to Sam's abilities, which may suggest that in the intervention phase, Sam was prompted to use strengths in a way that facilitated successful functioning. Although MOHOST domains other than *Environment* do not demonstrate an intervention effect, Sam's general self-efficacy (GSE) score improved by 2 points and self-confidence scores showed an upward trend. Toward the end of the intervention phase, Sam expressed interest in taking an art class in the community, which indicated a positive change.

Single-Case Results Summary

Visual analysis demonstrated that the strengths-based cognitive prompting intervention had a clear positive overall effect for two participants, Casey and Dana, in most MOHOST domains. The intervention had small positive effects for Angel on domains of *Pattern of Occupation* and *Communication & Interaction Skills*, for Sam on *Environment*, and for Jamie on *Environment*, *Motivation*, and *Process Skills*. The intervention had apparent negative effects on Jamie's *Communication & Interaction* and *Pattern of Occupation* domains; however, the interaction between occupational context and performance is important and likely affected results. For example, the intervention motivated Jamie to choose intervention activities and environments that were challenging and MOHOST scores reflected those challenges.

All participants had social goals (among other goals) and the intervention had a positive effect in some way. Angel, Casey, and Dana had significantly higher *Communication & Interaction* domain scores during the intervention phase. Jamie began reengagement in community activities and participation in PRS groups. Sam also began participation in PRS groups, and, following the intervention, expressed interest to enroll in a community art class. Single-case analysis showed that the strengths-based cognitive prompting approach had an overall small positive effect, with individual differences among participants and MOHOT domains.

Qualitative Results

Data analysis of participants' responses in individual interviews and the focus group yielded four interrelated themes with six subthemes: (1) Being Tested; (2) Being Prompted (responses to the intervention, with subthemes of: general responses, differences from other approaches, and program continuation), (3) Occupational Adaptation (development and use of strengths, with subthemes of: strength awareness, strength usage, and strengths-based strategies), and (4) Occupational Identity. Table 23 summarizes qualitative results by highlighting representative participant quotations corresponding to each theme and subtheme.

Table 23

Themes Constructed from Qualitative Data with Sample Participant Quotations

Themes	Examples of Participant Quotation
Being Tested	• *It's fine. We took a break in the middle of it so that helped.* • *Definitely use it. It was fun.*
Being Prompted	
a. Strong program	• *I didn't know I had these kinds of strengths, and they're right there!*
b. Different is good.	• *Like with therapy, for example, it's good to talk through things. But with the study I feel like . . . it's more definite.* • *I liked the part with the numbers.*
c. Keep it going.	• *It would help a lot more people, 'cause it helped me.* • *That would be the best part—we could help each other.*
Occupational Adaptation	
a. Strengths awareness	• *I took my strengths and I taped them on the fridge.*
b. Strengths usage	• *Getting out more. And going out to different places.* • *I can calm down and enjoy more.*
c. Strengths as strategies	• *I like the ability to now work with my challenges . . . . Now that I know what they are, I can do that so it'll help me prosper when I go to school next week.*
Occupational Identity	• *Seeing things I didn't see—it gave me . . . confidence.* • *I thought it was good, because like we learned our strengths and then we put them to use and that just made me feel better about myself.*

During both the individual interviews and focus group, participants' comments about the strengths-based cognitive prompting intervention were consistently positive. The following paragraphs summarize participants' responses and provide direct quotations that illustrate the four themes: being tested, being prompted, occupational adaptation, and occupational identity.

Being Tested

Participants all stated that they did not think that the assessment protocol was too long. "It's fine. We took a break in the middle of it so that helped. … You giving us brain food helped. Even though I gave mine to my dogs!" (Casey). Dana said that "the testing" was "frustrating a little bit. … Because it was hard to understand some of the words—big words." Dana also described assessments as "fun." Participants shared their thoughts about some specific assessments, including the EFPT, BLERT, and CTMT.

EFPT. Participants had the most to say about the EFPT. Casey said, "The only thing I didn't like was the bills. … the bill-paying and going to the catalog." Dana said that that "the catalog was hard for me." Angel commented on the difference between the EFPT activity of mailing a payment by check and the more customary activity of making a credit card payment by phone. "You mean to buy something from the catalog? That's neat, nothing wrong with that. When I ordered something I called 'em up before. I called 'em up and I payed like that" (Angel). Casey and Dana both said that they thought they did better on the first EFPT activity, paying bills, at T1 than on the second EFPT activity, ordering from a catalog, at T2. The first activity "made me think about realistically who I would pay first over who I would pay second" (Casey). Even though at least one participant found the EFPT "a little tedious" (Casey), when asked whether they would prefer that the EFPT not be used in the assessment protocol, all participants said that the EFPT should be included. Comments included: "No, I think you should definitely use it, because some people out there don't know how to pay bills" (Casey), "Definitely use it" (Dana), and "I'd keep it" (Sam).

BLERT and CTMT. Participants said that they talked about the BLERT before the focus group started. They laughed about the assessment; one participant said that "it was fun" (Casey). Jamie said that the BLERT was "very interesting. … You never know how this guy's emotions really are. You know you have to really try to figure them out. … It was very entertaining." Sam described his response to the BLERT: "I struggled. [Sam chuckled.] I found out later . . . . when I found out my scores. I was like, Oh! It is a little more difficult . . . . the very slight differences . . . . " Casey mentioned the CTMT when talking about assessments: "They're definitely cognitive. They had me thinking. The one where you had to do A to 1, B to 2." Jamie said of the assessments, "I like them all, because they . . . show me like what I can improve in."

Being Prompted

This theme incorporated general responses to the intervention, which were consistently positive. Participants' comments were in three main areas. They found benefits in knowing their strengths, expressed that the intervention was different from what they had experienced in the past, and wanted the intervention, as referred to as the "program," to keep going. The next three paragraphs present subthemes that summarize participants' comments.

Strong program. Participants spoke positively about the intervention in general, and in particular about their increasing awareness of their strengths. Casey's comment about the intervention summarizes what other participants expressed: "I thought it was good, because like we learned our strengths and then we put them to use and that just made me feel better about myself because I was able to use my strengths." Dana added, "I agree." Sam said that focusing on strengths was "encouraging. Like even just . . . to look back [at] in a period when I'm struggling." Jamie stated:

> I found out some strengths that I didn't realize I had. . . . I didn't recognize them at all. It's like you're blinded to it. … And 'til you see it written out on paper and you're like, Really? I didn't know I had these kinds of strengths, and they're right there!

Jamie said that this was “shocking:” “To me it was shocking. Like what? I didn’t even know I had those.” Other words that participants used to describe their experience of the intervention included “encouraging,” “good,” “easier,” “helpful,” and “positivity.”

Casey offered another perspective on the strengths-based cognitive prompting intervention. “I think it could help people who are bipolar. I’m schizoaffective so my main problems are from bipolar. I think that being bipolar and knowing your strengths can bring you back to reality, can help ground you.”

Different is good. Participants expressed that the strengths-based cognitive prompting intervention was different from what they had experienced in other services, or previously in the PRS program. One participant contrasted the experience of participating in the intervention in the PRS program with the experiences of participating in therapy:

> Like with therapy, for example, it’s good to talk through things. But with the study I feel like . . . it’s more definite. Even knowing sometimes where we can improve. But [by] having set positive strengths that we can know for sure, we can carry [them] forward, and use when we need [them]. (Sam)

Angel also commented that on an aspect of the intervention that was concrete. Specifically, Angel liked rating level of confidence in ability to participate in and successfully complete activities and goals, and seeing MOHOST ratings and assessment scores. Angel said: “I liked the part with the numbers. You figured out what your strengths [were]. You learned different things about yourself. I liked that part—it’s odd, or even, or the same.”

Participants related that the PRS program seemed different while using the strengths-based cognitive prompting approach.

> Even groups were different. … Because I knew my strengths and they made me more outgoing in groups. And then I was being watched in groups, and [the observer] would come and talk to me afterwards about it. … It was a good difference. (Casey).

Keep it going. Participants were asked what might make the strengths-based cognitive prompting approach better. Casey said, “I think it worked out perfectly fine; it was perfect.” One participant suggested that that the strengths-based cognitive prompting approach could be incorporated into the PRS group program. Sam explained, “Like a group on self-monitoring or cooperation or something, and then incorporate music or art with it.” Casey said, “That would help people who don’t have the strength, to build that strength as well.”

> I think it would be cool if . . . you had like multiple classes and everyone focus[ed] on the one topic or strength, or multiple strengths within one group. But have multiple groups . . . to accommodate for the . . . positivity that I felt when I received my feedback about what things to focus on. (Sam)

The other participants expressed that they liked this idea. One participant commented, “I think that would be good. That would help everybody in the group. I mean everybody. We could help each other. … That would be the best part; we could help each other.” (Jamie) Participants also said that they thought that the strengths-based cognitive prompting approach should continue and expand to other members of the PRS program. Examples of comments included “It would help a lot more people, ’cause it helped me” (Jamie) and “This could work big time” (Angel).

All participants said that they themselves wanted to continue with the strengths-based approach after the study. Sam expressed wanting to “morph it into an individual lifestyle approach" and also wanted to work on cognitive skills and strategies, especially for social cognition. Angel expressed that wanting to continue using the confidence rating scale and other forms that were used in the study. Jamie verbalized looking forward to going more places and feeling comfortable. Dana wanted to include more arts-and-crafts activities along with strengths-based prompting. Casey expressed wanting to work on "making my challenges my strengths," that is, developing strategies for challenges and getting really good at using those strategies.

Occupational Adaptation

Occupational adaptation refers to change that an individual undergoes to engage successfully in their occupations or to participate in new ones (Taylor, 2017). Participants shared their developing use of their strengths and skills. Comments related to using strengths fell in three general categories: developing awareness of strengths, strengths usage, and strengths-based strategies to address challenges.

Strengths awareness. One participant, Sam, used a strengths-based approach before the current study. Sam's PRS practitioner was the PI for approximately one year prior to the beginning of the study. Although they had used a strengths-based approach, there was no formal assessment or other aspect of the intervention. During the focus group, Sam said, "Even before the testing and stuff, it helped to know about it. And that's what kind of encouraged me to use strengths before I knew what my strengths [were from testing] and try to focus on strengths."

Two participants shared that they came up with their own strategies to stay mindful of their strengths. Sam said, "I took my strengths and I taped them on the fridge, so that's helpful, I think. From yesterday on. … So every day I can look at it and, you know, kind of remind myself." Another participant had developed a similar strategy: "I carry mines [*sic*] in my purse." Two of the other participants asked for extra copies of their strengths so that they could also carry their strengths with them.

