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Concept Mapping and the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach As An Intervention Framework for Adolescents with Autism Spectrum Disorder (ASD)

Jessie A. Wilson, *The University of Western Ontario*

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CONCEPT MAPPING AND THE COGNITIVE ORIENTATION TO DAILY
OCCUPATIONAL PERFORMANCE (CO-OP) APPROACH AS AN INTERVENTION
FRAMEWORK FOR ADOLESCENTS WITH AUTISM SPECTRUM DISORDER
(ASD)

(Thesis format: Integrated Article)

by

Jessie Amanda <u>Wilson</u>

Health and Rehabilitation Sciences

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The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

Abstract

Individuals who are diagnosed with Autism Spectrum Disorder (ASD) experience a range of difficulties that impact their daily occupational performance. The current body of research identifies the importance of occupational engagement and competence as fundamental elements in facilitating an individual's social connections, development of personal autonomy and overall wellbeing. This dissertation explores the use of concept mapping embedded within the meta-cognitive framework of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach, to engage adolescents with ASD in meaningful occupations.

This thesis contains three manuscripts, an introductory and a final reflection chapter. The first manuscript is a methodological paper that outlines a qualitative concept mapping framework that can be applied within the field of occupational science. The second manuscript explores how concept mapping can be theoretically embedded with the CO-OP approach to facilitate the engagement, occupational competence, relatedness and autonomy of adolescents with ASD. The third manuscript presents the findings of a focused sensory ethnography exploration that explores the personalized and socio-cultural perceptions of adolescents with ASD while participating in a novel intervention. The third manuscript is analyzed using an occupational science framework, and highlights the themes identified by the participants through their concept maps and personal reflections. The data were analyzed using the qualitative concept mapping framework presented in the first manuscript, and through deductive thematic analysis using a theoretical codebook derived and highlighted in the third manuscript.

This thesis contributes new knowledge to shaping the development and delivery of interventions focused on enhancing the occupational performance of adolescents with ASD in meaningful goals important in the transition to adulthood. It has expanded the limited research that approaches the topic from the frameworks of qualitative research, multi-modal and multi-sensory methods. It also uniquely explores the concept of human occupation as it relates to culture of ASD, and the development of meaningful life skills within a group environment. This work has implications for the future methodologies and research questions

for studies exploring the lives of adolescents with ASD, the CO-OP approach, and the use of visual methods in exploring occupational meaning.

Keywords

Co-Authorship Statement

I, Jessie Wilson, acknowledge that the three integrated manuscripts included within this thesis all resulted from collaboration with coauthors. In all four manuscripts, the primary intellectual contributions were made by the first author, who: researched and designed the methodologies and methods, conducted literature reviews, sought appropriate ethical approvals, recruited all participants, collected and transcribed all data, led the analysis of all data, and led in the construction and writing of all manuscripts. The primary author was also the primary contact for the publication process.

The contribution of coauthor Dr. Angela Mandich was primarily through her research supervision of the primary author, theoretical guidance, and support in the intellectual and editorial process of creating the work and preparing it for publication.

The contribution of coauthor Dr. Lilian Magalhães was primarily through theoretical and methodological guidance to the primary author, and support in the intellectual and editorial process of creating the work and preparing it for publication.

The contribution of coauthor Dr. Jan Polgar was primarily through her theoretical and methodological guidance of the primary author, and support in the intellectual and editorial process of creating the work and preparing it for publication.

The contribution of coauthor Dr. Jeff Holmes was primarily through his theoretical and methodological guidance of the primary author, and support in the intellectual and editorial process of creating the work and preparing it for publication.

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I dedicate this thesis to my Dad: Alan James How who helped to make me into the person I am today, and who I see in the eyes and hearts of my children everyday.

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Chapter 1

1   Introduction

This dissertation presents a qualitative exploration of the personalized and the socio-cultural experiences of Canadian adolescents with Autism Spectrum Disorder ASD), during their engagement in an intervention focused on the development of shared life skill goals. Their perceptions are communicated through the methods of concept mapping and self-reflections. This chapter will begin with a brief introduction of engagement, the development of occupational competence, relatedness and autonomy in adolescents with ASD as it is conceptualized within the literature. Next, the concept of occupation as it is applied throughout this research project will be presented, and its relevance to the field of occupational science will be highlighted. Following this, the purpose of researching the personalized and socio-cultural experiences of adolescents with ASD from a qualitative, multimodal and multisensory perspective will be explained. I will then present myself as the researcher by telling the story of how I came to choose this research topic. This chapter will conclude with the plan of presentation of this dissertation.

1.1   Engagement, Occupational Competence, Relatedness and Autonomy in Adolescents with Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder (ASD) is the most common form of any neurological disorder or severe developmental disability in childhood (Autism Society Canada, 2012). Recent studies by Canadian researchers report that ASDs affect at least 1 in 94 individuals in Canada, and an estimated 100,000 individuals in Ontario (Autism Ontario, n.d.; National Epidemiologic Database for the Study of Autism in Canada, 2009). Individuals who are diagnosed with ASD experience a variety of occupational performance issues that impact their daily functioning (Case-Smith & Arbesman, 2008). The interaction of multiple factors within the person, the environment and the occupation

affect an individual with ASD's ability to engage and participate effectively in their self-care, productivity and leisure routines (Bauminger-Zviely, Eden, Zancanaro, Weiss & Gal, 2013; Case-Smith & Arbesman, 2008; Koegel, Singh & Koegel, 2010; Palmen & Didden & Lang, 2012; Potvin, Snider, Prelock, Kehayia & Wood-Dauphinee, 2013). Engagement and the development of competence in meaningful occupations are essential to the growth and development of children, and have a direct impact on their social connectedness, development of self identify and overall happiness (Hasselkus, 2011; Hilton, Crouch & Israel, 2008; Hocking, 2009; Law, 2002; Wilcock, 2001; 2006; Whiteford & Wright-St Clair, 2005).

With such a significant portion of the young Canadian population being diagnosed with ASD, and the difficulties that they have engaging and developing competence in their chosen occupations, connecting with others and developing personal autonomy, therefore warrants the need for additional research to be undertaken to explore these important areas. The intent of this research was to gain a better understanding of this cultural group's rich insights into the sociocultural and personally experienced workings of a cognitive intervention program that targets these areas of difficulty, facilitated through visual and other multi-modal methods. With this information I have gained insights into how adolescents with ASD view themselves as a unique cultural group, strive to achieve competence in a variety of occupations, build social relatedness with others, and develop a sense of autonomy through sharing their insights and experiences (Bagatell, 2007; Haertl, Callahan, Markovics & Sheppard, 2013; O'Neil, 2008).

When exploring the concepts of engagement, competency, social connection and personal autonomy, it is necessary to view them as evolving and dynamic processes (Quinn, Gleeson & Nolan, 2014; Test, Smith & Carter, 2014). There is a complex interplay of personal, contextual, social and occupational factors that require exploration over the adolescent's transition into adulthood (Quinn et al., 2014; Test et al., 2014). Undertaking this research project from a holistic and dynamic perspective allowed for a

deeper understanding of how the participants' perceived the development of their occupational competence, their ability to connect with others, and their development of personal autonomy over the course of the investigation.

This dissertation explored adolescents with ASDs' thoughts and feelings regarding their participation in an intervention. The intervention was facilitated through the use of concept mapping and other multi-modal and multi-sensory methods to capture their unique individualized and cultural experiences. Recently, there have been several studies conducted that highlighted the lived experience of individuals with ASD and the psychosocial effects of their connection with others, participation and competence in various occupations, and the development of personal autonomy (Griffith, Totsika, Nash & Hastings, 2012; Haertl et al., 2013; Hurlbutt & Chalmers, 2002). Similarly, I intend to gain insight into the participants' perceptions as well as the greater socio-cultural factors that surround their participation in the therapeutic process over the course of this investigation.

1.1.1   Concept Mapping and Autism Spectrum Disorder (ASD)

Concept mapping is a unique and versatile visual method that draws on the strengths of individuals with Autism Spectrum Disorder (ASD) (Kimhi, 2013; Roberts & Joiner, 2007). Various studies have outlined that visual supports enhance independence, facilitate the generalization of newly developed skills, make abstract concepts more concrete, and enhance the processing and retention of information for individuals with ASD (Rao & Gagie, 2006; Roberts & Joiner, 2007). Temple Gradin (2008) explains the use of her visual processing skills by

> " I THINK IN PICTURES. Words are like a second language to me. I
> translate both spoken and written words into full-color movies, complete with
> sound, which run like a VCR tape in my head. When somebody speaks to me,
> his words are instantly translated into pictures. Language-based thinkers often
> find this phenomenon difficult to understand, but in my job as an equipment

designer for the livestock industry, visual thinking is a tremendous advantage." (p. 3)

Currently, there is a dearth research that has been conducted applying the method of concept mapping with individuals with ASD (Roberts & Joiner, 2007). However, a wealth of information has been produced and systematically replicated that demonstrates the effectiveness of visual supports and graphic organizers in supporting individuals with ASD in skill acquisition, retention and generalization (Fleury, Hedges, Hume, Browder, Thompson, Fallin, El Zein, Klein Reutebuch & Vaughn, 2014; Hart & Whalon, 2008; Kimhi, 2013; Rao & Gagie, 2006; Roberts & Joiner, 2007). Many commonalities exist in the theory and structure that underpins visual supports, graphic organizers and concept maps. These commonalities include; the application of visual processing skills for enhanced understanding and information retention (Caron, Mattrom, Rainville & Chouinard, 2004; Kinchin, 2013; Novak & Cañas, 2008; Roberts & Joiner, 2007); the facilitation of gestalt thinking, and the promotion of a more global understanding of information and its relationship to a broader meaning (Firth & Happe, 1999; Novak & Cañas, 2008; Roberts & Joiner, 2007); the ability to make the understanding and interpretation of abstract concepts more concrete (Gallenstein, 2013; Roberts & Joiner, 2007); the facilitation of the transfer and generalization of new concepts and skills to different environments and situations (Gallenstein, 2013); the unique opportunity for flexibility and the representation of individuality in its design and implementation (Kinchin, 2013; Kinchin, Hay & Adams, 2000); and finally allowing for independence and individual autonomy over one's learning (Roberts & Joiner, 2007). Therefore because of these commonalities, concept mapping theoretically possess many characteristics that would be beneficial for the learning and development of individuals with ASD.

This dissertation explored the use of concept mapping as a part of the intervention process, and as a way to ellicit personal and socio-cultural understandings of the participant's engagement in an intervention. The unique qualitative concept mapping

framework highlighted in chapter two of this dissertation helps to uncover this complex process. The creative component of concept mapping was highlighted through the development of a new qualitative framework that helped to appeal to the different senses of the individual allowing for a more holistic learning experience (Bulter-Kisber & Poldma, 2010; Taylor & Littleton-Kearney, 2011). Concept maps illustrate a form of multimodal communication that allows participants to find and share their voice in new ways, engage in a new way of learning, and facilitate the exploration of qualitative data through the creation of new pathways of understanding (Kress & van Leeuwen, 2001, Pink, 2011; Rose, 2012).

1.1.2   Cognitive Interventions and Autism Spectrum Disorder (ASD)

Within the occupation literature there are two main cognitive approaches that are currently being used as interventions to enhance occupational performance: cognitive approaches that try to change faulty or distorted ways of thinking/understanding (cognitive processes), and those that work to teach an individual cognitive skills. This dissertation regards cognition as a performance support, and focuses on the role of cognition and cognitive strategies in supporting occupational engagement, in the development of competence, the fostering of social connections, and the building of personal autonomy in adolescents with Austim Spectrum Disorder (ASD).

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach was used within this study as "a client-centred, performance-based, problem solving, intervention that enables skill acquisition through a process of strategy use and guided discovery." (Polatajko & Mandich, 2004, p. 2). It is a performance-based approach that emphasizes the importance of enabling the adolescent to identify, develop and utilize cognitive strategies to manage their chosen occupational life skill goals more effectively (Missiuna, Malloy-Miller & Mandich, 1998; Polatajko & Mandich, 2004; Polatajko, Mandich, Missiuna, Miller, Macnab, Malloy-Miller & Kinsella, 2001). Its foundational theories are drawn from behavioral and cognitive psychology, health, human movement

science and occupational therapy (Feuerstien, Rand, Hoffman & Miller, 1980; Gentile, 1987; Meichenbaum, 1977; Polatajko & Mandich, 2004; Pressley, Woloshyn, Lysynchuk, Martin, Wood & Willoughby, 1990). Unlike traditional intervention approaches, the CO-OP approach does not focus on changing the ability of the individual directly, instead it uses domain specific strategies embedded within a larger global problem solving framework to augment ability and in turn produce skilled performance.

There is currently a lack of empirical evidence displaying the positive long-term effectiveness of occupational therapy interventions for individuals with ASD (Parham, Cohn, Spitzer, Koomar, Miller, Burke, Brett-Green, May-Benson, Roley, Schaff, Schoen, Summers, 2007; Phelen, Steinke & Mandich, 2008; Rodger, Ireland & Vun, 2008). Due to the heterogeneous nature of this population, the approach to intervention must be targeted to the unique strengths of the individual. Preliminary data have shown the effectiveness of the CO-OP approach for individuals with ASD in addressing motor based, social and organizational goals (Rodger & Brandenburg, 2008; Rodger & Vischram, 2010; Rodger et al., 2008; Rodger, Pham & Mitchell, 2009; Phelen et al., 2009). Research is also starting to emerge regarding the effective use of the CO-OP approach within a group setting (Martini, Mandich & Green, 2014). Upon reviewing the literature surrounding the successful application of the CO-OP approach with individuals with ASD many important elements were highlighted as successful ingredients in enhancing their engagement, and learning. These included the framework's unique focus on occupation, the inclusion of purposeful motivators, the focus on the transfer and generalization of skills, the flexibility of applying the approach within different contexts and with different populations, and finally the building of autonomy through client-chosen goals.

1.1.3 Concept Mapping Embedded in the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

Cognitive Orientation to Daily Occupational Performance (CO-OP) approach is a verbally based cognitive intervention that is focused on enhancing an individual's

occupational performance (Polatajko & Mandich, 2004; Polatajko et al., 2001; Rodger & Polatajko, 2010). The work of Meichenbaum (1977) and his focus on verbal self-instruction was adopted as a cornerstone for the CO-OP approach. Inserting concept mapping into the CO-OP framework offers the opportunity to expand the approach to allow for the support and guidance of individuals with different learning styles. It is important to understand that learning preferences or styles of individuals are not exclusively situated in one sensory medium. Individuals learn through a blending of the senses, and employ multiple strategies to problem solve through difficult tasks (Newcombe & Stieff, 2012). By embedding concept mapping within the CO-OP approach one can address an individual's multiple learning styles and appeal to their different senses.

Concept mapping is a method that changes words into pictures and visually represents their connections. The process of concept mapping "harnesses the power of our vision to understand complex information "at a glace" (Ricon, 2010, p. 685). The concept mapping process is dialectical in nature and supports the individual in moving from the written analytic text to the visual and back again. It can help to synthesize ideas that are emerging in the learning process and that are difficult to put into words alone (Bulter-Kisber & Poldma, 2010). The flexibility of applying both verbally and visually based learning opportunities enhances the application of the CO-OP approach with individuals who have Autism Spectrum Disorder (ASD).

1.2   An Occupational Science Issue: Doing, Being, Belonging and Becoming

The personalized and socio-cultural meanings that adolescents hold regarding their engagement in occupations is an important factor when designing and implementing an intervention approach (Haertl et al., 2013; Hume, Boyd, Hamm & Kucharczyk, 2014; Quinn et al., 2014; Test et al., 2014). Rudman, Dennhardt, Fok, Huot, Molke, Park & Zur (2008) describe the importance of recognizing the dynamic constructs of the definition of occupation stating that "We also propose that various working definitions of occupation

are required in order to explore the breath and importance of this phenomenon within a variety of contexts" (p. 139).

The researcher views the engagement and the development in occupational competence, relatedness and autonomy in adolescents with Autism Spectrum Disorder (ASD) from an occupational perspective (Deci & Ryan, 1985; 2012; Poulsen, Rodger & Ziviani, 2006). Nejelesani, Tang, Josson & Polatajko (2014) define an occupational perspective as "a way of looking at or thinking about human doing" (p. 234). It highlights action and "human doing" within the definition, helping to distinguish the occupational perspective from other perspectives (Nejelesani et al., 2014). It also encourages the researcher to express his/her own assumptions underlying their occupational perspective, allowing them to situate their research within the broad context of occupation (Nejelesani et al., 2014). The assumptions underlying the occupational perspective of this research can be delineated into three main concepts which include: a) doing can contribute to the being, becoming and belonging (Hammell, 2004; 2009; 2014; Wilcock, 1998, 2006), b) engaging in everyday activities brings meaning and purpose to peoples' lives, and promotes heath and wellbeing (Hammell, 2004; Townsend & Polatajko, 2007; Whiteford, Townsend & Hocking, 2000; Wilcock, 1998) and c) specific dimensions of cultural diversity have a direct relationship to occupational engagement and well-being (Hammell, 2013; Whiteford & Wright-St. Clair, 2005). As discussed in Hitch, Pepin & Stagnetti (2014a; 2014b) these elements of dong, being, belonging and becoming are interconnected and inform each other in multidimensional way. This continuous interaction modifies each element's respective and collective natures, and connects to the other occupational assumptions underlying this research project (Hitch et al., 2014a; 2014b).

"Doing" as an active contributor to the being, becoming and belonging of individuals has been discussed by both Hammell (2004; 2009; 2014) and Wilcock (1998; 2006). They extend the purpose of occupations into the larger context of one's life, and advocate for the dissolving and redefining of occupational categories. This perspective

refocuses the importance of defining occupations through one's *experience* of them, and in turn highlights the strong relationship between occupation and wellbeing (Hammell, 2004; 2009; 2014; Wilcock, 1998; 2006). The first assumption underlying the occupational perspective of this dissertation explored the 'doing' of participating in an intervention, and examined how that impacted the being, belonging and becoming of the participants (Hammell, 2009; Wilcock, 2006). By exploring what the adolescents with Autism Spectrum Disorder (ASD) 'did,' and the meaningful occupations that they chose to participate in, I was able to gain insight into the subjective personal and socio-cultural experiences of participating in meaningful occupations (Ekelman, Bazyk & Bazyk, 2013; Pierce, 2001; Primeau, 1996; Wilcock, 2006).

The second assumption underlying the occupational perspective of this dissertation is that engaging in everyday activities brings meaning and purpose to peoples' lives, and promotes health and wellbeing (Hammell, 2004; Townsend & Polatajko, 2006; Whiteford et al., 2000; Wilcock, 1998, 2006). The literature suggests that individuals with ASD have difficulties with task engagement across a variety of occupational domains (Hume et al., 2014; Palmen & Didden, 2012; Stasolla, Damlani & Caffo, 2014). Engagement in meaningful occupations is essential in the development of occupational competency, fostering social connections with others, and in developing personal autonomy (Lough, Rice & Lough, 2012; Poulsen et al., 2006; Townsend & Polatajko, 2007). Through the concept of occupation I explored how engagement in meaningful goals is perceived and understood by adolescents with ASD. I then sought to highlight how their occupational engagement offers purpose in their lives now and in the future, and how it promotes their individualized and cultural experiences of health and wellbeing.

"Culture describes the knowledge, beliefs, values, assumptions, perspectives, attitudes, norms, and customs that people acquire through membership in a particular society or group" (Hammell, 2013, p. 255). The third underlying assumption of the occupational perspective of this study is that the specific dimensions of cultural diversity

have a direct relationship to an individual's occupational engagement and wellbeing (Hammell, 2013). Recently, researchers have begun to explore how the ASD population define themselves as a unique cultural group, and how that affects their engagement within the larger social and occupational contexts (Haertl et al., 2013; Hurlbutt & Chalmers, 2002; Solomon, 2010).

In addition to being apart of a cultural group this study also explored how adolescents with ASD defined and related to a sense of self through the use of occupation. Carlson, Park, Kuo & Clark (2014) defined the self as "being born out of social relationships and self-reflexivity; encompasses and organizes one's thoughts, emotions, identities, values, and attributes; and is an agentic force that is expressed while interfacing with the outside world" (p. 119). Engagement in occupation helps to shape and re-shape the identities of individuals through social interactions and the defining one's sense of self (Carlson et al., 2014; Huot & Rudman, 2010; Phelen & Kinsella, 2009). Engagment in meaningful occupations leads to a deeper connection with others, themselves, and the occupations that they choose to engage in.

This dissertation views the engagement and the development in occupational competence, relatedness and autonomy in adolescents with ASD from an occupational perspective. The assumptions underlying the occupational perspective of this research project were highlighted and discussed as a means to situate the research within the broad context of occupation.

1.3   Methodological Choices

Qualitative research methods allow for in-depth exploration into the adolescents' experience of participating in an intervention, and the occupationally relevant issues that are associated with it (Ekelman et al., 2013; Haertl et al, 2013; Quinn et al., 2014). This dissertation has drawn on the methodology of focused sensory ethnography that accounts for how a multi-sensorial perspective is integral to the understanding of the experiences of the participants, and of how we conduct research or "practice our craft " (Pink, 2009,

p.1). Providing the space and the multi-sensorial methods for the adolescents to reflect on their learning and share their experiences with others, brought rich insight and understanding into the meanings embedded within the intervention process. Multi-sensorial methods encourage the participant and the researcher to engage in new more reflexive ways of thinking about occupational engagement, and facilitate communication in a way that is not limited by language, culture or individual factors (Chilton & Leavy, 2014; Hartman, Mandich, Magalhaes & Orchard, 2013; Pink, 2009). Allowing participants to embrace and use different mediums to express their learning and insights gives them a unique voice that helps to illuminate different concepts, and occupational issues that may have remained hidden or overlooked by the researcher. The framework of focused ethnography was also adapted as apart of the methodology for this research study. A focused ethnography methodology was applied because it is often employed in applied health care research studies because of its direct applicability to improving interventions and health care processes (Cruz & Higginbottom, 2013; Higginbottom, Pillay & Boadu, 2013; Kilian, Salmoni, Ward, Griffin & Kloseck, 2008).

1.3.1   Theoretical Framework

The theoretical framework that overarches this dissertation is the Self-Determination Theory (SDT). Self Determination Theory (SDT) was developed by Deci & Ryan (1985), and is a macro-theory of human motivation that explicates the difference between the content of goals, and the regulatory processes through which outcomes are pursued (Deci & Ryan, 2000; 2012). Further, SDT highlights the three basic needs of competence, relatedness and autonomy as elements that directly affect goal pursuit and attainment across the lifespan. These three needs are seen as organismic necessities that must be directly linked to individual goals in order to promote ongoing psychological growth, wellbeing and integrity (Deci & Ryan, 2000; 2012). SDT views human beings as "active, growth-oriented organisms who are naturally inclined toward integration of their psychic elements into a unified sense of self and integration of themselves into larger social structures" (Deci & Ryan, 2000, p. 229). Therefore SDT proposes that individuals are not passive agents in their lives, but instead inherently strive towards growth-

orientated activity that is facilitated through the basic needs of competency, relatedness and autonomy.

Self Determination Theory (SDT) was applied as the overarching theoretical framework for this study for a number of reasons which are explained below.

1) SDT highlights the innate human potential within all individuals which, shares close ties with the values and enabling principals of occupational therapy and occupational science. It also approaches human development from a strength-based perspective that is a core element weaved through the research study (Deci & Ryan, 2000; 2012; Hawking, 1996; Rudman et al., 2008; Townsend & Polatajko, 2007)

2) SDT is a macro-theory that views human motivation as a dynamic and individualized process that occurs across the lifespan. The dynamic and individualized process meets the needs of the heterogeneous population of people with Autism Spectrum Diorder (ASD). Taking a life-course perspective is essential when working with adolescents because their occupational engagement and competence is in a state of change due to present and future life transitions (Deci & Ryan, 2000; 2012; Humphry & Womack, 2014; Test et al., 2014).

3) The three identified needs of competency, relatedness and autonomy are negatively impacted by the diagnosis of ASD. Literature highlights the difficulties that individuals with ASD have in their occupational engagement and competency, their ability to relate to others through meaningful social connections, and their lack of autonomy in their life choices (Griffith et al., 2011; Haertl et al., 2013; Hurlbutt & Chalmers, 2002; Test et al., 2014)

4) The needs identified by SDT can be paralleled with the being, doing, belonging and becoming framework for the dimensions of occupation described by Hammell (2009; 2014) and Wilcock (1998; 2006). In addition the SDT needs are interwoven through the qualitative concept mapping categories for understanding

that were developed in chapter two of this dissertation, and the Cognitive
Orientation to Daily Occupational Performance (CO-OP) Approach (Poulsen et
al., 2006). The common threads of cohesiveness resonate throughout all of the
chapters of this dissertation in the form of competency, relatedness and autonomy
(Ekelman et al., 2013).

5) SDT has direct connections to the environment and highlights the ongoing
   dialectical relationship between human needs, and the larger social context in
   fostering occupational engagement, motivation and enhancing wellbeing
   (Ekleman et al., 2013; Deci & Ryan, 2000; 2012; Townsend & Polatajko, 2007).

6) The macro-theory of SDT understands that people engage in occupations because
   they are meaningful, important and relevant to them. They do not necessarily
   participate in activities to meet their needs, instead they choose to engage in a task
   because of the pleasure they would experience as an outcome when their needs
   are in balance (Deci & Ryan, 2000; 2012; Hammell, 2004; 2009; Townsend &
   Polatajko, 2007).

1.3.2   Focused Sensory Ethnography Methodology

It is necessary to expound the underlying methodology that this paper was built
on to ensure quality and cohesiveness throughout the research process (Creswell, 2014;
Finlay & Ballinger, 2006; Tracy, 2010). Methodology is defined as "the overarching
approach to research and encompasses both philosophy and method" (Finlay, 2006, p.9).
Research philosophy incorporates both epistemology and theory, and is intertwined with
research methods (Finlay, 2006). Demonstrating transparency in the methodological
underpinnings of qualitative research displays rigor and meaningful coherence in the
research process (Creswell, 2014; Tracy, 2010).

Epistemological pluralism is the understanding that knowledge is highly
contextualized by historical, cultural and other external factors. It also acknowledges that
there exists a multiplicity of elements that directly and indirectly affect the acquisition of

knowledge (Miller, Baird, Littlefield, Kofinas, Chapin III & Redman, 2008; Thorne, 2011; Whittemore, Chase & Mandle, 2001). Epistemological pluralism recognizes that, in any given research context, there may be several valuable ways of knowing, and that accommodating this plurality can vastly enhance the richness of knowledge development (Miller et al., 2008; Whittemore et al., 2001). This perspective is reflected in acknowledgement and appreciation of the physical objects, sensory experiences, cognitive understanding, cultural values and contextual elements that contribute to the participants' and the researcher's construction of knowledge (Thorne, 2011). Throughout this research study not one *form* of understanding was seen as more important than another. The heterogeneous nature of the individuals that participated in the research study and the inherent complexity of the learning experience, required the researcher to be cognizant of not creating or implying a hierarchy among the many ways in which an individual can construct and co-construct knowledge.

The constructivist-interpretivist paradigm approaches research with the intention of understanding the participant's perspective on the phenomenon being studied (Creswell, 2014; Finlay, 2006; Wahyuni, 2012). It acknowledges that each individual with various experiences and assumptions contributes to the construction of reality in a broader social context through social interactions (Creswell, 2014; Wahyuni, 2012). The constructivist-interpretivist paradigm recognizes the impact of the researcher's own background and experiences in the generation of new knowledge (Creswell, 2014; Finlay, 2002; Finlay & Ballinger, 2006). The values and experiences of both the researcher and the participant influence the collection and analysis of the data; therefore knowledge is seen as co-constructed (Finlay & Ballinger, 2006; Lincoln, Lynham & Guba, 2011). The constructivist-interpretivist paradigm is highlighted throughout this research study in the manner in which the concept maps were created, the facilitation of interactive group learning, and through the process of reflexivity on the part of the participants and the researcher.

Focused sensory ethnography was the methodology that was employed in this dissertation. It is a unified approach between the methodologies of focused and sensory ethnography. Sensory ethnography expands upon the traditional approach of ethnography by highlighting the fundamental role that the senses play in how we learn about, understand and represent the lives of other people (Pink, 2009; 2011; Sunderland, Bristed, Gudes, Boddy & Da Silva, 2012). The intent is on broadening the ethnographic research methodology by obtaining knowledge through embodied practice and being mindful of all of the human senses (Nakarura, 2013; Pink, 2009; 2011). Sensory ethnography does not privilege one method for data collection, or one sensory experience over another instead it is a methodology that is open to multiple ways of knowing and understanding (Hurdley & Dicks, 2012; Nakamura, 2013; Pink, 2009). Sensory ethnography is informed by an understanding of the interconnectedness of the senses, and the emplacement of the ethnographer in the social, sensory, and material environment of the phenomenon in which they are studying (Ingold, 2000; Pink, 2009; 2011). Sensory ethnography incorporates innovative methods that go beyond listening and watching, to embracing the use of multi-modal forms of knowledge representation (Hurdley & Dicks, 2011; Pink, 2009).

One way of eliciting the sensory experience of an individual is through the construction and use of visual methods (Harris & Guillemin, 2012; Pink, 2009; Rose, 2012). Visual methods act as a way for participants to access different ways of understanding that might be difficult to convey through the spoken word (Harris & Guillemin, 2012; Pink, 2011). They enable individuals to connect past experiences with current knowledge, and invite the person to reflect on their embodied and multi-sensory experience (Harris & Guillemin, 2012; Hurdley & Davis, 2011; Pink, 2009).

In this study concept mapping was used as a visual method to enable the participants to express themselves beyond the restrictions of textual language (Rose, 2012). Visual methods are particularly beneficial for individuals with Autism Spectrum Disorder (ASD) who often struggle with language-based skills (Koning & Mcgill-Evans,

2001; Rao & Gagie, 2006; Williamson, Carnahan & Jacobs, 2012). The concept mapping framework that was applied regards mapping as a form of, and as a part of, multi-modal communication. This allows for the participants to find and share their voice through various communicative mediums (Wilson, Mandich, Magalhaes, Polgar & Holmes, forthcoming).

