Second Life™: Virtual World Case Studies Exploring Self-Determination of Adults with Developmental Disability

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Authorization to Submit Dissertation

This dissertation of Corinna Stiles, submitted for the degree of Doctor of Philosophy with a major in Education and titled "Second Life™: Virtual World Case Studies Exploring Self-Determination of Adults with Developmental Disability," has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies to the College of Graduate Studies for approval.

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Abstract

Studies report the virtual world program Second Life™ is a successful environment for learning, treatment, support services, and social activities (Wagner, 2008; Davis, Owens, Khazanchi and Zigurs, 2009; Nosek, Robinson-Whelen, Hughes, & Nosek, 2016). However, minimal studies specifically explore whether Second Life™ can support self-determination of adults with developmental disabilities. This two-participant case study investigated whether activities conducted by adults with developmental disabilities in Second Life™ can influence self-determination. Secondarily the study also investigated whether self-determination experienced in Second Life™ can transfer to the physical world.

Chapter one Introduction provides the context for the study including the background of the problem, the significance of the study and definition of key terms. Chapter two Literature Review explains Second Life™ and explores the use of virtual worlds as a learning, treatment and support services environment; as an environment for self-determination and; the transference of virtual world experiences to the physical world. Chapter two also provides a comprehensive look at the theoretical framework that informs the literature review, study design, and analysis of this study. These elements frame the study for the researcher, and help the reader to understand the context for how the researcher approached the study. Chapter three Methodology provides a description of the research design including how participants were selected, how data was gathered, how the researcher followed protocols to protect participants, how data was analyzed and validated, and what the study sought to accomplish. Chapter four Findings includes case studies presenting the influence and outcomes of Second Life™ activities on self-determination in the physical world as experienced by two adults

with Autism spectrum disorder. The chapter also introduces gatekeeping and its possible impact on participant selection. Chapter five Discussion, Implications, Limitations and Conclusions provide a discussion of the results, limitations, recommendations for further research, and conclusions. The findings of this study support the hypothesis that activities conducted in a virtual world by adults with developmental disabilities can influence self-determination and that self-determination experienced in a virtual world can transfer to the physical world. Ongoing research in the use of virtual world programs to support self-determination of adults with developmental disabilities would be beneficial and contribute to expanding the opportunities to live a self-determined life.

Key words: *Second Life™, virtual worlds, developmental disability, autism spectrum disorder, causal agency theory, self-determination*

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The work of an intellectual is not to mould the political will of others;
It is, through the analysis that he does in his own field, to re-examine evidence and assumptions, to shake up habitual ways of working and thinking, to dissipate conventional familiarities, to re-evaluate rules and institutions and to participate in the formation of a political will (where he has his role as citizen to play)
~Michel Foucault (1926-1984)

CHAPTER 1. INTRODUCTION

In 2003, Linden Lab launched a virtual world program called Second Life™ (SL). It is described as a "pioneering virtual world that's been enjoyed by millions of people and seen billions of dollars transacted among users in its economy" (www.lindenlab.com). Second Life™ has been used across diverse demographics as a way to learn, receive treatment, access support services and participate in social activities. Literature exists exploring the use of SL by people with disabilities. However, minimal studies provide insight for the specific use of SL by adults with developmental disability. An even wider research gap exists exploring the use of SL by adults with developmental disabilities as an environment to develop self-determination and additionally whether self-determination experienced in a virtual world can transfer to the physical world. Consistent with self-determination understandings, control of one's life, one's opinions, and one's identity should be in the hands of the individual with a disability. To accomplish this outcome, as suggested by Foucault, sometimes we need to re-examine evidence and assumptions, shake up habitual ways of working and thinking, dissipate conventional familiarities, and re-evaluate rules and institutions. This study through the theoretical framework Causal Agency Theory used the virtual world program Second Life™ to re-examine evidence, assumptions, and rules on how to gain self-determination.