Strengths usage. When asked what they noticed about using strengths, participants focused mainly on social and community interactions. "It made it easier to use my strengths in the community, socially and all that" (Casey). "It was about the same for me" (Dana). Dana said that Dana was better at seeing positive emotions and that paying attention to positive emotions was helpful in social situations. Jamie described what Jamie was experiencing:

> [I'm] getting out more. And going out to different places with [PRS practitioner] and exploring things. Which is better for me, 'cause I used to be a homebody. At home, wasn't going nowhere. Now I'm going places and it's like, wow, I'm not as scared as I was before. Trying to open up a little bit. So that's good. Yep, I can see it. It's better. (Jamie)

Angel shared that Angel was trying to have more positive social interactions, but that they continued to be difficult because it was hard to know what was going on inside another person. Angel said, "That's the goal, exactly, to say 'Hi, how are ya doin? My name is.' But it takes a while to comprehend before you get to know the person."

Casey said that Casey "used to be kind of shy," but now that knowing that personal strengths included identifying emotions and being able to see others' points of view, Casey was interacting more with others in PRS groups. Casey gave an example of going over to talk with a person who looked like they were feeling down and talking with the person to help them feel better. Casey said that Casey would not have done that before the intervention, and that “it felt good.”

Strengths as strategies to mitigate challenges. Along with their strengths, all participants chose to also know at least one cognitive challenge that T1 assessment results revealed. Although most agreed that learning of cognitive challenges could be uncomfortable, they also agreed that this could help make the areas in which they struggled in life more “understandable” (Angel). One participant, however, said that learning about a cognitive challenge was “frustrating” (Dana). Casey described learning about challenges as “a trip to reality. ’Cause I thought that I was perfectly fine in the challenging groups, and I was like, oh well, I guess I was wrong.” Three of the participants, Casey, Jamie, and Sam, wanted to directly address a challenge by using a strengths-based strategy to address it.

> But I do like that there was also the option or opportunity to work on and use and looking [*sic*] at the perspective [of challenges] and take the other strengths and . . . incorporate those to lift up the areas that I struggle in. (Sam)

Casey stated, “I like the ability to now work with my challenges with my psych rehab [staff]. Now that I know what they are, I can do that so it’ll help me prosper when I go to school next week.”

Two participants mentioned specific strengths-based strategies that they used to address challenges. Sam said, “I just bought post-it notes!” using a strength of being organized to help with the challenge of difficulty with memory and information processing. Jamie talked about the strategy of taking deep breaths before going somewhere that caused anxiety. Jamie also described keeping a paper copy of a list of individual strengths handy to look at before doing something or going somewhere that caused anxiety. Sam also talked about actively using awareness of strengths as a coping strategy and way to be more adaptive.

> That's why I put it [strengths list] on the fridge. So every morning I can look at it and say, okay, just remember A, B, or C and try to carry through. … Self-monitor in a productive way . . . with the positive reinforcement. … Because sometimes . . . you have those down days. (Sam)

Occupational Identity

Most participants used words and phrases that reflected increased belief in their abilities or in themselves. When talking about learning of individual strengths, Jamie said, "Seeing things I didn't see—it gave me . . . more confidence." Casey said that the intervention "just made me feel better about myself because I was able to use my strengths." Dana responded, "I agree." Casey seemed to see her/himself differently as a result of the intervention: "Knowing what my strengths are has helped. I wouldn't have been more outgoing. I feel more outgoing knowing what my strengths are." Casey also expressed feeling "excited about school."

Dana did not talk specifically about confidence but did say that some activities seemed easier. Dana expressed being better able to "calm down and enjoy" activities, and that he/she was "improving." Jamie, on the other hand, talked directly about believing in own abilities while sharing the experience of completing the second EFPT assessment, during which Jamie had reminded him/herself to look at each section of the order form, work step by step, and use strategies to stay calm to enable clear thinking.

> I mean, that helped. I was confused for a little bit, but I thought I had it. But I was a little confused about it, but I knew I was going to get it. Somehow, somewhere, some way, I was going to get this. And the strategies, it helped. It helped show you, things here and there, what you can do. And how to better do it. And now I'm ready for it.

Sam expressed feeling "more confident" overall, and more motivated to try to participate in art-related community activities, although being with groups of people still made Sam anxious.

Summary of Results

This chapter presented the results of the current study. The study utilized a mixed methodology—single-case experimental design with integrated quantitative and qualitative methods. The chapter gave detailed descriptions of the study's results, organized by research method. Quantitative methods yielded findings related to assessments, including relationships among variables and changes from pre- to postintervention. Postintervention, MOHOST domain scores were more related to executive function and life satisfaction. Single-case methods resulted in findings related to the effect of the intervention on occupational performance. Positive intervention effects were clear from visual and statistical analysis for two of the participants; the MOHOST provided context for understanding challenges that affected other participants' scores. Qualitative methods yielded results about participants' experiences of the intervention and the assessment protocol, both of which they responded to favorably. Results regarding self-efficacy were embedded in all three methods; some limited evidence of increased self-efficacy was shared. The next chapter will discuss the study's results within the context of the research questions, as well as the study's implications, limitations, and conclusions.

CHAPTER V

DISCUSSION

Research has established that cognitive impairments, including in executive function and social cognition, impede functioning in people with schizophrenia spectrum disorders. At the same time, psychiatric rehabilitation and occupational therapy professionals are called upon to be strengths-based in their work and not focus on deficits, although strengths-based approaches are not well-defined. Furthermore, cognitive skills account for approximately only 25% of the variance in functional outcomes (Fett et al., 2011) and other factors, such as self-efficacy, may affect individuals' abilities to use their cognitive skills in daily activities. The purpose of this study was to implement an intervention in which 1) individuals' strengths in executive function, social cognition, and occupational performance were concretely defined through assessment and 2) individuals were prompted to use their strengths in rehabilitation activities targeted to meet their self-identified goals. This chapter discusses the study's findings, application to theory, implications, limitations, and future directions.

Summary of the Study's Findings

This dissertation study investigated the effects of the strengths-based cognitive prompting intervention on occupational performance (i.e., functioning) and self-efficacy in people with schizophrenia and schizoaffective disorder. Strengths were identified through an assessment protocol that was introduced to the PRS program that was the setting for the study. The study employed single-case, quantitative, and qualitative methods to investigate the intervention, explore relationships among study variables, and learn about the feasibility of the intervention and assessment protocol from the perspective of the study's participants. This study provided beginning support for the intervention and for the assessment protocol. This chapter discusses the study's findings. The discussion below is organized by the topics of three of the four research questions: 1) effect of the intervention on self-efficacy, executive function/cognition, and occupational performance; 2) feasibility of the assessment protocol; and 3) participants' lived experience of the intervention. The fourth research question, which related to exploration of relationships between assessment variables and domains of the MOHOST, is integrated into discussion of the intervention's effect on occupational performance domains.

Effects of the Intervention on Self-Efficacy, Cognition, and Occupational Performance

The paragraphs that follow summarize intervention effects on occupational performance, self-efficacy, and cognition. The hypothesis was that the intervention would have positive effects on self-efficacy, subjective executive function, and occupational performance. The section that follows discusses the intervention's effect on each of these variables with the addition of life satisfaction.

Self-efficacy. The intervention had an overall positive effect on self-efficacy, which varied among participants. Scores on the GSE increased from T1 to T2 for four of the five participants. The overall positive change in GSE scores was not statistically significant, although statistical significance was not expected with this small sample size. Self-rated confidence levels followed an upward trend for all participants, and this may be a better indicator of increased self-efficacy. Bandura (1997) stated that self-efficacy assessments that measure beliefs about *specific* abilities are more accurate than global scales that ask about *general* capabilities. Bandura disputed the idea that self-efficacy as a trait is related to a person's self-efficacy in different activities; however, he acknowledged that people may have dispositions that are more or less efficacious. People may believe themselves to be generally less capable. Personal inefficacy is the belief that your inability to do what you want to do is because of your own "personal deficiencies" (Bandura, 1997, p. 144). One goal of the strengths-based cognitive prompting intervention was to counteract that belief.

Qualitative results support that the intervention had a positive effect on self-efficacy. Participants discussed feeling more confident. For example, Casey talked about increased social self-efficacy; learning of a personal cognitive strength in emotion perception enabled Casey to feel more socially confident. Belief in ability to accurately recognize emotions gave Casey the motivation to initiate contact with a peer who looked sad. Casey's story illustrates the relationship between self-efficacy, motivation, and functioning as described in the literature (Kurtz et al, 2013; Ventura et al., 2014). Prior to the intervention, Casey's lack of self-efficacy would have led to lack of motivation (avolition, a negative symptom) to initiate social contact, and subsequent decreased social functioning. The intervention allowed Casey to activate social cognitive strength in emotion perception, thereby increasing social self-efficacy and improving occupational performance, as depicted in Figure 33.

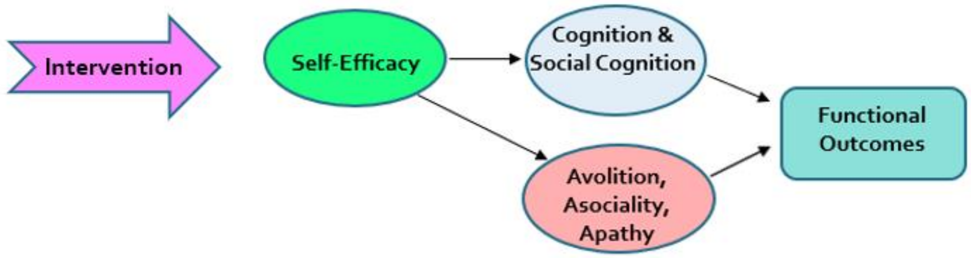


Figure 33. Intervention Positively Affected Self-efficacy, Leading to Improved Functioning. Adapted from model of Ventura et al. (2014), in which self-efficacy leads to improved functional outcomes through increased cognitive effort (demonstrated by improved scores on cognitive tests) or increased motivation (decreased negative symptomology).

Self-efficacy and executive function. Jamie's description of self-confidence while persisting at the EFPT also illustrates the model of Ventura et al. (2014) for the effect of increased self-efficacy on cognition and functioning, which suggests that when self-efficacy increases, so does cognitive effort, resulting in more positive cognitive outcomes (Figure 33). Jamie described how she/he kept trying on the EFPT at T2: "But I was a little confused about it, but I knew I was going to get it. Somehow, somewhere, some way, I was going to get this." Jamie's EFPT score at T2 did improve, as did scores for all participants except Casey, whose score was already very good.

Correlations were conducted to explore relationships among variables and with this small sample size can only suggest relationships. However, correlations between the GSE and assessments of EF and cognition offered some support to increased self-efficacy. Prior to the intervention, only the BRIEF-BRI (subjective EF, self-regulation subscale) was strongly correlated with the GSE; the correlation was not significant. After the intervention, the GSE was strongly and significantly correlated with the BRIEF-MI (subjective EF, metacognition subscale) and the

CTMT-Sw (objective EF, cognitive flexibility). In addition, the GSE had strong correlations with the BRIEF-Total, CTMT-Total, MoCA, and MoCA-Memory. These T2 correlations are interesting in light of the finding of Ventura et al. (2014) that self-efficacy is related to cognition in people with schizophrenia, and their contention that increased self-efficacy may trigger increased cognitive effort, resulting in better cognitive outcomes. In the current study, no causal relationship between self-efficacy and cognitive skills can be assumed. Furthermore, the pre- and postintervention correlations were not tested for statistical significance. Therefore, although the increased strength of correlations at T2 seem to provide some support for a positive intervention effect on self-efficacy, this cannot be assumed.