Focused ethnography is a methodology that is emerging as an approach for "applying ethnography to a particular issue or shared experience in cultures or sub-cultures and in specific settings" (Cruz & Higginbottom, 2013, p. 36). It is often employed in applied health care research studies because it is often used to determine ways to improve interventions and health care processes (Cruz & Higginbottom, 2013; Higginbottom et al., 2013; Kilian et al., 2008). The findings of a focused ethnography are anticipated to have a meaningful and useful application within health care practice (Higginbottom et al., 2013; Knoblauch, 2005). There are seven characteristics or elements of focused ethnography that have been delineated by Higginbottom et al., (2013). These are 1) conceptual orientation of a single researcher; 2) focus on a discrete community, organization or social phenomenon; 3) used in academia as well for the development of health care services; 4) involvement of a limited number of participants; 5) problem-focused and context specific; 6) participant usually holds specific knowledge; and 7) episodic participant observation (Higginbottom et al., 2013, p. 3). Therefore focused ethnography can be a pragmatic and efficient way to capture meaningful data on a specific topic that can help to shape the ways in which interventions are designed and implemented to meet the unique needs of a cultural group (Cruz & Higginbottom, 2013; Higginbottom et al., 2013; Kilian et al., 2008; Knoblauch, 2005).

1.4   Situating the Researcher

As qualitative researchers enter into an investigation they must accept that they are central figure who influence and helpsto construct the selection and interpretation of the data (Finlay, 2002; 2003; Finlay & Ballinger, 2006). This dissertation research is co-constructed between the participants and myself and is a joint product of our relationship

(Finlay, 2002; 2003; Finlay & Ballinger, 2006). Throughout the course of the investigation meanings and understandings were negotiated within a particular social and cultural context, and therefore the story that will unfold is unique. I am presenting my story here. I will explain my personal and professional interests in the topic, so that readers may understand the views with which I entered into the research process.

My interest in this research topic was born out of my experience as a student occupational therapist in the Movement Skills Clinic at Western University in London, Ontario. I volunteered to work with young children with a diagnosis of Autism Spectrum Disorder (ASD) on their chosen occupational goals using the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. It was my first opportunity to work with children with a diagnosis of ASD, and I was instantly amazed in their unique ways of engaging, connecting with others, and developing their occupational competence.

After graduating with my clinical masters degree I worked as an occupational therapist. Working in both a treatment centre and a community-school health context my interaction with individuals with ASD occurred frequently and across their developmental spectrum. Three notions became quite apparent during my interaction with adolescents who had been diagnosed with ASD and they were: 1) lack of services directed towards enhancing occupational goals focused on their transition to adulthood, 2) scripted interventions that lacked autonomous choice which therefore impeded client engagement and motivation, 3) instructional mediums that did not capitalize on their strengths, or offer variety to meet their heterogeneous learning styles.

My interest in concept mapping and other multi-modal methods of data collection came from my personal experiences in having to create visual diagrams and maps to consolidate new information throughout my university career. Often I would become frustrated in my learning process because of my need to "see" connections between pieces of information to generate a deeper conceptualized understanding. One evening while participating in one of my favourite leisure occupations, paper crafting (scrapbooking and card making), I came to the realization that I engage, learn and grow

by telling my story through a visual medium. Exploring the plethora of visual and other multi-sensorial methods to data collection sparked an interest between my own learning style, and the possibility of offering a new way for adolescents with ASD to share their story.

After deciding to return to complete my PhD in occupational science I approached my supervisor Dr. Angie Mandich and explained my interest in pulling together my experience of using the CO-OP approach with concept mapping to meet the heterogeneous learning needs of adolescents with ASD. I wanted to focus on participant chosen occupational goals related to their transition to adulthood, and incorporate other multi-modal methods such as self-reflection. She was immediately supportive however she was a little skeptical of the participants' ability to complete daily self-reflections and said "important information can be obtained from studies that don't work out just as much as from those at do".

1.5   Plan of Presentation

This dissertation is presented in an integrated article thesis format. The chapters are presented as independently publishable manuscripts. As such, it is worth noting that there will be some repetition throughout each one of the chapters. This was done intentionally, and serves the larger purpose of each manuscript being able to stand alone outside of this compiled dissertation.

In order to present this research in a contextually relevant manner, this introductory chapter has summarized the current trends in academic literature pertaining to the engagement, and development of occupational competence in adolescents with Autism Spectrum Disorder (ASD). It also highlights the utility and relevance of a qualitative multi-sensorial approach to uncovering the participant's insights related to their competency, relatedness and autonomy during the process of participating in an intervention. It has also given readers a better understanding of the values and intentions

with which I approached this research, so that my biases are transparently disclosed, as they are present throughout the construction and analysis of this dissertation.

Chapter two is a methodological paper that outlines the construction of a qualitative concept mapping framework that can be used in the field of occupational science. The purpose of this methodological paper is to explore the use of concept mapping as a qualitative research method that is represented as a form of multimodal communication that fosters new connections and understandings between the participants, the researchers and, the audience. Table 1 highlights the development of the categories for understanding.

Chapter three presents the theoretical basis for how the visual method of concept mapping can be embedded within the meta-cognitive framework of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach to meet the heterogeneous learning needs of adolescents with Autism Spectrum Disorder (ASD). Table 2 displays the domain specific strategies of the CO-OP approach adapted from Polatajko & Mandich (2004). This paper demonstrates promising evidence to support the effectiveness of the use of concept mapping embedded within the CO-OP approach in enabling individuals with ASD reach their full occupational potential. Further discussion of the commonalities and theoretical links between the CO-OP approach and concept mapping can be found in Table 3.

Chapter four presents the perceptions and insights of adolescents with ASD while participating in a novel intervention. The intervention combined the use of concept mapping with the CO-OP approach, to facilitate the engagement, the development occupational competence, relatedness and autonomy in adolescents with ASD. In this study, the 10 participants constructed concept maps, and completed daily self-reflections that helped them to implement the global problem solving framework of the CO-OP approach (Goal-Plan-Do-Check). The chapter includes the participants' concept maps, self-reflections as well as discussion of themes that were identified through the multi-modal data collection methods. The personal and socio-cultural messages of the

participants, and their relevance to the current academic discourse related to competency, relatedness and autonomy of adolescents with ASD are explored. Implications and the future directions for research in this area are presented. Information pertaining to the multi-modal and multi-sensory analysis of concept maps can be found in Table 4. The codebook for analyzing the participant concept maps and personal reflections is found in Table 5. Stage one of the analysis of the participant concept maps using the qualitative concept mapping categories for understanding, are presented in Table 6. Connecting the codes and identifying themes related to the concept maps and self-reflections can be found in Table 7 and Table 8. The table defining how the major themes connect and support the seven key features of the CO-OP approach can be found in Table 9. Corroborating and legitimating coded themes across three codes of competency, relatedness and autonomy can be found in Table 10

The future direction section presents concluding messages regarding the implications of our findings and areas for future research. This chapter also includes limitations and methodological constraints of the study. I present the measures used to maintain the quality of this research investigation from its inception through to the writing of this dissertation. I close this study with final reflections on the process involved in the design, the collection and the compilation of the data.

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Chapter 2

2 Concept Mapping: A Dynamic, Individualized and Qualitative Method for Uncovering Occupational Meaning

The purpose of this theoretical paper is to develop a qualitative concept mapping framework that can be represented as a form of multimodal communication in uncovering occupational meaning. This discussion was born from a larger research project that utilized concept mapping and the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach to help develop the activities of daily living (ADL) of adolescents with Autism Spectrum Disorder (ASD) transitioning to adulthood. This concept mapping framework strives to move mapping beyond the formalized structure and its quantitative evaluation and seeks to insert art and humanness into the process. This proposed framework does not evaluate maps for their "correctness" nor does it compare one individual's map to another's. The intention instead is to provide another means to highlight the ways in which people learn, understand and interpret the world around them. Three categories for understanding have been identified by the authors to help individuals create, interpret and understand qualitative concept maps. These categories include:

1) Voice: Tri-directional Voice and Mutual Absorption

2) Detail in the Parts & Recognition of the Whole: Uniqueness, Aesthetic Distance and Emplacement

3) Sensory Experience: Intellectual + Emotional Investment and Humanness.

Each of these categories is interconnected and informs each other in a dialectical way, therefore creating a piece of visual data with which the participant, researcher and audience can interact.

Concept maps are defined as tools to assist individuals in visualizing the journeying nature of a concept's development (Butler-Kisber & Poldma, 2010; Hunter, Lusardi, Zucker, Jacelon & Chandler, 2002). It allows for a visual representation of movement from the foundational tenets of an idea to its end product and future developments (Gallenstein, 2005; Hunter et al, 2002). Concept mapping uncovers the natural complexities embedded in learning, and provides a visual representation of how these nuances communicate with one another. This paper explores the history of concept mapping, and highlights its importance as an educational and research method. It will elaborate on the benefits of moving toward a more qualitative representation of concept mapping, and will propose a new framework for the map's construction, analysis, and interpretation.

2.1   History of Concept Mapping

Concept mapping is a visual method that was created by Novak (1990a; 1990b) in an attempt to understand changes in children's knowledge of science. Concept maps are described as 'graphical tools for organizing and representing knowledge' (Novak & Cañas, 2008). Rooted in education, concept mapping has been utilized in the fields of nursing and allied health care to enhance critical thinking skills and meaningful learning (Aberdeen, Leggat & Barraclough, 2010; Burke, O'Campo, Peak, Gielen, McDonnell, Trochim, 2005; Miller-Kuhaneck, Bortone & Frost, 2007; Novak, 2010; Passmore, 2013). Traditionally, concept maps include concepts that are usually enclosed in a circle or box arranged in a hierarchical fashion with the most general concept at the top of the map and the more detailed descriptions below (Eppler, 2006; Moon, Hoffman, Novak & Cañas, 2011; Passmore, 2013). Relationships are represented by unidirectional or bidirectional arrows between concepts with linking words or phrases that form a

meaningful statement (Moon et al., 2011; Novak & Cañas, 2008; Passmore, 2013). The focus question acts as a point of reference from which the concept map is generated. It can pertain to some situation or event that the researcher is trying to better understand and creates the context for the concept map (Moon et al., 2011; Novak, 1990b; Novak & Cañas, 2008). Mapping research findings can help to build a logical chain of evidence as well as conceptual and theoretical coherence (Butler-Kisber & Poldma, 2010; Daley, 2011; Hunter et al., 2002).

2.1.1 Epistomological and Methodological Foundations

Concept mapping is informed by Ausubel's Assimilation Theory (1963; 1968; 1978), which suggests that meaningful learning occurs when there is an assimilation of new concepts into one's existing knowledge base or 'cognitive structures'. In order to ensure meaningful learning the topic must be conceptually clear and presented with examples that are relatable to the learner's prior knowledge (Moon et al., 2011; Novak, 1990b). The learner must also have a foundation of basic understanding related to the topic, and finally the learner must choose to learn in a meaningful way (Akinsanya & Williams, 2004; Chiou, 2008; Novak, 1990b). 'Meaningful learning is the foundation of human constructivism which is both a psychological and epistemological phenomenon' (Novak, 1990b, p. 32).

The epistemological foundations of concept mapping arise from the constructivist paradigm and are closely linked with Vee Diagrams or Vee Heuristic developed by Novak's colleague Gowin (1970; 1981). Gowin's Vee diagrams were created to illustrate the methodological and conceptual elements that interact in the process of new knowledge construction (Gowin, 1970; 1981; Gowin & Alvarez, 2005; Novak, 1990b; Novak & Cañas, 2006; 2008). Vee diagrams help individuals comprehend the structure and meaning of the knowledge that they seek to understand (Gowin & Alvarez, 2005; Novak & Gowin, 1984). They are arranged in a "V" and highlight the underlying conceptual, theoretical and methodological assumptions that are required to construct

new knowledge informed by the focus question (Gowin & Alvarez, 2005; Novak & Cañas, 2008; Novak, 1990a).

Concept mapping and Vee diagrams are founded on the understanding that knowledge is constructed among individuals. The constructivism paradigm views meaning as constructed by individuals interacting and engaging with the world they are interpreting (Creswell, 2014; Crotty, 2003). Meaning is therefore seen as subjective, as are the concept maps that are created in response to understanding a particular question or phenomenon. Concept maps are subjective representations of one's understanding of a concept and therefore are the most useful to the person that creates them (Conceiaco & Taylor, 2007; Miller-Kuhaneck et al., 2007). Concept mapping encourages the construction of knowledge in a meaningful way by facilitating the creative interaction between the individual, their current cognitive structures and new information.

2.1.2   Evaluation of Concept Maps

The evaluation of concept maps focuses on comparing one map with another. It evaluates the "correctness" of a map by finding commonalities and quantifying the number of concepts presented and their relationship to one another (Davies, 2011; Eppler, 2006; Novak & Cañas, 2008). Novak & Gowin (1984) developed a scoring protocol for analyzing concept maps that evaluates an individual's map based on quantitative measurements. The number and the arrangement of concepts and the validity of their linking phrases are pivotal markers in how well an individual is learning and/or understanding a phenomenon (Chiou, 2008; Conceiaco & Taylor, 2007; Kinchin, Hay & Adams, 2000). Software programs exist to help measure and compare concept maps to one another, offering the educator and the researcher insight into how the individual is generating and linking new concepts in comparison to their peers (Chiou, 2008; Davies, 2011; Novak & Cañas, 2008).

Evaluating a concept map solely through a quantitative approach limits the descriptive richness, and narrows the opportunity to highlight the insights of the

participant and researcher (Kinchin et al., 2013; Trafimow, 2014) Comparing maps and counting concepts attempts to generalize how individuals learn and disregards the meaning behind the creation of the map. Establishing a hierarchy among concepts and instituting validity between linkages may cause the researcher to overlook important ideas embedded within the map, and minimizes the significance of the individual's perspective (Hay, 2007; Kinchin, 2013; Kinchin et al., 2000). Quantitative analysis of concept maps attempts to homogenize this individualized process, and extracts the humanness and subjectivity that makes concept mapping a rich method of qualitative data collection.

2.2   Developing a New Framework

Accompanying the steps and processes associated with constructing a sound concept map is an element of creativity. The manner in which an individual constructs their concept map gives clues to their values, beliefs and overall approach to research and learning (Bulter-Kisber & Poldma, 2010; Wheeldon & Faubert, 2009). Concept maps allow the researcher to interact with the data, uncover new relationships, and view the information from a different perspective.

The creative component of concept mapping appeals to the different senses of the individual allowing for a more holistic learning experience (Bulter-Kisber & Poldma, 2010; Taylor & Littleton-Kearney, 2011). Concept maps illustrate a form of multimodal communication that allows participants to find and share their voice in new ways. Multimodal communication encourages the interaction of multiple semiotic resources like language, art and photography (Kress & van Leeuwen, 2001, Pink, 2011b; Rose, 2012). This approach to communication allows for the exploration of theories derived from arts based disciplines to create new pathways of understanding qualitative data. Eisner (2008) suggests that art is another form of discourse and can be recognized as a specialized form of knowledge. Art as a form of discourse articulates cultural values and

beliefs, sheds light on society structures and allows self-expression beyond the restrictions of textual language (Eisner, 2008; Nead, 1988; Pink, 2011b; Rose, 2012).

This paper seeks to explore concept mapping as a qualitative research method that is represented as a form of multimodal communication. This framework strives to move mapping beyond the structure and its quantitative evaluation that has been previous discussed in its historical beginnings, and seeks to insert art and humanness into the process. The intention is to provide another way to illuminate the ways in which people learn, understand and interpret the world around them.

Throughout the development of the proposed framework, the researchers were aware of the necessity to have it strongly rooted in a qualitative methodology. Methodologies encompass both philosophy and methods (Carter & Little, 2007; Finlay & Ballinger, 2006) and lay the foundation for the development of a cohesive research project (Howell, 2013). It is therefore necessary to explicitly state the epistemological underpinnings of the framework as it guides the production of the concept mapping method. The proposed concept mapping framework is derived from the constructivist-interpretivist paradigm, which recognizes that the construction of knowledge has multiple meanings and subjective realities (Creswell, 2014; Denzin, 1994; Finlay & Ballinger, 2006). The understanding derived from this form of concept mapping is within the interpretivist tradition, and highlights the way in which "our perceptions and experiences are socially, culturally, historically and linguistically produced" (Finlay & Ballinger, 2006, p.19).

In this proposed framework the researchers are embedded within the phenomenon they are studying and are informing and are informed by, the participant(s) and the mapping process itself. Reflexivity is therefore an important skill that needs to be implemented throughout the mapping process. It allows the researchers to provide a transparent methodological account of the co-construction of knowledge during the research process, and deepens their understanding of how they collect, select and

interpret data based on their previous understandings, and personal values and beliefs (Creswell, 2014; Denzin, 1994; Finlay, 2002; Finlay & Ballinger, 2006).

Vygotksy's theory of socio-constructivist learning (Vygotsky, 1978) is embedded within the proposed concept mapping framework. It highlights the importance of social interaction and cooperative dialogues in the formation and development of new concepts (Baker, Quennerstedt & Annerstedt, 2013; Berk & Schanker, 2006; Berk & Winsler, 1995; Kinchin et al., 2000). Vygotsky believed that development was a process not a product, and saw learning as being embedded in social and cultural contexts (Berk & Schanker, 2006; Derry, 2013). He also called attention to the fluid nature of learning and the notion that intelligence lies not in what an individual knows but in their ability to solve problems (Derry, 2013; Gauvain, 2009). The notion of scaffolding was born out of the Vygotskian concept of the Zone of Proximal Development (ZPD) (Baker et al., 2013; Obukhava & Korepanova, 2009). The ZPD is the gap in development between what a learner has already mastered and what they can achieve when guided with support (Baker et al., 2013; Gauvain, 2009) Scaffolding is a form of cooperative learning through which the disparity between the individual's actual performance and their learning potential can be minimized (Case-Smith, Law, Missiuna, Pollock & Stewart, 2010; Casey & McWilliam, 2011; Obukhava & Korepanova, 2009). Concept mapping is tool that facilitates meaningful learning by as serving as a scaffold to organize and structure new and existing knowledge (Novak & Cañas, 2008).

2.3   Categories for Understanding

The proposed framework was informed by the work of Bresler (2006), Pink (2009) and Rose (2012). Each of these researchers offers unique insights into various art-based qualitative research methodologies, and they illuminate significant aspects of visual methodologies that have informed this proposed framework. It is important to acknowledge the dialectical relationship between the work of these three authors. The commonalities and connections between their work were used to expound the categories for constructing, analyzing and interpreting qualitative concept mapping. These

categories were identified through reading and analyzing their books and research papers for common themes. The themes and their associated descriptions from each author were then written down and compared to one another in a table. Table 1 highlights some of these connections. The commonalities among their works were uncovered and assimilated into the following categories for understanding that form the foundation of this proposed framework. The three categories include:

1) Voice: Tri-directional Voice and Mutual Absorption

2) Detail in the Parts & Recognition of the Whole: Uniqueness, Aesthetic Distance and Emplacement

3) Sensory Experience: Intellectual and Emotional Investment and Humanness.

Table 1: Connections uncovering the categories of understanding: voice; detail in the parts and recognition of the whole and the sensory experience

Bresler (2006)	Pink (2009)	Rose (2012)

-Tri-directional Relationship
  1) Connection to phenomenon
  2) Connection to self
  3) Connection to audience (p. 53)
 	
-Soft boundaries and flow of ideas and concepts (p.53)
 	
-Doing and Becoming through esthetic encounters (p. 54)
 	
-Empathetic understanding through research role of emotion in research and a blending of the affective and the rational (p. 54)
	-Voice and the message of the participant
	
	-Interconnection of the senses in a dynamic and non-hierarchical relationship (p. 2)
	
	-Developing ways of knowing by sharing in spaces and places with the participants and experiencing things together (p. 2)
	
	-Opening up opportunities for multiple ways of knowing (p. 8)
	
	-Drawing on a family of methods (p. 9)
		-Human beings are produced not just born: greatly influenced by their experiences (p. 141)
		
		-Discourse can by in the form of art work and other multi-modal works (p. 142)
		
		-One's culture influences the artwork/visual methods that are produced (p. 142)
		
		-vision and visuality; balance between what the eye actually physically sees and what our culture/experiences etc. have shape what we *do* see (p. 2)

-Aesthetic distance -Voice and a fusion of horizons (p. 55; p. 57) -Taking research to the next level (p. 57) -Researcher is apart of the learning process/change (p. 59) -Links to arts-based practices and ways of knowing	-Collaborative process between the researcher and the participant (p. 10) -Weaving of creative discourses and then effecting the way that people understand the world around them (p. 12) -Focus on everyday practice such as housework, laundry, gardening etc. (p. 15) -Body as a place of knowing through the senses (p. 24)	-multimodality in images and the importance of written text, photographs, drawings, multi-media representations etc. in informing understanding and knowledge production (p. 11) -Site of audiencing: different people will understand and interpret different meanings from the image (p. 22)

These categories are not isolated from one another but instead they are interconnected and inform each other through a symbiotic relationship. The conceptualization of soft boundaries allows for the flow of ideas among these domains, and mimics the relationship between research and art-making (Bresler, 2006; Irwin & de Cosson, 2004). This proposed framework highlights the importance of arts-based inquiry and regards artistic practices as significant forms of scholarly inquiry (Bresler, 2006; Finley & Knowles, 1995; Fox & Geichman, 2001; Sullivan, 2005). Therefore a blend of arts-based and qualitative research creates a new platform for the exploration of concept mapping and its use in exploring various areas of research and education.

2.3.1   Voice

The voice of the participant should be of primary importance during the concept mapping process. How the participant finds his/her voice and shares his/her story is a unique and individualized process (Banks, 2009; Bresler, 2006; Finnegan, 2002; Rose, 2012). There are many elements of a participant's voice that need to be considered when constructing, analyzing and interpreting a concept map.

Tri-directional Voice. The tri-directional voice refers to the dialogical relationship that evolves between the individual, the concept map, and the audience (Bresler, 2006). In visual methodologies audiencing is referred to as the process by which an image's meanings are interpreted and understood by individuals in various contexts (Banks, 2009; Rose, 2012). In this proposed framework the researchers extend the audiencing inward, and recognize the individual as a part of their own audience. This is because the communication (or voice) that develops within the individual facilitates a change of self, and promotes learning (Bresler, 2006; Dewey, 1934; Drew & Guillemin, 2014). Concept mapping is a medium through which people come to understand more about an event and about themselves. This change of self re-shapes the meaning of the phenomenon that is being studied, and offers the participants an opportunity to "re-see" the significance the experience and the mapping process offer them (Bresler, 2006; Butler-Kisber & Poldma, 2010; Dewey, 1934). Through this process of "re-seeing" the participant develops an artistic expression of self-discovery (the concept map) and their voice resonates on both an individual and a social level.

Mutual Absorption. Mutual absorption is the process of intense dialogue between the audience and the visual method (Armstrong, 2000; Lapum, Ruttonsha, Church, Yau & Matthews David, 2012; Rose, 2012). It is characterized by a deep open-ended relationship where the audience is engaged with the concept map as they attempt to understand the perspectives of the participants, which are expressed through the map. The perspectives of the audience and the participants may be very different from one another (Armstrong, 2000; Bresler, 2006; Drew & Guillemin, 2014). Gadamer (1988) describes this process as the discovery of others' horizons. It is the process of acknowledging and respecting other people's ideas through an interactive and open-ended dialogue that enables the expansion of the ones self.

Throughout this process the audience needs to recognize and acknowledge their own subjectivities that have developed through past experiences, their culture, their values and beliefs (Pink, 2006; 2009; 2013). This reflexivity allows the audience to position

themselves along a continuum of understanding in respect to the participants' perspectives producing "horizons of understanding" (Bresler, 2006; Finlay, 2012; Gadamer, 1988). This space acknowledges the similarities and differences between the audience and the participants' viewpoints, and facilitates the "fusion of horizons" between the research participant's voice (message) and the intended audience's understanding (Bresler, 2006; Finlay, 2012; Gadamer, 1988).

A concept map is a visual image that facilitates an interactive relationship with its audience. Following pathways and connections allows the audience to become absorbed in the map, and in turn the map becomes absorbed into the audience (Armstrong, 2000; Lapum et al., 2012; Rose, 2012). This mutual exchange of information strengthens the methodological underpinnings of this framework, which recognizes that knowledge is interpretive and co-constructed. Through this reciprocal relationship new knowledge is formed, and with communicative sharing it can become a part of cultural knowledge (Baker et al., 2013; Bresler, 2006).

Images are interwoven in our cultures, societies and personal narratives therefore, it is important to recognize that concept maps can have various meanings in different contexts (Drew & Guillemin, 2014; Pink, 2009; 2013). How the audience (including the individual) sees and interprets the map through their own cultural lens affects the meaning(s) that they absorb and pass on to others. Qualitative concept maps encourage mutual absorption in turn facilitating the exchange of knowledge that is unique and individually meaningful.

2.3.2   Detail in the Parts and Recognition of the Whole

This framework emphasizes the need for researchers to recognize and appreciate the details of concept maps, while simultaneously respecting how each map contributes to a larger body of knowledge (Bresler, 2006, Drew & Guillemin, 2014; Rose, 2012). It takes conscious effort on the part of the researcher to look at each element of the participant's map, and refrain from habitually scanning over details. Concurrently, the

researcher must take a step back and find common themes embedded within the maps, and link the visual data together to achieve a higher level of understanding (Armstrong, 2000; Bresler, 2006; Pink, 2013).

Uniqueness. As individuals interact and construct the world around them they develop their own unique and personalized understanding of various phenomenon (Denzin, 1994; Finlay & Ballinger, 2006). The manner in which one person interprets a situation can be very different from how another individual ascertains meaning from the same event. This variability is embraced and celebrated in qualitative concept mapping. As researchers we attempt to understand phenomenon based on the meanings that people bring to them (Creswell, 2014; Denzin & Lincoln, 2005; Finlay & Ballinger, 2006). Uniqueness is embedded within the details of an individual's concept map. These details encourage a connection between the voice of the participant and the audience. For example "the story of Anne Frank reaches us in ways that the number "six million" does not. A focus on the individual allows for a noticing, a perception, and a connection." (Bresler, 2006, p. 57). This dialogic connection with the uniqueness of a participant's concept map encourages the researcher to move beyond their preconceptions, and expand their conventional interpretations therefore generating new and meaningful knowledge (Bulter-Kisber & Poldma, 2010; Bresler, 2006; Corbin & Strauss, 2008).

Aesthetic Distance. Aesthetic distance is defined as the distance between the audience's reality and the fictional reality created by a visual image (Bullough, 1912; Cupchick, 2002). It is a position that is centrally located between excessive distance (withdrawn from the image), and insufficient distance: being too close to the image that the audience interprets it as a part of reality (Bresler, 2006; Cupchick, 2002). It allows the audience to appreciate the voice and the unique story of the individual while at the same time being cognisant of their own values and beliefs. Aesthetic distance is important in concept mapping because it enhances empathetic understanding by establishing a sincere connection between the audience and the map (Bresler, 2006). Empathetic understanding involves an emotional connection between the researcher, participant and the audience

(Gair, 2012; Lapum et al., 2012; Weber, 1949). Keen (2006) referred to this relationship as a tri-directional empathy bond that brings authenticity and humanness to the research process. The tri-directional nature of the empathetic bond created through aesthetic distance mirrors the complexity of the tri-directional voice of the participant.

  Emplacement. The sensuous interaction between the body, the mind and the environment of both the researcher and the participant, in the creation of meaning is defined as emplacement (Hurdley & Dicks, 2011; Howes, 2005; Pink, 2009). Pink (2009) describes emplacement as a concept that advances the concept of embodiment by recognizing the body as apart of the environment. " The body provides us not simply with embodied knowing and skills that we use to act on or in that environment, but that the body itself is simultaneously physically transformed as part of this process" (Pink, 2011a, p. 347).

  Through the mapping process the individual may experience physical changes related to the creation, analysis and interpretation of a map. Cognitive changes can be evident in learning and through the development of new pathways of understanding. Physical and emotional expressions of self can occur through the development of a concept map that connects experiences that are sensitive or challenging. It is through acknowledging these interactions during the mapping process that one can deepen their understanding of how someone creates a concept map and utilizes it as part of their learning and/or reflexive experience.

2.3.3 Sensory Experience

  Concept maps elicit visual data for analysis and interpretation, however the authors propose that concept maps offer an opportunity for the participants and the researchers to use their multiple senses throughout the mapping process. The use of all the senses is fundamental to how we learn and understand the world around us (Case-Smith et al., 2010; Pink, 2009; 2011b). The senses are seen as interconnected, and concept maps are created as a piece of visual data for the participant and the audience to

interact with. Acknowledging the importance of the sensory experience in the construction of knowledge opens new pathways of exploration and understanding in qualitative research (Ingold, 2000; Pink, 2006; 2009; 2011b; 2012).

Intellectual and Emotional Investment. Throughout the process of creating, analyzing and interpreting qualitative concept maps there is an interconnection between the intellectual and emotional elements of an individual. Emotions are constructed of various sensorial experiences. Emotional learning emotional intelligence embraces emotional awareness in relation to the self and others (Akerjordek & Severinsson, 2007; Gilbert, 2010; Matthews, Zeidner & Roberts, 2012). It fosters a deeper understanding of personal identity and facilitates optimal learning and development. Emotional intelligence is based on self-awareness, motivation, self-regulation, empathy and adeptness in relationships (Akerjordek & Severinsson, 2007; Goleman, 1995; Matthews et al., 2012). It is a powerful and interactive relationship between cognitive understanding and emotional engagement that brings meaning and relevance to qualitative concept mapping. This marriage between the analytical and the creative process creates a rich space where new learning can occur. Sullivan (2005) describes how the science of sight and the creativity of the eye mirror the relationship between the practices of the scientist and those of the artist. Concept mapping allows the individual to adopt the roles of both the scientist who is an analytical problem solver, and the artist who expresses themselves through creative mediums. Concept mapping is an outward response to an event that is experienced internally (Drever, 2002; Kinchin, 2013; Pink, 2009) that draws on both intelligence, and emotion with the purpose of producing meaningful learning.

In qualitative research the researcher is seen as "a central figure who influences, and perhaps actively constructs, the collection, selection and interpretation of data" (Finley, 2006, p.6). Researcher subjectivity is seen as an opportunity rather than a problem, (Finley, 2002; Trafimov, 2014) and celebrates the co-construction of knowledge among the participants, researchers and the audience (Bott, 2010; Trafimov, 2014). Subjectivity involves the linking of intellect and emotion. It helps to shape perceptions,

interpretations and enhances the way in which the mapping process resonates with the participant, the researcher, and the audience (Bresler, 2006; Pink, 2009). It can be seen as enabling and facilitating a mutual process of emotional attunement, and the sharing of subjectivities (Coburn, 2001; Pink, 2012). These points of conjunction that occur between the researcher, the participant, and the audience bring a sense of "human sameness" (Coburn, 2001) through the intellectual and emotional experiences of life events.