Background of the Problem

The social norms of society often result in individuals with disabilities being told by others what is possible, what their personal and professional limits are, what social activities they may participate in, and what future opportunities do or do not exist for them. Influencers with good intentions such as family, teachers, support staff, professional service providers, and friends often draw from their own opinions, experiences, and their own interpretations of those experiences when deliberately or inadvertently influencing another person's self-determination. Unfortunately for the person with a disability, this can lead to low self-expectations, minimized independence, and minimal control over decision-making and other unrealized aspects of self-determination. Wehmeyer and Abery (2013) pointed out that adults with developmental disability are less self-determined than their non-disabled peers. However the additional point was made that his does not speak to the capacity of adults with developmental disability to become more self-determined (Wehmeyer & Abery, 2013).

Self-determination is vital to the health and well-being of people with disabilities. The conventional and familiar opportunities for self-determination are grounded in the physical world. However, the growing expanse of virtual worlds should be considered as an additional opportunity to gain self-determination. Barriers to self-determination that sometimes exist in the physical world, such as limited access to people, activities and places, can be overcome in virtual worlds like Second Life™. This study challenged the conventional and familiar opportunities for self-determination by grounding self-determination in the virtual world of Second Life™.

All opportunities that support living a self-determined life are valuable. Increasingly the sophistication of technology is blurring the line between virtual and physical worlds. This leads to the importance of identifying associations and intersections between the virtual and physical worlds, including associations and intersections with living a self-determined life. Consider the current normalization in the use of smartphones. Smartphones (a device capable of online and virtual activities) provide the opportunity for communication and access to infinite amounts of information at any moment of the day. Ongoing online activities, virtual communication, and access to information inform what people see, hear or read. For most people, this information subsequently influences ongoing or future physical world behaviors, activities, and decision-making. For example, watching a trailer online for a new movie may influence whether or not a person goes to see that movie. Following a local business or event on Facebook may influence how discretionary income is spent. Participating in an online petition allows someone's voice to be heard on an issue important to him or her. Technology has been integrated into the normal routine of most people's every day life. However, literature and the present study indicate adults with developmental disability do not consistently have the freedom to access the same routine technology and opportunities for online experiences. Limitations include access to computers or computers with high speed Internet, support staff with limited technology skills, and outright restrictions to online access (Balandin & Molka-Danielsen, 2015; Nosek et al., 2016). As a result, these limitations may impact self-determination.

Purpose of the Study

The purpose of this study is to investigate whether activities by adults with developmental disability conducted in a virtual world can influence self-determination. Identifying research gaps and building upon minimally studied concept associations, this study also provides new insight into the current body of knowledge that supports the usability of virtual worlds, specifically Second Life™, by adults with developmental disability to influence self-determination in the physical world.

Research Questions

The research question was:

How can activities in a virtual world influence self-determination of adults with developmental disability?

The sub question was:

How can self-determination experienced in a virtual world transfer to the physical world?

Significance of the Study

Self-determination is linked to more positive employment, independent living, quality of life and life satisfaction (Wehmeyer, 2014). Insight into alternative ways to develop and enhance self-determination is needed to match the conditions of an ever-changing world. Historical approaches and methodologies, while still viable, present limitations in a world that has seen population shifts in rural and urban areas, shifting availability of direct and indirect services, expanding rights of individuals with disabilities to live lives autonomously and free

of outside influence, and an explosion of technology. It is important to understand that people should have the same opportunities to access the world around them regardless of whether or not they have a disability and regardless of what that disability might be.

This study identified a large portion of research regarding the use of virtual worlds by individuals with disabilities focused on individuals with physical disabilities. In comparison, few studies focused on the use of virtual worlds by adults with developmental disability. Fewer studies associated virtual worlds and self-determination of adults with developmental disabilities. This study investigated whether activities conducted by adults with developmental disability in a virtual world can influence self-determination. No single study could be found that associates the transference of self-determination between virtual and physical worlds. In response, the present study also investigates the transference of self-determination from a virtual world to a physical world. There are significant gaps in research on the application of activities in virtual worlds to influence self-determination or the transference of self-determination from a virtual world to the physical world. This study begins to fill these research gaps with a two-participant case study of adults with Autism spectrum disorder (ASD) who complete study activities grounded in self-determination in the virtual world Second Life™.