Self-efficacy, symptomology, and occupational performance. The model of Ventura et al. (2014) also posits that self-efficacy does not directly affect functioning, but rather does so indirectly through cognitive skills or negative symptoms. At T2, negative symptoms correlated with MOHOST scores but positive symptoms did not. Lower negative symptom scores were correlated with higher occupational performance in the *Process Skills* and *Environment* domains (and for the MOHOST Total). This aligns with the schizophrenia literature on the relationship between negative symptoms and functioning (Achim et al., 2013). Participants' positive symptoms did not seem to directly affect occupational performance. Symptomology was measured by the BPRS-E. Dana's BPRS-E score for the positive symptom subscale increased at T2 and Jamie's remained elevated, but both participants demonstrated improved occupational performance during the intervention phase. At T1, Agitation/Mania was correlated with several domains, and significantly with *Motivation* and *Pattern of Occupation*. The correlation may have been driven by one participant's score (Dana), whose BPRS-Agitation/Mania score was relatively high at T1. All participants' BPRS - Agitation/Mania scores fell at T2, representing the only statistically significant change in an assessment score. Qualitative data included Dana's postintervention statement that they felt "calmer." While no changes in symptomology can be directly attributed to the intervention or to possible changes in self-efficacy, the pattern of correlational findings in this study aligns with the research that function is more related to negative than to positive symptoms (Velligan et al., 1997; Ventura, Hellemann, Thames, Koellner, & Nuechterlein, 2009) and that self-efficacy affects negative symptoms, which in turn affects functioning (Ventura et al., 2014)

Executive function and cognition. The second hypothesis was that the intervention would have a positive effect on subjective EF, that is, that participants' scores on the BRIEF-A would decrease. The hypothesis was not supported. Mean BRIEF scores of the group changed very little from T1 to T2. This hypothesis was made on the assumption that participants would be self-critical of their cognitive skills prior to the intervention, and this assumption was not true for all participants. Angel's T1 BRIEF total score was the lowest of the group, indicating the highest self-perceived executive function skill. Yet, Angel's scores for the CTMT, the measure of objective EF, were the lowest of the group. Impaired insight regarding illness is not uncommon in people with schizophrenia (Kurtz et al., 2013), and may extend to other spheres such as executive function skills. Dana's subjective EF scores, however, did improve and came more into line with Dana's objective EF scores.

Functional EF scores on the EFPT improved for all participants except Casey, whose score changed by one point. Jamie described the sense of self-efficacy when taking the EFPT at T2. Jamie's experience illustrated the point of Ventura et al. (2014) that a person's belief in their ability to successfully complete a task motivates them to give more cognitive effort, resulting in better functional performance. The same could be true of the overall improvement in scores on the MoCA, the screening for overall cognition. Again, all participants' scores improved except for Casey's, whose score was already high and stayed the same. Scores for both Jamie and Sam moved into the range indicating that overall cognition was not impaired, again illustrating the possible effect of increased self-efficacy on cognitive effort.

Occupational performance. Single-case analysis found that the strengths-based cognitive prompting intervention had a small positive effect (d = .26) on overall occupational performance as measured by the MOHOST, with individual differences among participants and MOHOT domains. Positive intervention effects were clear and spanned most domains for two participants, Casey and Dana. The intervention had positive effects for Angel on domains of *Pattern of Occupation* and *Communication & Interaction Skills*, for Jamie on *Environment*, *Motivation,* and *Process Skills*, and for Sam on *Environment*. The interaction between occupational context and performance may have affected results. For example, the intervention motivated Jamie to choose activities and environments that were challenging, resulting in lower intervention phase MOHOST scores.

All participants' goals included a social goal and the intervention had a positive social effect in some way. Angel, Casey, and Dana had higher MOHOST scores in the *Communication & Interaction* domain during the intervention phase. Jamie was motivated to begin interacting socially in PRS groups and in the community. Sam decided to take an art class in the community following the intervention, a new step for Sam. The following paragraphs discuss four MOHOST domains in more detail: *Motivation*, *Communication & Interaction Skills*, *Process Skills*, and *Environment*.

Motivation. Motivation scores improved for two participants (Dana and Jamie), decreased for two participants (Angel and Casey), and stayed virtually the same for the fifth (Sam). That *Motivation* scores for all participants did not increase may seem puzzling at first, given the link between motivation and self-efficacy. However, this was likely due to the nature of the intervention. The four items of the *Motivation* domain include *awareness of strengths/ challenges*, *shows pride/seeks challenges*, *curiosity and interest*, and *identifies preferences/is goal-oriented.* On the MOHOST, when a practitioner assists, the individual does not receive the maximum score for that item. The strengths-based intervention itself required practitioners to give prompts, which are a form of assistance. The overall lower ratings in this domain therefore make sense. Also, the focus on using strengths to achieve goals may have focused raters' attention on these items more intensely than they had during the baseline phase.

Different factors may have contributed to the scores of the two participants whose mean *Motivation* scores decreased during the intervention phase. Based on raters' comments, Angel had a strength in *curiosity and interest*, but continued to need assistance with insight about strengths and challenges. Casey's situation was different. Bandura (1997) discussed emotion regulation as part of motivation and of self-efficacy. A rater's note provided an example of how Casey's frustration with a cooking task caused Casey to give up on it rather than problem-solve the difficulty. This led to a lower rating on the *seeks challenges* item. Although Casey's *Motivation* score did not improve, Casey said in the individual interview that he/she felt that the intervention had helped with managing emotions more effectively.

Communication & Interaction Skills. Three participants' scores increased significantly in this domain, and scores for two participants, Jamie and Sam, decreased. However, their score decreases likely did not reflect actual declines in social occupational performance. Both participants had social anxiety, which is common in people with schizophrenia (Achim et al., 2013), and both were trying to increase their social/community interactions and comfort in social situations. One of the MOHOST's strengths is that the tool includes the context of occupational performance, and MOHOST data show that Jamie chose social situations in the intervention phase that were very challenging. In Sam's case, the graphed MOHOST data in the baseline and intervention phases look visually similar. Each phase has one observation rated at 11 (i.e., not a strength) with the remaining observations all similarly rated at 12 or higher; the difference is that the baseline phase has more sessions and therefore more "strength" ratings to raise the mean for the phase. Overall, the *Communication & Interaction Skills* domain was an area of strength for Sam in both phases. For both Jamie and Sam, the intervention did not have a positive effect on occupational performance in the *Communication & Interaction Skills* domain but did positively affect social self-efficacy and led to increased social participation.

Social and community functioning in people with schizophrenia is impeded by impairments in social cognitive skills (Green et al., 2008), including emotion perception (Couture et al., 2006) and theory of mind (Roux et al., 2016). Assessment scores of most participants indicated impairments in these skills, but also improvements. Interestingly, HT scores for all participants except Sam increased, whose score stayed the same. The HT is subject to practice effects (Pinkham et al., 2018), which may explain the score increase. However, Hill & Startup (2013) found that belief in ability to successfully complete a theory of mind task was positively related to social functioning, which suggests that increased self-efficacy may have contributed to the increased HT scores. Scores on the BLERT rose for all participants except Dana, whose score decreased by one point. Scores for both Dana and Sam remained in the impairment range of emotion recognition at T2; however, they both made gains in occupational performance related to social function or in social self-efficacy. Of the five participants, three had scores in the *Communication & Interaction Skills* domain that increased in the intervention phase.

Process Skills. The intervention positively affected occupational performance in the *Process Skills* domain for three of the participants: Casey, Dana, and Jamie. Angel's mean score decreased; Sam's mean score remained virtually stable. The *Process Skills* domain is arguably the MOHOST domain most closely aligned with executive function and cognitive skills. EFPT scores (functional EF) improved at T2 for all participants except Casey, whose EFPT score was already good and changed by only one point. On the CTMT (objective EF), four of the five participants' scores improved on the CTMT-Total (processing speed) and the CTMT-Sw (flexibility), and three improved on the CTMT-Attn/Seq (attention/sequencing). Angel was the only participant for whom all three BRIEF (subjective EF) scores increased, indicating perception of increased difficulty with metacognitive, self-regulation, and overall EF skills. However, in Angel's in case, higher BRIEF scores suggested improved insight into Angel's challenges and how they affected functioning.

MoCA (general cognition) scores improved for all participants and scores for Jamie and Sam moved out of the impairment range. The increase in Sam's MoCA score was driven entirely by an increase in the Memory Index Score. Verbal memory is frequently impaired in people with schizophrenia (Green et al., 2000). As part of the strengths-based cognitive prompting intervention, Sam had chosen to address memory impairment by using strengths-based strategies. This may have improved memory self-efficacy. However, Raffard et al. (2014) found that memory self-efficacy, which is related to memory performance in neurotypical people, did not relate to memory performance in people with schizophrenia, and that the lower memory self-efficacy in people with schizophrenia was associated with depression. Sam's Depression/Anxiety score on the BPRS – E decreased by 3 points at T2, indicating reduced depression and anxiety.

Correlations between *Process Skills* domain mean scores and EF assessment scores also suggest a positive intervention effect. During the baseline phase, only the CTMT-Total and CTMT-Attn/Seq were strongly correlated with *Process Skills*, the CTMT-Attn/Seq significantly so. Following the intervention, the EFPT, CTMT-Total, CTMT-Attn/Seq, and CTMT-Sw had strong correlations with *Process Skills*; the first three correlations were also significant. Increased self-efficacy may have contributed to increased cognitive effort, resulting in enhanced performance. However, differences in pre- and postintervention correlations were not tested for statistical significance. Therefore, although the increased strength of correlations at T2 seem to suggest that greater cognitive performance in the intervention phase was more strongly associated with the *Process Skills* domain of occupational participation, this cannot be assumed.

Environment. The *Environment* domain is different from the other MOHOST domains in that it does not assess performance or participation per se. Skills must be seen within their environmental context, and the *Environment* domain of the MOHOST allows that context to be assessed as part of occupational participation (Parkinson et al., 2006). The strengths-based cognitive prompting intervention had a positive effect on the *Environment* domain for all participants except Angel. In Angel's case, the intervention revealed how the lack of social support impeded ability to work toward goals of improving social skills and making friends. Lack of social support is not uncommon in people with schizophrenia, and is associated with decreased social functioning, lower self-efficacy, and increased loneliness (Schwartz & Gronemann, 2009).