Humanness. Learning how to see and understand the message that the person behind the concept map is trying to share is an essential component to this proposed framework. The power imbalances that are embedded within the researcher-participant relationship need to be negotiated throughout the inquiry process. Ideally an egalitarian relationship will be constructed between parties, stressing the acknowledgement of one's equal right to contribute to the generation of knowledge (Ben-Ari & Enosh, 2013; Karnieli-Miller, Strier & Pessach, 2009). It is through the development of a respectful and understanding connection between the researcher and the participant that the element of humanness behind the concept map can be truly appreciated (Ben-Ari & Enosh, 2013; Karnieli-Miller et al., 2009). Humanness brings life, appreciation, and expressiveness to qualitative research, and is an essential element in the sensorial experience of concept mapping.

Due to the visual nature of the data collected in concept mapping, the interpretation of the audience beyond that of the researcher and the participant must also be considered. The seeing of an image always takes place in a social context that influences its impact (Drew & Guillemin, 2014; Rose, 2012; Pink, 2012). It is important to recognize that not all audiences will be able to respond to the way of seeing that is invited by the participant (Rose, 2012; Pink, 2012; 2013). It is the multimodal nature of qualitative concept maps that can help emplace the image, and bring a sense of humanness to the process that can be helpful in illuminating the voice of the participant (Clark, 2011; Pink, 2011b; Rose, 2012).

Four criteria defined by Bogdan & Taylor (1989) can be useful in embedding humanness in concept mapping and they include: attributing thinking to the other, seeing uniqueness in the other, viewing the other as reciprocating and defining a social place for the other. These perspectives enable the audience to connect and find sameness in the experiences of the participant and themselves (Bogdan &Taylor, 1989; Russell & Diaz, 2013). Humanness is therefore strongly tied to the notions of aesthetic distance and empathetic understanding. It acknowledges and celebrates the human connection behind qualitative research, and bridges the distance between the understanding of audience and the participant message (Gadamer, 1988; Husserl, 1962; Russell & Diaz, 2013).

2.4   Future Directions

Through this paper the authors have provided a brief history of concept mapping and articulated its ties to quantitative research methodologies. Qualitative concept mapping was then highlighted as a multimodal and creative form of visual data. It can provide a rich understanding of a participant's learning experience and their subjective meanings related to a phenomenon. In order to expand concept mapping into the qualitative research domain, a new framework needed to be developed in order for qualitative concept mapping to align cohesively with the constructivist-interpretivist paradigm. Adapted from the work of Bresler (2006), Rose (2012) and Pink (2009) the authors have outlined three criteria to consider when constructing, analyzing and interpreting qualitative concept maps. These criteria include:

1) Voice: Tri-directional Voice and Mutual Absorption

2) Detail in the Parts & Recognition of the Whole: Uniqueness, Aesthetic Distance and Emplacement

3) Sensory Experience: Intellectual and Emotional Investment, and Humanness.

Each of these criteria is interdependent and informs each other through a dialectical relationship. The complexity and interconnectedness of this framework mirrors the intricacy of qualitative concept mapping.

Future research needs to explore how this proposed framework would be applied in qualitative research studies. Further discussion needs to be generated around what it would look like to engage with these categories during the mapping process, and throughout data analysis. Extending the description of categories would allow for the generation of guidelines around the application of this method in future research studies. This paper is the beginning of the discussion around acknowledging concept mapping as a multimodal art form that fosters new connections and understandings between the participants, the researchers and, the audience.

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Chapter 3

3 Concept Mapping and the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

The purpose of this paper is to present an intervention framework that combines the visual method of concept mapping and the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach to facilitate the development of life skills in adolescents with Autism Spectrum Disorder (ASD). This paper summarizes and consolidates the current literature regarding the effectiveness of the CO-OP approach and concept mapping for individuals with ASD. New connections between these two approaches are highlighted, and the theoretical utility of this new framework is discussed in its application to adolescents with ASD. Embedding concept mapping within the CO-OP approach generates new knowledge that builds upon and enhances the existing evidence supporting the effectiveness of the CO-OP approach. The focus of this paper is highlighting the theoretical utility of combining the CO-OP approach and concept mapping. This study is part of a series of studies (chapter one, two and three of this dissertation) designed to provide occupational therapists with a new approach to the treatment of adolescents with ASDs.

3.1 Children with Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder (ASD) is the most common form of any neurological disorder or severe developmental disability in childhood (Autism Society Canada, 2012). Recent studies by Canadian researchers report that ASDs affect at least 1 in 94 individuals in Canada, and an estimated 100,000 individuals in Ontario (Autism Speaks, n.d.; National Epidemiologic Database for the Study of Autism in Canada, 2009). There is no consensus regarding the etiology of ASDs, and there is no cure for the disorder. Autism Ontario, 2012; Myers & Johnson, 2007). Individuals with ASD often display communication and social skill deficits, can be overly dependent on routines, are highly sensitive to changes in their environment, and can be intensely focused on particular

items or events (American Psychological Association, 2013).   The symptoms of ASD are variable in their severity ranging from mild to severe, and can be best understood as falling on a spectrum (American Psychological Association, 2013). This spectrum allows health care practitioners to account for the heterogeneous nature of each person's symptoms, and highlights the importance of recognizing the unique strengths and weaknesses of each individual.

3.1.1   Occupational Performance Problems

Individuals who are diagnosed with Autism Spectrum Disorders (ASDs) experience a range of occupational performance issues that impact their daily functioning (Case-Smith & Arbesman, 2008). The individual's symptoms affect their ability to participate effectively in their self-care, productivity and leisure routines (Case-Smith & Arbesman, 2008). Participation in occupations is essential to growth and development of children, and has a direct impact on an individual's health and wellbeing (Hilton, Crouch & Israel, 2008; Hocking, 2009; Law, 2000; Wilcock, 2001). Occupational engagement is fundamental to an individual's social connectedness, development of self-identify and overall happiness (Hasselkus, 2011; Wilcock, 2006; Whiteford & Wright-St Clair, 2005). Children with a diagnosis of ASD struggle with occupations within the home, school and community setting. Over time children's limited engagement leads to a decrease in the variety of occupations they participate in; they engage in more socially isolated activities, and they limit the environments in which they interact in (Hilton, Crouch & Israel, 2008). This narrowing of their occupational participation makes the variety of transitions from childhood to adulthood increasingly difficult (Autism Speaks, n.d.; Billstedt, Gillberg & Gillberg, 2005).

Cognitive profiles are a collective summary of the strengths and weaknesses in the cognitive functioning of a diagnostic group. They are determined through a variety of standardized tests, replicated over a number of systematic trials in order to help explicate the profile of cognitive abilities unique to a specific population. The cognitive profiles of individuals with ASD help to illuminate the underlying skill deficits that result in their

occupational performance problems. Individuals with ASD struggle with central coherence that makes the formation of overarching connections between concepts difficult (Happe & Firth, 2006; Roberts & Joiner, 2007). Deficits in these processes prevent individuals with ASD from pulling together information to generate a higher-level meaning, and instead they focus on the details of a concept rather than understanding the global picture (Happe & Firth, 2006; Roberts & Joiner, 2007). Individuals with ASD commonly have difficulties with executive functioning (Autism Speaks, n.d.; Corbett, Constantine, Hendren, Rocke & Ozonoff, 2009; Kaweski, 2011). This is demonstrated through impairment or a deficit in the higher-order processes that enable an individual to plan, sequence, initiate, and sustain their behavior towards a chosen goal (Winner, 2002). Executive functioning also incorporates the ability to make adjustments to one's behavior through the use of continuous or dynamic feedback when engaging in an activity or task (Carlson, Moses & Claxton, 2004; Winner, 2002). Recently, the literature has supported the direct connection between executive functioning and theory of mind in children (Baron Cohn, Ring, Wheelwright, Bullmore, Brammer, Simmons & Williams, 1994; Ozonoff, Pennington & Rogers, 1991; Pellicano, 2007; Winner, 2002). Individuals with ASD display difficulties with theory of mind, which is understood as the ability of an individual to consider the perspective of others, such as recognize and understand their emotions, motives and intents even when they might be different from one's own (Baron-Cohn, Leslie & Frith, 1985). The inability to use theory of mind causes individuals with ASD to often misinterpret other people's messages, and struggle with monitoring and responding to the social cues/social needs of their communicative partners (Hale & Tager-Flusberg, 2005; Winner, 2002). Difficulties in these two areas impact an individual with ASD's ability to engage appropriately and meaningfully with their peers.

3.2   Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

Cognitive Orientation to Daily Occupational Performance (CO-OP) approach is "a client-centred, performance-based, problem solving, intervention that enables skill

acquisition through a process of strategy use and guided discovery." (Polatajko & Mandich, 2004, p. 2,). It is a performance-based approach that emphasizes the importance of enabling the child to identify, develop and utilize cognitive strategies to manage activities of daily living more effectively (Missiuna, Malloy-Miller & Mandich, 1998; Polatajko & Mandich, 2004). The CO-OP approach is informed by relevant and current theory within occupational therapy practice. Its foundational theories are drawn from behavioral and cognitive psychology, health, human movement science and occupational therapy (Feuerstien, Rand, Hoffman & Miller, 1980; Gentile, 1987; Polatajko & Mandich, 2004; Meichenbaum, 1977; Pressley, Woloshyn, Lysynchuk, Martin, Wood & Willoughby, 1990). Unlike traditional intervention approaches, the CO-OP approach does not focus on changing the ability of the client directly, instead it uses domain specific strategies embedded within a larger global problem solving framework to augment ability and in turn produce skilled performance.

A global strategy is described as a framework that is used to control and coordinate other domain specific cognitive strategies (Pressely, Borkowski, & Schneider, 1987). Global strategies are intended to be used over long periods of time, and implemented in a variety of different contexts. The global cognitive strategy GOAL-PLAN-DO-CHECK (GPDC) used in CO-OP approach highlights self-instructional training and focuses on activity and participation as opposed to impairment and disability (Camp, Blom, Herbert & VanDoorwick, 1976; Meichenbaum, 1977; 1991 Missiuna, Mandich, Polatajko, Malloy-Miller, 2001). This global problem solving strategy makes every effort to eliminate barriers and create facilitators that will essentially enable the participation of all children in their chosen activities (Missiuna et al., 2001; World Health Organization, 2001; Polatajko & Mandich, 2004). The CO-OP is strongly rooted in Verbal Self Guidance (VSG) developed by Meichenbaum (1991) which encourages learners to verbalize their problem solving process as they work through a complex task. In the CO-OP approach the individual uses the global problem solving framework of GPDC to talk themselves through their chosen activity:

GOAL: What do I want to do?

PLAN: How am I going to do it?

DO: Do it!

CHECK: How well did my plan work? Do I need to revise my plan?

If the desired GOAL was achieved, then the PLAN is kept, if not, a new PLAN is devised and the child implements the DO and the CHECK elements of the global problems solving framework until their chosen GOAL is achieved (Missiuna et al., 2001; Polatajko & Mandich, 2004; Polatajko, Mandich, Miller & Macnab, 2001a; Polatajko, Mandich, Missiuna, Miller, Macnab, Malloy-Miller & Kinsella, 2001b). Initially the process of talking oneself through a task happens overtly (Vygotksy, 1978). Over time and with additional practice the GPDC steps become internalized and eventually covert, therefore speech guides the child's behavior (Missiuna et al., 2001; Polatajko & Mandich, 2004; Vygtosky, 1978).

Domain specific strategies (DSSs) are cognitive strategies that are embedded with the global problem solving framework of GPDC. They are cognitive strategies that are specific to a particular task or part of a task, and are intended to be used for only a short period time (Polatajko & Mandich, 2004; Pressely et al., 1987; Toglia, Rodger & Polatajko, 2012). DSSs can also be individualized to the person and can vary with the specific performance problem of the client (Polatajko & Mandich, 2004; Rodger, Ireland, Vun, 2008). The global problem solving framework of GPDC is used in an iterative fashion, with frequent modifications to the PLAN and the supplementation of various DSSs. Originally the CO-OP approach was implemented with children with DCD and seven classes of DSSs were identified and summarized by the mnemonic *VG(BATS For 2 V's*) (Polatajko & Mandich, 2004) (see Table 2). Each of these DSSs addresses a different performance problem to help support skilled performance.

Table 2. The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach domain specific strategies: VG (BATS For 2 V's).

	Strategy	Description
V	**B**ody position	Any verbalization of attention to, or shifting of, the body, whole or in part, relative to the task.
E **R**	**A**ttention to doing	Any verbalization to cue attending to the doing of the task.
B **A** **L**	**T**ask specification/modification	Any discussions regarding the specifics or modification of the task, or parts of the task, or any modification of the task or any action to change the task, or parts of the task.
G **U**	**S**upplementing task knowledge	Any verbalization of task specific information or how to get task specific information.
I **G**	**F**eeling the movement	Any verbalization of attention to the feeling of a particular movement.
A **N**	**V**erbal motor mnemonic	A name given to the task, component of the task or body position that evokes a mental image of the required motor performance.

C **E**	<u>V</u>erbal rote script	A rote pattern of four or five clear concise words that are meaningful to the child to guide a motor sequence.

*Adapted From (Mandich & Polatajko, 2004; Mandich, Polatajko, Missiuna, & Miller, 2001)

Currently, the CO-OP approach has been used successfully with a number of different client populations. Individuals with ASD (Phelen, Steinke & Mandich, 2009; Rodger & Brandenburg, 2009; Rodger et al., 2008; Rodger, Pham & Mitchell, 2009; Rodger, Springfield & Polatajko, 2007; Rodger & Vishram, 2010), Traumatic Brain Injuries (TBIs) (Cernich, Kurtz, Mordecai & Ryan, 2010; Dawson, Gaya, Hunt, Levine, Lemski & Polatajko, 2009; Galvin & Mandalis, 2005; Missiuna, DeMatteo, Hanna, Mandich, Law, Mahoney & Scott, 2010) stroke (Henshaw, Polatajko & McEwen, 2011; McEwen, Polatajko, Huijbregts & Ryan, 2009; McEwen, Polatajko, Huijbregts & Ryan, 2010; Polatajko, McEwen, Ryan & Baum, 2012) and developmental disabilities (Gharebaghy, Rassaffian, Behnia, Karbalaee, Mirzaee, 2013; Mandich, Polatajko & Rodger, 2003; Poltajako & Cantin, 2010) have shown improvements in their occupational performance after implementing the CO-OP approach in their treatment programs. The ability to implement the CO-OP approach with a number of different client populations demonstrates the strength and validity of its theoretical foundations and key features.

3.3 Individuals with Autism Spectrum Disorder (ASD) and the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

There is currently a lack of empirical evidence displaying the positive long-term effectiveness of occupation-based interventions for individuals with ASD (Parham et al., 2007; Phelen et al., 2008; Rodger et al., 2008). Due to the heterogeneous nature of this population, the approach to intervention must be targeted to the unique strengths of the

individual. Preliminary data have shown the effectiveness of the CO-OP approach for children with ASD (Rodger & Brandenburg, 2009; Rodger & Vischram, 2010; Rodger et al., 2008; Rodger et al., 2009; Phelen et al., 2009). Upon review of the current literature, the following features of the CO-OP approach make it an effective intervention in enabling individuals with ASD to reach their full occupational potential.

3.3.1   Focus on Occupation

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach is a top-down, occupationally based intervention approach that places the element of *doing* at the core of its global problem-solving framework (Polatajko & Mandich, 2004; Rodger & Polatajko, 2010). Participation in an activity that is chosen by the client fosters their engagement and contributes to a sense of health and well-being. Engagement in these meaningful occupations allows for the expression of identity, connects people, and builds self-efficacy (Hasselkus, 2011; Hocking, 2009; Polatajko & Mandich, 2004; Townsend & Polatajko, 2007). Learning through *doing* is an important concept for enhancing the skill acquisition and performance of individuals with Autism Spectrum Disorder (ASD). An area of weakness that many people with ASD experience is difficulty with the transfer and generalization of information (Cowan & Allen, 2007; Mesibov & Shea, 2010; Shangraw, 2012). Therefore directly participating in a chosen activity is embedded within a contextually relevant environment, an individual with ASD has a greater chance of learning and applying new information (Cowan & Allen, 2007; Mesibov & Shea, 2010; Strauss, Esposito, Polidori, Vicari, Valeri & Fava, 2014).

3.3.2   Motivation

Motivation can be defined as "an explanation for why people are interested in a certain activity and not interested in another. Motivation explains how people gain an identity that is associated with their participation in particular occupations" (Christiansen, 2004, p.123). The occupation that an individual chooses to engage in influences his/her definition of self adds to their experiences, and creates new meaning that is needed in order to derive satisfaction from their lives (Christiansen, 2004; Hammell, 2013; 2014;

Hasselkus, 2011). Motivation also impacts learning, persistence and the willingness to participate (Dweck, 1986; Mega, Ronconi & De Beni, 2014).

Motivating individuals with ASD to engage and participate in activities is often challenging. This is because they are directly and indirectly impacted by key factors that influence motivation (Koegel & Mentis, 1985; Koegel, Singh & Koegel, 2010; Palmen & Didden, 2012; Stasolla, Damiani & Caffo, 2014; Stewart, 2014). The factors that strongly influence an individual's motivation are: learning history; learning styles; internal and external incentives; expectations of success or failure; meaningfulness and purposefulness of the task from the perspective of the learner; and task-surrounding environmental variables which affect attention and achievement (Koegel & Mantis, 1985; Palmen & Didden, 2012; Stasolla et al., 2014; Stewart, 2014). Difficulties with task engagement in persons with ASD have been identified in performing occupations across several domains. These included daily living tasks, academics, vocational employment, social interactions with peers, and play/leisure activities (Bauminger-Zviely, Eden, Zancanaro, Weiss & Gal, 2013; Koegel et al., 2010; Palmen & Didden, 2012; Potvin, Snider, Prelock, Kehayia & Wood-Dauphinee, 2013).

Embedded within the CO-OP approach are purposeful motivators that highlight the role of conscious thought and cognition in determining activity choice and participation (Christiansen, 2004). Cognitive interventions like the CO-OP approach offer individuals choice and control, which allow participants to derive a sense of self-determination and empowerment from their engagement in their chosen occupations (Miller-Polgar & Landry, 2003). Motivation is a key determinant in the ability of an individual to transfer and generalize newly developed skills to different contexts and occupations (Phelen et al., 2006; Rodger et al., 2008).

3.3.3   Transfer and Generalization

Generalization is defined as the ability of an individual to apply what they have learned in therapeutic rehabilitation to different occupations and contexts (Sufrin, 1984;

Toglia, 1991; 2001; Toglia, Rodger & Polatajko, 2012). "Transfer of learning refers to the degree to which learning one skill influences the learning of another skill" (Polatajko & Mandich, 2004, p.33). Generalization and transfer of skills are important because in order for the outcomes of therapy to be meaningful (cognitive strategy development and skill acquisition) the individual must be able to use them appropriately in the complex and multifaceted context of daily life, and apply their learning to the development of new skills.

Individuals with ASD have difficulty with the generalization of newly developed skills to different environments (Brown & Bebko, 2012; Cowan & Allen, 2007; Happe & Firth, 2006). They also struggle with transferring their previous knowledge and cognitive strategies into the learning and development of new occupational skills (Brown & Bebko, 2012; Cowan & Allen, 2007; Happe & Firth, 2006). Individuals with ASD acquire new knowledge that is translational and sustainable through their active involvement in goal setting, planning and implementation of rehabilitation programs (Wright, Wright, Diener & Eaton, 2014). It is therefore important to acknowledge the collaborative role that participants must have in the rehabilitation process, and the need for skill practice in contextually relevant environments (Rodger et al., 2007; Rodger & Vishram, 2010; Rodger et al., 2009).

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach addresses the importance of the transfer and generalization of skills throughout its seven key features. These key features include: client chosen goals, dynamic performance analysis (DPA), cognitive strategy use, guided discovery, enabling principals, parent/caregiver involvement, and the intervention format (Polatajko & Mandich, 2004; Polatajko et al., 2001b). Scaffolding is embedded within the seven features of the CO-OP approach and aides in the generalization of cognitive strategies through bridging newly acquired skills to real life situations through the use of feedback from a more competent peer/adult (Case-Smith, Law, Missiuna, Pollock & Stewart, 2010; Meichenbaum, 1977; Missiuna et al., 2001). The CO-OP approach emphasizes the necessity of carrying out

individualized treatment plans in relevant environments to ensure optimal learning (Meichenbaum, 1977; Polatajko & Mandich, 2004; Rodger & Polatajko, 2010). The skills of generalization and transfer occur during the learning process, they do not occur automatically and therefore must be addressed throughout the cognitive intervention process (Sternberg, 1987; Toglia, 1991; Toglia et al., 2012). The CO-OP approach focuses on the generalization and transfer of skills through the following means:

- Maintaining client motivation: this allows for optimal learning to occur and ensures that the individual agrees to using their newly developed cognitive strategies in various environments, and will attempt to apply them to different tasks. Working from a client-centred approach places participants in the role of collaborators throughout the therapeutic process. Promoting participant autonomy enhances their motivation and aides in their ability to transfer and generalize skills (Meichenbaum, 1977; Polatajko et al., 2001b).

- Contextually relevant practice: this ensures that the skill is practiced in a number of different environments that are meaningful and relevant to the chosen skill. This exposes the individual to a number of different opportunities to practice the skill and uncover commonalities between situations/tasks (Polatajko & Mandich, 2004; Toglia, 1991). Discovering these commonalities among tasks, environments and one's own performance develops a strong knowledge base that enables the transfer and generalization of skills and cognitive strategies.

- Direct exposure to the task: working from an occupationally based perspective allows the individual to engage directly in their chosen activity within a meaningful and relevant context. Offering the individual the opportunity to engage directly in their chosen occupation allows for the interaction of many different systems, including those of the environment, task and the individual characteristics of the person. This interaction provides pertinent information directly and indirectly to the individual to aid them in the acquisition,

development, transfer and generalization of new skills and cognitive strategies (Bernie & Rodger, 2004; Perry, 1998).

The process of Dynamic Performance Analysis (DPA) is an important feature of the CO-OP approach that promotes the transfer and generalization of new skills and cognitive strategies. DPA is an iterative process that occurs throughout the treatment session. It focuses on solving performance problems and identifying possible solutions through gaining a deeper understanding of the connection between the task and environmental demands, and various domain specific cognitive strategies that can be implemented to enhance occupational performance (Polatajko et al., 2001; Polatajko & Mandich, 2004). The individual through the technique of scaffolding eventually internalizes the process of DPA.

3.3.4   Flexibility

The occupations that an individual participates in over time are defined as their occupational trajectory (Humphry & Womack, 2014). Occupational trajectories are fluid in nature and can change due to different physical, environmental or occupational transitions. Some examples of these transitions include experiencing a disability, moving to a different home, getting a job, or choosing to participate in a new social/leisure pursuit. As individuals grow older and adopt different life roles, they experience different tasks/activities that might become barriers to their occupational success (Humphry & Womack, 2014). As people encounter transition points in their lives their occupations change, as do the cognitive strategies that they employ. Fluidity and flexibility in the attributes and uses of cognitive strategies enable them to be used over the life course, and with individuals who experience various disabilities (Toglia, 2011).

The symptoms of ASD are variable in their severity ranging from mild to severe, and can be best understood as falling within a spectrum (American Psychological Association, 2013). This spectrum of functioning allows for health care practitioners to account for the heterogeneous nature of each person's symptoms, and highlights the

importance of recognizing the unique strengths and weaknesses of each individual (Roger & Vismara, 2014). Individuals who are diagnosed with an ASD experience a range of occupational performance issues that impact their daily functioning in their self-care, productivity and leisure routines (Ashburner, Rodger, Ziviani & Hinder, 2014; Case-Smith & Arbesman, 2008).

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach is a cognitive intervention that has successfully been implemented with a variety of different populations of people with various disabilities across the lifespan. In addition research has been conducted investigating the use of the CO-OP approach as an intervention for individuals with ASD for addressing both socio-emotional and motor-based goals (Phelen et al., 2007; Rodger et al., 2007; Rodger et al., 2008; Rodger & Vishram, 2010). Through the adaption and expansion of the domain specific strategies initially identified by Mandich et al. (2001) the CO-OP approach has proven to be a beneficial intervention strategy for a variety of occupational goals. The large scope of occupational performance problems that can be addressed through the implementation of the CO-OP approach framework is especially important for individuals with ASD. This is because of the breath and depth of occupational performance issues that they experience on a daily basis.

3.3.5   Autonomy

Autonomy is defined as "the freedom to make choices based on consideration of internal and external circumstances and to act on those choices" (Creek, 2010, p.118). It is a dynamic concept that is dependent on a person's age, gender, roles, culture and responsibilities (Creek, 2010; Hagedorn, 1995; Hammell, 2013a; 2013b). The amount of autonomy an individual possesses at a particular time is not absolute, and can fluctuate depending on internal and external factors (Creek, 2010; Hammell, 2013a; 2013b). Autonomy is directly linked to client-centred practice, and is a core concept in occupational therapy and occupational science research (Hammell, 2013a; 2013b; Townsend & Wilcock, 2003).

Historically, external reinforcements have been used to help individuals with ASD learn new skills, and to reduce negative behaviours. The use of external rewards creates a relationship of dependence and decreases autonomy (Shea, Millea & Diehl, 2013). Fostering autonomy enhances intrinsic motivation, which is necessary in supporting optimal functioning, facilitating development, and enhancing social wellbeing (Deci & Ryan, 2000; Shea et al., 2013). Autonomy and independence are important contributors to the success of individuals with ASD in life skills, academics and in the workplace (Hume, Boyd, Hamm & Kucharczyk, 2014; Shea et al., 2013).

Recently there has been a reconceptualization of ASD within the research community that challenges the traditional deficit driven biomedical model. A strength-based approach is being adopted to help to understand individual differences through the involvement of people with ASD, along with their families, schools and workplaces (Kapp, Gillespie-Lynch, Sherman & Hutman, 2013; Rodger & Brandenburg, 2009). Conducting research and interventions from this participant driven, strength- based approach helps to develop a stronger science that is translational and sustainable (Hammell, 2006; Kapp et al., 2013; Wright et al., 2014).

One of the key features of the CO-OP approach is client-chosen goals. Enabling an individual to choose occupational goals that are relevant and meaningful to them enhances their self-efficacy and autonomy (Missiuna et al., 2001; Polatajko & Mandich, 2004). The CO-OP approach is a therapeutic intervention that recognizes the importance of the individual building their independence through the application of cognitive strategies to improve their occupational performance in their chosen goals (Missiuna et al., 2001; Polatajko & Mandich, 2004; Polatajko et al., 2001a; Polatajko et al., 2001b 2001; Toglia, 2011).

3.4   Concept Mapping

Concept maps are valuable tools used to assist individuals in visualizing the journeying nature of a concept's development (Butler-Kisber & Poldma, 2010; Hunter,

Lusardi, Zucker, Jacelon & Chandler, 2002). They are described as 'graphical tools for organizing and representing knowledge' (Novak & Cañas, 2008, p. 1). Concept maps reveal an individual's decision making process generated from the integration of previous knowledge with new information and future insights (Gallenstein, 2005; Hunter et al, 2002). Traditionally, concept maps include concepts that are usually enclosed in a circle or box arranged in a hierarchical fashion with the most general concept at the top of the map and the more detailed explanations below (Eppler, 2006; Moon, Hoffman, Novak & Cañas, 2011; Passmore, 2014). Relationships between concepts are represented by unidirectional or bidirectional arrows that also contain linking words or phrases that form a meaningful statement (Moon et al., 2011; Novak & Cañas, 2008; Passmore, 2014). The focus question acts as a point of reference from which the concept map is generated. It can pertain to some situation or event that the researcher is trying to better understand and creates the context for the concept map (Moon et al., 2011; Novak, 1990a;1990b; 2010; Novak & Cañas, 2008).

Concept maps facilitate learning in a meaningful way by illuminating the individual's learning process through the creation and use of a visual schematic. They facilitate the creative interaction between the individual, their current cognitive structures and new information (Passmore, 2014; Roberts & Joiner, 2007). Embedded within the structure of concept mapping is a creative and qualitative element that brings humanness and meaning into the learning process. This creative component appeals to the different senses of the individual allowing for a more holistic learning experience (Taylor & Littleton-Kearney, 2011, Wilson et al., manuscript in preparation). For more information related to the purposed concept mapping framework see chapter 1 of this dissertation. The visual and the cognitive assets of concept mapping theoretically possess many features that may have a positive effect on the learning of individuals with ASD (Roberts & Joiner, 2007; Wilson et al., manuscript in preparation).

3.4.1 Individuals with Autism Spectrum Disorder (ASD) and Concept Mapping

Individuals with Autism Spectrum Disorder (ASD) have unique strengths that can be utilized to assist them to reach their full occupational performance potential. Although individuals with ASD present as a heterogeneous population commonalities have been found regarding the predisposition of individuals with ASD towards visual processing (Ring, Baron-Cohn, Wheelwright, Williams, Brammer, Andrew & Bullmore, 1999; Roberts & Joiner, 2007). Various studies have outlined that visual supports enhance independence, facilitate the generalization of newly developed skills, make abstract concepts more concrete, and enhance the processing and retention of information for individuals with ASD (Rao & Gagie, 2006; Roberts & Joiner, 2007).

Concept mapping is a unique and versatile visual method that draws on the strengths of individuals with ASD (Kimhi, 2013; Roberts & Joiner). Currently there is little research that has been conducted applying the method of concept mapping with individuals with ASD. However, a wealth of information has been produced and systematically replicated that demonstrates the effectiveness of visual supports and graphic organizers in supporting individuals with ASD in skill acquisition, retention and generalization (Fleury, Hedges, Hume, Browder, Thompson, Fallin, El Zein, Klein Reutebuch & Vaughn, 2014; Hart & Whalon, 2008; Kimhi, 2013; Rao & Gagie, 2006; Roberts & Joiner, 2007). Many commonalities exist in the theory and structure that underpin visual supports, graphic organizers and concept maps. These commonalities include:

- The application of visual processing skills for enhanced understanding and information retention (Caron, Mattrom, Rainville & Chouinard, 2004; Kinchin, 2013; Novak & Cañas, 2008; Roberts & Joiner, 2007).

- Enhances gestalt thinking, and promotes a more global understanding of information and its relationship to a broader meaning (Firth & Happe, 1999; Novak & Cañas, 2008; Roberts & Joiner, 2007;

- Makes the understanding and interpretation of abstract concepts more concrete (Roberts & Joiner, 2007; Gallenstein, 2013).