Definitions of Key Terms

Developmental Disability

The Developmental Disabilities Assistance and Bill of Rights Act of 2000 defines developmental disability as:

A severe, chronic disability of an individual that:

(i) is attributable to a mental or physical impairment or combination of mental and physical impairments;

(ii) is manifested before the individual attains age 22;

(iii) is likely to continue indefinitely;

(iv) results in substantial functional limitations in 3 or more of the following areas of major life activity:

- Self-care;
- Receptive and expressive language;
- Learning;
- Mobility;
- Self-direction;
- Capacity for independent living;
- Economic self-sufficiency; and

(v) reflects the individual's need for a combination and sequence of special, interdisciplinary, or generic services, individualized supports, or other forms of assistance that are of lifelong or extended duration and are individually planned and coordinated.

This definition includes individuals with Autism spectrum disorder (ASD).

Physical World

The Merriam-Webster dictionary does not define physical world. Metaphysical arguments do not reach consensus on how to define what is or is not a physical world. For the purposes of this study, the researcher defines physical world as an environment that is not a virtual world. Research in virtual worlds use synonymously the terms actual world, real world, off-line world, and physical world. The use of the term physical world was selected by the researcher to highlight a difference between online and offline behavior, without adding an implication that one environment is more "real" than the other.

Self-determination

Wehmeyer (2004) posits that the term self-determination "has become laden with multiple meanings and intents" (p. 338). The truth of this statement requires the researcher to clearly state the construct of the definition being used. This study defines being self-determined as acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference (Wehmeyer, 2004).

Virtual World

Techopedia (2017) defines virtual world as a computer-based online community environment that is designed and shared by individuals so that they can interact in a custom-built, simulated world. Users interact with each other in this simulated world using text-based, two-dimensional or three-dimensional graphical models called avatars.

CHAPTER 2. LITERATURE REVIEW

The purpose of this study is to investigate whether activities conducted by adults with developmental disability in Second Life™ can influence self-determination. Chapter two provides a review of the literature on the use of virtual worlds by adults with disabilities, self-determination, and the transference of self-determination from virtual worlds to the physical world.

The search strategy for this literature review began with specific attention paid to virtual worlds, adults with developmental disabilities, and self-determination. Iterative searches were conducted within, Academic Search Premier (EBSCO), Pro Quest, JSTOR and Google Scholar to retrieve articles containing key search terms and combinations of key terms. These key terms included: identity, choice-making, self-determination, Second Life™, virtual worlds, physical worlds, transference from virtual to physical world, virtual worlds and disability, and self-determination in virtual worlds.

Due to the nature of ongoing changes in technology and the use of technology, the field of virtual studies provides ongoing emergent knowledge. Emergent studies guided the analysis of data and the conclusion that additional research in the use of SL to influence self-determination of adults with developmental disabilities is needed.

Vast literature could be found on issues related singularly to disability, the use of virtual world, and self-determination. However, a research gap exists when these issues are linked together and knowledge is sought specifically regarding the use of SL by adults with

developmental disability to influence self-determination, and the transference of self-determination to the physical world.

Review of Literature Specific to the Research Questions

Literature in the field of virtual world platforms and programs did not present a deep historical anthology that could be determined relevant to most current studies. This is likely due to rapid changes in technology and continual programming innovations. As a result, studies conducted in or about virtual worlds are at constant risk of being outdated with little applicability to a study's present technology environment. Motherboard blogger Emanuel Maiberg (2016) recently stated, "Thirteen years is an eon in the technology business". This should not, however, prevent studies in this area from moving forward. It simply means current rather than historical research may guide the study. In the present study literature dating back fifteen years to the present informed the study's focus on the use of SL by adults with developmental disabilities.

Second Life™

Second Life™, launched by Linden Labs in 2003, is a three-dimensional (3-D), immersive computer-simulated environment with 39 million registered users internationally and up to approximately 50,000 online at any given time (Nosek et al., 2016). Boellstorff (2008) explained three fundamental elements are present in all virtual worlds: (a) places, (b) inhabited by persons, and (c) enabled by online technologies. Second Life™ is a virtual world consisting of islands that are built out by users who use 3-D simulated objects to replicate buildings, furniture, landscape, vehicles, animals, and people. Second Life™ users,

called “residents” interact with each other through “avatars,” a graphical representation of the user. The individual behind the avatar can choose to reveal as much or as little about their real life in the appearance of their avatar. For people with disabilities, this allows for the unique experience of experimenting with alternative forms of embodiment and presence in a social context (Nosek et al., 2016).