For the other participants, improved *Environment* scores were due to the intervention's positive effect on social environment or to an improved match between the activity and abilities or interests. For example, MOHOST notes state that during the baseline phase Casey's fiancé at times made comments that were not supportive of Casey, but after learning about the intervention and Casey's strengths, the fiancé was supportive of Casey during PRS sessions. A strengths-based approach may help family and peers view an individual in a more positive light, helping to create an environment that supports improved occupational participation. The intervention may also have helped PRS practitioners to create a better fit between activities and abilities. By prompting participants to use the strengths that they needed to be successful in their chosen activities, PRS practitioners may have used the intervention to create a "just right challenge" that both held the participant's interest and facilitated an experience of success. Successful experiences help to build self-efficacy (Bandura, 1997). *Environment* domain scores correlated strongly (although not significantly) with the GSE in both the baseline and intervention phases.

Summary of intervention effects on occupational performance. In sum, the intervention had a mixed effect on occupational performance. There was a clear and significant intervention effect on occupational performance for two participants: Casey and Dana. Based on MOHOST scores alone, occupational performance for Jamie and Sam did not benefit from the intervention; however, their increased ability to participate in challenging occupational contexts and their increased participation in social or community activities demonstrated positive changes in occupational engagement. Angel had positive changes in some domains, but overall no significant change in occupational participation; Angel also had relatively low cognitive assessment scores pre- and postintervention. Angel (as well as other participants) may benefit from cognitive remediation. The cognitive strengths-based approach may be more beneficial for individuals with a certain level of cognitive capability, including in executive function and social cognitive skills, or may be more effective in conjunction with cognitive remediation.

Recovery: Occupational Performance, Symptomology, and Life Satisfaction

Correlations between MOHOST and SWL scores were stronger at T2 than at T1, particularly in the *Communication & Interaction Skills* and *Process Skills* domains. There was a stronger relationship between occupational performance in these domains and in SWL-L, SWL-S, and SWL-S&L. It is possible that increased self-efficacy allowed participants to more effectively put occupational performance skills to use, thereby increasing life satisfaction. Also, correlations between BPRS-E and SWL scores were less strong at T2; only negative symptoms remained strongly correlated. This would suggest that symptomology interfered less with participants' life satisfaction after the intervention. Correlations between the MOHOST, SWL, and BPRS-E raise interesting questions about the potential of the strengths-based approach to increase self-efficacy and contribute to recovery. Differences in pre- and postintervention correlations were not tested for statistical significance. Therefore, inferences about the intervention's effect on the relationships among symptomology, occupational participation, and life satisfaction are only conjecture and warrant further study.

Feasibility of the Assessment Protocol

The hypothesis that the assessment protocol would be well-tolerated by the participants was supported. Participants reported that the assessment protocol did not take too long, and that the assessments themselves were not too arduous. There were some negative comments about the assessments, including comments about "big words" and an assessment task being "tiring." However, most of the participants' comments about their experiences with the assessments were positive. Participants especially enjoyed the BLERT. Comments about the assessment of functional cognition (EFPT) suggested that having an actual life activity as part of an evaluation was a new experience for participants. Comments suggested that they found the assessment activity difficult but thought that the test was important because it offered "real" information about skills. Participants stated that they thought that the assessment process helped them to understand themselves better, and that they liked the focus on their strengths.

Anecdotally, several participants shared with the PI that evaluation results are not usually reviewed with them in the way that they were reviewed in this study. These participants said that if a formal assessment is done, for example by a psychiatrist or therapist, they might be told what their deficits are and given suggestions on how improve them. Psychiatric rehabilitation has a "diagnostic phase" (Anthony & Farkas, 2009, p. 17) including a functional assessment that does identify strengths. However, in PRS, "strengths" refer either to activities that a person is able to do, such as cook a meal, or to resources that a person has, such as a supportive family member. In the PRS program that served as the site for this study, PRS practitioners were directed by state regulations to include in their functional assessments the condition-related impairments (e.g., disorganized thoughts) that get in the way of individuals' activity performance. Typically, the component strengths that promote successful performance and participation (e.g., skills related to executive function) are not included in PRS assessment.

Evaluation is one of the ways that occupational therapy can contribute to psychiatric rehabilitation (Brown, 2009; Krupa, Fossey, Anthony, Brown, & Pitts, 2009). Occupational therapists have expertise in the evaluation of occupational performance. Their understanding of the many facets that contribute to successful performance can translate to success and satisfaction in real-world experiences for people with mental illness (Krupa et al., 2009). Occupational therapists use assessment tools that are ecologically valid, focus on function, and assess actual skill performance. However, occupational therapists also conduct assessments of specific domains that support performance, including cognitive skills, sensory processing, environmental factors, personal interests, volitional concerns, and task demands (Brown, 2009).

The discipline of occupational therapy recommends the cognitive functional evaluation (CFE) process for individuals with cognitive challenges, including people with mental illness. The findings of this study support using the assessment protocol in psychiatric rehabilitation. Given that participants had executive function challenges but scored well on the EFPT at T2, consideration of another functional EF measure is warranted. Administering the EFPT in its entirety is another option. However, the EFPT presents defines tasks in a structured way and may not capture some aspects of executive function (e.g., concept formation) that are impaired in people with schizophrenia. The Multiple Errands Test was recently adapted for community use and testing of its psychometric properties yielded favorable results (MET-H; Burns et al., 2019). The MET-H may be worth consideration to assess executive function for individuals with mental illness.

Participants' Lived Experience of the Intervention

The third hypothesis was that the participants would respond favorably to the strengths-based cognitive prompting intervention. Based on the findings of the focus group and individual interviews, this hypothesis was supported. Participants were unanimous in saying that they liked the program, that is, the strengths-based cognitive prompting intervention. They said that their experiences as participants were different from what they had experienced in other mental health services, and even from what they had previously experienced in the PRS program. They described this as a "good" difference.

A participant commented that they liked the "positivity" of the intervention. Stigma, negative beliefs about people who have mental illness, affects the health, well-being, and participation of many people who have mental health conditions. Perceived stigma leads to decreased self-efficacy and a decrease in positive coping skills in people with schizophrenia (Kleim et al., 2008). Stigma impedes recovery by causing people with mental illness to feel inferior (Markowitz, Angell, & Greenberg, 2011). The resulting self-stigma can lead to shame, social isolation, and lack of motivation to pursue goals (Ben-Zeev, Young, & Corrigan, 2010).

Practitioners in both physical and mental health settings may have stigmatizing beliefs towards people with mental illness, which interfere with individuals' abilities to receive the care that they need (Henderson et al., 2014). Stigmatizing beliefs may also exist among psychiatric rehabilitation staff (Nemec et al., 2015); strengths-based approaches can help to address those beliefs (Rapp et al., 2015). Group supervision that focuses on strengths and includes a positive approach to problem-solving can help prevent stigmatizing beliefs among staff and enable them to focus on recovery (Rapp et al., 2015). During this study, the PI met weekly with the research team as a group and individually as needed. RAs who were also PRS staff stated that group meetings helped them to understand their clients and work with them more effectively.

In sum, each of the participants expressed that they liked the intervention. All participants said they wanted the program to continue to develop. Participants had different perspectives on what aspects of the program were most meaningful or enjoyable, including more self-confidence, increased occupational engagement, and improved skills. They all responded favorably to the positive nature of the cognitive strengths-based approach.

Application to Theory

Kielhofner's MOHO (Taylor, 2017) provided a theoretical framework for this study. Chapter II included a description of MOHO and its application to this study; this chapter illustrates that application through one of the study participants. In brief, MOHO describes the process by which people motivate toward, acclimate to, and engage in occupations within the context of their environments, and conceptualizes how individuals adapt and create fulfilling lives (Taylor & Kielhofner, 2017). The person is conceptualized as having three parts: volition (values, interests, and personal causation, i.e., perception of capacities and self-efficacy), habituation (roles and internalized habits), and performance capacity (ability to do activities, as determined by underlying capacities and subjective experience; Yamada et al., 2017). Participation in occupations leads to occupational adaptation, a process by which people develop and change to meet challenges or to experience well-being (de las Heras de Pablo et al., 2017). Occupational adaptation comprises three elements: occupational identity, occupational competence, and environmental impact (de las Heras de Pablo et al., 2017). The following paragraphs are not meant to be a comprehensive case study; rather, they serve to illustrate the study's foundational theory and as such will focus on the most relevant aspects of MOHO. Figure 34 depicts MOHO integrated with the strengths-based cognitive prompting intervention.

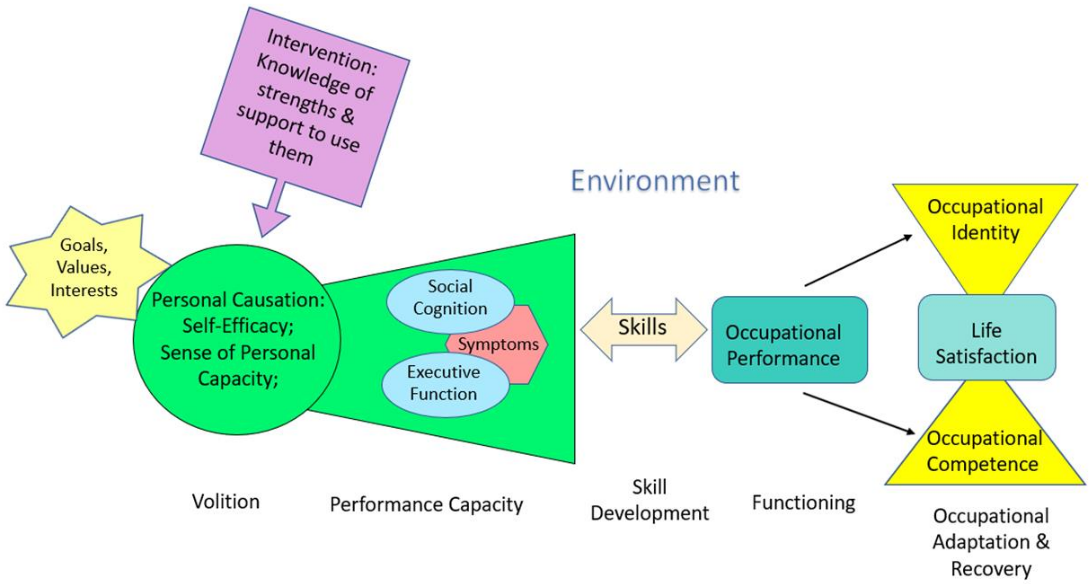


Figure 34. MOHO and the Strengths-based Cognitive Prompting Intervention. Adaptation and recovery result when increased self-efficacy facilitates development of capacities into the skills that enable successful and satisfying occupational performance.

Model for Application of MOHO to the Intervention: Casey

Values and interests. Casey's overall goal was to develop roles as student and fiancé. Objectives were to learn how to cook some tasty and economical meals, develop skills for studying and task management, improve health by exercising more regularly, and feel more comfortable socially. Casey lived with his/her fiancé in a house they rented with Casey's brother and a housemate. Casey enjoyed caring for their dogs.