- Facilitates the transfer and generalization of new concepts and skills to different environments and situations (Gallenstein, 2013)

- Allows for flexibility and the representation of individuality in its design and implementation (Kinchin, 2013; Kinchin & Hay, 2000).

- Enhances independence and individual autonomy over one's learning (Roberts & Joiner, 2007)

Therefore because of these commonalities, concept mapping theoretically possesses many characteristics that would be beneficial for the learning and development of individual with ASDs.

3.5 Concept Mapping Embedded Within the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

The CO-OP is a verbally based cognitive intervention that is focused on enhancing an individual's occupational performance (Polatajko & Mandich, 2004; Polatajko et al., 2001b; Rodger & Polatajko, 2010). The work of Meichenbaum (1977) and his focus on verbal self-instruction was adopted as a cornerstone for the CO-OP approach. The strong verbal component of the CO-OP approach may not meet the learning needs of all people that could benefit from this occupationally based, client-centred framework. Inserting concept mapping into the CO-OP framework offers the opportunity to expand the approach to allow for the support and guidance of individuals with different learning styles. It is important to understand that learning preferences or styles of individuals are not exclusively situated in one sensory medium. Individuals learn through a blending of the senses, and employ multiple strategies to problem solve through difficult tasks (Newcombe & Stieff, 2012). By embedding concept mapping

within the CO-OP approach one can address an individual's multiple learning styles and appeal to their different senses.

Concept mapping is a method that changes words into pictures and visually represents their connections. The process of concept mapping "harnesses the power of our vision to understand complex information "at a glace". " (Ricon, 2010, p. 685). The concept mapping process is dialectical in nature and supports the individual in moving from the written analytic text to the visual and back again. It can help to synthesize ideas that are becoming evident in the learning process that are difficult to put into words alone (Bulter-Kisber & Poldma, 2010). The flexibility of applying both verbally and visually based learning opportunities enhances the application of the CO-OP approach with individuals who have ASD.

Links and commonalities can also be found between the theoretical foundations of the CO-OP approach and concept mapping. Highlighting the cohesiveness of the two interventions and learning frameworks justifies their use together to promote the occupational performance of individuals with ASD. These theoretical commonalities and will be discussed below and can be found in Table 3. Commonalities in Theories: Links Between the CO-OP Approach and Concept Mapping.

Table 3. Commonalities in theories: Links between the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and concept mapping

CO-OP Approach	Concept Mapping	Commonalities
Social Constructivist (Vygotsky, 1978; Bruner, 1960; 1961;1978) -Foundational theory of learning (Missiuna et al., 2001; Polatajko & Mandich, 2004) -Social constructionist -Scaffolding for skill	**Social Constructivist Paradigm** (Vygotksy, 1978) -Concept maps developed as a product between researcher, participant and peers: Co-constructed knowledge (Kinchin, 2013; Wheeldon & Fauber, 2009)	-Built upon foundational social constructionist theory developed by Vygotksy (1978) -Co-constructed knowledge generated through scaffolding, participant/researcher relationship and peer relationships

cognitive development (Berk & Schanker, 2006; Mascolo, 2005; Polatajko & Mandich, 2004)		
Instrumental Enrichment (Feuerstein et al., 1980) -Foundational learning theory: Structural Cognitive Modifiability/mediated learning/instrumental enrichment (Feuerstein et al., 1980; Missiuna et al., 2001; Polatajko & Mandich, 2004) -Individuals with disabilities can enhance performance/learn through cognitive strategies interventions (Feuerstein et al., 1980)	**ASD and Cognitive Intervention** -Through Feuerstein's: structural cognitive modifiability/mediated/learning / instrumental enrichment suggests learning can occur for individuals with a disability; specifically the population of individuals with ASD (Ricon, 2010; Roberts & Joiner, 2007)	-Justifies reason for using cognitive approach (CO-OP and concept mapping) with individuals with ASD to develop their cognitive functions and operations to build metacognition
Guided Discovery Learning (Pressley et al., 1987;1990; 2003) (Bruner, 1960; 1961; 1978) -Foundational learning theory (Missiuna et al., 2001; Polatajko & Mandich, 2004) -Guided discovery is apart of one of the seven key features of the approach (Polatajko & Mandich, 2004)	**Methodological Underpinnings** -Built upon the same methodology (social constructivism) as CO-OP approach founded from (Bruner, 1960;1961;1978), (Papert & Harel, 1991) (Piaget, 1970) -Concept mapping is a different way to learn and discovery meaning (Novak & Canas, 2008) -Concept mapping is focused around collaboration instead of instruction (Kinchin, 2013; Wheeldon & Fauber, 2009 -Creating maps that are for	-Links to building autonomy/self efficacy -Leveling the power imbalances between researcher/therapist and participants -Participants create concept maps them for themselves (not necessarily for others), and through guided discovery choose cognitive strategies (CO-OP approach) -Learning through different mediums, and through supports (interactions)

	themselves: individualized meaning (Kinchin, 2013; Kinchin & Hay, 2000)	
Dynamic Systems -Foundational theory in CO-OP approach (Polatajko & Mandich, 2004; Thelen, 1995) -Dynamic interaction systems (i.e. environment, sensory, motor etc.) at all levels to develop occupational competencies (Humphry, 2002; Rodger, 2010)	**Qualitative Concept Mapping** (Wilson et al., 2014) -Qualitative concept mapping methodology- linking of multiple systems in the generation of maps (Bulter-Kisber & Poldma, 2010; Wheeldon & Faubert, 2009) -Interaction between many different systems…not valuing the importance of one over the other (Bresler, 2006; Wilson et al., 2014)	-Highlights the important role that multiple systems interacting in a dynamic manner makes in learning and occupational performance. -Links to foundational theories in CO-OP and qualitative concept mapping re the multiple factors that interact to generate a deeper understanding.
Self Efficacy and Self Determination -(Poulsen, Rodger & Ziviani, 2006) summarizes link between CO-OP approach and Self Determinaton Theory (SDT) (Deci & Ryan, 1985; 2000; 2012) -Elements of client-directed goal setting, self-monitoring/checking through global problem solving framework and incorporation of family/peers/teachers/therapist in treatment sessions (Polatajko et al., 2001; Polatajko & Mandich, 2004) -Links to Bandura (self efficacy theory and client centredness) as outlined in CO-OP foundational theories	**Self-Determination Theory (SDT)** (Deci & Ryan, 1985; 2000; 2012) -Concept mapping meets the three needs related to the SDT -Competence: built through deeper understanding/ meaning and continuous learning (Hay, 2007; Kinchin, 2013; Novak, 2010). -Competence: discovering their own pathways to generating knowledge, assimilating past, present and future understandings, transfer/generalization of skills (Chiou, 2008; Hay, 2007; Adesope & Nesbit, 2009; Novak, 2010)	-Links between the three needs of SDT (autonomy, competence and relatedness) to CO-OP, concept mapping, learning and skill transfer/generalization -Link between SDT, CO-OP and concept mapping to general well-being which is an important concept in occupational therapy and occupational science. -CO-OP and concept mapping elaborate on understanding of importance of intrinsic motivation through the underlying understanding/application of SDT.

(Bandura, 1982; 1997) (Missiuna et al., 2001) (Polatajko & Mandich, 2004)	-Autonomy: engagement, empowering the learning process (Novak, 2010). -Relatedness: co-constructed idea sharing process (Conceicao & Taylor, 2007; Nesbit & Olusola, 2006).	
Occupationally Based Learning -Occupationally based, top-down approach to intervention (Rodger & Polatajko, 2010; Polatajko & Mandich, 2004) -DO as apart of the global problem solving framework: engagement in the occupation (Meichenbaum, 1977; Rodger & Polatajko, 2010; Polatajko & Mandich, 2004) -Engagement in occupations promotes learning, self-efficacy and enhances motivation (Hasselkus, 2011; Polatajko & Mandich, 2004; Townsend & Polatajko, 2007).	**Mapping Experiences** -Concept mapping is a visual representation of the learning experience (Bulter-Kisber & Poldma, 2010 -Engaging in concept mapping facilitates the learning process (Novak, 2010) -Learning occurs through the act of doing (Kinchin, 2013; Novak, 2010) -The different ways of learning/experiencing through mapping, visual, tactile (multisensory) (Clark, 2011; Wilson et al., 2014).	-Justifies the different styles of learning for different populations of people: how both CO-OP approach and concept mapping can be beneficial and achieving their optimal level of occupational performance. -Places focus on the learning process for the individual; individualized learning -Meaning making through direct experience.

3.5.1   Social Constructivist Paradigm

Both the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and the method of concept mapping have a strong foundation in the social constructivist paradigm highlighted by Lev Vygostky (1978). They are built on the understanding that cognitive development occurs through the gradual internalization of concepts and relationships (Missiuna et al., 2001; Polatajko & Mandich, 2004; Rodger & Polatajko, 2010). Vygotksy's social constructivist theory emphasizes development as a

process not a product, and views learning as being embedded within and developed through, the interaction with the social, cultural and physical environments (Butler-Kisber & Poldma, 2010; Creswell, 2014; Crotty, 2003; Vygotksy, 1987; 1978). The CO-OP approach and concept mapping encourage the construction of knowledge in a meaningful way by facilitating the creative interaction between the individual, their current cognitive structures and new information. The CO-OP approach and concept mapping underscore the necessity of cooperative dialogues within and between individuals throughout the learning process, and values these communicative opportunities as pathways of knowledge construction (Berk & Shanker, 2006; Conceicao & Taylor, 2007; Polatajko & Mandich, 2004; Rodger & Polatajko, 2010).

3.5.2   Instrumental Enrichment

Instrumental Enrichment was developed from the work of Feuerstein et al., (1980) who developed a program based on the notion that an individual's cognitive performance can be modified through intentional mediated interventions (Ben-Hur & Feuerstein, 2011; Kozulin, Lebeer, Madella-Noja, Gonzalez, Jeffrey, Rosenthal & Koslowsky, 2010). Feuerstein's theory can be linked to the ecological and/or constructivist models of learning developed by Vygostky (1978) and Bruner (1960; 1961) which lay the theoretical foundation for both the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and the method of concept mapping (Kinchin & Hay, 2000; Kozulin et al., 2010; Novak & Cañas, 2008; Polatajko & Mandich, 2004). Feuerstein's approach is designed to help individuals with disabilities expand basic concepts, develop emerging cognitive functions, and improve intrinsic motivation (Ben-Hur & Feuerstein, 2011; Kozulin et al., 2010). The focus of Feuerstein's work is on exposing individuals to tasks situated in relevant environments, and to offer a mediated learning experience (Missiuna et al., 2001). The attention that Instrumental Enrichment gives to the context of learning mirrors the enabling principles of the CO-OP approach, and the contextual situatedness of concept mapping. Feurestein's mediated learning methods are similar to the scaffolding techniques found within the CO-OP approach, and

are congruent with concept mapping's theoretical underpinnings related to the production of co-constructed knowledge.

3.5.3   Guided Discovery

Guided discovery is a constructivist based educational approach that highlights the importance of constructing new knowledge through the merging of past experiences, with new information that is gathered through direct interaction with the task and the environment(s) (Bruner, 1961; Pressley, Roehrig, Raphael, Dolezal, Bohn, Mohan, Wharton-McDonald, Bogner & Hogan, 2003). Discovery learning is task exploration with the addition of instructional scaffolding established from Vygotksy's Zone of Proximal Development (Newman & Holzman, 2014; Pressley et al., 2003). Instructional scaffolding is the temporary support provided for the completion of a task that an individual might not otherwise be able to complete. This support can be provided in a variety of ways (e.g. modeling or questioning), and is individualized to the meet the learner's needs (Belland, 2010; Van de Pol, Volman & Belshuizen, 2010). The scaffolding process is a fluid, interpersonal activity in which both individuals are active participants in building a common understanding or inter-subjectivity through communicative exchanges (Belland, 2010; Van de Pol et al., 2010).

Guided discovery offers the learner the opportunity to approach an activity differently, and engages the individual by facilitating their independence throughout the learning process (Pressley et al., 2003). Guided discovery is one of the seven key features of the CO-OP approach. It focuses on enabling the individual to discover the cognitive strategies that will solve their performance problems themselves (Polatajko & Mandich, 2004; Polatajko, McEwen, Ryan & Baum, 2012). Concept mapping is also an individualized learning process. The mapping activity is unique to the person, and the final product holds meaning that is subjective, embedded within a specific context, and is most purposeful to the person who created it (Kinchin, 2013; Wheeldon, 2010; Wheeldon & Fauber, 2009). As an individual experiences increased success and enhanced occupational performance through the CO-OP approach and the method of concept

mapping, guided discovery learning shifts their reinforcement for learning from an external to internal locus of control (Bruner, 1961; Polatajko & Mandich, 2004). Through the shifting of the individual's motivation to an internally reinforced behaviour, guided discovery aids in enhancing the learner's level of self-efficacy, self-esteem and self-determination.

3.5.4   Self Efficacy and Self Determination

Intrinsic motivation is a key element in both the CO-OP approach and concept mapping. Intrinsic motivation is a natural inclination towards engagement in an activity, learning and exploration (Deci & Ryan, 1985; 2012; Ryan & Deci, 2000a; 2000b). It is driven by enjoyment and interest, and is essential to both cognitive and social development. The Self-Determination Theory (SDT) was developed by Deci & Ryan (1985) with the purpose of explaining human motivation and personality. The SDT highlights the importance of human's "inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration" (Ryan & Deci, 2000b, p. 68). The three needs of competence, autonomy and relatedness were identified as essential elements of the SDT that are fundamental in facilitating optimal functioning, positive social development, enriched self-esteem, and enhanced personal wellbeing (Deci & Ryan, 2012; Ryan & Deci, 2000a; 2000b;). All of these behavioural elements are important in client-centred practice, and fostering an individual's occupational performance (Boyle, 2014; Case-Smith & Clifford O'Brien, 2010; Poulsen et al., 2006;).

The motivational and client-centred climate that is created when individuals engage in the CO-OP intervention, demonstrates attention to the three needs of the SDT (Poulsen et al., 2006). First, the CO-OP approach encourages the child to engage in autonomous self-directed goal setting through collaborative client-centred practice processes (Polatajko & Mandich, 2004; Poulsen et al., 2006). Second, the CO-OP approach addresses the need for competence through the process of performance checking which is embedded within the global problem solving framework of GOAL-

PLAN-DO-CHECK (Polatajko & Mandich, 2004; Poulsen et al., 2006). Allowing the individual to engage in self-correction fosters autonomy and competence by building independence through the balancing of support, guidance and feedback (Polatajko & Mandich, 2004; Poulsen et al., 2006; Rodger& Polatajko, 2012). Lastly, the CO-OP approach implicitly addresses the need of relatedness by highlighting the role of teachers, parents, peers and therapists in sustaining an individual's motivation in occupations that fulfill the desire to be competent and self-driven (Polatajko & Mandich, 2004; Poulsen et al., 2006; Ryan & Deci, 2000b).

Concept mapping shares many commonalities with Self Determination Theory (SDT), and can foster the fulfillment of the three needs. Concept mapping enables individuals to develop competence through developing a deeper, more meaningful understanding of a subject through the processes of continuous learning (Hay, 2007; Kinchin, 2013; Novak, 2010; Novak & Cañas, 2008). Concept mapping advances an individual's understanding of a concept by allowing them the opportunity to develop their own problem solving pathways, and assimilate their past, current and future knowledge in a way that is meaningful to them (Hay, 2007; Novak, 2010; Novak & Cañas, 2008). The process of concept mapping enables individuals to develop competence in learning and problem solving so that these skills can be transferred and generalized to new situations and different environments (Chiou, 2008; Nesbit & Olusola, 2006). Concept mapping meets the need of autonomy in the SDT by facilitating an individual's ownership over their scholarship. It empowers people to become engaged in their learning process and views meaningful learning as underlining "the constructive integration of thinking, feeling and acting leading to empowerment for commitment and responsibility" (Novak, 2010, p.23). Finally, concept mapping can be understood as a co-constructed method of generating knowledge (Bulter-Kisber & Poldma, 2010; Conceicao & Taylor, 2007; Nesbit & Olusola, 2006). Working with peers, teachers, researchers and therapists demonstrates the need for relatedness in the SDT embedded within the concept mapping process.

3.5.5   Dynamic Systems Theory and Qualitative Concept Mapping

Dynamic Systems Theory emphasizes movement as a product of the on-going interaction of the person, the environment and the task (Case-Smith et al., 2009). Each general system has sub-systems, which interact to either support or constrain movement. No sub-system is of greater importance during this process therefore it is necessary to consider all aspects of the person, the task and the environment when trying to teach a new movement pattern (Bartlett & Sauvek, 2010; Case-Smith et al., 2010; Zwiker & Harris, 2009). Development is seen as a non-linear process, and the variability seen during motor skill acquisition is defined as a transition period or phase shift (Bartlett & Sauvek, 2010; Thelen, 1995). The Dynamic Systems Theory is one of the foundational theories supporting the CO-OP approach as it has been used to describe the acquisition of occupational skills (Case-Smith et al., 2010; Humphry, 2002; Polatajko & Mandich, 2004).

Concept mapping can also be regarded as a dynamic process that is created as a product of an individual's learning progression. Qualitative concept mapping embraces the multidimensional nature of learning, and highlights the interaction of the person, the task/concept and the environment in forming new understandings (Bulter-Kisber & Poldma, 2010; Freeman & Jessup, 2004; Wilson et al,). Qualitative concept mapping does not place the properties of the person, the environment or the task into a hierarchy of importance, instead it emphasizes the uniqueness of the mapping experience to each individual (Freeman & Jessup, 2004; Kinchin, 2013). This allows for the opportunity to hear the voice of the individual in their map, and in turn gain a greater understanding of how their learning experiences are shaped by their interactions (Butler-Kisber & Poldma, 2010; Clark, 2011; Hay, Kinchin & Lygo-Baker, 2008).

3.5.6   Occupationally Based Learning

The Cognitive Orientation to Daily Occupational Performance (CO-OP) approach is an occupationally based, top-down approach to solve occupational performance problems. It emphasizes engagement in meaningful occupations through a client-centred approach

that is embedded within current motor learning and occupational therapy theories and frameworks (Polatajko & Mandich, 2004; Rodger & Polatajko, 2010). The act of DOING is at the core of the global problem-solving framework Goal-Plan-Do-Check. It highlights the necessity of a hands-on active approach to learning, strategy development, and skill generalization and transfer (Meichebaum, 1977; Rodger & Polatajko, 2010; Polatajko & Mandich, 2004). In addition to cognitive strategy development, the engagement of the individual in the CO-OP approach promotes their health, wellbeing, develops their self-efficacy and enhances task motivation (Hasselkus, 2011; Polatajko & Mandich, 2004; Townsend & Polatajko, 2007).

Learning is experienced in an on-going, fluid and individualized manner throughout the concept mapping process. Learning is understood as a process and not only as an outcome (Kolb & Kolb, 2005). Concept mapping is a visual representation of an individual's learning from the conception of an idea through to its final products (Bulter-Kisber & Poldma, 2010; Novak, 2010). Learning occurs during the act of creating the concept map, through the act of *doing.* The method of mapping can be artistic in nature, and draw in elements of creativity to help explicate the individual's learning process (Clark, 2011; Wilson et al., manuscript in preparation). The learning experience is holistic in nature and involves thinking, feeling, perceiving and behaving (Bresler, 2006; Pink, 2011; Rose, 2012). Concept mapping as a method of multimodal communication seeks to illuminate the ways in which people learn, understand and interpret the world around them (Wilson et al., manuscript in preparation).

3.6 Concept Mapping Embedded Within the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach for Individuals with Autism Spectrum Disorder (ASD)

Through reviewing the literature it was determined that both the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and the visual method of concept mapping have been shown to promote learning, occupational performance and

skill generalization and transfer of individuals with Autism Spectrum Disorders (ASDs). The strong verbal nature of the CO-OP's global problem solving framework (Rodger & Polatajko, 2010; Polatajko & Mandich, 2004) opens the door to questions regarding the possible effectiveness of embedding a visual method into the existing cognitive framework to help support the heterogeneous learning needs of individuals with ASD. A plethora of research has been conducted across various academic disciplines investigating the effectiveness of using visual prompts and cueing with individuals with ASD to support them in their skill acquisition and retention in various environments (Case-Smith & Clifford O'Brien, 2010; Goodman & Williams, 2007; Hart & Whalon, 2008; Kandalaft, Didehbani, Krawczyk, Allen & Chapman, 2013; Milley & Machalicek, 2012; Rao & Gagie, 2006; Roberts & Joiner, 2007).

Concept mapping is an individualized, flexible, and meaningful way of putting words into pictures and visually displaying meaningful connections between concepts (Kinchin, 2013; Novak, 2010). It offers individuals with ASD another medium to engage in the learning process, and in turn enhances their occupational performance (Miller-Polgar & Landry, 2003; Stasolla et al., 2014; Wright et al., 2014). Through inserting this creative visual method into a framework that is well researched, occupationally based and has thoroughly developed structured sessions, blends the visual and verbal approaches to learning and marries the flexibility and structure characteristic to both approaches. Concept mapping can be used as a planning tool prior to engagement in the occupation, as an organizational strategy during the activity and as a reflective activity that meets the needs of the individual and the therapist (Ricon, 2010). Therefore taking a strength-based approach to intervention, one can infer that by offering the visual method of concept mapping as apart of the framework of the CO-OP approach would greater meet the learning needs of individuals with ASD.

3.7   Future Directions

This paper has provided valuable insights into the theoretical effectiveness of embedding concept mapping into the Cognitive Orientation to Daily Occupational

Performance (CO-OP) approach. In chapter three the authors will apply the approach discussed in this paper with 10 adolescent boys between the ages of 15 and 21 who have a diagnosis of Autism Spectrum Disorder (ASD). Chapter three will highlight the direct application of the concept mapping approach embedded within the CO-OP framework during a four-week summer camp program focused on life skill development.

Future research needs to be conducted around using the concept mapping and the CO-OP approach to meet the heterogeneous learning needs of adolescents with ASDs. Using learning and research methods that are relevant, meaningful and socially acceptable can offer individuals with ASD the support they need to meaningfully engage in their chosen occupations. Additional evidence would be valuable supporting the use of these approaches together with different populations who may also benefit from the integration of a visual and cognitive learning approach. Specific protocols about how to apply the concept mapping framework would help to provide a more transparent pathway about how to apply this intervention with clients in various contexts. In conclusion, there is promising evidence to support the efficacy of the use of concept mapping embedded within the CO-OP approach framework in enabling individuals with ASD reach their full occupational potential.

3.8   References

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Chapter 4

4 Adolescents With Autism Spectrum Disorder (ASD): Personal and Sociocultural Insights Into Participating in a Novel Intervention

The impetus for this paper was derived from a pilot study that explored the use of concept mapping in combination with the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach to facilitate the development of life skills in adolescents with Autism Spectrum Disorder (ASD). This is the first time that the visual method of concept mapping has been used in conjunction with the CO-OP approach to teach life skills to adolescents with ASD. This generates new knowledge this enhances and builds upon the existing evidence supporting the effectiveness of the CO-OP approach (Missiuna, Malloy-Miller & Mandich, 1998; Phelen, Steinke & Mandich, 2009; Polatajko & Mandich, 2004; Rodger & Vishram, 2010). Technology (iPad^R) was also used to facilitate the use of concept mapping and collect the rich insights of the participants during their participation in the intervention process. The purpose of this paper is to explore the personal and sociocultural insights and meanings of adolescents with ASD while participating in an innovative intervention that combines concept mapping with the CO-OP approach. This study is the first step in a series of investigations designed to explore the utility of combining concept mapping with the CO-OP approach, in order to shape intervention delivery for this unique and heterogeneous population.

4.1 Technology, Autism Spectrum Disorders (ASDs) and Concept Mapping

Currently there is a shift in education and rehabilitation therapies towards using technology to teach new skills, foster independence in life skills and apply them within a larger social and environmental context (Ayres, Mechling & Sansosti, 2013; Neely, Rispoli, Camargo, Davis & Boles, 2013). Innovations in technology have allowed for the development of mobile technologies that can offer individuals with ASD support that is

portable, easily available and inexpensive, individualized, and stigma free (Ayres et al., 2013; Grant, 2008; Kagohara, van der Meer, Ramdoss, O'Reilly, Lancioni, Davis, Rispoli, Land, Marschik, Sutherland, Green & Sigafoos, 2013; Mintz, 2013; Neely, Rispoli, Camargo, Davis & Boles, 2013). Mobile technologies can be used to enhance the competence of individuals with ASD across a variety of occupational domains. These may include enhanced academic achievement, improved vocational skills, and the development of successful social and interpersonal connections (Ayres et al., 2013; Bauminger-Zviely, Eden, Zancanaro, Weiss & Gal., 2013; Mintz, 2013; Mintz, Branch, March & Lerman, 2012). The development of these necessary life skills are also supported by the magnitude of accessible applications designed specifically for people with developmental disabilities (Kagohara et al., 2013; Neely et al., 2013). The use of mobile technologies with individuals with ASD draws on the current literature highlighting the use of visual supports in helping to enhance the person's independence, make abstract concepts more concrete, improve the cognitive processing and retention of new information, and can help to facilitate the generalization of newly developed skills (Rao & Gagie, 2006; Roberts & Joiner, 2007). Researchers also promote the use of mobile technology with individuals with ASD because of its consistency in providing clearly defined tasks, and the ability to use the device free from social, environmental and sensory distractions and/or demands that are embedded in human interactions (Bauminger-Zviely et al., 2013; Carlson, Moses & Claxton, 2004; Cihak, Frhrenkrog, Ayres & Smith, 2010; Grynszpain, Weiss, Perez-Diaz & Gal., 2014). Finally mobile technologies have proven to be fun and engaging for individuals with ASD that in turn enhances their participation and decreases the likelihood of technology abandonment (Grant, 2008; Kagohara et al., 2013; Shane & Albert, 2008).

Concept mapping is a learning and research method that is used to visually display and organize material in order to highlight the connections and relationships between concepts. Concept mapping uncovers the natural complexities embedded in learning, and provides a visual representation of how these nuances communicate with one another (Wilson et al., manuscript in preparation; Hunter, Lusardi, Zucker, Jacelon & Chandler,

2002; Novak & Canas, 2008). The uniting of technological innovation with the visual nature of concept mapping, has provided opportunities for the manufacturing of software and applications that move the method of concept mapping into the virtual world. Mapping technology has expanded allowing for new and different ways of creating, interpreting and presenting information (Mackinnon & Saklofske, 2010; Novak & Canas, 2008). The ability to import pictures, co-create maps with peers, use different colours, shapes and text allows each individual to personalize their map to reflect their individualized learning experience (Novak & Canas, 2008; Wilson et al., manuscript in preparation.

4.2   Methodology

Focused sensory ethnography was the methodology employed in this study to explore the personal, and sociocultural experience of adolescents with Autism Spectrum Disorder (ASD) while participating in a novel occupationally based intervention. This methodology combines focused ethnography (Cruz & Higginbottom, 2013; Higginbottom, Pillay & Boadu, 2013; Knoblauch, 2006) and sensory ethnography (Pink, 2009; 2011) to develop a new methodological framework.

Sensory ethnography expands upon the traditional approach of ethnography by highlighting the fundamental role that the senses play in how we learn about, understand and represent the lives of other people (Pink, 2009; 2011; Sunderland, Bristed, Gudes, Boddy & Da Silva, 2012). The intent is on broadening the ethnographic research methodology by obtaining knowledge through embodied practice and being mindful of all of the human senses (Nakamura, 2013; Pink, 2009; 2011). Sensory ethnography does not privilege one method for data collection, or one sensory experience over another. Instead it is a methodology that is open to multiple ways of knowing and understanding (Hurdley & Dicks, 2011; Nakamura, 2013; Pink, 2009). Sensory ethnography is informed by the interconnectedness of the senses, and the emplacement of the ethnographer in the social, sensory, and material environment of the phenomenon in which they are studying (Ingold, 2000; Pink, 2009; 2011). Sensory ethnography

incorporates innovative methods that go beyond listening and watching, to embracing the use of multi-modal forms of knowledge representation (Hurdley & Dicks, 2011; Pink, 2009). One way of eliciting the sensory experience of an individual is through the construction and use of visual methods (Harris & Guillemin, 2012; Pink, 2009; Rose, 2012). Visual methods act as a way for participants to access different ways of understanding that might be difficult to convey through the spoken word (Harris & Guillemin, 2012; Pink, 2011). They enable individuals to connect past experiences with current knowledge, and invite the person to reflect on their embodied and multi-sensory experience (Harris & Guillemin, 2012; Hurdley & Dicks, 2011; Pink, 2009).

In this study concept mapping was used as a visual method to enable the participants to express themselves beyond the restrictions of textual language (Novak & Canas, 2008; Pink, 2009; Rose, 2012), which was particularly beneficial for individuals with ASD who often struggle with language-based skills (Koning & Mcgill-Evans, 2001; Rao & Gagie, 2006; Williamson, Carnahan & Jacobs, 2012). The concept mapping framework that was applied regards mapping as a form of and as a part of multi-modal communication and allows for participants to find and share their voice through various mediums (Wilson et al., manuscript in preparation).

Focused ethnography is a methodology that is often employed in applied health care research studies because it is often used to determine ways to improve health care processes (Cruz & Higginbottom, 2013; Higginbottom et al., 2013; Kilian, Salmoni, Ward, Griffin & Kloseck, 2008). Focused ethnography investigates "specific beliefs and practices of particular illnesses, or particular healthcare processes, as held by patients and practitioners" (Higginbottom et al., 2013, p. 2). The findings of a focused ethnography are anticipated to have a meaningful and useful application within the health care practice (Higginbottom et al., 2013; Knoblauch, 2005). There are seven characteristics or elements of focused ethnography that have been delineated by Higginbottom et al. (2013). These are 1) conceptual orientation of a single researcher; 2) focus on a discrete community, organization or social phenomenon; 3) used in academia as well for the

development of health care services; 4) involvement of a limited number of participants; 5) problem-focused and context specific; 6) participant usually holds specific knowledge; and 7) episodic participant observation (Higginbottom et al., 2013, p. 3). Therefore focused ethnography can be a pragmatic and efficient way to capture meaningful data on a specific topic that can help to shape the ways in which interventions are designed and implemented to meet the needs of unique cultural groups (Cruz & Higginbottom, 2013; Higginbottom et al., 2013; Kilian et al., 2008; Knoblauch, 2005).