Users can register for a free basic account in SL and download free software to run the program (www.SecondLife.com). Accessed from any location with a high-speed Internet connection, environments exist before the user logs on, and still exist and transform as a result of the activity of other residents when the user is logged off. Unlike traditional computer games, SL does not have a designated objective, or traditional game play mechanics or rules. It is a user-created, community-driven experience. Social interaction occurs through both verbal and non-verbal forms that are consistent with physical world communication including speech, writing, and body language. Residents can communicate via local chat, group chat, global instant messaging (known as IM), and voice chat. Social cues and body language are made possible through textual description or deliberate avatar movement (Stendal & Baladin, 2015).

Second Life™ is a vibrant environment that includes universities, businesses, health organizations and social venues, to name a few. Linden Lab CEO Ebbe Altberg stated, in 2015, users redeemed $60 million (USD) from their Second Life™ businesses, and the virtual world’s GDP is about $500 million (Maiberg, 2016). Residents interact in real time, contributing to SL being considered a community, a society, and even a culture (Davis & Calitz, 2014). Literature supports the use of SL as a platform that is safe and useful for people

with disabilities (Baladin & Molka-Danielsen, 2015; Beals, 2010; Bloustien & Wood, 2015; Bullingham & Vasconcelos, 2013; Davis & Calitz, 2014; Davis et al., 2009; Gilbert, Murphy, Krueger, Ludwid, and Efron, 2013; Kleban & Kaye, 2014; Nosek et al., 2016; Partala, 2011; Stendal & Baladin, 2015; Stendal, Balandin & Molka-Danielsen, 2011; Standen, Brown and Cromby, 2001). For example, Balandin and Molka-Danielsen (2015) found that educators could use virtual worlds such as SL with people with intellectual disability as an enjoyable medium to experience new activities and gain feelings of independence. Nosek et al. (2016) similarly concluded that a virtual reality self-esteem enhancement intervention for women with physical disabilities, yielded improvements in self-esteem and depressive symptomology, with a trend toward improvement in generalized self-efficacy. Stendal and Balandin (2015) found virtual worlds offer an arena for people with autism spectrum disorder to meet their peers on equal terms, not being dependent on social cues, which in the physical world can be a barrier for this group.

The literature review confirmed (1) minimal empirical research has been conducted in the area of individuals with developmental disability actively engaged with virtual worlds, (2) research on the use of interventions in Second Life™ has been focused on individuals with physical disabilities, and (3) there is a continued need to further explore gatekeeping that results in a barrier for people with developmental disability to access virtual worlds (Balandin & Molka-Danielsen, 2015; Nosek et al., 2016; Stendal & Balandin, 2015).

Learning Environment. In Second Life™, virtually everything and anything is possible (Stendal et al., 2011). In the physical world, people are often constrained by physical laws and stigma. However, virtual worlds eliminate the physical laws, provide a unique

opportunity to eliminate stigma and offer experiences that may be otherwise unavailable. Dancing, horseback riding, exploring German villages, attending music concerts, poetry readings, or just hanging with friends by a campfire are all activities available to people with disabilities in SL. Second Life™ provides opportunities to overcome barriers often encountered in the physical world. Krell (2007) pointed out that business management consultants have described SL as "the ultimate non-discriminatory medium" (p.85). This statement was made after a business management consultant determined after staff was interviewed and hired on the SL platform, that she was deaf. Kleban and Kaye (2014) suggest the strength of such programs for people with disabilities lies in their ability to provide safe access to interactive true-to-life situations, which would otherwise be inaccessible to such individuals.

Enabled by a stimulating multimedia environment, virtual worlds, like Second Life™, have several characteristics that facilitate learning: the experience is immersive; the platform engages learning-by-doing; participants acquire tacit knowledge; it is capable of supporting effective interaction; and participants can explore extreme situations in simulated environments without fear (Davis et al., 2009; Wagner, 2008). One of the main advantages of virtual worlds is the ability to overcome limitations related to geographical distances (Partala, 2011). The availability and proximity to activities in the physical world often proves difficult to learn a skill or enjoy an activity.