T1 Performance capacity and symptomology. Prior to the intervention, Casey's scores on assessments of social cognition, the HT and BLERT, were low but did not indicate impairment in theory of mind or emotion perception, respectively. Score for general cognition (MoCA) was in the normal range, indicating good general cognitive ability. Objective executive function (EF) scores as measured by the CTMT was below average, just on the cusp of the mild-moderate impairment range. Functional cognition as measure by the EFPT indicated good EF skills. Scores on the BRIEF, which indicate self-perceived self-regulation and metacognition, were in the normal range. Casey's scores on the BPRS-E and subscales, the assessment of symptomology, were relatively low; highest subscale scores were in Depression/Anxiety and Positive Symptoms.

Strengths. The assessment process revealed Casey's many strengths in performance capacities and occupational performance, which were gleaned from T1 assessments and baseline MOHOST observations, respectively. Identified strengths from assessments included theory of mind, recognizing emotions of others, memory, attention, emotional control, self-monitoring, and task-monitoring. Four MOHOST items emerged as strengths: *curiosity and interest*, *remaining settled/copes with disruption/change*, *physical and manipulation skills*, *and non-verbal expression.*

Baseline occupational performance. Casey's performance capacities suggested that occupational performance, as measured by the MOHOST, could be successful and satisfying. However, the schizophrenia literature states that functional capacity only partially predicts functional performance, and this was true in Casey's case. During the baseline phase, Casey's *Process Skills* mean score was 10.50; a score of 12 indicates domain strength. *Communication & Interaction Skills* mean score was 12.00, with three observations below the threshold for strength. Domain scores for *Motivation* fluctuated widely; raters commented on Casey's shying away from challenges and over- or under-estimating abilities. *Pattern of Occupation* scores also fluctuated. Although *remaining settled/copes with disruption/change* was an identified strength, a rater noted Casey's difficulty making use of that strength during challenging tasks. Casey's *Motor Skills* scores were low for a person without a physical disability, indicating variable energy and effort. *Environment* domain assessment reflected lack of social support from Casey's fiancé, who did not seem to understand Casey's strengths or challenges.

Personal causation: Sense of personal capacity. Sense of personal capacity refers to self-assessment of one's capacities; people with disabilities may have difficulty appraising their capacities, leading to over- or under-rating their abilities (Lee & Kielhofner, 2017). This was true for Casey. A negative sense of personal capacity can cause fear of failure, leading to decreased motivation. This may help to explain Casey's fluctuating *Motivation* scores. The first part of the strengths-based cognitive prompting intervention was to talk with Casey about individual strengths so that Casey would have a more positive sense of capacity. For example, Casey learned about her/his strength in emotion perception and ways to apply that strength in social situations.

Personal causation: Self-efficacy. MOHO defines self-efficacy as a person's beliefs about their ability to effectively use their capacities, have control over their environments, and use personal self-control (Lee & Kielhofner, 2017). Self-control allows people to manage their emotions, thoughts, behaviors, and actions. Feeling out of control makes engagement in goal-directed activities difficult, while self-control enables the ability to adapt. The strengths-based cognitive prompting intervention was used to reinforce participants' use of their capabilities and to use strategies (based on strengths) to address difficulties, allowing them to experience control over their environment through successful and satisfying occupational performance. For example, Casey was prompted to use emotion recognition strength in social situations, which Casey did successfully. Casey's general self-efficacy (GSE) score increased by 6 points at T2. Casey also talked about feeling more in control of his/her own emotions.

The intervention allowed Casey to effectively use emotion-reading capacity, and for that capacity to begin to become a skill that facilitated occupational performance; for example, Casey described initiating interaction with a peer who looked sad.   Casey's *Communication & Interaction Skills* score improved in T2, as did scores in most MOHOST domains. *Motivation* scores decreased at the start of the intervention phase, likely influenced by the challenging nature of occupations, but scores then stabilized into a range of relative strength. *Environment* scores improved; Casey's fiancé became supportive and more involved in Casey's recovery as he/she learned about Casey's many strengths.

Occupational adaptation.   Participation in occupations leads to occupational adaptation, a process by which people develop and change to meet challenges and experience well-being (de las Heras de Pablo, 2017). Occupational adaptation comprises three elements: occupational identity, occupational competence, and environmental impact. Figure 35 presents the elements of the MOHO adaptation process, with each element defined and described by application of Casey's intervention experience. The figure provides examples of how the intervention contributed to the occupational adaptation process.

MOHO Occupational Adaptation Concept	Baseline		Intervention
Occupational Identity Self-concept that includes personal causation, interests, values, volitional choices, and anticipation of environmental supports and demands.	• Had goals and interests, but difficulty fulfilling them. • Lacked a good understanding of her strengths and challenges and how they affected her occupations • More optimistic than realistic about environmental supports and demands		• More confident about ability to fulfill her roles as student and fiancé Increased understanding of strengths and challenges • Verbalized that she wanted to develop more strategies to "make her challenges her strengths" • Global self-efficacy score improved by 2 points, and occupational self-confidence ratings showed steady increase
Occupational Competence Person's ability to maintain a pattern of occupations that supports an occupational identity	• Occupational performance not consistently supporting goals and interests • Many performance capacities, but not supporting occupational performance in activities	**Occupational Adaptation**	• Evidence of using capacities for occupational performance: capacities →skills • Verbalized that she sees how she is using strengths Increased occupational performance scores in most domains
Environmental Impact Dynamic interaction between the person and their many environmental contexts, which present both opportunities and constraints.	• Rehab focus on identifying desired goals, building needed skills, addressing psych impairments that affect function • Partner supportive in general but less so of psych rehab work; lack of understanding of partner strengths/challenges • Minimal interaction with peers in group, so little impact on them		• Rehab focus on identifying goals, more comprehensive assessment, identifying concrete strengths and strategies, and intentionally using them to build skills • Partner has better understanding of strengths and challenges, and is more supportive • Socially interacting with peers, which positively affects peers on both individual and group level.

Figure 35. Applied MOHO Occupational Adaptation Concepts. Examples from a study participant illustrate each of the three concepts and show how the intervention contributed to occupational adaptation.

Recovery. Recovery is the goal of rehabilitation, above and beyond building skills and improving occupational performance. Recovery is different for each person, but generally means having a sense of well-being that comes from finding fulfillment in roles and activities that you value and feeling a sense of control in life. The SWL scale (Test et al., 2005) is one way to measure recovery. Casey's scores on the SWL living situation and work subscales each went down by 2 points. Feeling less satisfied about these life domains can reflect the desire for change. Casey shared a small house and was planning to marry. Casey's present living situation may have been less attractive than it had been at the beginning of the study. Casey had also mentioned that he/she wanted to start thinking about getting a job. This is a positive change that might cause Casey to be less satisfied with present status of not working. Casey's SWL-

Satisfaction with Self & Present Life score increased by 3 points. After the intervention, Casey rated him/herself more highly on three questions:

- How satisfied are you with your present life?
- How satisfied are you with yourself on the whole?
- Do you feel you get as much enjoyment from life as most people do?

Casey's more positive responses to these questions provide evidence of recovery and further illustrate the process of adaptation.

Implications

Individuals with schizophrenia spectrum disorders have cognitive impairments that interfere with successful and satisfying occupational performance. Cognitive rehabilitation by itself does not significantly improve functioning. Functioning and recovery are influenced by other factors that may be addressed by intervention. Self-efficacy is one of those factors. This study has several findings that are relevant for occupational therapy:

- The strengths-based cognitive prompting intervention demonstrates initial promising results in helping individuals with mental illness to increase self-efficacy and improve occupational performance and participation.
- Individuals with schizophrenia spectrum disorders usually have impairments in executive function and social cognition that can be assessed and addressed by occupational therapists, whose focus on occupational performance and recovery make them an important part of the rehabilitation team.

- A formal occupational therapy CFE would be helpful in psychiatric rehabilitation programs. The CFE would help individuals with mental illnesses to better understand their strengths and challenges and would inform the rehabilitation plan.
- The MOHOST is an easy to use non-invasive instrument that can be used in an individual's natural environments to observe activities that the person wants or needs to do. Researchers have acknowledged that observation in natural environments is needed in order to accurately assess the real-world functioning of people with schizophrenia (Bromley & Brekke, 2010). The MOHSOST has potential as an ecologically valid tool to meet that need. The MOHOST is also a useful tool to train staff how to analyze activities and to sharpen their observation skills.
- Addressing self-efficacy may be important in rehabilitation for any population, whether related to mental or physical health. Interventions to improve self-efficacy may increase individuals' sense of control over their rehabilitation and improve motivation and satisfaction not only in the rehabilitation process, but also in the life domains and activities that contribute to their sense of well-being.
- Groups serve an important purpose in helping people with mental illness to increase self-efficacy. Therapeutic groups that allow individuals to practice skills within the context of meaningful activity and social interaction provide

opportunities for individual to strengthen their beliefs that they can be successful in community activities and social relationships.

- A strengths-based approach can have a positive effect on an individual's social environment, including family, friends, healthcare staff, and support personnel and reduce the stigmatizing beliefs that can become internalized in people with mental illness. By acknowledging an individual's strengths and enabling their use, practitioners help people see the individual in a positive light, as a person who is capable and has agency. This creates opportunities for people to support the individual in their recovery. Even when a formalized strengths-based approach is not used in rehabilitation, occupational therapists can discuss an individual's strengths during family education and healthcare team meetings.

Limitations

The study's findings need to be considered in light of several limitations. The study had a small sample size, which limits generalizability, although mixed methodology added validity to the findings. The sample size was appropriate for single-case experimental design and qualitative methods, and the design was clear that quantitative methods were mainly exploratory. The PI was the administrator of the assessments, which, while not ideal, did not present a conflict for most assessments. The PI also served as the focus group facilitator, which may have introduced bias; however, PRS meetings with the program director (the PI) for the purpose of providing feedback was customary in the PRS program.

The PI served as the PRS practitioner for one of the participants. This affected the study in several ways that may have both helped and hindered the research. The PI worked with one of the participants, Sam, for approximately a year before the study began; they had used a strengths-based approach, although strengths were not defined through formal assessment. Sam expressed liking this approach; as a person with lived experience, Sam's input was important for development of the study's design. For example, Sam expressed that having another person observe a session to complete an observation assessment (i.e., the MOHOST) would not feel intrusive, as many PRS participants were accustomed to having PRS staff or interns observe individual and group sessions. The PI chose not to have Sam's exposure to a strengths-based approach disqualify Sam for the study, as Sam expressed great interest to participate in the study and to learn more about using a strengths-based intervention. However, the PI's role as PRS program director may have introduced bias in another way. It is possible that the RA who most frequently completed Sam's MOHOST assessments may have rated more highly because the PI, who was also her supervisor, was providing the service.

Another limitation of the study may be that the MOHOST raters were not occupational therapists. There were two occupational therapy (OT) Level II Fieldwork students who were RAs in the early part of the study. PRS staff were trained as MOHOST raters when the OT students completed their internships. PRS staff commented that they appreciated learning to use the MOHOST because it taught them about the many factors and skills that are needed to successfully complete or engage in activities. The PI trained all raters using the video-based MOHOST training protocol and the study met interrater reliability expectations. However, it is possible that given their expertise in activity analysis and therapeutic intervention, occupational therapists may have been more accurate in using the MOHOST and more skilled in providing the intervention.