4.3   Overview of the Intervention: Summer Camp Program

An innovative summer camp intervention program (Lopata, Thomeer, Volker, Nida & Lee, 2008; Walker, Barry & Bader, 2010) was designed for adolescents and young adults between 15-21 years of age that focused on improving their daily living skills, in order to support their successful transition to adulthood. This intervention combined concept mapping and the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach (Polatajko & Mandich, 2004), to support participant engagement, independence and skill acquisition over a four-week timeframe. Technology, specifically iPad^{R}s were used to help encourage participants to use concept mapping, and to facilitate skill development. The program incorporated community based activities where participants had the opportunity to apply their newly developed skills within a different environmental context. This format was chosen to help aid in the process of transfer and generalization, and to offer the adolescents the chance to foster meaningful social connections with their peers. Due to the unique and involved nature of the summer camp program, the details of the program will be further elaborated on in a future research paper. There were many individuals that are involved in the implementation of this summer camp program. The principal investigator was the person who oversaw the research study, and organized the group goals, concept maps and participant reflections. The co-investigator assisted in the daily programming of the camp and the organization of the individual goals. Four volunteers assisted with the community integration activites, and provided one-on-one support during the individual and group goals (when it was requested by the participants). Each individual who was involved in

the summer camp program kept reflexive journals, and was apart of a daily de-briefing session to help highlight and consolidate the insights and perspectives from each day.

4.3.1 Study Sample and Recruitment

This focused sensory ethnography (Higginbottom et al., 2013; Pink, 2009) study was conducted with a group of 10 participants between the ages of 15-21 with a diagnosis of ASD. The sample size of 10 was chosen based on the characteristics and methods of focused ethnography (Higginbottom, 2004; Higginbottom et al., 2013). The inclusion criteria for this investigation were as follows:

1) Intellectual Quotient (IQ) within normal range. Due to the cognitive demands of concept mapping and the CO-OP approach the participants were required to have an IQ within normal range which was confirmed through a formal letter from their health care practitioner.

2) Participants had to have a formal diagnosis of Autism Spectrum Disorder (ASD). Diagnosis was confirmed through a formal letter from the participant's health care practitioner.

3) Participants had to be between 15-21 years of age. The World Health Organization (WHO) defines an adolescent as someone who is between the ages of 10-19 (2013). The age range for this study was extended to 21 years of age is because, the children's treatment centres that service the geographical area that this study was located in service clients up to the age of 21.

4) Participants had to be able to speak English fluently to participate in the study.

Participants were recruited through purposive sampling (Higginbottom et al., 2013; Miles, Huberman & Saladana, 2013; Williamson, 2006) through a not-for-profit organization serving individuals and their families with ASD. A screening interview was completed with both the participant and a family member prior to their participation in the study to ensure that they met the inclusion criteria for the investigation. During this

initial interview the letter of information was reviewed, and the participants informed ascent and the family member(s) informed consent was obtained. This study was approved through the Research Ethics Board at Western University.

4.3.2   Intervention Procedure

Training for Participants: Concept Mapping. The training protocol for the participants was adapted from Roberts & Joiner (2007). On the first day of camp participants were informed about the purpose of concept mapping and how it could be applied to help facilitate their learning process and skill development over the course of the camp program. All of the participants took part in two one-hour training sessions on how to create a concept map. The first session taught the participants how to create concept maps using the application called Inspiration©. Inspiration© was chosen because of its current availability within the schools that our participants attended. Having access to this software outside of the camp enhanced the applicability of this intervention to the local community, and facilitated the opportunity for the transfer and generalization of concept mapping into the school environment. In addition, Inspiration© concept mapping software has been highlighted within the academic literature (DeSimone, Schmid & McEwen, 2001; Eppler, 2006; Liu, Chen & Chang, 2010; Roberts & Joiner, 2007; Novak & Canas, 2008) and has won numerous awards from various educational and technical organizations (Inspiration Software Inc., n.d.). The initial training session acted as a general introduction to the application, followed by an activity where the participants worked together as a group collaboratively to create a concept map on the chalkboard with the researcher's guidance. Each participant individually completed an additional map about their personal topics of interest using the Inspiration© application.

The second session was conducted later in the day and consisted of creating a concept map embedded within a lesson to help consolidate the learning process. The concept mapping activity consisted of using Inspiration© software to map out process(s) of building social connections with peers using the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach (Polatajko & Mandich, 2004). Participants

were then encouraged to share their maps with the researchers as well as their peers in order to help increase comfort with concept mapping, and to facilitate the development of a learner-centred teaching environment (Blumberg, 2008; Stewart, Brown, Weston, McWhinney, McWilliam & Freeman, 2006; Weimer, 2013).

Learner-centred teaching parallels client-centred practice, which is a foundational approach in occupational therapy practice, concept mapping and the CO-OP approach (Stewart et al., 2006; Townsend & Polatajko, 2007). The learner-centred model includes six interactive components of the teaching and learning process which are: 1) exploring both learning needs and aspirations; 2) understanding the whole person; 3) finding common group; 4) building on previous learning; 5) enhancing the learner-teacher relationship; and 6) being realistic (Stewart et al., 2006; Weimer, 2013). It is important to highlight the way the learning environment was constructed to ensure theoretical cohesiveness was maintained throughout all aspects of the research study.

Implementation of Group Goals and the Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach. On the first day of the summer camp program the participants were also introduced to the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and the global strategy of Goal-Plan-Do-Check (Polatajko & Mandich, 2004; Rodger & Polatajko, 2010). Information booklets (found in Appendix A) containing information about the CO-OP approach and the day-to-day timetables of the camp were given to parents/caregivers and the participants on the first day of camp. Parents/caregivers and participants were encouraged to review the material together and attempt to implement some of the activity suggestions in their home environment (e.g. using the Goal-Plan-Do-Check framework make yourself a sandwich for a snack when you get home from school). These information packages were provided with the intention of preparing the participants ahead of time to what the day at camp would involve and to underscore our expectations of each of the participants (Polatajko & Mandich, 2004; Wenzel & Rowley, 2010). Parents/caregivers were given permission to observe any or all of the camp sessions in order to a gain deeper understanding of how to

implement the CO-OP approach, use the iPads and facilitate their child's skill acquisition through the method of concept mapping (Polatajko & Mandich, 2004). Every day during the camp the global strategy of Goal-Plan-Do-Check was reviewed and applied through the method of concept mapping to a weekly group goal.

The weekly goal sessions were facilitated in a group format with the conscious involvement of all participants. Literature is emerging supporting social skill instruction within a group format for individuals with higher functioning ASD (Cappadocia & Weiss, 2011; DeRosier, Swick, Ornstein Davis, Sturtz McMillen & Mathews, 2011; Flynn & Healy, 2012). There is a paucity in the current literature surrounding the implementation of interventions focused on enhancing the occupational performance of individuals with ASD in their activities of daily living (ADLs) and instrumental activities of daily living (IADLs) during adolescence and adulthood (Haertl, Callahan, Markovics & Sheppard, 2013; Matson, Hattier & Belva, 2012; Palmen, Didden & Lang, 2012). It is important to address these occupational domains with adolescents with ASD in order to facilitate successful life transitions, and promote their independence at home, school, the workplace and within the community (Haertl et al., 2013; Smith, Maenner, Seltzer, 2012; Test, Smith & Carter, 2014).

Research is beginning to focus on the efficacy of implementing the CO-OP approach for children with Development Coordination Disorder (DCD) within group settings to facilitate unique opportunities for occupational development. These opportunities include the enhanced use of dynamic performance analysis on oneself and others, building collaborative experiences among the participants, seeing the implementation of different cognitive strategies in solving performance problems, and engaging the social aspect of group learning through problem solving and fun activities (Dunford, 2011; Martini, Mandich & Green, 2014; Wilson et al., 2014b). Group intervention for children with disabilities is becoming an alternative method for the administration of services in occupational therapy practice. Research indicates that group interventions increase psychological support for children and their families, enhance

participant motivation, provide the increased opportunity for the practice of new skills, facilitates social connections, and can be a cost effective format for service delivery (Camaden, Tetreault & Swaine, 2012; Laforme Fiss, 2012; Martini et al., 2014).

4.3.3   Site of the Study

This study was conducted in a city in Ontario, Canada with a population of approximately 360,000 people (Statistics Canada, 2011). This city in Ontario, Canada has a number of resources available for individuals with Autism Spectrum Disorders (ASDs), which include public treatment facilities, private therapists and not-for-profit organizations (Autism Ontario, n.d.).

4.3.4   Data Collection Methods

During the initial interviews with the participant and their family member(s), the researchers administered the Canadian Occupational Performance Measure (COPM) (Law, Baptiste, Carswell, McColl, Polatajko & Pollock, 1998) to establish three occupational performance goals. The participant and their family member(s) mutually agreed upon the goals (Gentry, Wallace, Kvarfordt & Lynch, 2010). "The COPM is a valid, reliable, clinically useful and responsive outcome measure acceptable for occupational therapist practitioners and researchers" (Carswell, McColl, Baptiste, Law, Polatajko & Pollock, 2004, p. 210). Notes were taken by the researchers during the interview process and recorded on the participant's COPMs detailing their unique areas of strength and weakness related to their chosen occupational performance goals. The participant and their family member(s) selected three individual and three group goals. The researchers summarized the final group goals after reviewing each participant's COPM assessment form, and identifying three common occupational goals that all participants had reported. For the purpose of this paper, only the group goals will be discussed and analyzed, and the quantative COPM scores will be analyzed in a future paper. The purpose of this paper is to explore the qualitative personal and sociocultural insights of the participants while they are participating in the intervention to explore the feasibility and appropriatness of this unique intervention. The three group goals that each

participant engaged in during the course of the 4-week camp were: 1) social connections; 2) meal preparation; and 3) budgeting/money management. The focus of each of the group goals was slightly different for each participant depending on their level of overall functioning. A social connection included independently demonstating appropriate communication with individuals in the community (e.g. asking the bus driver a question or talking to the lady at the grocergy store check out), to keeping a new friend and learning how to meet a girlfriend. Meal preparation included making a snack independently when they arrived home from school, planning and executing a trip to the grocery store, and learning how to make a week of simple meals. Finally, the goal of budgeting was diverse for each participant and included learning how to write cheques, setting a budget for the month, and opening up their own bank account. The flexibility and diversity of each of the group goals allowed each participant to work on their own areas of weakenss, while using their strengths to help support the other memebers of he group.

The combined Cognitive Orientation to Daily Occupational Performance (CO-OP) approach and concept mapping intervention approach was used in conjunction with iPad^R technology, to address the three group goals with the intent of exploring the utility of this purposed framework from the personal, and sociocultural perspectives of the participants. The specific use of technology as apart of this camp program will be further elaborated on in a future paper. An example of one of the concept maps that was created can be found in Appendix B.

4.4   Data analysis

4.4.1   Multimodal and Multisensory Data Collection and Analysis

There were many methods that the researchers used to collect data during the course of this research project. The muli-modal and multi-sensory nature of the collection of information is intrinsically linked to the pluralistic epistemology, constructivist-interpretivist paradigm and focused sensory ethnography methodology of the research investigation. Multi-modal refers to the physical difference between the pieces of data

that are collected as part of a research study (Clark, 2011). In this investigation participants' concept maps and personal reflection notes were collected. In addition, the primary investigator kept field notes, and engaged in reflexive journaling to ensure contextualization of the data upon analysis (Kress & van Leeuwen, 2001, Pink, 2011; 2012; Rose, 2012). The multi-sensory value of the data was reflected in its ability to evoke different feelings and interpretations based on the recruitment of all the human senses throughout the research process (Ingold, 2000; Pink, 2011; 2012). Both the multi-modal and multi-sensory nature of data collection, analysis and interpretation allows for a more holistic understanding of the themes that were uncovered.

For the purpose of this paper the method of concept mapping will be discussed, analyzed and interpreted however it is important to recognize that the data collection method of concept mapping is situated within a collection of multi-modal forms of knowledge construction. Special attention will be given to make explicit the multi-modal method of data analysis that surrounded the interpretation of the concept maps, and its direct ties with frameworks established within the sensory ethnography methodology outlined by Pink (2009). Due to the large amount of data that was collected throughout the course of this research study it is necessary to divide up the analysis and interpretation to ensure that the principal investigator was giving adequate time and attention to exploring the richness of the concept maps. While focusing on the analysis and interpretation of the maps, the researchers ensured that they did not remove the data from the rich multi-modal context from which it was collected (Pink, 2009; Rose, 2012; Rose & Webb, 1998). This was achieved by attending to the elements outlined in Table 4.

Table 4. Multi-modal and multi-sensory analysis of concept maps

Elements of Interpreting Multi-Sensory Research	Definition and Description	How the Element was Utilized in the Research Process
Situating Analysis	Analysis is a way of knowing engaged in by the researcher	-Reflection notes taken throughout the course of the camp and after

	both during the research and as a reflexive practice after the data is collected. It is a process that seeks to understand people's ways of being in the world while being aware of the researcher's involvement as apart of the process with the intent of producing academic knowledge (Pink, 2009)	each day. -Interactions throughout the day are informed by previous experiences and interactions had in the camp, as well as personal insights from clinical practices and knowledge from academic literature review. -Transparency with participants re the intended dissemination of information and role in knowledge construction.
(Pink, 2009)		
Research Materials as Sensory Texts (Pink, 2009)	Treating the material collected (e.g. notebooks, photographs, transcripts etc.) as multi-sensorial and memory objects that are embedded and connected to the research process (Pink, 2009)	-Collecting data through multi-modal and multi-sensory means. -Collecting volunteer and principal invesgitator's notebooks and reflections, maps, participant reflections, photos, videotape and gifts. -While analyzing a piece of the data having the other material present and available for clarification, sensory experience and to facilitate iterative data analysis.

Working with Sensory Categories (Pink, 2009)	A focus on the integration of the senses (interconnectedness) and the importance of understanding how that informs the collection, analysis and interpretation of the research data (Pink, 2009).	-Having an explicit list of the human senses ensuring that throughout the research process the investigators are acknowledging them and reflecting on how they are impacting their understandings. -During note taking and reflections being cognizant of not separating the senses but acknowledging how they shape experience as a whole/integrated. -Considering how the sensorial experiences of the participants are being incorporated into the construction of knowledge: cueing them to be aware of this process and the important role it plays in developing understanding.
Interpreting and Connecting Research Experiences, Materials and Texts (Pink, 2009)	Analysis is a process that moves between different levels of engagement with a variety of research materials (Pink, 2009). The interweaving of theory, images and text creates a rich description of the phenomenon being studied (Pink, 2009).	-Having the multi-modal and multi-sensory material present and apart of the data analysis process. -Celebrating the organic process of developing understanding through the data and grounding it in theoretical foundations of the study, current occupational therapy and occupational science theory and academic literature. -Allowing for different levels of engagement with the research materials through the collection, analysis and interpretation processes.

To ensure that the concept maps remained immersed in the context from which they were produced, and that the voices of the participants were acknowledged throughout the data analysis process, the daily reflections from each participant were also

analyzed using the deductive thematic analysis framework outlined in Table 5. This multimodal form of data analysis created a more holistic understanding of the mapping process.

Table 5. Codebook for analyzing concept maps *(Deci & Ryan, 1985; 2012; Wilcock, 1998; 2006; Hammell, 2004; 2009; 2014)*

Code 1	Competence
Definition	Engaging in doing occupations to facilitate occupational competence which contributes to a sense of purpose and meaning in everyday life (Deci & Ryan, 1985; Hammell, 2009, Wilcock, 1998).
Description	Meeting new challenges and development of knowledge, skills and abilities to meet performance expectations (Deci & Ryan, 1985; 2002, Townsend & Polatajko, 2007)

Code 2	Relatedness
Definition	A universal need of belonging, contributing and connecting to others that fosters perceptions of self worth, value, competence and social inclusion.
Description	Development of relationship between people that allows for an opportunity to interact and connect, can be in a state of change/process of evolving and involve mutual support and reciprocity (Deci & Ryan, 1985; 2002, Hammell, 2014, Wilcock, 1998)

Code 3	Autonomy
Definition	A causal agent in choosing and engaging in occupation that one needs and wants to do. Acting in harmony with one's integrated self that reflects continuity, hope and coherence.
Description	Making choices and building on intrinsic motivation. Taking a place within the group community and evoking authenticity in choices and actions (Deci & Ryan, 1985; 2002, Hammell, 2014, Wilcock, 1998).

4.4.2   Overview of the Data Analysis Process

There were five stages of data analysis that occurred within an iterative and reflexive process. The first stage consisted of analyzing the participants' concept maps using the qualitative concept mapping framework developed in chapter two of this dissertation. The number of maps varied slightly for each individual depending on a number of different factors (e.g. mood, goal that was being discussed) however on average each individual produced 10-15 concept maps over the couse of the investigation. The second stage of data analysis was adapted from Fereday & Muir-Cochrane (2006) and Crabtree & Miller (1999) and involved the development of a code manual (see Table 5.). Following the creation of the code manual the principal investigator analyzed each one of the participants' maps individually, and as a unit, and coded their personal reflections. The principal investigator's field notes and their reflective journals were also reviewed in an iterative fashion while immersed in the data analysis process to help to further contextualize the data. Stage three of the data analysis process consisted of linking the themes to the seven key features of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. The principal invesgitagor connected the codes and identified the major themes in stage four of the data analysis process. In stage five the corroborating and legitimizing the themes was completed as outlined by Crabtree & Miller (1999). A photograph of the data analysis process can be found in Appendix C.

Stage One: Analysis Using Qualitative Concept Mapping Framework. Stage one of the analysis process consisted of printing off the concept maps in colour, separating them by participant number and arranging them in chronological order. Each participants' collection of maps was analyzed by applying the qualitative concept mapping framework categories for understanding outlined in chapter one of this dissertation. In Table 6 the qualitative concept mapping framework categories for understanding are outlined with guiding questions to help facilitate the principal investigator's interaction with the maps. For the purpose of this study guiding questions were used instead of descriptors as, the framework is used to create a personalized sensorial experience between the principal

investigator and the collection of each participant's maps. The guiding questions help to facilitate reflexive practice and provide guidance in illuminating the different ways in which people learn, understand and interpret the world around them (Doyle, 2013; Finlay, 2002; 2003; Wilson et al., manuscript in preparation).

Table 6. Stage one: analysis of concept maps using qualitative concept mapping categories for understanding

Category for Understanding	Voice
Sub-Category	Tri-directional Voice
Definition	The dialogical relationship that evolves between the individual, the concept map and the audience (Wilson et al., submitted)
Description Questions	1) Who is the map speaking to? 2) Is the audience extended inward? 3) Is there progression, learning and evolving occurring? With whom? 4) Is there a reshaping and/or reseeding of experience through the map? 5) Is the map speaking to a larger audience?
Sub-Category	Mutual Absorption
Definition	The process of intense dialogue between audience and the visual method through a deep open ended relationship where the audience is engaged with the concept maps as they attempt to understand the perspective of the participants.
Description Questions	1) Reflexivity; are there differences/tensions in understanding between the audience and the participants? 2) Did you learn something new? Or see something differently? 3) Does the map draw you in and provide a mutual exchange of information (co-construction of knowledge)?

Category for Understanding	Detail in the Parts and Recognition of the Whole
Sub-Category	Uniqueness
Definition	Each individual constructs their map in a unique manner which sheds

	light on their values, beliefs, and understandings.
Description Questions	1) What details encourage your connection with the map? 2) Did the uniqueness of how this individual constructed their map surprise, inform, or teach you? 3) Is the uniqueness embedded through the map (cohesive)or is it just reflected in certain parts: what does this mean to you?
Sub-Category	Aesthetic Distance
Definition	Distance between the audience's reality and the fictional reality created by a visual image.
Description Questions	1) How do you position yourself as an audience member so you are not too close to the phenomenon being studied within the map or too detached? 2) Do you have an emotional connection with the map? What emotions do you have? 3) Is your empathetic understanding enhanced through looking at the map? Are there elements of a tri-directional voice?
Sub-Category	Emplacement
Definition	The sensuous interaction between the body, the mind and the environment of both the researcher and participant in the creation of meaning.
Description Questions	1) When exploring the map do you feel any physical changes/reactions? 2) Were there any physical and emotional expressions of self through this learning process of mapping? 3) Did the participant express any emplaced feelings in the creating of this map?

Category for Understanding	**Sensory Experience**
Sub-Category	Intellectual + Emotional Investment
Definition	Through the creation, analysis and interpretation of maps there lies an interconnection of the intellectual and emotional elements of an individual to create a more holistic learning experience (emotional intelligence).
Description Questions	1) Be aware of your emotional intelligence and how that informs how you interpret the map. 2) Self awareness, motivation, self-regulation, empathy, adeptness

	in relationships are outward expressions experienced internally: do you experience any/all of these when exploring the map? 3) Cognitive understanding in conjunction with emotional engagement leads to new understanding.
Sub-Category	Humanness
Definition	Learning how to see and understand the message that the person behind the concept map is trying to share.
Description Questions	1) Are you aware of any power imbalances between you and the participant and does that inform the way you look at the map? 2) Is there humanness embedded in the map, is it brought to life, does it have expressiveness? 3) Consider the social and contextual factors that might influence the creation and interpretation of this map. 4) How might other people respond when they explore this map? 5) Be cognizant of the equal rights of the participant to share, express and co-construct knowledge.

Adapted from Wilson et al.,(manuscript in preparation); code organization table adapted from Fereday & Muir-Cochrane (2006).

The maps were viewed as a collection, progressing and evolving over time in order to reflect the unique and individualized learning process of each participant. Viewing the participant's maps as a unit helps to highlight the natural complexities embedded in learning process, and provides a visual representation of how these nuances communicate with one another (Wilson et al., manuscript in preparation). Analysing the maps in this format also enables the principal investigator to develop a deeper understanding of the participant's experience over time by not segmenting it or imposing boundaries between maps and the categories for understanding. Notes and memos were taken during the analysis process - researcher insights and overall impressions are presented in Table 7.

**Note the italics represents the nuances/subthemes of each main theme discussed in the chart. They bring depth and additional understanding to the main themes.

Table 7. Themes emerging from stage one analysis: qualitative concept mapping categories for understanding

Name of Theme	Description
Purpose	-Purpose of the map reflects how it is created (brainstorming vs. self instructional tool). -Affects the *voice,* who the map is speaking to and informing in addition to how the voice/meaning is expressed (example: map about an areas of passion like music is arranged with the use of colour, different shapes, visual places of interest (pictures) vs. a map about budgeting with default colours and shapes) -*Meaning and enjoyment*: helps to connect both the individual and the audience to the map -*Occupational application*: practical in nature with specific relevance to a particular occupation.
Process of Change	-The evolution of the way in which the map(s) are constructed *from the first through to the last day*. -Difficulty *initiating* on the first day moving to *engagement* in the mapping process over time. -The act of *personalizing* the maps over time by adding in personal experiences, insights or plans. -Increased *competence* in creating the maps leads to investing more of oneself in the process, and *clarity* around how they are organizing and representing their learning experiences. -*Personal absorption* of the information facilitating a deeper learning experience depicted through the personalization of the maps.
Patterning and Repetition	-The *style/visual sequencing* of how the participant creates a map is repeated over time. Highlighting their comfort in expressing and sharing *their voice* in a way that has meaning to them. -Repetition of *concepts within and between maps* to show *connections* and demonstrate complexity of goals.
Finding a Voice	-Creating *a safe space* for the participant to express their goals, wants and needs.

	-Leveling the power *imbalances* between the participants and the researchers, their families and extended community. -Facilitating their *connection* with others and themselves. -Speaking to a *larger audience*: peers, parents and social structures/services. -*Co-construction* of knowledge and the *support of another* in initiating the process of finding a voice.
Multi-Sensory Experience	-*Colours and shapes* depict a different *tone of voice* within an individual's map. -*Technology as a facilitator* of the mapping experience. -*Pictures* to facilitate an *emotional connection* (inward: with oneself and outward: audience). -*Blending of textual language and visual representation* of concepts to represent learning style and meaning. The amount of each method of communication falls within a spectrum (different for each individual).
Autonomy	-*Augmenting the mapping process* to *meet own needs*. Facilitates the connection of the person with the map and enhances their learning. It also gives them *autonomy and choice* over how they represent the construction of new knowledge. -*Structure* of the map reflects the way in which they learn and interpret new information. -*Builds on their strengths by channeling them* toward a purposeful learning experience.
Shape and Flow	-Differences in the way in which the maps are *visually organized* indicates *their* learning process, and the purpose of the map. -*Blending of structure and creativity* offers a unique learning opportunity and a chance to find ones inner voice. -Differences in the way in which the individual positions the concepts, the sizing of the bubbles, the arrow (uni-directional and bi-directional) arrangement gives clues to the *connectivity* of the map. -*Boundaries* imposed by shapes, space and the overall configuration of

	the maps highlights the meaning placed on concepts and the flow of the learning process for that individual. -Facilitating *gestalt thinking* by the arrangement of the parts (details) in relationship to the whole (larger concepts)

Stage Two: Deductive Thematic Analysis of the Concept Maps. Stage two consisted of the deductive thematic analysis of each participant's concept maps. Thematic analysis is a method for detecting and analyzing patterns of meaning within a data set (Braun & Clarke, 2013; Joffe, 2011). The themes highlight the most salient features, meanings and descriptions of a phenomenon that is being investigated (Bruan & Clarke, 2013; Joffe, 2011). An a priori template of codes was established from the theoretical framework of Self Determination Theory (SDT) (Deci & Ryan, 1985; 2000; 2012) supplemented with dimensions of occupation descriptors of doing, being, belonging and becoming outlined by Hammell (2009; 2014) and Wilcock (1998, 2006). The combination of SDT with the purpose of occupations framework of doing, being, belonging and becoming demonstrates cohesiveness of the study from its theoretical foundations through to its final stages of analysis and interpretation. In addition the uniting of this macro-theory of human motivation with this occupationally relevant framework helps to illuminate the important role that occupational therapy and occupational science play in understanding human motivation, and how they have informed each stage of the research process. The deductive thematic analysis codebook for the maps can be found in Table 5. The format for explicating the codes book was adapted from Crabtree & Miller (1999) and Fereday & Muir-Cochrane (2006). This approach complemented the purpose of this study by allowing the tenets of the SDT and the doing, being, becoming and belonging dimensions of occupation to be integral in the process of examining, and interpreting the concept maps through the process of deductive thematic analysis.

Each one of the maps was analyzed independently, then as apart of the larger group. The codebook from Table 5 was used to guide the thematic analysis process and information pertaining to each one of the codes was highlighted in a different colour and

summarized in a table format to help facilitate the identification of initial themes
(Crabtree & Miller, 1999; Fereday & Muir-Cochrane, 2006). To supplement the data
analysis process the daily reflections of each participant were printed off and attached to
the maps in chronological order. These reflections were also analyzed using the deductive
thematic analysis codebook outlined in Table 5 and gave additional depth and context to
the analysis process. The themes uncovered through the analysis of the participant
reflections were not separated from those highlighted in the maps. This was done to
maintain a strong connection between the two mediums of data collection, and not give
precedence to one form of knowledge or understanding over another. Table 8 highlights
the process(s) of connecting the codes and identifying the themes from the participant's
concept maps and personal reflections utilizing deductive thematic analysis.

Table 8. Connecting the codes and identifying themes

Code 1: Competency *(Deci & Ryan, 1985; Hammell, 2009; 2014; Wilcock, 1998, 2006)*

Name of Theme	**Description From Data: Concept Maps and Reflections**
Process of Change	-Listing vs. learning -Personalization of learning over time reflected in the mapping process; embedding oneself in their learning -External to internal voice -Purpose driven learning, awareness of themselves in the present. -Consolidation of knowledge (discovery of new knowledge and enhancement of old understandings) -Sense of experience and success, fun and enjoyment.
Balance	-Moving from dependence to independence and navigating supports and building -Moving from external to internal locus of control -Balancing priorities within the maps; focusing on specific areas of improvement.

	-Balancing use of textual language and visual representation of learning within the construction of new knowledge.
Meaning in Occupation	-Fosters engagement and participation -Client chosen goals -Purposefully driven engagement -Connection through participation in occupations
Future	-Looking forward (becoming) to the future and planning one's path -Seeing potential to engage in occupations with success in the future -Transfer and generalization of skills in the future; demonstrating occupational competency -Expanding competencies, growing and becoming through expanding one's expectations around their performance. -Hope
Tools	-Global cognitive strategy in Goal-Plan-Do-Check used for frame and organize maps; also domain specific strategies embedded within the map to facilitate learning -Technology: facilitator and barrier, maintains connection to material -Concept Mapping: getting information down, organized, giving meaning to learning process, multiple uses -Reflections: consolidate knowledge, look towards the future -People as supports to help facilitate learning -Multi-sensory experiences and multi-modal learning facilitates occupational competency -Skills and strengths: specific areas of intense interest channeled in a positive way to facilitate learning potentials

	-Imposing their own rules and structure to facilitate learning and make it more meaningful to them.
Action	-Do as part of CO-OP global cognitive strategy.
	-Doing occupations
	-Routines embedded within Doing occupations
	-Necessary medium for learning new skills
	-Exposure and opportunity to "Do"
	-As a platform to show the development of competence to others (process of evolving independence).
	-Want and need for engagement

Code 2: Relatedness *(Deci & Ryan, 1985; Hammell, 2009; 2014; Wilcock, 1998, 2006)*

Name of Theme	**Description From Data: Concept Maps and Reflections**
Roles	-Finding ones place with family, friends, groups and relationships; where do "I" fit in
	-Related to balance: flexibility of the individual in adapting to their role as a leader, teacher, listener, supporter of others etc.
Balance	-Negotiating interactions (positive and negative) with other people
	-Leading and following; teaching and supporting
	-Distance: physical and emotion from people and connections with others
	-Balancing strengths and weaknesses of oneself to enter into a relationship with another person
	-Communicative partnerships: embedding oneself into the connection with another (2-way relatedness).
Power Imbalances	-Social as a skill, as something that needs to be mastered or conquered vs. lived and experienced

	-External location of power in personal connections; family, friends and relationships
Connecting Through Occupations	-As a tool (videogames, music) to build commonality and opportunities to connect -Looking to community for accessible options for occupations to connect with others, community agencies -Connecting through group occupations -Age appropriate occupations -Purposeful and enjoyable
Sense of Belonging	-To a group; something larger then oneself -"I" turns into "We" -Relation of the group to a Team -Not based around diagnosis but commonalities/interests -Camp is seen as a "place"; their own sense of community -Related to autonomy; need to build a sense of self in order to find a place of belonging within a group -Authenticity in connections with others
Action	-Process of evolving from being tentative to enter into any connections with peers to action phase of Doing. -Process of a) initiating connections b) building connections (fostering process) c) maintaining connections -DO/DOING to build competency and self-efficacy in one's ability to relate to others -Exposure and opportunity
Spectrum of Connectivity	-Amount of connection: spectrum of relatedness -How do they look different for each individual, and is it ok they do not meet the "norm"

	-Who do they connect with: positive and supportive connections vs. being taken advantage of and used
	-Purposeful connections: not random but with meaning behind relating to another.