A study conducted by Nosek et al. (2016) that looked at enhancing the self-esteem of 19 women with physical disabilities through SL activities confirms the virtual world offers people with significant mobility limitations opportunities for movement and social

engagement that can only be imagined in real life. For individuals with developmental disability, virtual worlds offer a safe, risk-free environment to experiment or practice skills that may include, taking social risks that are not possible or too great in the physical world (Savin-Baden, 2010; Stendal & Balandin, 2015). In the virtual world a person's experiences are only limited by their own choice-making rather than geographical, physical or societal limitations.

While the body of knowledge is growing, few studies have measured the impact of using SL and its direct application to adults with developmental disabilities (Balandin & Molka-Danielsen, 2015; Kleban &Kaye, 2014; Nosek et al., 2016; Stendal & Balandin, 2015). Standen et al. (2001) studied the effective use of virtual environments in the education and rehabilitation of nine students with intellectual disabilities. An early study in this area, the study found pupils with intellectual disabilities would find stimulation through "enjoyable repetition" and a gradual increase in level of challenge (p.290). With computers, learners can be less dependent and more capable. The learner can work at his or her own pace. They can make as many mistakes as they like without irritating others and the computer will not tire of the learner attempting the same task over and over again, nor get impatient because they are slow or engrossed in particular details. It enables pupils to take charge of their own learning.

The Standen et al. (2001) study also drew attention to three characteristics of virtual worlds that make them particularly appropriate for people with intellectual disabilities. First, virtual worlds allow the opportunity for people with intellectual disabilities to learn by making mistakes but without suffering the consequences of their errors. Second, virtual worlds can be manipulated in ways the real world cannot be. Tasks can be constructed so as

to be more prominent or complex as the user becomes more familiar with the task. Third, in virtual worlds, rules and abstract concepts can be conveyed without the use of language. Virtual worlds support the attainment of concepts by direct interaction and practical activity.

Identity. Chapter one discussed that adults with developmental disabilities often experience their identity as determined by others. They are often told who they are, rather than allowing their natural abilities and personal experiences define their identity.

Erik Erickson, a psychoanalytic theorist, introduced the notion that the social, cultural, and historical context is the ground in which individual identity is embedded (Adams et al., 2010). Beginning in childhood, contemporary conceptualizations by Erikson and Marcia identify exploration and commitment as key to identity formation (La Guardia, 2009). La Guardia (2009) explained "exploration" as actively questioning and evaluating a variety of values, beliefs, goals and social roles. "Commitment" refers to clearly dedicating oneself to a set of values, beliefs, goals and roles and engaging in the associated activities to maintain them. Social norms and lack of environmental accessibility often curtails the opportunities children with disabilities have for exploration and commitment. As a result, when an individual with a disability reaches adulthood, key steps to identifying oneself may have been missed, or at the very least minimized.

Danforth (2000) suggested the identity of people with disabilities more often than not amounts to a report referred to by professionals that define the individual's identity in numbers and words. The report includes descriptions and test scores that often determine the location of residence and opportunities for personal or professional activities. Typically the individual's knowledge about himself or herself is excluded because the report defines the

person in such a way that their own words and self-understanding is irrelevant. When minimal focus is placed on identity, the individual with a disability may perceive a lack of importance in establishing one's own identity. The Danforth study suggests a need for alternative ways for an individual with developmental disability to establish and emphasize their identity. Consistent with concepts of self-determination, control of one's life and one's identity should be in the hands of the individual with a disability.

A sense of total control over ones self-representation has been a striking feature of virtual worlds (Boellstorff, 2008). A resident of SL stated, "In Second Life, you can develop parts of you that because of other constraints or expectations, you do not." The resident further explained that the development of these parts "can be practiced in a natural way, every day, as much as you want." An adult with developmental disability does not always have control over their self-representation (or identity) in the physical world. In Second Life™, "you can be who you are, not your [actual world] body" (Boellstorff, 2008).