The self-efficacy measure that was used in the study, the GSE, may be a limitation. Another self-efficacy measure, the Revised Self-Efficacy Scale (RSES; McDermott, 1995), is more commonly used in schizophrenia research. The RSES is a general scale but has items about specific activities and also includes a social self-efficacy scale that may be implemented by itself. Some researchers have made the case for using domain-specific scales when studying self-efficacy (Vaskinn et al., 2015); others suggested that domain-specific scales may not be necessary in schizophrenia research (Kurtz et al., 2013). The GSE was chosen because of its focus on problem-solving and approaching new or unfamiliar activities, which aligns with this study's focus on executive function. In addition, the self-confidence rating scale provided a way to measure activity-specific self-efficacy.

The differences in the number of intervention sessions among participants may account for some of the variance in intervention effect. In other words, some participants had a lower "dosage" of strengths-based intervention than others did. For example, Jamie had five intervention sessions in only two weeks, the lowest frequency and shortest intervention phase of any participant; based on MOHOST scores, Jamie did not experience a positive intervention effect. However, Jamie's MOHOST scores showed a positive trend during the intervention phase and were relatively high in the last two sessions. A higher dosage of intervention and longer invention phase, more aligned with those of the other participants, may have yielded a more positive intervention effect.

Another aspect of intervention variance, the person-centered nature of activities and their contexts, may also have affected results. Jamie again provides an example; Jamie chose challenging social contexts for intervention phase activities. The level of challenge of activities and environments were not controlled for in this study. Rather, participants chose their own activities, in collaboration with their PRS practitioners, as was the practice in the PRS program. Some participants attended PRS groups, and so some activities were similar to those of other participants. Study results may have been different if participants had consistently engaged in the same activities or if activities held similar levels of challenge across participants.

Finally, this paper includes discussion of comparisons between correlations pre- and postintervention. However, these comparisons were not tested for statistical significance. This was noted in the discussion but bears repeating because of the opportunity that further statistical analysis may provide to strengthen the study's findings.

Future Research Directions

There are several opportunities for further research to continue the work that this study began. The study was the initial step in the development of a strengths-based cognitive prompting intervention to enhance self-efficacy and occupational performance in people with schizophrenia. Opportunities for future research include:

- Further statistical analysis of the study's data may serve to inform findings. For example, statistical analysis using Fisher's *r*-to-*Z* transformation to compare correlations pre- and postintervention may strengthen findings regarding intervention effects.
- Future studies should replicate the study with the aim of continuing to develop the intervention.
- Future studies could integrate the strengths-based cognitive prompting method into cognitive remediation programs. The purpose would be to investigate how

intervention aimed at increasing self-efficacy enhances the efficacy of cognitive remediation to positively affect functional outcomes.

- Future research could study the strengths-based cognitive prompting intervention in a group service delivery model. Participants in this study suggested that the intervention also be implemented in psych rehab groups.
- This is the first known study that used the MOHOST in conjunction with cognitive evaluation. Future studies could continue to investigate relationships between occupational participation and executive function using the MOHOST. The MOHOST could also be studied for its validity as an assessment of real-world functioning for people with schizophrenia.
- This is also the first known study to use a strengths-based approach in which strengths were concretely defined using assessments of cognition or occupational performance. Future studies could continue this line of research, perhaps with one aim of more fully engaging individuals in the assessment process.
- Future studies could investigate how occupational therapy evaluation that incudes CFE affects recovery-oriented outcomes in psychiatric rehabilitation programs.

Conclusion

This study investigated a strengths-based cognitive prompting intervention to enhance self-efficacy and occupational performance in people with schizophrenia. Results varied among the five participants, but overall, the study provided initial support for the intervention.

Participants responded positively to the intervention and to the assessment protocol, supporting the feasibility of both. Assessment scores, confidence rating scales, and qualitative data provided evidence of increased self-efficacy in the participant group. Positive changes in MOHOST scores indicated that the intervention had some positive effects on occupational performance, which varied among participants and among occupational performance domains. The study has implications for integrating interventions to enhance self-efficacy into rehabilitation and treatment programs for both mental and physical health. Self-efficacy is an important factor for transforming performance capacities into performance skills, and just as importantly, for experiencing recovery, adaptation, and fulfillment.

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APPENDIX A

Study Approval Forms

Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378
email: IRB@twu.edu
https://www.twu.edu/institutional-review-board-irb/

DATE: June 29, 2018

TO: Ms. Christine Linkie
Occupational Therapy

FROM: Institutional Review Board (IRB) - Denton

Re: Approval for A Strengths-Based Cognitive Approach to Enhancing occupational Performance and Self-Efficacy in Individuals with Schizophrenia (Protocol #: 20152)

The above referenced study was reviewed at a fully convened meeting of the Denton IRB (operating under FWA00000178). The study was approved on 6/29/2018. This approval is valid for one year and expires on 6/29/2019. The IRB will send an email notification 45 days prior to the expiration date with instructions to extend or close the study. It is your responsibility to request an extension for the study if it is not yet complete, to close the protocol file when the study is complete, and to make certain that the study is not conducted beyond the expiration date.

If applicable, agency approval letters must be submitted to the IRB upon receipt prior to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp is enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. A copy of the signed consent forms must be submitted with the request to close the study file at the completion of the study.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Cynthia Evetts, Occupational Therapy
Graduate School

TWU
TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Institutional Review Board
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DATE: June 19, 2019

TO: Ms. Christine Linkie
Occupational Therapy

FROM: Institutional Review Board (IRB) - Denton

Re: Extension for A Strengths-Based Cognitive Approach to Enhancing occupational Performance and Self-Efficacy in Individuals with Schizophrenia (Protocol #: 20152)

The request for an extension of the IRB approval for the above referenced study has been reviewed by the TWU IRB (operating under FWA00000178). This study was originally approved on June 29, 2018 and has been renewed. Approval for this study expires on June 28, 2020.

If applicable, agency approval letters must be submitted to the IRB upon receipt prior to any data collection at that agency. If subject recruitment is on-going, a copy of the approved consent form with the IRB approval stamp is enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. A copy of the signed consent forms must be submitted with the request to close the study file at the completion of the study.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Cynthia Evetts, Occupational Therapy

Stairways behavioral health

April 20, 2018

Texas Women's University
Institutional Review Board

To Whom It May Concern:

This letter is to indicate that Stairways Behavioral Health (Stairways) is in support of Christine Linkie conducting the research project *Strengths-Based Prompting, Occupational Performance, and Cognitive Functioning In Individuals with Schizophrenia Spectrum Disorders* at Stairways in the Psychiatric Rehabilitation Services program. The study was discussed with the Ethics Committee at Stairways in a presentation given by Christine. Stairways' support of the research project is conditional on the approval of the Institutional Review Board (IRB) at Texas Woman's University.

Should you have any questions or need further information, please contact me at 814.878.2177 or rldowling@stairwaysbh.org.

Sincerely.

Robin L Dowling

Robin L. Dowling
Executive Director

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Joint Commission

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Title: A Strengths-based Cognitive Approach to Enhancing Occupational Performance and Self-Efficacy in Individuals with Schizophrenia

Investigator: Christine Linkie .... clinkie@twu.edu 814/870-5345
Advisor: Cynthia Evetts, PhD .... cevetts@twu.edu 940/898-2803

Explanation and Purpose of the Research

You are being asked to participate in a research study for Christine's dissertation at Texas Woman's University. This research has 3 purposes. 1) Pilot a new intervention (approach) that uses your cognitive (thinking skill) strengths to increase your self-efficacy (belief in your own abilities) and your success in daily activities. 2) Understand more about how self-efficacy and thinking skills affect daily activities and satisfaction with life. 3) Have your feedback on the new approach and on the testing that is used in the study. You are being asked to participate in this study because you are in the Psychiatric Rehabilitation Services (PRS) program at Stairways and have a diagnosis of schizophrenia or schizoaffective disorder.

Description of Procedures

As a participant in this study you will be asked to spend 1½ - 2 hours of your time doing pre-tests with the researcher (Christine) and also be observed for up to one hour during usual PRS activities. This pre-testing procedure is to identify your strengths, and also to pinpoint a challenge or two in order to develop strategies. You will receive a $10.00 gift card for completing the pre-testing procedure.

Five-8 participants who complete the pre-testing procedure will be randomly selected to participate in the strengths-based cognitive intervention. If you are selected to be in the intervention condition, two interns in the PRS program (research assistants) will observe your PRS sessions (one-to-one and group) for up to 8 hours total time over a 3-4 week "baseline" period, to assess occupational performance. ("Occupational" as used here does not mean "job;" it means participation and functioning in meaningful and daily activities.) The researcher will then join you and your main PRS staff in a PRS session to go over your strengths and talk together about ways to use them in activities that are important to you. For the next 4 weeks or so ("intervention" period), your PRS staff will work with you to use your strengths in activities, especially toward your goals on your Individual Rehabilitation Plan (IRP). The interns will again observe about 8 hours of your regular PRS sessions to track how the strengths-based approach is working. Then you will meet with the researcher and spend 1½ - 2 hours doing the post-tests to learn what changes have occurred. The researcher will join you during a PRS session to go over the test results and answer any questions you may have. She will ask a few questions about your experience with the strengths-based approach. The interns will be there to take notes. Finally, you and others in the study will be asked to participate in a focus group to share your feedback. The focus group will be audio taped and then written down by the interns without noting who said what, so that you can talk freely. The researcher can then use your feedback to make changes to the strengths-based approach and the testing. The researcher will not be present for the focus group, which will take about one hour of your time and will include lunch. In sum, your time in the study amounts to what would be 2 extra PRS sessions for testing (4-5 hours), plus the one-hour focus group.

If you are not chosen to be in the intervention condition, you can be on a waiting list and receive the intervention after the study is over. As a participant in the waitlist condition, you will do the post-testing procedure at the end of the study and receive another $10.00 gift card.

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Initials

The charts below are summaries of your time as either an intervention participant or a waitlisted participant who completes the pre-testing and/or post-testing procedures.

Intervention Study Participant

Study Activity	Your time outside of PRS activities	Time that is part of usual PRS activities
1. Pre-testing (with snacks and $10.00 gift card)	1½ - 2 hours	
2. Interns observe PRS sessions (baseline period)		8 hours
3. Researcher meets with you and your PRS staff to go over strengths		30 minutes
4. Interns observe PRS sessions (intervention period)		8 hours
5. Post-testing (with snacks and $10.00 gift card)	1½ - 2 hours	
6. Researcher meets with you and your PRS staff to go over testing results, and ask questions about your experience		30 minutes
7. Focus group (with lunch and $10.00 gift card)	1 hour	
Total Time	4 – 5 hours	17 hours

Waitlisted Study Participant Time

Study Activity	Your time outside of PRS activities	Time that is part of usual PRS activities
1. Pre-testing (with snacks and $10.00 gift card) Interns observe PRS sessions	1½ - 2 hours	 2 hours
2. Post-testing (with snacks and $10.00 gift card)	1½ - 2 hours	
Total Time	3 – 4 hours	2 hours

In order to participate in this study, you must be at least 18 years old, have a diagnosis of schizophrenia or schizoaffective disorder, and participate regularly in the PRS program, which means meeting two times per week (one-to-one or group) for most weeks during the study time period (about 8 weeks).