Code 3: Autonomy *(Deci & Ryan, 1985; Hammell, 2009; 2014; Wilcock, 1998, 2006)*

Name of Theme	**Description From Data: Concept Maps and Reflections**
Balance	-Want for independence and need for support
	-Support from others to foster independence vs. learned helplessness
	-External locus of control and the process of fostering internal rewards
Finding a Voice	-Developing of insight through increased competency.
	-Tools that facilitate the opportunity to express one's voice: mapping and reflections.
	-Creating an open forum for self-expression.
	-Need to recognize wants/needs and be able to express them (2 parts to the process)
	-Feelings of not being heard and power imbalances within families, peer groups and community
Developing a Sense of Self	-Redefining oneself; finding new possibilities through experiences of success, pride and self worth
	-Finding and expressing likes and dislikes; related to finding a voice, developing an understanding of choice
	-Finding adaptability and flexibility in oneself
	-Acknowledging both strengths and weaknesses
	-Highlighting skills: how they contribute to the group and to the development of oneself
Future and Process of	-Transfer and generalization of new self to different contexts

Change	-Becoming who you want to be
	-Process of evolving oneself and exposure of occupational possibilities due to enhanced competencies and self-efficacy
	-Action phase in building independence: a sense of doing
Advocacy: Being Apart of Something Larger Then Oneself	-Moving beyond oneself and helping, encouraging others
	-Fostering potential vs. instructing/dominating over others
	-Recognizing need for services and support for others "like" them
	-Recognizing need for programs to engage youth with ASD
Sense of Ownership and Responsibility	-"Making my own" participant 03
	-Finding pride and ownership over newly developed competencies and transferring/generalizing them to different contexts
	-Feelings of autonomy and self-worth
	-Internalizing reinforcements

Stage Three: Linking Themes to the Key Features of the CO-OP Approach.
Stage three of the data analysis process involved scanning the maps, the participant reflections and the initial themes to identify how they reflected the seven key features of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach (Polatajko & Mandich, 2004). This stage of the data analysis is important because the CO-OP approach was embedded throughout the camp as a framework used in the concept mapping process, and was part of how the principal investigator carried out the daily interventions. Reflexive journaling throughout the stages of data analysis brought to light the necessity of this procedure. Highlighting how the initial themes support the seven key features of the CO-OP approach strengthens the theoretical cohesiveness of this research study, and helps to embed the themes that were uncovered into a sound clinical framework. The way in which the themes connected and supported the seven key features of the CO-OP approach were added into the summary tables as comment boxes

highlighted in a different colour. Table 9 describes how the major themes deduced from the concept maps and participant reflections connect and support the seven key features of the CO-OP approach (Polatajko & Mandich, 2004).

Table 9. Defining how the major themes connect and support the seven key features of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach *(Polatajko & Mandich, 2004).*

CO-OP Key Feature	Major Theme	Component Connection
Client Chosen Goals	Purposeful and authentic occupations	-Setting the parameters and having the individual choose the goals that are meaningful and purposeful to them.
Dynamic Performance Analysis	Balance through negotiating tensions	-Balancing task knowledge and performance competence.
	Purposeful and authentic occupations	-Motivation to participate.
	Multi-modal and multi-sensory tools	-Assessing performance competence and task knowledge in different ways.
Cognitive Strategy Use	Multi-modal and multi-sensory tools	-Different ways of embedding global and domain specific strategies into learning.
	Action: doing and connecting with the present	-Ensuring good strategy use through the process of doing.
Guided Discovery	Balance through negotiating tensions	-One thing at a time and making it obvious.
	Action: doing and connecting with the present	-Through the process of doing facilitating interaction with all

		areas of guided discovery to enhance connectivity and competence: one thing at a time, ask don't tell, coach don't adjust and make it obvious.
Enabling Principals	Balance through negotiating tensions	-Working towards independence in negotiating different tensions.
	Sense of "We" and a sense of "I"	-Work towards independence "I" and promote generalization and transfer to groups "We" and to different contexts.
	Purposeful and authentic occupations	-Make it fun and promote learning.
	Multi-modal and multi-sensory tools	-Make it fun, and promote learning, generalization and transfer.
	Action: doing and connecting with the present	-Make it fun, promote learning, work toward independence and promote generalization and transfer.
Parent or Significant Other Involvement	Balance through negotiating tensions	-Learning how to negotiate role and relationship(s) with family and caregivers, building autonomy and independence balanced with support.
	Sense of "We" and a sense of "I"	-Developing a sense of "I" within the family and yet maintaining the "We" of connection.
Intervention Format	Purposeful and authentic occupations	-Session structure, embedding within the community and age appropriateness.
	Multi-modal and multi-sensory tools	-Materials, using different mediums to connect, engage and give voice to the population.

	Action: doing and connecting with the present	-Program and session structure, flexibility to meet specific needs of the population.

Stage Four: Connecting the Codes and identifying Themes. "Connecting codes is the process of discovering themes and patterns in the data" (Fereday & Muir-Cochrane, 2006, p.89). The researchers connected the codes and identified the themes between the maps and reflections of all ten participants. Areas of consensus and conflict were identified across the emerging themes. During the organization of the data into the summary chart, the themes began to cluster bringing more depth to the coded text and concept maps (Crabtree & Miller, 1999; Fereday & Muir-Cochrane, 2006).

Stage 5: Corroborating and Legitimating Coded Themes. The final stage of the data analysis process involved corroborating and legitimating the coded themes. Corroborating is a term used by Crabtree & Miller, (1999) that describes the process of confirming the findings. This process is used because fabricating evidence can be a problem throughout the data analysis process due to unintentional, unconscious "seeing" of the data that the researcher expects to uncover (Crabtree & Miller, 1999; Fereday & Muir-Cochrane, 2006, p. 90). To ensure the accuracy of the themes, the previous stages of the data analysis process were reviewed in a thorough and iterative fashion (Braun & Clarke, 2013; Fereday & Muir-Cochrane, 2006). The themes were then further clustered from all participants and all three codes and assigned a major theme to illuminate the essence and describe the meaning of what is happening within the data (Braun & Clarke, 2013). These major themes and their associated descriptions can be found in Table 10

Table 10. Corroborating and legitimizing coded themes across three codes of competency, relatedness and autonomy *(Deci & Ryan, 1985; Fereday & Muir-Cochrane, 2006; Hammell, 2009; 2014; Wilcock, 1998, 2006)*

Major Theme	Description	Example(s)
Finding comfort in negotiating tensions	Negotiating tensions and finding an optimal personal balance that fosters	-Accepting the positive and negative experiences of interacting with others and

	occupational competence in learning, connections with others and in building individual autonomy.	navigating the process of maintaining of a connection with another. -Recognizing ones own strengths and weakness in order to facilitate learning and deeper insight into oneself.
Sense of "We" and a sense of "I"	Developing a sense of oneself ("I") in order to contribute to the building of a group and a sense of "we"	-One-sided connections with externalized locus of control due to a lack of understanding around who "I" am and what "I" can contribute to the communicative partnership. -Building a sense of "we" through equal engagement in a social connection, building a community of "own".
Purposeful, meaningful and authentic occupations	Participation in meaningful, purposeful and authentic occupations in order to connect with oneself, develop competencies and build relationships with others.	-Meaningful and relevant occupations foster deeper connections amongst individuals. -Participating in occupations that are meaningful enhances motivation and competency.
Multi-modal and multi-sensory tools	The use of multi-modal and multi-sensory tools to build occupational competence, relate to others and express one's voice.	-Allowing for experimentation with various mediums and modalities offers different opportunities to engage and learn. -Offering different platforms for self-expression and the development of

		occupational competencies.
Action: doing and connecting with the present	Action and doing as necessary elements in connecting to the present, building competencies, engaging in social connections and developing a sense of self.	-Connecting over doing (engaging and participating) -Opportunity and exposure facilitates occupational competency and enhances self-efficacy and self-worth.

4.5   Qualitative Quality

The creative complexity of the qualitative research landscape calls for "a parsimonious framework for qualitative quality can help us communicate value for our work to a variety of audiences" (Tracy, 2010, p. 838). The eight-point conceptualization of qualitative quality developed by Tracy (2010; 2013) was used throughout this research study to ensure methodological rigor. The criteria include: 1) researching a worthy topic, 2) displaying rich rigor, 3) the study is characterized by sincerity, 4) the research is marked by credibility, 5) the research influences, affects, or moves particular readers or a variety of audiences through its resonance, 6) the research provides a significant contribution, 7) the research considers ethics, and 8) the study has meaningful coherence (Tracy, 2010; 2013). This framework was chosen is because it "delineates eight universal hallmarks for qualitative methods across paradigms" (Tracy, 2010, p. 837) and can be used as a platform that allows for qualitative scholars to come together and share in a unified voice that speaks to the importance and validity of their research and their craft (Tracy, 2010; 2013).

The process of reflexivity was initiated in the pre-research stage of the investigation and was engaged in throughout the course of the data collection, analysis and writing process. The reflexivity used throughout was a combination of inter-subjective reflection and mutual collaboration (Finlay 2002). These forms of reflexivity outlined by Finlay (2002) underscore the social constructionist nature of the this research study, and turns subjectivity inward highlighting the position of the researchers as active contributors to the knowledge construction throughout the investigation (Finlay, 2002;

Finlay & Ballinger, 2006; Mead, 1934). On-going reflection and self-awareness
journaling, and debriefing with the research team opened the doors to transparency and
reflexivity amongst the investigation team.

Member reflections were used throughout this research study. Member reflections
extend beyond member checks by presenting an opportunity for collaboration and
reflexive elaboration instead of just testing for accuracy of interpretation (Bloor, 2001;
Ravenek & Rudman, 2013; Tracy, 2010). Member reflections were completed through
daily reflections by the participants on their iPads^R, and daily de-briefing sessions that
were completed with the group and with each individual to clarify their thoughts, feelings
and perceptions. Throughout the research study participants were also encouraged to
discuss their thoughts and ideas at *any* time regarding the research process to ensure that
their insights were always taken into account and their voices were always heard.

4.6 Results

The major themes that represent meaningful contributions to the understanding of
how adolescents with ASD experience the combined concept mapping and Cognitive
Orientation to Daily Occupational Performance (CO-OP) approach intervention will be
discussed. They will be presented through the process of weaving together an analytic
narrative supported by the visual method of concept mapping. These forms of visual and
textual communication will help to illuminate a coherent and persuasive story about the
data (Braun & Clarke, 2013). There were five major themes that were uncovered in this
study. The first theme was Finding comfort in negotiating tensions. Next, the participants
shared the Development of a sense of "we" and a sense of "I" over the course of their
participation in the intervention. Engaging in purposeful, meaningful and authentic
occupations was highlighted as an important theme in order to connect with oneself,
develop competencies and build relationships with others. Another theme that emerged
was the Importance of using multi-modal and multi-sensory tools to facilitate their
engagement in the learning process. Finally, the theme of Action through participating in

"doing" (Hammell, 2004, 2009; Wilcock, 1998; 2006) occupations was uncovered as a necessary element to facilitate their connection with the present.

4.6.1   Finding Comfort in Negotiating Tensions

This theme describes the process of the individual negotiating tensions with the purpose of finding an optimal personal balance that fosters occupational competence in learning, connections with others, and in building individual autonomy. Experiences of tension can be found embedded within all three codes of competency, relatedness and autonomy. During the process of developing and finding balance in their occupational competence the participant has to recognize and effectively utilize their current task knowledge and supplement the gaps in their current understanding through meaningful learning.

"Reflecting helps me look back and think about positives and negatives and what I should do differently." Participant 02

The participants reflected on the discrepancy between their perceived skills, and the task demands of participating in the goal of making social connections with their peers.

"I learned today that being social is harder than I ever could have predicted, so I think I want to be a hermit. Just kidding. But I think that I should be watching more of the autism TV." Participant 06

The process of learning to identify and accept their own weaknesses opened up the possibilities to start engaging in activities, learning new skills and working toward achieving their full occupational potential.

"It also helped [in reference to the camp program] *me see my own weaknesses and how to work with them instead of against them" Participant 03*

Finding balance and negotiating tensions was also an important theme as the participants navigated the building and maintaining of connections with their peers. Recognizing

areas of disconnect and tension from a connection with someone and then reacting appropriately, and changing their behavior facilitates opportunities for learning and growth. For example….

"Some people were really freaking annoying to the point where I had to walk away of literally would have called them on it." Participant 07

When the participants were engaging in the intervention sessions they not only had to negotiate tensions with their peers, but also with the researcher(s) and volunteers. Recognizing the feelings of others within the group is an important element in building meaningful and lasting social connections (Rao, Beidel & Murray, 2008)

"Today we started off with meal prep again and we did the whole spiel where [volunteer] made soup and salad and we had to hit the buzzer when she did something wrong. I think it went better today though, since [volunteer] did not get annoyed visibly" Participant 08

4.6.2   Sense of "We" and a Sense of "I"

This theme reflects the importance of the individuals developing an understanding of themselves ("I"), in order to contribute positively to the building of a collective "we" (group). At the beginning of the summer camp the participants typically participated in one-sided connections facilitated by an externalized locus of control. They lacked an understanding around who they were and what they could contribute to their learning experiences, and to a communicative partnership. Embedded within finding oneself and contributing to a larger whole is sense of developing autonomy and self-efficacy, which positively affects all areas of the participant's lives.

"My music [referring to a musical preference] would change depending on the social situation" Participant 04

This quote highlights the lack of confidence in oneself and ones preferences when entering a social connection. It is difficult to build strong authentic relationships with others when there is not a strong sense of "I".

"The activities and the OTs helped me to feel more comfortable about my personality and I am going back to school with some new tips for my life" Participant 04

As the mapping process continued many participant maps began to become more individualized. This theme demonstrated an increase in the participant's ownership over their learning experience and a newly developed confidence in their evolving occupational competencies.

Building a sense of "We" was an important theme that permeated the data. As participants begin to engage in occupations within a group format and develop a connection with themselves and with their peers, a sense of "We" in reference to the group started to emerge within the data.

"We had lots of fun today"- Participant 06

"I feel more open when I know other people I meet are going through the same thing I am" Participant 04

Connecting and building a space and a place of understanding and relatedness can help to build meaningful connections with oneself and others.

4.6.3   Purposeful, Meaningful and Authentic Occupations

Participation in purposeful, meaningful and authentic occupations is a theme that was found within all three codes of competency, relatedness and autonomy. It was also reflected in the way in which the participant maps were constructed through the themes of Purpose and Shape and Flow (Table 7) Engaging in purposeful, meaningful and authentic occupations appeared to enhance the participant's motivation to participate, in turn facilitating their learning and offering opportunities to connect with peers over similar interests.

"Today I learned that working in groups can help you socially by giving you a common goals" Participant 04

The participants highlighted the importance of being able to choose the occupations in which they shared in during times of social connection with their peers. They displayed thoughtful and perceptive insights into the underlying meanings behind the relevance of participating in meaningful occupations with others.

"Playing music can connect people on a deep level because just by simply picking up a piece of wood with some string you can create beautiful music and you can relate to other people who share the same passion about music, even with such different tastes in music spanning hundreds of years we all understood each other." Participant 11

Authenticity in engaging in occupations relates to the skills that are taught and the relevance of the occupations to the population of adolescents with ASD. During the mapping process one participant listed "shake their hand" as an appropriate behavior to engage a peer in a social connection. One must be aware of the social norms and the cultural practices of the population to ensure that therapeutic interventions and occupational opportunities are applicable to foster successful connections.

"There was the ps2, and 3 as well as an xbox and the wii. Today was really fun and it made me feel more as part of the group" Participant 08

The participants started to gain insights into the necessity of structuring the environment and the occupations in a way to facilitate positive interactions with their peers.

"I found out that it's much harder to become friends with someone if you are just throwing preset questions at someone then it is to maintain a social conversation" Participant 08

4.6.4   Multimodal and Multisensory Tools

The use of multi-modal and multi-sensory tools to build occupational competence, relate to others and express one's own voice is a major theme that emerged throughout the data analysis process. Inspiration^R software was used to facilitate the organization, construction and sharing of the participant's concept maps. This technology

offered the opportunity to use different colours, shapes, pictures and text to engage the participants in the construction of new knowledge. Participants expressed their connection with the multi-modal and multi-sensory tools used throughout the camp both in their reflections, and in the different ways they chose to create and share their concept maps.

"Concept mapping is a cool way to take notes and get ideas down. I think that it makes it more interesting to make notes and interesting to read. It also is a fun way to map out what I am thinking." Participant 04

"We learned inspiration you listen with your brain and eyes" Participant 10

The use of people as supports, popular media as learning tools and different occupations (e.g. playing music) and opportunities for social connections, were all multi-modal and multi-sensory tools that seemed to impact the engagement and learning of all the participants.

"I really liked the clips from BBT [Big Bang Theory] and The Social Network. It helped me visualize what not to do during a conversation." Participant 03

Recognizing their own unique ways of learning, and the positive impact of engaging with new information in a different way began to emerge among the participant's reflections.

"I also want this program to continue because I love this. It teaches me things in ways most people won't teach them" Participant 06

4.6.5   Action: Doing and Connecting With the Present

Doing, acting and engaging in the present is an important theme that emerged through the data analysis process. Connecting over doing through the engagement and participation in an occupation was a vital concept to the successful learning of all participants.

"In small group we looked at different organization examples, which was a really big help to show me each organization ideal in a better way then just talk about it."
Participant 06

"Learning better by seeing and doing" Participant 05

With a focus on doing, different opportunities arise and exposure to new experiences can occur. This facilitates occupational competence, strengthens connections with others and enhances self-efficacy.

"On the way back, we forgot where to find the bus stop and had to take directions from a stranger. We had to run to catch the bus! That was pretty funny. Over all, I think that today was pretty awesome." Participant 07

The participants identified the importance of opening doors to new occupational possibilities.

"The geocaching was amazing and I had a lot more fun then I expected myself to have" Participant 11

The five major themes that were uncovered through the deductive thematic analysis of the concept maps and the participant reflections were difficult to separate from one another due to the interconnectedness of their meanings. The depth and interconnectedness of each of the themes highlights the importance of the insights of the participants in shaping the development and delivery of intervention services to meet their unique and complex needs.

4.7   Discussion

The themes presented through this study add new dimension and information to the literature, through the inclusion of an innovative framework uniting the visual method of concept mapping with the meta-cognitive intervention the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. Throughout the concept maps and

personal reflections, all participants identified the process of achieving balance through the negotiation of tensions. Aligning with the current research (Happe & Frith, 2006; Johnson, Filliter & Murphy, 2009; Pellicano, 2010), individuals with Autism Spectrum Disorder (ASD) often require support recognizing and understanding their personal strengths and weaknesses. Difficulties in theory of mind, executive functioning and central coherence are interconnected in creating barriers to individuals with ASD. These areas of difficulty inhibit them from utilizing their strengths and accepting their weaknesses in order to achieve optimal occupational performance and develop meaningful social connections (Happe & Frith, 2006; Johnson, Filliter & Murphy, 2009; Pellicano, 2010).

Similar to a study completed by Haertl et al., 2013, many of the individuals within the camp sought to develop a sense of "we" by being apart of a peer group, and expressed a want to build a sense of belonging through friendships. The way in which these friendships and social connections are defined can be quite different from how they are understood by neuro-typical peers and family members (Calder, Hill & Pellicano, 2012; Kuo, Orsmond, Cohn & Coster, 2013). A study completed by Ekelman, Bazyk & Bazyk (2013) explored the relationship of occupational engagement and wellbeing from the perspective of university students with disabilities uncovering two themes related to a strong desire to belong, and the importance of being a part of something beyond themselves. Currently, there is limited research surrounding the desire for social interaction among individuals with ASD. Further exploration of this topic has great implications with regard to the social and emotional wellbeing of this population.

Participation in purposeful, meaningful and authentic occupations was found to of utmost importance in the individual development of occupational competency, facilitation of social connections and a deeper understanding of oneself. Townsend & Polatajko (2007), Hasselkus (2011) and Cutchin (2013), identify this theme to be apart of the foundational understanding of occupational therapy practice and occupational science research. It is suggested that participation and engagement in meaningful and relevant

occupations foster deeper connections amongst individuals (Dunn & Thrall, 2012; Hammell, 2009) and oneself (Carlson, Ku, Chou, Clark, 2013; Hammell, 2014), and enhances an individual's task motivation and overall wellbeing (Beiswenger & Grolnick, 2010). This theme is interwoven among all of the participant's concept maps and their individual reflections highlighting its importance and meaning.

Many of the participants described the use of multi-modal and multi-sensory tools help them develop their occupational competence, relate better to others and express themselves. It became clear the participant connection to technology was immediate, with it fostering both a sense of belonging and a sense of support. The use of popular media, personal supports and visual methods all helped to gain and maintain their engagement and participation. Similar to other studies exploring this area, individuals with ASD learn more efficiently and effectively through the use of technology and visual supports (Bauminger-Zviely, Zancanaro, Weiss & Gal, 2013; Cihak et al., 2010; Grynszpain et al., 2014; Rao & Gagie, 2006; Roberts & Joiner, 2007). The participants voiced that the various mediums and modalities offered different opportunities to engage with the information and consolidate their new knowledge.

Taking action through doing and connecting with the present was the final theme that was conveyed in both the concept maps and the reflections of the participants. This theme represented the participant want and need to engage directly in their occupational goals, experience connections with others and develop a sense of self in the present. This theme is supported by the work of Wilcock (1998) and Kielhofner (2009), who highlight the power of "doing" as an interconnected construct necessary in building competence, identity, and connections to oneself and others. The participant emphasized the importance of moving beyond talking about an occupation, to doing it as a necessary construct in their learning process.

4.8   Methodological Constraints

This paper has outlined the analysis of the concept maps and individual reflections of ten adolescents with Autism Spectrum Disorder (ASD) surrounding personalized and sociocultural experiences of engaging in an innovative intervention focused on life skill development. The use of a focus sensory ethnography methodology was carefully selected as a way to explore these experiences from a constructivist-interpretivist paradigm (Creswell, 2014; Finlay, 2006a; 2006b; Pink, 2009; 2011; Wahyuni, 2012). The use of this methodology and paradigm includes some considerations for the future applicability of this research. Caution must be taken regarding manner in which the data are collected and interpreted as to not perpetuate power imbalances that might lie within disseminating knowledge *about* people (Murphy & Dingwall, 2007; Pink, 2011). As Pink (2009; 2011) highlights sensory ethnography "involves the production of meaning *in participation with them* [in reference to the participants, italics not added] through a shared activity in a shared place" (Pink, 2011, p. 271).

Additionally, the methods of gathering the sensory data from the participants may vary depending on the research question (Pink, 2009). For the purpose of this study the visual method of concept mapping supplemented with the textual reflections of the participants was used as the method of data collection with the purpose of allowing the participants to share their voice through different mediums. This form of multimodal communication facilitated the self expression of their learning experiences, and did not impose boundaries to communication which is essential for individual with ASD who have been found to demonstrate difficulty in organizing and conveying their accounts of emotional experience in a traditional narrative framework (Losh & Capps, 2006; McCabe, Hillier & Shapiro, 2013). Individuals with ASD tend to describe visually salient elements of memories and feelings (Grandin, 2008; Losh & Capps, 2006) therefore making it necessary to consider multi-modal forms of communication to fully understand the participant's learning experience.

There were a number of methodological constraints in my research. These should not be viewed as limitations of the research, but realities of conducting an in-depth qualitative study for the purposes of a doctoral degree (Creswell, 2014; Higginbottom, 2014; Higginbottom et al., 2013; Lincoln, Lynham & Guba, 2011; Pink, 2009). A methodological constraint was that all my participants were recruited through the same non-profit organization. Participants were not involved with this organization may have provided different perspectives. The support that they might have received had in accessing services and experiences with various therapeutic programs may have affected their experience in this research project. The intention of this research study was to examine the personal and socio-cultural experiences of adolescents with ASD regarding their engagement and the development of their occupational competence following an intervention. The purpose was exploratory in nature and therefore the goal was not generalizability. Focused sensory ethnography and ethnography "takes the position that human behavior and the ways in which people construct and make meaning of their worlds and their lives are highly variable and locally specific" (LeCompte & Schensul, 2010, p. 1). The value and meaning remains present within my research, and affects future investigations in this area. The insights offered in this dissertation represent experience embedded within an institutional culture, and while it does not represent the experience of all adolescents with ASD who are exposed to the intervention, it acts as a starting point for further exploration of engagement and occupational competence in this population.

The context in which the intervention and the data were collected in could have posed a methodological constraint. Ethnographies are richly embedded in the context of the participant's own communities (Creswell, 2014; Finlay & Ballinger, 2006; O'Reilly, 2012). Pink (2009) discusses the notion that lengthy emersion in fieldwork that is embedded in the participant's communities is not always a viable option. She highlights that the focus of the research should guide the ways in which we connect, learn and understand our participant's experiences (Pink, 2009; 2005). The focus of this dissertation was on gaining a deeper understanding the participant's personal and socio-

cultural experiences while participating in an *intervention*. The characteristics and criteria of a focused ethnography also support that was used throughout the course of this research study (Higginbottom et al., 2013). On-going effort was made to balance the clinical context with community programming and participant-driven environmental modifications, to help build a sense of community and ownership over their context (Ghaziani, 2012; Vroman, 2013).

The amount of time that I had to interact with the participants during the summer camp program is another methodological constraint of this dissertation. This type of sensory ethnography complies more with the format of a focused ethnography. A focused ethnography has seven characteristics which include: 1) conceptual orientation of a single researcher; 2) focus on a discrete community; 3) used in academia and health care research 4) involvement of a limited number of participants 5) problems focused and context specific 6) participants usually hold specific knowledge 7) episodic participant observation (Higginbottom et al., 2013 LeCompte & Schensul, 2010; Muecke, 1994). As elaborated by Jeffrey & Tronan, (2004) this dissertation fits with recurrent time mode format that focuses on observing change as a documentary approach to developing a deeper understanding.

4.9　　Future Directions

The purpose of this paper was to examine the personalized and socio-cultural perspectives of adolescents with Autism Spectrum Disorder (ASD) during their participation in a novel intervention. Focus was placed on examining their insights related to the development of their occupation competence, their connections with others, and the building of their personal autonomy. There are many areas of overlap between the information provided by the participants in this study and the findings in the literature. However, the findings of this study add a new perspective and depth to the research in this area, particularly due to the unique methodology and methods that were employed.

The findings of this paper add to the literature supporting group intervention and the use of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. It further explores the use of the CO-OP approach with the ASD population and the supports the efficacy of this meta-cognitive framework for supporting the meaningful exploration of both motor based and psychosocial goals. It also connects the seven key features of the CO-OP approach to the themes uncovered in this study associated with the competency, relatedness and autonomy of the participant's engagement in meaningful occupations.

The results of this study also add to the literature surrounding the effectiveness of providing an intervention to adolescents with ASD within a group format to help facilitate the development of meaningful social connections. It highlights through the use of multi-modal and multi-sensory mediums the importance of social connections to these individuals, and how through the collaborative building of a safe and supportive environment they were able to find a sense of belonging.

This study adds to the literature supporting the use of technology and concept mapping with adolescents with ASD to help facilitate their engagement in meaningful occupations. It presents a unique qualitative framework for concept mapping that unites structure and creativity to offer the participants an individualized method to help facilitate their learning process. It highlights the fit between technology and the cognitive and psychosocial profiles of individuals with ASD while maintaining the fun, engaging and social appropriateness of the supportive aide.

The results of this study are encouraging with regard to the effectiveness of the method of concept mapping as a visual strategy embedded within the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. The insights and perspectives provided from the participants regarding their personalized and socio-cultural insights of participating in this novel intervention will help to shape its development and implementation in the future. Additional studies need to be conducted to replicate these findings and support the application of this framework to a larger

sample size. Future studies need to assess the quantitative changes associated with the occupational-based assessments to strengthen the effectiveness of this intervention approach. Research into the transfer and generalization of the framework and any newly developed cognitive strategies to different tasks and contexts would enhance the validity of this intervention approach. How to aide in the transfer, generalization and maintenance of these skills and strategies with the successful involvement of parents and/or caregivers is an important component to investigate. The participation of parents and/or caregivers in the intervention process is a key feature in the CO-OP approach however how this relationship is negotiated with adolescents with Autism Spectrum Disorder (ASD) requires further investigation.

Additionally, future studies should explore the therapeutic effectiveness of this combined framework for other populations beyond those with ASD, that have demonstrated positive changes in occupational competence after completing the CO-OP approach intervention protocol. Finally extending the dialogue around the possibility of capturing the reflective experiences of adolescents with ASD through the use of technology and concept mapping is an exciting area worthy of future investigation.

This study highlighted many important themes regarding the meaningfulness and the usefulness of this intervention approach for adolescents with ASD. This study cohesively combined the use of visual methods, technology, and group work with the CO-OP approach as a possible occupational based intervention for life skill development. Therefore, this study has opened the doors to the future possibility of enhancing the occupational performance of adolescents with ASD through the application of this unique and theoretically sound framework.

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Chapter 5

5   Final Considerations

This chapter concludes the dissertation, and highlights the contributions of this research in developing a deeper understanding of how adolescents with Autism Spectrum Disorder (ASD) define their personal and socio-cultural experience(s) of participating in an intervention. Attention is given to how the participants are positioned within the context and how they form connections with one another. It supports the effectiveness for the use of concept mapping embedded within the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach as a potential intervention method for this population. I will highlight how this study contributes to the field of occupational science by developing a deeper understanding of the ways in which adolescents with ASD experience occupations, and how they foster their sense of competency, relatedness and personal autonomy. The adopted criteria for evaluating the trustworthiness of this research investigation will be provided, and the methodological constraints of the study will be discussed. Finally my personalized reflections on the research process from its inception to its completion will be provided.

5.1   Research Implications

5.1.1   Contributions to Understanding Occupational Competency, Relatedness and Personal Autonomy

Chapters three and four provided new insights into the understanding of how adolescents with Autism Spectrum Disorders (ASDs) define their personal and socio-cultural experience(s) of participating in an intervention. These unique perceptions can be used to help shape the way that this intervention will be conducted in the future (LeCompte & Schensul, 2010; Ritchie & Ormston, 2013; Sandelowski & Leeman, 2012). Sandelowski & Leeman's (2012) article that addresses strategies to enhance the accessibility and usability of qualitative health research findings was taken into consideration when discussing the research implications of this dissertation. This was

done because I wanted to enhance the accessibility and utilization value of the findings by translating them into the language of intervention and implementation to inform future research studies with this population (Sandelowski & Leeman, 2012).