However, Adams et al. (2000) suggested we should consider the process of identity formation a lifelong journey and the salience of particular aspects of our identity varies at different points in our lives. Likewise, Renzaglia (2003) noted that even those who did not have an opportunity to learn self-determination skills during their school years can learn the skills later in life. Because identity formation is a complex interplay among individual decisions and choices, life events, community expectations, and societal categorization and socialization, interventions or activities at any stage of life may have impact on an individual's identity. Second Life™ as a teaching and learning platform that provides the ability to create opportunities for choice and control, allowing adults with developmental

disability to learn skills systematically and experiment with concepts risk free. The present study suggests activities in Second life conducted by adults with developmental disability may impact an individuals' identity through enhanced self-determination in the physical world.

"Otherness". In U.S. society there are at least seven aspects of identity that sets us apart as exceptional or "other": race or ethnicity, gender, religion, sexual orientation, socioeconomic status, age and physical or mental ability. Each category has a form of oppression associated with it and each category has a group that can be considered dominant and a group considered subordinate (Adams et al., 2010). Danforth (2000) examines Foucault's *Madness and Civilization* as an informative template for understanding how persons are subjugated and oppressed through classification as "other," examples of lesser forms of humanity that differ in substance and character from "normal." Dominant groups, by definition, set the parameters within which the subordinates operate (Adams et al., 2010). In the category of physical ability, able-bodied individuals are classified as the dominant group while persons with disabilities is classified as the subordinate group. Further acknowledging that identity and "otherness" often leads to oppression, the term *oppression* is used to encapsulate the fusion of institutional and systemic discrimination, personal bias, bigotry, and social prejudice and further states oppression restricts both self-development and self-determination (Adams et al., 2010).

The question to be answered is to what extent can identity that has been influenced and formed in the physical world by all of these preceding factors be influenced in the virtual world? Studies show the virtual world represents a new way to construct and understand the

theories of identity and oppression; a new way to consider and explore ones personal identity, physical difference and social networks, and a new way to consider, explore and manipulate "otherness." Adams et al. (2010) notes, in general "It can be challenging to discover that skin color, accented speech, perceived gender or sexual orientation, or the presence or absence of a physical or mental disability are useless as indicators of talent, character, intelligence, or morality" (p. 3). Yet due to advances in technology and virtual worlds such as SL, these challenges are now readily available and are actively informing a new way of thinking.

Identity Tourism. Users in Second Life™ determine their avatar's appearance by modifying their avatar with free or purchased features such as clothing, hair, skin tones, gestures and accessories. Some users modify their avatars to resemble their own physical appearance, for example including characteristics of physical disabilities, using a wheelchair or including a guide dog. While others explore "identity tourism," imaginative visual representations of themselves that may not include any of the individual's true real world physical characteristics (Blasing, 2010). Bullingham and Vasconcelos (2013) explain that identity tourism utilizes the potential for anonymity to adopt a different gender or race. Once doing this, the user, knowing nothing about being, say, female or black (or both) behaves and talks in a stereotypical way with the result that they later feel they know how it is to inhabit this 'other' skin.

Partala (2011) surveyed 258 users of SL to gain insight into the psychological needs of users. The study noted that many participants expressed that the possibilities for creative self-expression are better [in SL] than in their real lives and this forms a central motivation for SL usage. The present study supported self-expression by participants in the opportunity for the

participant to represent themselves through their avatar, the 3-D graphical representation of the user.

The present study included adults with developmental disability who explored identity tourism as individuals without a disability. As previously suggested, engaging with other residents of Second Life™ without disclosure of disability provides opportunities for adults with developmental disability to experience interactions without stigma, without pre-conceived notions, and without judgment. Boellstorff (2008) noted, that often interactions in SL between people would occur for months before it was learned that a resident had an actual-world disability. As a result, many residents with physical world disabilities found that SL broadened their social networks. This study supports the findings that the use of identity tourism can provide the adult with developmental disability a sense of belonging and community that may not otherwise be readily available.

To further understand identity tourism in SL, Savin-Baden (2010) reviewed a study by Ducheneaut that examined identity reassignment activities exploring issues related to culture, gender, race, disability, and age. The Ducheneaut study revealed almost everyone chose to be young and beautiful but by asking students to swap gender, become a wheelchair user or become an older person, it challenged them to explore how they are treated, viewed and spoken to in SL. After Master's students completed a subsequent module conducted by Savin-Baden in SL, the students were queried on what were their top experiences in SL? Consistent with the Ducheneaut study, "Being challenged about some real world attitudes" represented a common response. These studies offer insight into the capacity of SL to allow for self-awareness exploration, engage in relationships with others and understandings of

stigma. Identity tourism provides a safe space for adults with developmental disabilities to challenge what they, and others, think is known.