Potential Risks

One potential risk is emotional discomfort. There are several short surveys and tests at the start and at the end of the study. Surveys ask about your self-efficacy (beliefs in your abilities), satisfaction with life, and your opinion on how thinking skills affect your everyday activities. Tests assess thinking skills. Some of the questions may seem difficult, which could be uncomfortable. You are welcome to ask questions at any time. Breaks are built in to testing sessions, and you can also take breaks as needed. The researcher will end a testing session if it seems too stressful, and you can also end the testing or any PRS session at any time.

During the study you will be prompted to use strengths and strategies, but you never have to use any suggestion that you are not comfortable with. Respect and collaboration are important in the PRS program, and strengths and strategies need to be ones that make sense to you and that you think are helpful.

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Initials

Sometimes people feel uncomfortable being observed. It is not unusual in the PRS program for students or PRS staff and supervisors to observe sessions and groups. You will not be singled out in any way. Interns will not take notes when they are observing; they will make their notes after a session or group is over. Researchers will work to make sure that the study is a positive experience, and that you always know the purpose of what you are doing in the study.

Another risk in this study is loss of confidentiality. Confidentiality will be protected to the extent that is allowed by law. The tests and interviews will be conducted in the researcher's office, in your home, or in another place of your choosing. The completed test forms, audio recording, and written interview and focus group conversation will be stored in a locked cabinet in the researcher's office. Only the interns will hear the focus group audio recording. Only the researcher, her advisor and supervisor, the interns, and your primary PRS staff and PRS clinical supervisors will see the paper copies of your test forms. With your consent, assessment results may also be shared with other Stairways providers (psychiatrist, therapist, case manager, etc.) for coordination of care.* Completed assessment forms will be shredded within 5 years after the study is finished. The written interview and focus group conversation will be shredded within 5 years after the study is finished. The results of the study will be reported in scientific magazines or journals but your name or any other identifying information will not be included. There is a potential risk of loss of confidentiality in all email, downloading, electronic meetings and internet transactions.

Other risks include fatigue, loss of time, and feeling pressured into participating. Participating in the study is completely your choice. If you do decide to participate, you do not have to stay in the study and may withdraw at any time. The services that you receive from PRS, and your relationships with PRS staff, supervisors, and director will not be affected by your decision to participate or not participate in the study. Your decision to participate or not will also not affect your involvement or relationships with any other Stairways programs that you may participate in.

Researchers will watch for signs that you might feel tired, and ask if you would like to have a break or stop. You may stop any testing or activity or take a break at any time. You will be reminded prior to starting the study of how much of your time the research activities will take. Researchers will do all they can to respect your time, and will conduct as much of the study as possible within your regular PRS activities.

The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participation and Benefits

Your involvement in this study is completely voluntary and you may withdraw from the study at any time. Withdrawing from the study will not affect your services in the PRS program or in any other Stairways program. You will receive a $10.00 gift card after completing the pre-testing, which includes a testing session of 1½ - 2 hours and up to one hour of PRS observation. You will receive another $10.00 gift card after post-testing, which includes a 1½ - 2 testing session and up to one hour of PRS observation. If you receive the intervention as a study participant, you will receive a $10.00 gift card after completing the focus group. The testing sessions include snacks, and the focus group includes lunch.

If you would like to know the results of this study we will mail them to you.**

Approved by the
Texas Woman's University
Institutional Review Board
Approved: June 29, 2018

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Initials

Questions Regarding the Study

You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

____ _______________

Signature of Participant   Date

*I give my consent for assessments that I complete as part of this study to be shared with my providers in other Stairways programs, outside of Psychiatric Rehabilitation Services (PRS).

☐ Yes

☐ No

**If you would like to know the results of this study tell us where you want them to be sent:

Address:

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____

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APPENDIX B

Recruitment Materials

TEXAS WOMAN'S UNIVERSITY

Jane Doe
123 Main Street
Erie, PA 12345

Dear Jane:

You are invited to a **lunch meeting** to learn about a research study being done in the Psychiatric Rehabilitation Services (PRS) program this summer. This lunch meeting is completely voluntary.

The research study is completely voluntary, and you may withdraw at any time.

People who participate in the study will receive gift cards.

Please contact me at (814) 870-5345 if you have any questions, or if you cannot attend the meeting but would still like to know about the study.

Thank you! I look forward to hearing from you and/or seeing you at the lunch meeting.

Sincerely.
Christine
Christine Linkie
PhD Candidate, Texas Woman's University

What: Lunch meeting about PRS research study
The research will study an intervention that uses strengths to reach goals and improve self-efficacy (belief in own abilities).

Who: People in PRS program who have schizophrenia or schizoaffective disorder

When: Friday August 24, 2018; 1:00 p.m. – 2:00 p.m.

Where: PRS at Bloom, 138 E. 26th Street, lower level

How: Call Celeste (PRS Administrative Assistant) at (814) 870-5300 by Wednesday August 22nd to RSVP or to ask about transportation.

Outline for Informational Meeting (Part of study recruitment)

A. Welcome
Script: *Welcome, everyone! This lunch meeting is about the research study that will be done this summer. Once everyone has their food, we'll talk through the study and I'll answer any questions.*

B. Lunch is served buffet-style
Note: People in the Psychiatric Rehabilitation Services (PRS) program are accustomed to a light lunch being part of Client Advisory meetings. Lunch will likely consist of pasta (or pizza) and salad.

C. Description of study
As participants eat lunch, PI describes the study. The name of the study will be posted so that participants can see it. The script follows.

The first thing to know is that no one is required to be in this study. Participation is completely voluntary. It is your choice, and whether you choose to be in the study or not, that will not affect your participation in the PRS program, or in any Stairways program. Let's talk through the study. I'm going to talk through what it is, why we're doing it, who is involved, where and when it takes place, and how you can participate if you choose to.

What: The name of the study is "A Strengths-based Cognitive Approach to Enhancing Occupational Performance and Self-Efficacy in Individuals with Schizophrenia." It is a lot of words. In a nutshell, that means that we will be trying a new intervention in PRS that uses people's strengths to help them reach their goals. "Cognitive" means thinking skills. That means skills like starting a task, planning, and memory, and it also means social thinking skills like reading facial expressions. We'll identify strengths, and also come up with strategies for a skill or two that isn't a strength right now. I know that some of you have worked on these types of skills in PRS. After your strengths and strategies are identified, your psych rehab coach will work with you to use them in activities that are part of your IRP, so that you can use strengths and strategies to reach your goals. A few more things about the title. "Occupational" doesn't mean "job," it means "meaningful or daily activities," which a lot of you already know from being in PRS groups. Sometimes occupational performance is also called "functioning." "Self-efficacy" means belief in your own abilities. The hypothesis is that the strengths-based approach will have a positive effect on both occupational performance and self-efficacy.

Why: This study is for my dissertation. This topic was chosen with the help of my supervisor at Stairways because many people who have schizophrenia and schizoaffective disorder also have difficulty with some cognitive skills, that is, thinking skills, and that can get in the way of feeling successful in doing things that you want to do. We want to be able to address this in the PRS program, and want your help to see if the strengths-based approach would be helpful.

Who: This study is open to people who participate regularly in the PRS program and have schizophrenia or schizoaffective disorder, and no other diagnoses that could affect cognitive skills.

When and Where: The study starts this summer, very soon. The study has a testing session at the beginning of the summer to identify your strengths, and a testing session at the end of the summer to see if there are any changes. The testing will be with me, in my office, or if you would prefer, in your home—whichever will be more comfortable and private. The testing sessions last 1½-2 hours, about the same amount of time as a PRS session, and include snacks. In between, you will participate in PRS as usual for the first half of the summer, and then use the new strengths-based approach in the second half of the summer. This is so we can see if there is a difference between your *occupational performance first without and then with using the strengths-based approach. We will have 2 interns in the PRS program, like we often do, and these interns will also be research assistants who observe PRS activities and track occupational performance. Your PRS sessions will be in the same places that they usually are—here at the PRS site, at your home, or in the community. At the end of the summer, there will be a focus group for people who do the intervention to give their feedback about the strengths-based approach and the testing. The focus group will be here at PRS. Participants will receive a $10.00 gift card for completing each testing session, and a $10.00 gift card for doing the study intervention (the strengths-based cognitive approach) and the focus group.*

<u>How</u>: *If you agree to be in the study, you will sign the consent form, and then complete the pre-testing procedure. We'll go over the consent form in a few minutes. We can only have 5-8 people in the intervention part of the study. So these people will be randomly selected from everyone who does the pre-testing. If you are not selected, you can be on a waiting list to try the strengths-based approach after the study is over. You can also still do the post-testing sessions at the end of the summer, and receive another $10.00 gift card.* This will become more clear when we go over the consent form, which we will do next.

As consent forms are distributed: *Questions so far?*

D. Consent forms
When everyone has a consent form, the PI reads the consent forms aloud.
I'm going to read the consent form out loud. I'll stop after each section in case there are questions, and we'll also have time for questions at the end.
PI will spend time going over the charts on the consent form, so that everyone understands the procedures.

E. Questions and Discussion
What questions do you have?

F. Consent form signing
If you want to participate in the study and understand what we've discussed, you can sign the consent form today. If you want to think about it, that is okay, too. I would be happy to talk individually with anyone who has more questions. We can talk after this meeting or another time on the phone.
The PI then talks individually with people who are interested, and makes sure that they understand the consent form and the study, and answers any questions before they sign.

G. Conclusion
Thank you, everyone, for coming to the meeting today! Please don't hesitate to contact me if you have any questions about the study.