Translating findings into the language of intervention. Chapter three and four summarized and consolidated the current literature surrounding the effectiveness of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach as an intervention for adolescents with Autism Spectrum Disorders (ASDs). These chapters also discussed how the method of concept mapping can be utilized to foster participant engagement and learning within an intervention approach. New connections between these two approaches were highlighted, and the theoretical utility of this new framework was discussed. Occupation, motivation, transfer, generalization, flexibility and autonomy are concepts that are embedded within the CO-OP approach, and act as important facilitators in the development of occupational engagement, competency, relatedness and autonomy of adolescents with ASD (Rodger & Polatajko, 2010; Polatajko & Mandich, 2004; Polatajko et al., 2001; Poulsen, Rodger & Ziviani, 2006). Theoretical and empirical evidence was presented regarding how the visual method of concept mapping can help to teach and reinforce these concepts during an intervention. Chapter four displayed evidence for the effectivenss of this intervention approach, and generated new knowledge that builds upon and enhances the existing evidence supporting the effectiveness of the CO-OP approach (Rodger & Brandenburg, 2008; Rodger & Vischram, 2010; Rodger et al., 2008; Rodger et al., 2009; Phelen et al., 2009), and the use of concept mapping with adolescents with ASD (Wilson et al., manuscript in preparation).

Three themes in chapter four of this dissertation informed the ways that the participants' experienced the intervention process, and gave insights into some important factors to consider in its future implementation. Engaging in purposeful, meaningful and authentic occupations fostered meaningful connections between participants, and enabled them to develop a deeper insight into their own strengths and weaknesses. It also promoted their engagement in the process of developing their occupational competence

in both themselves and as a member of the group. This theme is supported in both the occupational therapy and occupational science literature through the enabling principles (Townsend & Polatajko, 2006) and the dimensions of occupation (Hammell, 2004, 2009; 2014; Wilcock, 1998; 2006).

Using multi-modal and multi-sensory tools to engage the participants in the intervention process was an important theme that was uncovered to help facilitate the use of the CO-OP approach with adolescents with ASD. This theme is supported within the current literature regarding the importance of offering different modalities for learning within the context of the classroom and therapeutic environment (Case-Smith & Clifford O'Brien, 2010; Goodman & Williams, 2007; Hart & Whalon, 2011; Kandalaft, Didehbani, Krawczyk, Allen & Chapman, 2013; Milley & Machalicek, 2012; Rao & Gagie, 2006; Roberts & Joiner, 2007).

As well, this dissertation added new information to the literature regarding the use of multi-modal and multi-sensory tools within the context of an intervention in facilitating the development of personal autonomy, and fostering meaningful connections with others. The use of technology offered the opportunity for participants to the share their voices through reflexive journaling and mapping. It also aided the participants in forming connections with each other by sharing common interests within the group (e.g. playing video games, sharing applications on their iPads[R], playing musical instruments), and connecting to the multi-media learning tools that were presented throughout the intervention (e.g. popular movies and television shows).

Finally, action through "doing" (Hammell, 2004; 2009; Wilcock 1998; 2006) as a necessary element in connecting to the present, building competencies, engaging in social connections and developing a sense of self, was a theme that was uncovered in chapter four. This theme has direct implications for future interventions. It is supported within the occupational therapy and occupational science literature through acknowledging the importance of connecting over "doing" (engaging and participating in meaningful occupations), and its interconnectedness with the other dimensions of occupation: being,

belonging and becoming (Hammell, 2004; 2009; 2014; Hitch, Pepin & Stagnitti, 2014a; 2014b; Riley, 2008; Wilcock, 1998; 2006). This theme adds to the current literature by highlighting the participant's insights into the value of being exposed to new occupations and how that facilitated their engagement, development of occupational competency, connections with others and a sense of personal autonomy.

   Application of the findings for the CO-OP intervention. Chapter three and four delineated how the context(s) of the intervention played an important role in the participant personal and socio-cultural experiences. Awareness of context is an element that is weaved throughout all of the key features of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach (Polatajko & Mandich, 2004). The participant reflections and their concept maps highlighted the importance of context in developing their occupational competencies, connecting with others, and building a sense of personal autonomy. These perspectives added valuable insights into the negotiation of cultural spaces for adolescents with Autism Spectrum Disorder (ASD). The major themes discussed in chapter four that helped to delineate the importance of context included: finding balance through the negotiation of tensions, and the engagement in purposeful, meaningful and authentic occupations. Within these themes the participants discussed how they had to navigate the physical and social spaces in the kitchen while preparing meals (alone and with others), the importance of creating a meaningful space (physical, emotional and social) within the classroom to enhance their occupational engagement and participation, and the process of negotiating their occupational and social roles as a member of a group, as a member of their family, and within the larger context of their community. Within the current literature the contextual relevance of interventions for individuals with ASD has been focused on facilitating academic success, managing difficult behavior, and practicing skills for the purpose of transfer and generalization (Case-Smith & Arbesman, 2008; Rodger et al., 2008; Rodger & Polatajko, 2010; Rodger et al., 2009). These insights into the deeper significance of the context in relationship to the meaning and relevance of an intervention are important factors for future program design and implementation.

Translating the findings *into thematic sentences.* Chapter four added new and meaningful information to the literature by emphasizing five major themes that were revealed through the participants' concept maps, and their personal reflections during their participation in the intervention. These themes explicitly connect to the theoretical perspective of the Self Determination Theory (SDT) (Deci & Ryan, 1985; 2000), the dimensions of occupation defined within the field occupational science (Hammel, 2004; 2014; Hitch et al., 2014a; 2014b; Wilcock, 1998, 2006), and to the seven key features of the CO-OP approach (Polatajko & Mandich, 2004). The themes also support the current literature by highlighting the interaction of multiple factors within the person, the environment and the occupation, that affect an individual with ASD's ability to engage and develop occupational competency in their chosen goals (Bauminger-Zviely, et al., 2013; Case-Smith & Arbesman, 2008; Koegel et al., 2010; Palmen et al., 2012; Potvin et al., 2013). These themes tie in closely with the importance of occupation and this dissertation's contributions to the field of occupational science.

5.1.2   Contributions to Occupational Science: Doing, Being, Belonging and Becoming

Self-Determination Theory (SDT) (Deci & Ryan, 1985, 2000), and the dimensions of occupation (Hammell, 2004, 2014; Hitch et al., 2014a; 2014b; Wilcock, 1998, 2006) have contributed to understanding and framing the personalized and socio-cultural perspectives of the participants. Chapter four discussed the cohesiveness of the two frameworks in explicating the meaning and relevance of occupational engagement, competency, social relatedness and personal autonomy. The amalgamation of the SDT and the dimensions of occupation framework recognizes the importance and value of the insights of the participants in the design and implementation of an intervention. People engage in occupations because they are meaningful, important and relevant to them. They do not necessarily participate in activities to meet their needs, instead they choose to engage in a task because of the pleasure they will experience (Deci & Ryan, 2000; 2012; Townsend & Polatajko, 2007; Hammell, 2004; 2009).

This dissertation opened the dilaouge around further exploring the importance of choice and control over occupational goal setting and engagement (Polatajko & Mandich, 2004; Townsend & Polatajko, 2007; Hammell, 2004; 2013). It explored the perspective offering choice to adolescents with Autism Spectrum Disorder (ASD) around *how much* and *in what ways* they will engage in the development of their occupational competencies, social connections and their personal autonomy. As explained by Calder, Hill & Pellicano (2013) at times there exists a conflict between the individual and their support system with what is wanted, and what is expected regarding their engagement in occupations. This tension should be further explored in the literature regarding the discourse of normalcy, and the expectations surrounding the engagement and performance of individuals with ASD (Bagatell, 2007; Calder et al., 2013; Solomon, 2010, Solomon & Bagatell, 2010). This dissertation highlighted the importance of ascertaining the perspectives of adolescents with ASD regarding their engagement in occupations from social, cultural and ethical perspectives.

Chapter four of this dissertation highlighted the five major themes uncovered through the participant concept maps and their reflections. The themes that emerged can be further contextualized by applying the interconnected dimensions of occupation framework highlighted by (Hammell, 2004, 2006; 2014; Hitch et al., 2014a; 2014b; Wilcock, 1998; 2006). The dimensions of doing, being, belonging and becoming permeated all five themes that were uncovered in this dissertation. The interconnectedness of the dimensions of occupation mirrors the complexity of the engagement, the development of occupational competency, the building of social connections, and the process of emerging personal autonomy for each one of the participants. The depth and breath of the themes uncovered in chapter four warrant further exploration and elaboration in a future research paper.

5.1.3   Contribution to Methodology

After reviewing the current research literature regarding intervention approaches for adolescents with Autism Spectrum Disorder (ASD), I noted paucity in the information

related to their personal and cultural insights of participating in an intervention. I decided to investigate these gaps in the literature through a focused sensory ethnography study. The combining of focused and senory ethnography allowed me to incorperate innovative methods that extended beyond listening and watching, and encouraged the use of multi-modal forms of knowledge representation (Hurdley & Dicks, 2011; Pink, 2009). Aditionally, it allowed me to apply the results of this study directly to the improvement of the proposed intervention framework and its future implementation (Cruz & Higginbottom, 2014; Higginbottom, Pillay & Boadu, 2013). Focused sensory ethnography also allowed me to utilize the unique sensory experiences of the participants to help frame their perceptions and insights. As highlighted by Solomon (2010), "both sense and the senses are paths toward and objects of the empirical understanding of autism" (p. 241).

The use of the concept-mapping framework developed in chapter two of this dissertation facilitated through the use of iPad^R technology, enabled me to gain a deeper understanding of the participant perspectives and their personal and socio-cultural insights regarding the intervention. It acted as a way for the adolescents with ASD to access different ways of understanding that might be difficult to convey through the spoken word (Harris & Guillemin, 2012; Pink, 2011). It allowed the participants to express themselves beyond the restrictions of textual language (Rose, 2012) which is particularly beneficial for individuals with ASD who often struggle with language-based skills (Koning & Mcgill-Evans, 2001; Rao & Gagie, 2006; Williamson et al., 2012).

In chapter four of this dissertation I engaged in the data analysis process by remaining cognizant of the need to remain immersed in the sensory experience of the study. I created expansive visual representations of the participants' maps and self-reflections, and re-read field notes and journal entries in an iterative fashion to keep the data contextualized (Hurdley & Dicks, 2011; McNaughton Nicholls, Mills & Kotecha, 2013). See Appendix C for photographs of the data analysis process. If there were special interests (e.g. music, food, objects) that a participant had, I ensured that I involved

them in the data analysis process. This dissertation has added new knowledge regarding the use of focused sensory ethnography in understanding the personal and socio-cultural insights of adolescents with ASD while participating in an intervention.

5.2   Qualitative Criteria

Throughout the research process, from its inception to its completion I set up practices to help ensure the quality of my dissertation. The following section outlines with great transparency the tools that have contributed to my research's trustworthiness. The creative complexity of the qualitative research landscape calls for "a parsimonious framework for qualitative quality can help us communicate the value for our work to a variety of audiences" (Tracy, 2010, p. 838). The eight-point conceptualization of qualitative quality developed by Tracy (2010; 2013) was used throughout this research study to ensure methodological rigor. The reason that this framework was chosen is because it "delineates eight universal hallmarks for qualitative methods across paradigms" (Tracy, 2010, p. 837) and can be used as a platform that allows for qualitative scholars to come together and share in a unified voice that speaks to the importance and validity of their research and their craft (Tracy, 2010; 2013). The quality criteria are further described and additional justification is provided regarding how these criteria were met during the research process

Researching a Worthy Topic. This quality criteria is further explained in the introduction of this dissertation. An extensive literature review was done prior to initiating this research project to ensure that I was conducting a study that would contribute to the current literature on engagement, the development of occupational competence, the fostering of social connections, and the building of personal autonomy in adolescents with Autism Spectrum Disorders (ASDs) (Flick, 2013; Steward, 2006; Tracy, 2010; 2013). In chapter one I discussed how my interest in this research topic was born from both my clinical experience as an occupational therapist, and from the critical analysis of this topic during my academic career. The combination of approaching the research question from an academic and a clinical perspective was an important element

in ensuring that I was researching a worthy topic (Creswell, 2014; Tracy, 2010; Steward, 2006). Because my beliefs and motives informed my topic for this dissertation, I will discuss my process of reflexivity during the research process later in this section (Steward, 2006).

    Displaying Rich Rigor. Explanations and descriptions that are rich are seen as being bountifully supplied, generous, and offer a variety of data sources, contexts and samples (Tracy, 2010; Weick, 2007). The data being collected should be as "complex, flexible, and multifaceted as the phenomena being studied" (Tracy, 2010, p. 841). During this dissertation I collected a number of different forms of data, which included: researcher field notes and reflexive journals, participant reflections and concept maps. The plethora of data ensured that I collected a multi-faceted perspective of each participant's as well as the collective cultural groups' thoughts, feelings, perspectives and insights.

    Rigor and richness also speaks to the ability of the research to display evidence of their due diligence in exercising the appropriate time, care, effort and thoroughness to the design, data collection and write up of their research project (Tracy, 2010). The summer camp program was five days a week for four weeks. Each day ran for seven hours, and included individual, group, and community programming. The length of time, the different contexts, the amount and the variety of data that was collected during the research process, ensures the thoroughness of this dissertation. There is no specific time frame that needs to be met in order to display rigorous qualitative research, and because of the new and unique nature of this topic a valuable contribution was made within the time frame selected (Pink, 2009; Tracy, 2010). It is important to acknowledge that through this research project the data that were collected were meaningful in nature, and relevant to the understanding of the research question. I was cognizant throughout my dissertation regarding the reasons for why and how I was collecting information, so that that I did not run into a prospective issue highlighted by Charmaz (2007) who stated "a

potential problem with ethnographic studies is seeing data everywhere and nowhere, gathering everything and nothing" (Chamaz, 2007, p. 23).

Sincerity. "Sincerity as an end goal can be achieved through self-reflexivity, vulnerability, honesty, transparency, and data auditing" (Tracy, 2010, p. 841). Authenticity was at the heart of designing, implementing and writing up this dissertation. Through my honesty in positioning myself as a researcher in chapter one, through to my final reflections located at the end of chapter five, I have maintained sincerity in my research. The process of reflexivity was initiated in the pre-research stage of the investigation, and was engaged in throughout the course of the data collection, analysis and writing process. The process of reflexivity used throughout the investigation was a combination of inter-subjective reflection and mutual collaboration (Finlay 2002). These forms of reflexivity outlined by Finlay (2002) underscore the social constructionist nature of the this research study. It turns subjectivity inward highlighting the position of the researcher as an active contributor to the knowledge construction throughout the investigation (Finlay, 2002; Finlay & Ballinger, 2006; Mead, 1934). On-going reflection, self-awareness journaling, and debriefing with the research team ensured transparency my sincerity throughout the study.

Credibility. This dissertation displayed credibility by providing a trustworthy account of the personal, cultural and the shared sense of the real (Richardson, 2000; Tracy, 2010). Credibility is also established in this dissertation through providing a thick description of the personal and culturally situated perspectives of the participants. I also remained aware of the importance of tacit knowledge that is both observed, and not observed through the interactions with the participants in informing the data analysis process (Creswell, 2014; Tracy, 2010; 2013). Credibility is also observed through crystallization and triangulation. Crystallization as described by Ellingson (2009) was used in this dissertation because of the interpretive social-constructivist nature of the study. Crystallization accounts for the growth and change of the data as they are accumulated through multiple sources and viewpoints with the purpose of developing

multivocality, and more complex understanding of the data (Ellignson, 2009; Ravenek & Rudman, 2013; Tracy, 2010). Member reflections were also encouraged throughout this dissertation.

Member reflections extend beyond member checks by presenting an opportunity for collaboration and reflexive elaboration instead of just testing for accuracy of interpretation (Bloor, 2001; Ravenek & Rudman, 2013; Tracy, 2010). Member reflections were completed through daily reflections by the participants on their iPads[R], and daily de-briefing sessions that were completed with the group and with each individual to clarify their thoughts, feelings and perceptions. Throughout the research study participants were also encouraged to discuss their thoughts and ideas at *any* time to ensure that their insights were always taken into account and their voices were always heard.

Resonance. Resonance refers to the research's ability to meaningfully connect to an audience (Kuper, Reeves, Levinson, 2008; Tracy, 2010; 2013). It is accomplished through aesthetic merit, transferability and naturalistic generalizations. This dissertation displayed aesthetic merit through its use of multi-modal and multi-sensory methods. Participants' voices were highlighted through concept mapping and personal reflections that are layered with the observations from the researcher. This complex and multifaceted way of gathering and interpreting the data displays aesthetic merit. Transferability and naturalistic generalizations are displayed in the evocative insights of the participants, that make the audience feel as though they have experienced the same phenomenon but in a different way (Ellis, Adams & Bochner, 2011; Tracy, 2010).

Significant Contribution. This dissertation provided a significant contribution to the field of occupational science. Chapter five explored in depth the personal and sociocultural insights of adolecsents with Autism Spectrum Disorder (ASD) as they participated in a novel intervention focused on engagement, the development of occupational competency, social relatedness, and personal autonomy. This research is theoretically significant by extending and building on the disciplinary knowledge of occupational science (Tracy, 2010; 2013). This dissertation demonstrates its theoretical

significance through the generation of a new qualitative concept mapping framework highlighted in chapter two, and through developing a new intervention approach by combining the visual method of concept mapping with the meta-cognitive framework of the Cognitive Orientation to Daily Occupational Performacne (CO-OP) approach. This dissertation is heuristically significant (Tracy, 2010; 2013) because it opens up a new platform for the possibility of exploring the use of concept mapping and the CO-OP approach as an intervention tool within the different environments/contexts that adolescents with ASD occupy, and with different populations who have previously benefited from the CO-OP approach intervention. Finally, this dissertation is methodologically significant (Tracy, 2010; 2013) because it approaches research with adolescents with ASD from a new strength-based perspective, which leads to unique theoretical insights for future research.

Consideration of Ethics. Attending to ethics in qualitative studies includes the procedural, situational, relational and exiting of the research process (Tracy, 2010). Procedural ethics was fulfilled in this dissertation through approval of this study from the Ethics Review Board at Western University in London, Ontario, Canada (Appendix D). In addition I carried out the correct procedures to safeguard the participants from undue exposure (example: the research data was *always* kept in a locked office drawer in a locked office). Situational ethics was maintained throughout the investigation process through researcher reflexivity (Finlay, 2002; Tracy, 2010). Relational ethics is when which researchers are mindful of the connection between themselves and the participants, and ensure that they develop a relationship built on mutual respect, dignity and autonomy (Ellis, 2007; Karnieli-Miller, Strier & Pessach, 2009; Tracy, 2010). Relational ethics is built into the theoretical approach of this dissertation. Using the Self Determination Theory (SDT) (Deci & Ryan, 1985), taking a strength based approach to the intervention, and empowering the participants to share their perspectives and voices involves an ethical self consciousness that is weaved throughout this dissertation. Exiting the research relationship with the participants is an important step in the ethics process, and was considered from the inception of the project through to the writing of the dissertation. I

used journaling and reflexivity to ensure that I was presenting the research in an ethically sound manner as so to "avoid unjust or unintended consequences" (Tracy, 2010, p. 847).

Meaningful Coherence. Meaningful coherent research is defined as studies that "eloquently interconnect their research design, data collection, and analysis with their theoretical framework and situational goals" (Tracy, 2010, p. 848). I ensured meaningful coherence throughout this dissertation from the introduction, through each one of the studies and into the final considerations. The theoretical and methodological underpinnings of this dissertation help to shape and inform the data collection, analysis and writing up of the research to ensure a meaningful, relevant and ethically sound contribution to the academic literature (Finlay & Ballinger, 2006; Revenek & Rudman, 2013;Tracy, 2010; 2013).

5.3   Methodological Constraints

There were a number of methodological constraints in my research. These should not be viewed as limitations of the research, but realities of conducting an in-depth qualitative study for the purposes of a doctoral degree (Creswell, 2014; Higginbottom, et al., 2013; Pink, 2009; 2005).

First, all my participants were recruited through the same non-profit organization. Participants who were not involved with this organization may have provided different perspectives. The support that they might have received in accessing services and the experience(s) that they may have had with various therapeutic programs, could have affected their experience(s)/interpretation(s) of this research project. The intention of this research study was to examine the personal and socio-cultural experiences of adolescents with Autism Spectrum Disorder (ASD) regarding their engagement, the development of their occupational competence, the fostering of meaningful social connections, and the building of personal autonomy following an intervention. The purpose was exploratory in nature and therefore the goal was not generalizability. Focused sensory ethnography "takes the position that human behavior and the ways in which people construct and

make meaning of their worlds and their lives are highly variable and locally specific"
(LeCompte & Schensul, 2010, p. 1). The value and meaning remains present within my
research, and affects future investigations in this area. The insights offered in this
dissertation represents experience embedded within a culture, and while it does not
represent the experience of all adolescents with ASD who are exposed to an intervention,
it acts as a starting point for further exploration of engagement, occupational competence,
social connection, and personal autonomy with this population.

Another methodological constraint was the context in which the intervention was
conducted and the data were collected. Ethnographies are richly embedded in the context
of the participant own communities (Creswell, 2014; Finlay & Ballinger, 2006; O'Reilly,
2012). Pink (2009) discusses the notion that lengthy immersion in fieldwork that is
embedded in the participants' communities is not always a viable option. She highlights
that the focus of the research should guide the ways in which we connect, learn and
understand our participants' experiences (Pink, 2009; 2005). The focus of this
dissertation was on gaining a deeper understanding of the participants' personal and
socio-cultural experiences while participating in an *intervention*. The intervention was
situated in a clinic-style format therefore that is where the data were collected. On-going
effort was made to balance the clinical context with community programming and
participant-driven environmental modifications, to help build a sense of community and
ownership over their context (Ghaziani, 2012; Vroman & O'Brien, 2013).

The amount of time that I had to interact with the participants during the summer
camp program is another methodological constraint of this dissertation. This type of
ethnographic methodology complies more with the format of a focused ethnography. A
focused ethnography has seven characteristics which include: 1) conceptual orientation of
a single researcher; 2) focus on a discrete community; 3) used in academia and health
care research 4) involvement of a limited number of participants 5) problems focused and
context specific 6) participants usually hold specific knowledge 7) episodic participant
observation (Higginbottom et al., 2013; LeCompte & Schensul, 2010; Muecke, 1994). As

elaborated by Jeffrey & Tronan (2004) this dissertation fits with recurrent time mode format that focuses on observing change as a documentary approach to developing a deeper understanding.

5.4   Final Reflections

This concludes my dissertation regarding the engagement, the development of occupational competence, the fostering of social connections, and the building of personal autonomy in adolescents with Autism Spectrum Disorder (ASD). I provided new and meaningful information to the body of literature by adding qualitative and occupationally relevant data. I have contributed a new framework for designing, implementing and evaluating concept mapping, and demonstrated its effectivenss when embedded in the meta-cognitive framework of the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach. I have offered adolescents with ASD a new medium to express their personal and socio-cultural thoughts and insights regarding their experiences of participating in an intervention. This in turn helps us to create more relevant and meaningful ways to meet the occupational needs of this unique population.

I am honoured to have been able to address these questions and add the insights of these adolescents to the greater body of research. Thank you to all of the participants who created their own unique space and place within the summer camp program and were gracious enough to involve me in the process.

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Appendices

Appendix A: Intervention Booklet: Cognitive Orientation to Daily Occupational Performance (CO-OP) Approach

CO-OP
Cognitive Approach to Daily Occupational Performance

CO-OP Approach: Parent Resource

The CO-OP Approach is a highly individualized cognitive intervention that is focused on enhancing skill acquisition and development. It is a highly verbal approach that supports skill generalization and transfer

(Polatajko, Mandich, Missiuna, Miller, Macnab, Malloy-Miller & Kinsella, 2001)

The Beginning

A little bit of history
Who, What, Where, When, Why

The CO-OP Approach was initially created to address the motor development needs of children with Developmental Coordination Disorder (DCD). Researchers found that children with DCD appeared to perform a task in the same way whether it was successful or not. They also struggled with selecting an appropriate motor response, and were unable to generalize or transfer skill sets to other tasks or new environments (Missiuna et al., 2001). The CO-OP approach has been used with a variety of different populations whom also experience difficulties achieving their desired level of occupational performance. These include children with Autism Spectrum Disorder, children with learning disabilities, and fine motor difficulties, and individual who have experienced a brain injury. The CO-OP Approach is a global problem solving framework that helps children to develop cognitive strategies, enhance their skill acquisition, and promotes their ability to generalize and transfer their newly developed skill sets to different tasks and environments (Bernie & Rodger, 2004). The CO-OP approach is "highly individualized, client-centred approach to strategy-based skill acquisition" (Polatajko et al., 2001, p.110). The key features of the CO-OP Approach include: 1) regularity in the session structure 2) focus on child chosen goals 3) continued dynamic performance analysis by the therapist 4) learning of cognitive strategies 5) illuminating enabling principals 6) constant involvement of the parent/caregiver (Polatajko et al., 2001). For more information regarding the history, protocols and the objectives/key features of the CO-OP approach please see the parental tool box at the end of this informational package.

Appendix A: Continued from previous page

Rationale for why it works…

The CO-OP approach is a child-centred, cognitive based intervention, focused on enabling children to achieve their functional goals" (Polatajko et al, 2001, p.83).

The following is a summary of the key tenants of the CO-OP Approach and how they provide the foundational elements that make the CO-OP Approach a successful, evidenced based intervention.

1) Session Structure: allows for consistency throughout the 12 one hour sessions where parents/caregivers are encouraged to observe as frequently as possible to help with generalization and transfer.

2) Child-Chosen Goals: the CO-OP is a client-centred approach that views the child as an active collaborator throughout the therapeutic process. This philosophy promotes motivation, generalization and transfer.

3) Dynamic Performance Analysis (DPA): is conducted on an on-going basis where performance problems are solved through breaking the task down into pieces, identifying possible solutions and then testing them on a trial and error basis. DPA is based on motivation, task knowledge and occupational performance.

4) Cognitive Strategies: are strategic thinking processes aimed at accomplishing the child's chosen goals. In the CO-OP approach there are both global and domain specific strategies used. Goal, Plan, Do, Check is the global cognitive strategy used to frame each goal. Domain specific strategies are then used that focus on improving performance that are task, situation or child specific. There are 8 domain specific strategies used in the CO-OP approach and the child applies these strategies to

their task performance with the guidance of the therapist. The combination of global and domain specific strategies provides children with a "tool-kit" of strategies that will help them improve their task performance as well as promote skill generalization and transfer to new activities and environments.

5) Enabling Principals: these help the child and his/her parents through the process, use cognitive strategies, develop occupational skills and generalize/transfer learning. These include:
Making it fun- playful interactions improve success
Promote good strategy use- constant evaluating and supplementing the child's task knowledge as needed therefore helping the child to develop a range of strategies, and improve task performance.
Frame in Goal, Plan, Do, Check- focus on building independence with using this framework to solve occupational performance problems.
One thing at a time- focusing the child on one task at a time therefore not placing excessive attention demands on the child.
Working toward independence- focus is placed on building child's independence with strategy use.
Guided discovery- "children remember best when they discovery something themselves" (Polatajko et al., 2001, p. 118). Therefore when completing activities we want to "ask not tell", "guide, don't adjust". This iterative process occurs throughout the therapeutic intervention and enables learning.

6) Parent/Caregiver Involvement: is crucial for promoting on-going skill acquisition, strategy use, and generalization and transfer of learning.

Adapted from: (Polatajko et al., 2001)

3

CO-OP protocol in brief
Steps to trying it at home!

The objectives and the key features of the CO-OP approach need to remain in the forefront of the therapists' and parents/caregiver's minds when engaging in the sessions. The prerequisites that the child must have in order to benefit from the CO-OP Approach include: 1) the ability to identify three occupational goals 2) be able to attend/respond to the therapist/parent/caregiver 3) be able demonstrate some insight into their task performance (how well they perform their chosen goals) 4) have the potential to perform the task 5) have the motivation to learn three skills (Polatajko et al., 2001). The following outline is an adapted version of the CO-OP intervention protocol that provides parents/caregivers with a summary of what a session may look like. There are typically 12 sessions in each treatment block. The CO-OP intervention protocol encompasses more detail and rigor then what is provided. For more information re the protocol in brief please refer to the parental tool kit.

1) Establish occupationally relevant goals and have the child rate their performance of these goals and their level of satisfaction with their current level of performance on a scale of 1-10 (1= low and 10= high).

2) Introduce the global problem-solving framework of Goal, Plan, Do, Check and apply to each of their 3 goals.
Goal: What do I want to do?
Plan: How am I going to do it?
Do: Do it! (carry out the plan)
Check: How well did my plan work?

3) Help to guide/facilitate the child's acquisition and application of the Goal, Plan, Do, Check framework remembering to promote independence and guided discovery throughout the process (i.e. Don't tell the child what to do…set up the task and environment to promote skill acquisition/discovery).

See case studies for more information re the application of the CO-OP approach!

4

Current Research…

Research is currently being conducted looking at the CO-OP Approach implemented with various populations of children to help enhance their occupational performance. Investigation into employing the CO-OP approach in groups, as well as in conjunction with visual methodologies and technology is a growing area of research in the field of occupational therapy. Due to the versatility of the CO-OP approach and its strong theoretical foundations, the sky is the limit with research into this exciting area! Studies are even being conducted looking at using the CO-OP Approach with older adults who have suffered a stroke (Polatajko et al., 2012; Henshaw et al., 2011). Additional information is being generated researching the effectiveness of the CO-OP Approach with children who have Autism Spectrum Disorder, Sensory Integration Dysfunction, and Attention Deficit Disorder. To stay abreast of the new knowledge available on this intervention please see the resources provided...new discoveries are happening all the time!

Missiuna, C., DeMatteo, C., Hanna, S., Mandich, A., Mahoney, W. & Scott, L. (2010). Exploring the use of cognitive interventions for children with acquired brain injury. *Physical & Occupational Therapy in Pediatrics, 30(3), 205-219.*

Phelan, S., Steinke, L. & Mandich, A. (2009). Exploring a cognitive intervention for children with pervasive developmental disorder. *Canadian Journal of Occupational Therapy, 76(1), 23-28*

Polatajko, H.J. & Cantin, N. (2010). Exploring the effectiveness of occupational therapy interventions, other than the sensory integration approach, with children and adolescents experiencing difficulty

5

Case Examples
Your child is not alone….