APPENDIX C

Example of Strengths Summary Sheet

with IRP Goals

Participant Example

Goals (*IRP objectives)

Overall: I will be a student and parent in the Erie area by 4/23/2020
* I will cook 1 new healthy meal a week.
* I will engage in a physical activity 3 times a week.
* I will implement 2 strategies to be successful in school
* I will develop coping skills to feel more comfortable in classroom settings

Notes and Other Goals (Feel free to add more as they come up!):

Strengths with Definitions

Curiosity and interest	Curious, tries new things, expresses pleasure, perseveres; Interests that guide choices, some opportunities to pursue interests
Remains settled; copes with change (Adaptability)	Anticipates change, alters actions or routine to meet demands, flexible/accommodating; Makes the best of things even if expectations aren't fulfilled, improving ability to modify behavior Generally able to modify behavior, may need time to adjust, hesitant or may be impulsive at times
Good physical and manipulation skills	Coordinated, uses the whole body, able to use tools easily and quickly; May be slow at times but manages tasks without activity being disrupted, some awkwardness but only minor disruptions to activity
Good non-verbal expression	Able to convey mood, nonverbal behaviors congruent with verbal communication; Eye contact and gestures generally appropriate; Awareness of personal space; Physical contact
Perspective-taking (Seeing from others' points of view, theory of mind)	Able to attribute mental states (beliefs, emotions, intents, desires) to oneself and to others; Understands that others have intentions, beliefs, perspectives, knowledge that are different from your own
Reading emotions of others	Generally able to identify emotional states of others, based on facial expression, tone of voice, and other non-verbal cues
Self-monitoring	Aware of own behaviors and the effect that they have on others; Generally able to use self-control and adapt behaviors based on others' responses
Memory and Attention	Short-term memory (delayed recall) generally supports ability to engage in activities Generally able to sustain attention in order to complete tasks
Task-monitoring	Generally able to judge how successful will be at a task or how challenging a task will be, checks work for errors, self-corrects work, able to complete tasks
Emotional Control	Generally able to be in control of emotions, usually not over-reactive to relatively small issues, usually able to remain calm

APPENDIX D

Strengths-based Cognitive Prompting Checklist (fidelity form)

with Simple Self-Confidence Scale

Strengths-based Cognitive Prompting Checklist

Instructions:

- Complete the Confidence scale on the other side of the page before individual begins the activity.
- Please complete Outcomes section with client after activity or at the end of the session.
- Complete the rest of the checklist should be completed at the end of the session. Thank you!

Client	PRS Practitioner
Location	Date
Activity	

Responses

	Very good	So-so	Not good
Client's perception of activity performance			
Client's satisfaction with activity performance and participation			
Practitioner's level of satisfaction with intervention			

Did the individual use identified strengths or strategies? Yes / No	Strengths/Strategy

Did you provide strengths-based prompting? Yes / No Level(s)

Example(s) of prompting

Comments

For example: What other strengths did the person use?
How will you modify your intervention (i.e., prompting) at the next visit?

Linkie Strengths-Based Cognitive Prompting Checklist page 1

Please do before the activity. ☺
Person points to the place on the line that gives an estimate of his or her level of confidence; PRS practitioner marks the line at that spot.

"How confident are you about your participation or performance in this activity?"

Not confident | Very confident

(Reverse side of Page 1 of Strengths-based Cognitive Prompting Checklist)

APPENDIX E

Strengths-based Cognitive Prompting Examples Chart

with Prompting Hierarchy

The charts below provide examples of strengths that could be used to enhance occupational performance, and strategies that might be suggested to turn a specific cognitive or performance challenge into a strength so that the individual can be successful. For clarity, all examples are for person in a PRS cooking group. (Note that a cooking group addresses skills other than cooking).

Cognitive / Performance <u>strength</u> & related assessment	**Potential occupational performance areas affected**	**Examples of ways to use strength when working on goal in this area**	**Example of PRS staff's strengths-based prompts**
Emotion Perception (especially negative or neutral emotion); BLERT	Occupations (activities) that involve social interaction	• Notice person in group who looks like he might be feeling sad or frustrated. In group discussion, ask his opinion to help him feel included, or ask if you could work together on meal preparation.	*You're good at reading emotions, especially when someone's sad or frustrated. That suggests that you're empathetic—a great skill. Could you use that to help <u>you</u> feel more at ease in the group, by focusing on someone else?* (Remind right before group.)
Task initiation (executive function skill); EFPT (& BRIEF-A)	Occupations that involve multi-step tasks	• PRS staff gives person copy of group protocol beforehand, and asks what activities he could initiate (going over recipe steps, getting ingredients together, starting group discussion or clean-up)	*You are very good at starting tasks. Let's use that as a way for you to feel more confident with cooking, and even in the group overall. We can look at the group plan ahead of time, and identify all the "start" points in it.* (Remind right before group.)
Memory; MoCA	Occupations with more than one step. (In this case, carry-over of skills to home environment)	Use verbal memory to enhance occupational engagement and performance	*You have a good memory when words are said aloud. I wonder if saying the steps in the recipe aloud would make it easier to remember, so you'll feel confident making it at home.* (Copy of recipe always provided.)
Motor skills (Manipulates tools and materials easily); MOHOST	Occupations that include fine motor skills (In this case, use strength to enhance motivation in cooking goal.)	Use cooking tools that would be enjoyable for person, and would enable success (food processor, whisk, different types of chopping knives, etc.)	*You're really good with using tools and working with your hands. The cooking group is making veggie noodles for the chicken dish. We have a new "veggie-matic" for that. Could you help me learn how to use it? Maybe lead that part of the group?* (Practice and role-play beforehand.)

Cognitive / Performance challenge & related assessment	**Potential areas affected**	**Examples of suggested strategies for person working on goal in this area**	**Example of PRS staff's strengths-based prompts**
Emotion Perception (especially neutral and negative emotion; BLERT	Occupations (activities) that involve social interaction	• Focus on only 2 people in the group • Remind self that a neutral expression does not necessarily mean that a person is angry	*Who are 2 people in your group who seem easiest to relate to? What if you wait until one of them seems "positive," meaning upbeat and friendly, before you approach him?*
Theory of Mind: Hinting Task	Occupations (activities) that involve social interaction	Use a strength to compensate for challenge. Example: interest/curiosity (Motivation item) from MOHOST	*Your curiosity is a great quality. Did you notice how the questions you asked the leader about the recipe got people talking? What if you used your curiosity to ask a group member a question about herself during lunch? Let's brainstorm what you might ask.*
Cognitive flexibility (executive function skill); CTMT (& BRIEF-A)	Occupations that involve multi-step tasks and integrating new information	• PRS staff gives person a copy of new recipe days before class, and asks what 2 "roles" she could have (e.g., celery chopper and timekeeper)	*What would it be like for you to be the "expert" in the class in one or 2 roles that are needed to make the chicken vegetable casserole recipe successful?*
Pattern of occupation (Remains settled/ copes with change); MOHOST	Occupations that might be frustrating or include environmental stressors	Coping skill (deep breathing, counting to self, visualization, etc.)	*You've gotten really good at using deep breathing if you feel overwhelmed at the grocery store. What would you think about trying that when the cooking class isn't going the way that you want it to?*

Figure

Strengths-Based Cognitive Prompting Hierarchy

Level	Prompt	Participant Description	Examples
5	Positive feedback; Encouragement; Processing to promote learning	• Knows and uses strengths/strategies. • Needs support for continued success, or to use strengths/strategies in other contexts.	*How do you think that went/is going?* *Which of your strengths were/are you using?* *That seemed to really make a difference when you . . . .* *What made that go well that time?*
4	Indirect verbal prompt	• Knows strengths/strategies uses sometimes. • Responds well to indirect prompts and uses strengths/strategies for success at activity in this environment.	*I wonder what might make this easier.* *What are you noticing?* *What else could you try?* *I wonder what the next step might be.* *How do you think this is going?* *What could you/we try next time?* Nonverbal cue for positive reinforcement (e.g., a smile)
3	Direct question	• Knows strengths/strategies but needs support to use them. • Responds well to direct questions and does well with activity when prompted to use strengths.	*Which of your strengths could help make this easier?* *What is the next step?* *Which way worked best?* *Did you use your strengths/strategy?* Model (without saying that's what you're doing) how strength/strategy could be applied. Metacognitive strategy (e.g., 1-5 scale)
2	Non-verbal cue; Directive Question (choices)	• May have some awareness of strengths/ strategies, but limited ability to use to use them. • Direct question (Level 3) does not provide enough support to be successful at the activity.	*Which of your strengths/strategies* (name them) *should we try?* (Then problem-solve together how to apply the strength.) *You have strengths in curiosity and organizing. Which one do you want to use to work on your goal of getting along better with your housemate?* Cooking: Point to object that person needs to use next. Overtalking: Gesture to remind person to finish speaking. Metacognitive strategy to increase awareness (e.g., pre/post)
1	Direct verbal instruction	• Does not verbalize awareness of strengths/strategies. • Needs direct instruction (or step-by-step prompting) to be successful at the activity.	Identify strength/strategy and instruct how to apply it. *One of your strengths is curiosity. Could that help with this situation? Let's talk through it.* (Provide instruction.) Verbalize strategy for identified challenge. *Let's try using your memory strategy* (e.g., post-it notes for recipe steps). Overtalking: Tell person that you want to hear what they have to say but need to give someone else a chance to speak.

APPENDIX F

Interview Guides for Focus Group and Individual Participant Interviews

Focus Group Questions

Introduction:

Let's talk about the study that we just finished. First, thank you so much for your participation! It was great to work with you. The purpose of our meeting is for you to have an opportunity to give feedback about the study. Your feedback is always important in learning how we can best provide services in our program. We're going to start by my asking you some questions. And then, you can share anything that comes to mind or that you think I should know. Do you have any questions before we jump in?

Open questions:

1. This study was about understanding and using strengths, with a focus on skills related to cognition (thinking skills) and occupation (activities that people do). Please share a little about what it was like for you to be in this study, to be prompted to use your strengths, as well as use strategies.
2. Please talk a bit about the helpfulness—or not—of having prompts (reminders) to use strengths, and to use strategies.
3. What was it like if prompting was then used less (faded), and PRS coaches used a more facilitative approach? Talk a little about whether that helped you to be successful in the activities.
4. Did you notice any changes overall in yourself or in how you do activities? I know we also talked about this individually. For example, did you notice anything that was harder or easier for you, or that you did more (or felt more motivated to do) at home, at PRS, or in the community?
5. Do you think that the strengths-based prompting approach is something that we should consider using more in psych rehab? What would make this approach better or more effective?
6. Another part of this study was to explore using the assessments that we did as part of our work together, in order to better understand how people's skills are related to their self-efficacy (or confidence) and to their abilities to do the things that they need and want to do. What did you think of the assessments? (Hard, fun, tiring, helpful, etc.)
7. My next step is to analyze all the data. I will be comparing the items on the MOHOST observation form before and after we started doing strengths-based prompting, to see if there is a difference. I

will also compare the scores on the assessments that we did before the study began, to the scores on the assessments that you just did. I will also compare your scores to those of other people who did the assessments, but did not participate in the strengths-based prompting. When I've done that and written up the results, do you want me to let you know so that we can go over the results together?

8. Is there anything else that you want to share, or that you would like me to know?

Thank you very much! I really appreciate your being part of the study.

Christine Linkie
Open-ended Interview Response Summary

1. What are your strengths? Obviously you have many! But what were your strengths that were identified in this study?

2. Were there any strategies that you started using to turn a challenge into a strength?

3. Overall, did you notice any changes in yourself or in how you do activities? For example, did activities seem harder/easier, or did you participate in more/fewer activities at home, at PRS, or in the community?

4. Now that the study is ending, is there anything that you would like to continue with as part of your work with psych rehab? For example, do you want your PRS practitioner to continue using the strengths-based cognitive prompting approach, or to adapt it in some way?