Productivity

Matty is a 15-year old boy who struggles with organization in the classroom. Matty's difficulties negatively impact his overall academic performance. The Occupational Therapist (OT) worked with Matty on his organizational skills, using the CO-OP approach, and the 'Goal, Plan, Do, Check' framework. Within this framework, Matty was able to identify his own concerns with his organizational skills, and generate his own solutions to resolve the problematic aspects of this area of weakness. With verbal guidance from the OT, Matty was able to identify that sometimes, he forgets to write in his day planner homework that needs to be completed, and often forgets it at home. The Occupational Therapist was then able to guide Matty in identifying domain specific strategies which can be used to assist with this including: setting his watch with an alarm that reminds him at the same time each day to write in his planner, and having a special place at home designated for keeping his planner. Using these strategies, Matty was able to work towards improving these specific areas of his organization within the classroom environment.

Leisure

Sam is a 12 year old boy who has a diagnosis of Aspergers Syndrome. Sam is seen by an OT to learn how to improve his social communication when participating in sport activities with his peers. The OT used the CO-OP approach and the process of task analysis to "break-down" the cognitive components of social skills. The OT modeled various social skills that he might encounter while using verbal guidance. The OT also utilized domain specific cognitive strategies like supplementing task knowledge and body positioning to help Sam navigate through the learning process. Ensuring Sam is an active collaborator in the therapeutic process guarantees his motivation, and improves his skill acquisition and retention. Sam was provided "homework" to practice the skill of social communication at home. This encourages the involvement of Sam's family in the learning process, and helps with skill retention, generalization and transfer. After succeeding at each cognitive component of social communication Sam was able to demonstrate proficiency in this area and started to apply his newly developed

Self-Care

Sarah is a 18 year old girl who has difficulty with remembering to consistently participate in her hygiene routines (i.e. showering, brushing teeth etc.). Sarah was seen by an OT, in which the CO-OP approach was used to support her skill acquisition. Throughout the first sessions, the OT introduced the 'Goal, Plan, Do, Check' framework, and applied it to activities, which Sarah was already successful in completing. In doing so, Sarah was able to see the 'Goal, Plan, Do, Check' strategy, and how it can be applied successfully. Working with the Sarah's parents, the OT was able to explain this strategy, and discuss how it can be incorporated into Sarah's daily activities to ensure success and strategy transfer. The OT working with Sarah was then able to work alongside Sarah and her parents in identifying a variety of domain specific strategies, which would assist in skill acquisition. Through using verbal instruction and self-guidance, Sarah was able to collaboratively assemble a hygiene schedule that was effective for her and her family's routines. Through developing a partnership between Sara and her parents they were able to effectively implement these important changes.

6

Appendix A: Continued from previous page

+ Additional Resources

Add these important resources to your parental "tool kit".

Foundational Articles

Missuna, C., Mandich A.D., Polatajko, H.J. & Malloy-Miller, T. (2001). Cognitive orientation to daily occupational performance (CO-OP): Part I- Theoretical foundations. *Physical & Occupational Therapy in Pediatrics, 20(2/3), 69-81.*

Missuna, C., Mandich, A.D., Polatajko, H.J., Miller, L.T., Macnab, J.J., Malloy-Miller, T. & Kinsella, K.A. (2001). Cognitive orientation to daily occupational performance (CO-OP): Part III- Protocol in brief. *Physical & Occupational Therapy in Pediatrics, 20(2/3), 107-123.*

Polatajko, H.J., Mandich, A.D., Miller, L.T. & Macnab, J.J. (2001). Cognitive orientation to daily occupational performance (CO-OP): Part II- The evidence. *Physical & Occupational Therapy in Pediatrics, 20(2/3), 83-106.*

A...

Resources

www.canchild.ca

www.caot.ca

http://www.ot.utoronto.ca/coop/about.htm

A...

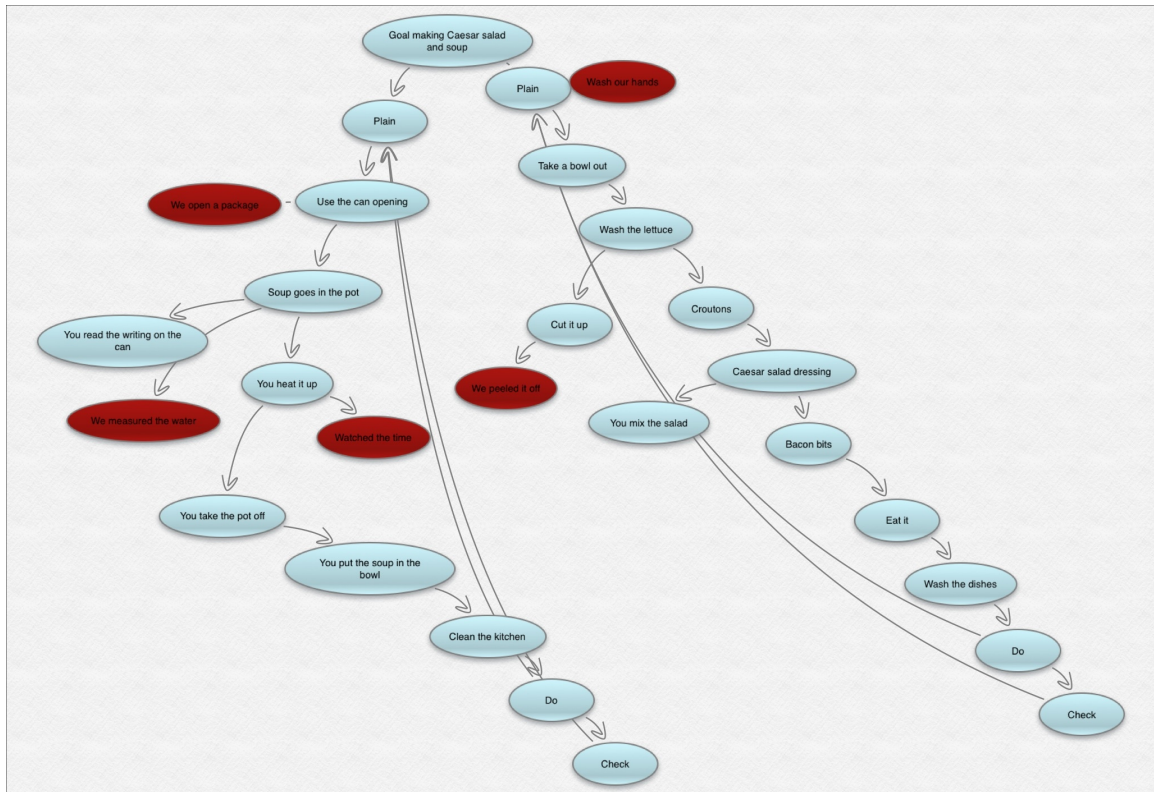### CO-OP Global Problem Solving Framework (GPDC)

Goal: What do I want to do?

Plan: How and I going to do it?

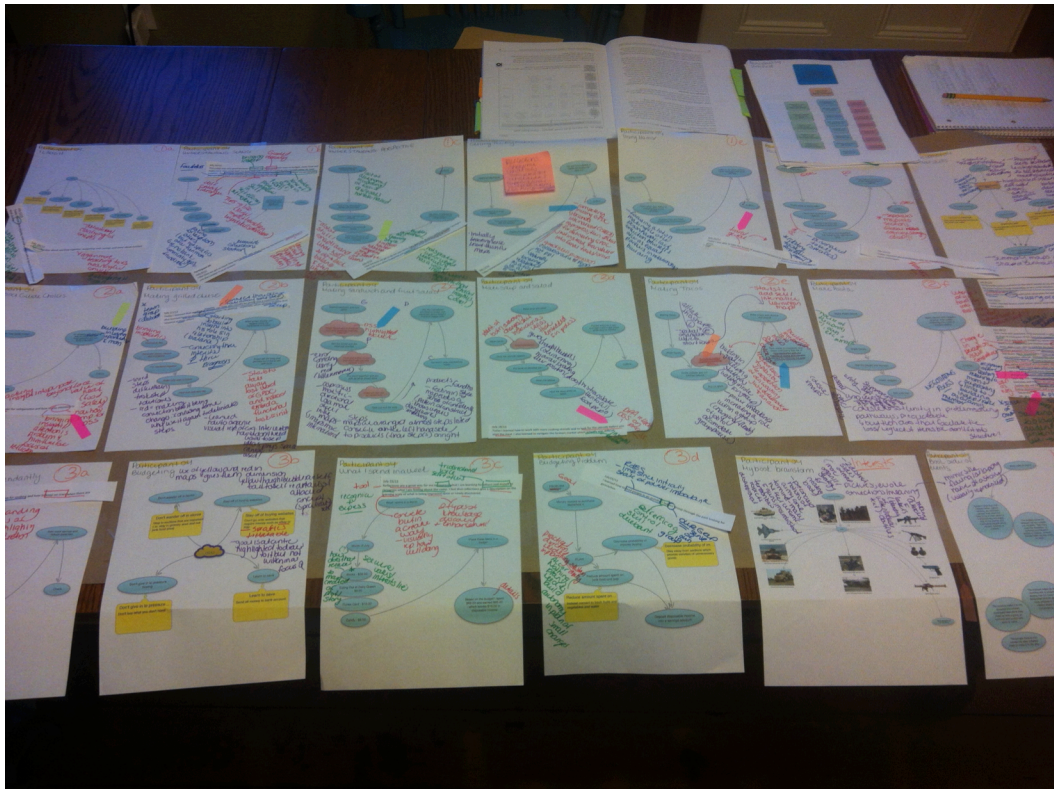*Do:* Do it! (carry out the plan)

Check: How well did my plan work?

Appendix B: Concept Map of Meal Preparation: Participant 10

Appendix C: Photographs of the Data Analysis Process

Appendix C: Ethics Approval

Western Research

Research Ethics

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Angela Mandich
File Number:103594
Review Level:Delegated
Approved Local Adult Participants:10
Approved Local Minor Participants:10
Protocol Title:Transitioning to Adulthood: A Pilot Trail Teaching Life Skills to Young Adults Through a Summer Camp Program
Department & Institution:Health Sciences\Occupational Therapy,Western University
Sponsor:
Ethics Approval Date:April 18, 2013 Expiry Date:August 02, 2013
Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
Western University Protocol		2013/02/27
Recruitment Items	RECRUITMENT EMAIL - REVISED	2013/03/22
Assent	Consent/Assent Form	2013/04/12
Other	Ethics Revisions Responses to requests.	2013/04/12
Letter of Information	April 12/13 - Revised LOI with assessment information included.	2013/04/12

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the University of Western Ontario Updated Approval Request Form.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

The Chair of the HSREB is Dr. Joseph Gilbert. The HSREB is registered with the U.S. Department of Health & Human

Ethics Officer to Contact for Further Information

This is an official document. Please retain the original in your files.

Western University, **Research,** Support Services Bldg., Rm. 5150

Appendix D: Letter of Information

Project Title: Transitioning to Adulthood: A Pilot Trial Teaching Life Skills to Young Adults through a Summer Camp Program
Principal Investigator: Dr. Angie Mandich, School of Occupational Therapy, Western University

<u>**Letter of Information**</u>

1. **Invitation to Participate**

   You and/or your child are being invited to participate in this research study entitled 'Transitioning to Adulthood: A Pilot Trial Teaching Life Skills to Young Adults through a Summer Camp Program'. This information is being distributed by Autism Ontario London on behalf of the project researchers.

2. **Purpose of the Letter**

   The purpose of this letter is to provide you with information required for you and/or your child to make an informed decision regarding participation in this research project.

3. **Purpose of this Study**

   The purpose of this study is to provide Occupational Therapists with a new approach in the treatment of adolescents and young adults with Autism Spectrum Disorders (ASDs). This study seeks to provide a cognitive, community based, therapeutic summer camp run by an Occupational Therapist and Occupational Therapy students at Western University. This treatment program is focused on using the Cognitive Orientation to Occupational Performance (CO-OP) approach to improve daily living skills and ease the transition to adulthood for study participants. The CO-OP approach will be used throughout the course of the 3-week camp program as an intervention to work on specific daily living skills chosen by participants. The CO-OP approach will be integrated into the daily programing and focus on improving specific tasks related to activities of daily living required within the transition to adulthood. This program will incorporate community-based activities and the use of technology, specifically Ipads, to improve the overall functioning of adolescents and young adults with ASDs.

4. **Inclusion Criteria**

   Individuals who are between the ages of 15 and 21 at time of intake and have a diagnosis of an ASD (including Asperger's Syndrome) are eligible to participate in this study.

Appendix E: Letter of Information

5. **Exclusion Criteria**
   Individuals who are currently receiving cognitive based therapy are not eligible to participate.

6. **Study Procedures**
   If you and/or your child agree to participate, you will be asked to attend an initial assessment session at Western University in London, Ontario, where you will be asked to participate in both narrative interviews surrounding your experiences with interventions for you and your child and two standardized assessments focused on selecting and understanding your goals throughout the camp program. The two standardized assessments include:
   - The Canadian Occupational Performance Measure (COPM) is an interview designed to help participants identify and set goals for the summer camp. Each participant and their parents will be asked to identify three activities of daily living tasks to be worked on during the summer camp program. Once goals are set, a behavioural rating scaled called the Performance Quality Rating Scale (PQRS) will be used to show the performance and quality changes of participant goals during the summer camp.
   - The Vineland Adaptive Behaviour Scales (VABS) will be completed. The VABS is an interview that will be completed with parents reporting on their child's skills across a number of areas including communication, socialization and daily living skills. All these assessments will be done at the beginning of the camp and the end of the camp. The PQRS will be used throughout the study to measure day to day changes

   It is expected that this initial assessment session will take approximately two hours. A three week camp block based out of Elborn College at Western University will be run from July 8th – 26th, 2013 from 9:00am-3:00pm Monday to Friday. A post-camp assessment session will follow the three-week camp, allowing for evaluation of change in performance goals. There will be a total of 10 adolescents and young adults participating.

7. **Possible Risks and Harms**
   There are no known or anticipated risks or discomforts associated with participating in this study.

8. **Possible Benefits**
   The possible benefits to participants may include improved independence in activities of daily living and specific goal attainment to ease the transition to adulthood.

Appendix E: Letter of Information

9. **Compensation**

    The use of Ipad Mini technology will be used throughout the summer camp program. Following the completion of the three-week summer camp block, you and/or your child will be compensated for your participation in this study, and keep the Ipad and applicable applications used throughout the program.

10. **Voluntary Participation**

    Participation in this study is voluntary. You and/or your child may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no consequences.

11. **Confidentiality**

    All data collected will remain confidential and accessible only to the investigators of this study. If the results are published, you and/or your child's name will not be used. If you and/or your child choose to withdraw from this study, your data will be removed and destroyed from our database. While we will do our best to protect your information there is no guarantee that we will be able to do so. All data collected will remain confidential and accessible only by the investigators of this study. Your research records will be stored in the following manner: locked in a cabinet and/or on a password-protected computer in a secure office; and they will be destroyed after 5 years. If we find information we are required by law to disclose, we cannot guarantee confidentiality. Representatives of Western University Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

12. **Contact for Further Information**

    If you require any further information regarding this research project or your participation in the study you may contact

    Dr. Angie Mandich   Kaity Gain, PhD Candidate, 2014

    If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics

13. **Publication**

    If the results of the study are published, your name will not be used. If you would like to receive a copy of any potential study results, please provide your name and contact number on a piece of paper separate from the Consent Form.

    This letter is yours to keep for future reference.

Appendix F: Consent Form

Consent Form

Project Title: Transitioning to Adulthood: A Pilot Trial Teaching Life Skills to Young Adults through a Summer Camp Program

Study Investigator's Name: Dr. Angie Mandich, School of Occupational Therapy, Western University

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Child's Name (please print): _____

Participant's Name (please print): _____

Participant's Signature: _____

Date: _____

Parent/Legal Guardian (Print): _____

Parent/Legal Guardian (Sign): _____

Parent/Legal Guardian (Date): _____

Person Obtaining Informed Consent (please print): _____

Signature: _____

Date: _____

Curriculum Vitae

Jessie Amanda Wilson, PhD Candidate 2014

Jessie Wilson

PROFILE

Occupational Therapist, Reg. OT (Ont.)

Canadian Association of Occupational Therapists, member

Ontario Society of Occupational Therapists, member

Association of Caribbean Occupational Therapists, member

World Federation of Occupational Therapists, member

Occupational Scientist, PhD candidate 2014

Canadian Society of Occupational Scientists, member

Executive Director: Canadian Society of Occupational Scientists, 2014

Independent Authorizer, communication devices: in progress

EDUCATION

PhD Health and Rehabilitation Science: Occupational Science
Western University, London, ON
PhD candidate 2014

Masters of Occupational Therapy
Western University, London, ON
Graduated 2006
Thesis: Implementing the Cognitive Orientation to Daily Occupations (CO-OP) Approach With-In a Group Setting for Children with Developmental Coordination Disorder (DCD).

Honours Bachelor Degree in Kinesiology, Minor in Gerontology
Lakehead University, Thunder Bay, ON
Graduated 2004
Final Research Paper: Social Participation of Children With Developmental Coordination Disorder (DCD) With-In the School Setting.

SKILLS

Western Certificate in University Teaching and Learning
In progress- enrolled for Spring 2014
Western University, London, Ontario, Canada

Independent Authorizer ADP: Communication Devices
In progress- completion date 2014

Autism Intervention Level 1: Geneva Centre
Completed 2009

TEACHING

Norway Exchange Student Module   **June 2014**
Occupational Development

Guest Lecture: Western University   **March 2014**
Occupational Therapy 9562
**Occupation and mental health changes and challenges in occupation through the
lifespan: Children and adolescents**

Guest Lecture: Western University   Winter 2014
Physical Therapy 9545: Pediatrics Elective, Developmental Coordination Disorder
(DCD) and the Cognitive Orientation to Daily Occupational Performance
Approach (CO-OP).

Guest Lecture: Western University   **Fall 2013**
Autism: Occupational Implications
First year students OT9531

Guest Lecture: Western University   **Fall 2013**
Autism: The Lived Experience
First year students OT9531

Sessional Instructor: Western University   **Fall 2013**
Occupational Therapy 9641: Enabling Occupation Through Assistive Technology
and Environmental Adaptation.

Teaching Assistant: Western University   **Fall 2013**
Occupational Therapy 9512: Foundations of Practice
Lecture: Mental Health and Crisis Interviewing
Lecture: Interviewing Children

Norway Exchange Student Module   January 2013
Health Promotion Students: Occupational Development

Sessional Instructor: Western University   **Fall 2012**

Occupational Therapy 9461: Enabling Occupation Through Assistive Technology and Environmental Adaptation.

Teaching Assistant: Western University   Fall 2012
Occupational Therapy 9512: Foundations of Practice
Lecture: Mental Health and Crisis Interviewing
Lecture: Interviewing Children

Sessional Instructor: Western University   Winter 2012
Occupational Therapy 9542: Evaluating Occupation in Context

Norway Exchange Student Module   April 2012
Health Promotion Students: Occupational Development

Guest Lecture: Western University   Spring 2011
Experiences as an Occupational Therapist Working in Mental Health
Msc OT First Year Students

Teaching Assistant: Western University   Winter 2011
Occupational Therapy 9595: Evidence Informed Practice

PUBLICATIONS: *Peer Reviewed Journals*

Wilson, J., Mandich, A., Magalhaes, L., Polgar, J. & Gain, K. (accepted 2013). Children's participation in the co-occupation of play: Concepts, meanings and relevance to the field of occupational science. *Journal of Occupational Science*.

Wilson, J., Mandich, A., Magalhaes, L., Polgar, J. & Holmes, J. (submitted 2014). Concept mapping: A dynamic, individualized and qualitative method for uncovering meaning. Awaiting confirmation from committee.

Wilson, J., Mandich, A., Magalhaes, L., Polgar, J & Holmes, J. (manuscript in preparation 2014). Concept mapping with adolescents with Autism Spectrum Disorder (ASD): A multimodal approach to understanding occupational meaning. Awaiting confirmation from committee.

Wilson, J., Magalhaes, L., Gain, K. (submitted 2014). Critical vs. Criticism. *Qualitative Research*.

Wilson, J., Mandich, A., Holmes, J & Gain, K. (manuscript in process 2014). Implementing the Cognitive Orientation to Daily Occupations (CO-OP)

approach with-in a group setting for children with developmental coordination disorder (DCD).

PUBLICATIONS: *Book Chapters*

Mandich, A., Wilson, J. & Gain, K. (submitted 2013). Cognitive assessment and interventions in pediatrics. In J. Case-Smith & J. Davis (Eds.), *Occupational Therapy for Children* (7ᵗʰ ed.).

RESENTATIONS: *ORAL*

Wilson, J., Gain, K. & Mandich, A. (submitted May, 2014). The use of iPadR technology and concept mapping in facilitating independence in adolescents with Autism Spectrum Disorder (ASD). Child Health Symposium 2014, Thames Valley Children's Centre, London, Ontario, Canada.

Gain, K., **Wilson, J.** & Mandich, A. (submitted May, 2014). The transition to adulthood: Teaching life skills to young adults with Autism Spectrum Disorder (ASD)through a community based summer program. Child Health Symposium 2014, Thames Valley Children's Centre, London, Ontario, Canada.

Gain, K., **Wilson, J.** & Mandich, A. (accepted, March 2014). The use of iPadR applications to facilitate independence within the school Setting in adolescents with Autism Spectrum Disorder (ASD). Technology in Education Symposium (TIES @ Western), London, Ontario, Canada.

Wilson, J., Gain, K. & Mandich, A. (accepted October, 2014). Concept mapping: A dynamic, individualized and qualitative method for uncovering occupational meaning. 2014 Joint International Conference, Globalization & Occupational Science: Partnerships, Methodologies & Research. Canadian Society of Occupational Scientists, Society for the Study of Occupation: USA & International Society of Occupational Science. Minneapolis, Minnesota, United States of America.

Wilson, J., Gain, K. & Mandich, A. (accepted May 2014). Concept mapping and Cognitive Orientation to Daily Occupational Performance (CO-OP). Canadian Society of Occupational Therapists (CAOT) Conference 2014, Fredericton, New Brunswick, Canada.

Wilson, J., Gain, K. & Mandich, A. (November, 2013). Concept mapping and the CO-OP approach: Facilitating independence in adolescents with Autism

Spectrum Disorder (ASD). 11th Scientific Conference: Association of Caribbean Occupational Therapists (ACOT), Grand Cayman, Cayman Islands.

Gain, K., Wilson, J. & Mandich, A. (November, 2013). Transitioning to adulthood: A pilot trail teaching life skills to young adults through a summer camp program. 11th Scientific Conference: Association of Caribbean Occupational Therapists (ACOT), Grand Cayman, Grand Cayman Islands.
***Wilson, J. presented

Wilson, J., Magalhaes, L., Polgar, J. & Mandich, A. (2011). Co-occupation of play among children. Society for the Study of Occupation: USA 2011 Conference, Park City, Utah, United States of America.

Polgar, J. & Wilson, J. (2011). The discourse of play: How we structure and value play for children with disabilities. Society for the Study of Occupation: USA 2011 Conference. Park City, Utah, United States of America.

Wilson, J. & Mandich, A. (2011). Co-constructed occupations in children. Health and Rehabilitation Sciences Research Forum 2011 ,Western University, London, Ontario, Canada.

Wilson, J. & Mandich, A. (2011). Occupational transitions from treatment centres to school health therapy. Health and Rehabilitation Sciences Research Forum 2011, Western University, London, Ontario, Canada.

Wilson, J. & Mandich, A. (2011). Occupational transitions from treatment centres to school health therapy. Canadian Association of Occupational Therapists (CAOT) Conference 2011, Saskatoon, Saskatchewan, Canada.

Wilson, J., Mandich, A. (2006). Implementing the Cognitive Orientation to Daily Occupations (CO-OP) approach with-in a group setting for children with developmental coordination disorder (DCD). Annual Occupational Therapy Conference on Evidence Based Practice, Western University, London, Ontario, Canada.

Wilson, J. & Taylor, J. (2004). Social participation of children with developmental coordination disorder (DCD) with-in the school setting. Lakehead University Kinesiology Student Research Forum 2004, Thunder Bay, Ontario, Canada.

PRESENTATIONS: POSTER

Gain, K., Wilson, J., Mandich, A. (accepted October 2014). Critical narratives: Parent stories of the culture of interventions for children with Autism Spectrum Disorders (ASD). 2014 Joint International Conference, Globalization & Occupational Science: Partnerships, Methodologies & Research. Canadian Society of Occupational Scientists, Society for the Study of Occupation: USA and International Society of Occupational Science. Minneapolis, Minnesota, United States of America.

Gain, K., Wilson, J. & Mandich, A. (accepted May 2014). Teaching life skills to young adults with Autism Spectrum Disorders (ASD). Canadian Society of Occupational Therapists (CAOT) Conference 2014, Fredericton, New Brunswick, Canada.

COMMUNITY SERVICE

Presentation: "Safety Precautions When Transporting Children with Disabilities" presented to the bus drivers in the Lambton-Kent District School Board.

Presentation: "Occupational Therapy: Skills For The Job Of Living" presented to various high school students in the Lambton-Kent District School Board directed at enhancing student's knowledge of the OT profession.

Presentation: "Disability and Occupational Therapy" presented to siblings of children with disabilities to enhance their knowledge of various disabilities and how OT helps their siblings reach their rehabilitation goals.

Presentation: "Occupational Therapy" presented at the Ontario Medical School Week (OMSW) 2005 to medical students re the roles/responsibilities of an OT.

OT Grass Roots Committee Member: Western University   2005-2006
Grassroots Marketing Committee focused on increasing awareness of the role of Occupational Therapy in the field of health care.

Children's Movement Clinic: Western University   2004-2006
Cognitive Orientation to Daily Occupational Performance (CO-OP)
Volunteer and Instructor

Inter-professional Health Care Association (IHA)   2005-2006
Occupational Therapy Student Representative
Focus on bringing together different health care faculties to promote interdisciplinary teamwork.

North American Federation of Adapted Physical Activity   2004
Conference Planning: Kinesiology Representative

Swimming Lessons: Student with Special Needs   2003-2004
Adapted swimming lessons for children with developmental disabilities
Lakehead University: Thunder Bay, Ontario, Canada

The Motor Development Clinic for Children with DCD   2003-2004
Organizer and Volunteer Student Mentor
Lakehead University: Thunder Bay, Ontario, Canada

Therapeutic Horse Back Riding: Thunder Bay, Ontario   2002-2004
Volunteer with the Thunder Bay Therapeutic Riding Association
Basic Instructor

FUNDING

Canadian Society of Occupational Scientists   **2013**
In the amount of $500.00
Award in Student Scholarship- Not Accepted

C. Kingsley Allison Award : Western University   **2013**
In the amount of $9000
Directed toward research program for adolescents with ASD

Student Travel Bursaries Western University   **2011, 2013 & 2014**
In the amount of $500.00
Awarded to assist cover costs for students presenting at various conferences

Allied Health Professionals Development Fund   **2011**
In the amount of $500.00

New Brunswick Health Bursary Program Recipient   **2006**
In the amount of $5,000.00
Awarded to occupational therapy student for recruitment to New Brunswick to
practice upon graduation.

CLINCAL EXPERIENCE

Pace Home Health Care   2010-2013
School health occupational therapist, enhancing the working relationships between the school board, teachers, educational assistants (EA), parents and other community agencies.

Additional focus placed on: completing standardized assessments, ongoing documentation and goal setting, conferencing with CCAC staff/parents and resource teachers, working in both a consultative and direct service delivery model, working in partnerships with other agencies/schools and daycares, communicating with parents on an on-going basis, treatment planning, developing strong community partnerships and advocating/educating public regarding the role/profession of OT .

Children's Treatment Centre of Chatham Kent   2008-2010
Occupational Therapist, coordinator of the Seating and Mobility Clinic, lead occupational therapist on the School Age Team (youth 6-21 yrs), and home and school modifications/environmental accessibility.

Additional focus placed on: completing standardized assessments, ongoing documentation and goal setting, self directed program development (seating and School Age Team), working in both a consultative and direct service delivery model, working in partnerships with other agencies/schools and daycares, communicating with parents on an on-going basis, treatment planning, knowledge and understanding of delegating tasks to an OTA, developing strong community partnerships and advocating/educating public regarding the role/profession of OT.

Holistic Home Health   2010-2011
Occupational Therapist who conducted home assessments/environmental modifications, seating and daily aid prescription, ongoing education to clients, long term care facilities and families.

Search Community Mental Health Centre   2008-2009
Crisis worker based out of Middlesex General Hospital ER department working with an interdisciplinary team, conducting mental health assessments, working in a consultative role, participating in active problem solving, crisis management, decision making, and treatment planning, working with clients' families and leading/arranging client discharge or transfers.

Regional Mental Health Care St. Thomas: ACT 1 Team   2006-2008

Occupational Therapist, lead developer of the Walking Program directed at encouraging healthy lifestyles among the ACT 1 clients.

Additional focus placed on: Working with clients who have serious and persistent mental illnesses, working in the community, working from a psychosocial model of care, working in a trans-disciplinary team, conducting initial ADL/IADL/cognitive/gait assessments, charting, participating in rounds, crisis intervention, setting overall rehabilitation goals and treatment plans, and working with client's families.

PLACEMENT EXPERIENCE

Steel Street Outpatient Group Home: RMHC St. Thomas   2006
Conducting initial intake assessments with clients, developing rehabilitation focused goals, working on community based interventions focusing on employment, education, ADL's, social relationships and IADL's, participating in recreational therapy sessions, shadowing forensic OT and ACT OT, charting, and participating in rounds discussions.

Grand River Hospital: Inpatient Surgery and Orthopedics   2006
Conducting initial interviews with clients and families, observing a knee replacement surgery, organizing and conducting ADL and functional mobility assessments, participating in pre-surgical clinics, planning TA programs, and charting.

Bluewater Health: Outpatient Physical Health   2005
Conducting range of motion and strength testing, conducting initial assessments, conducting individualized treatment sessions focusing on refinement of fine motor skills and improving cognitive capabilities, planning treatment sessions, observing the hand and upper extremity clinic, fabricating hand splints, charting, and participating in interdisciplinary team meetings.

London Health Sciences Centre: Inpatient Mental Health   2004
Observing initial inpatient assessments, organizing group therapy sessions, assisting with discharge planning, and participating in interdisciplinary team meetings.

REFERENCES   Given upon request