A study by Hansen, Davies and Hansen (2008) introduced the concept "acquired abilities." A panel member participating in a virtual debate in SL entitled "Is Second Life really accessible to those with disabilities?" recounts:

> *"'When I first came into Second Life, I found I had acquired some abilities. I could walk (I can't walk in real life); I could fly; I could even teleport. I felt more comfortable seated and so got a Segway [scooter] to move around in-world' "*
>
> Do you think that this will be a really useful tool for people who are unable to get around, who have problems of mobility in real life?" *"Yes, because you can have friends without having to go out and physically find them"* (Hansen et al.)

"Acquired abilities" is a new concept explored in the present study as often co-existing with identity tourism. At the time of the present study, no specific literature was available to inform the application of this concept to individuals with disabilities and their related activities in SL. Acquired abilities is introduced and defined in the current study as a method by which an individual with a disability experiences activities in ways previously unavailable. As in the forgoing example, this individual uses a head wand to activate a keyboard one key at a time in her SL interface. This allows her to socialize and participate in physical activities, which would otherwise be limited by her disability (Hansen, Davies & Hansen, 2008). Identity tourism and acquired abilities suggest the possibility to reframe one's identity in SL.

Self-Determination

Western concepts of self-determination in the physical world are traced back to Plato in Classical Greece. Since the early 17th century self-determination has been rooted in determinism, a philosophical doctrine positing that events, in this context human behavior and actions, are effects of preceding causes. John Locke, in his 1690 treatise *An Essay Concerning Human Understanding*, saw both causality and free will at work in human behavior (Wehmeyer, 2004). Deci's more recent 20th century Self-Determination Theory (SDT) is summarized as

> "distinguish[ing] between the motivational dynamics underlying activities that people do freely and those that they feel coerced or pressured to do. To be self-determining means to engage in an activity with a full sense of wanting, choosing, and personal endorsement. When self-determined, people are acting in accord with, or expressing, themselves" (p. 348).

According to early Wehmeyer (2004), self-determination is the outcome that people with disabilities have opportunities to exert control in their lives and are provided supports that enable them to take advantage of such opportunities in ways which respect their values, beliefs, and customs and those of their family and culture. Shogren, Wehmeyer, Palmer and Forber-Pratt (2015) refined self-determination as a process that can be explicitly taught, and becomes increasingly internalized with repeated opportunities to engage in self-determined action. While it has been widely held for generations that promoting self-determination results in achieving a better quality of life, the exact meaning of self-determination remains varied in the research (Wehmeyer & Abery, 2013). However, the underlying essence of all

self-determination refers to acting based on one's own mind or free will, without external compulsion (Wehmeyer, 2004).

Studies have identified many component elements of self-determined behavior (Akridge, 1985; Ju, Zeng & Landmark, 2017; Test, Karvonen, Wood, Browder and Algozzine, 2000). These include but are not limited to goal setting/attainment, leadership, problem solving, self-advocacy, relationships with others, and self-awareness. The present study identified the self-determination characteristics of problem solving, relationships with others, and self-awareness as the characteristics that would be associated with the activities in Second Life. In a study that reviewed literature on self-determination from 1972-2016, Ju et al. (2017) found success of students with disabilities in postsecondary education more probable if the students exhibited the ability to problem solve situations that supported their learning needs, developed friendships and engaged in socialization, and had self-awareness to understand their disabilities and needs for accommodations. The researcher concluded, based on personal experience in virtual worlds that these characteristics would lend themselves to a virtual world environment.

Choice-making was also consistently revealed as instrumental in promoting self-determination. Research indicates choice-making opportunities provide a strong predictor for self-determination and that by learning to speak for themselves and by making decisions, solving problems, and setting goals, individuals with disabilities become equipped with the skills to more successfully navigate their environments and become active participants in their own lives (Renzaglia, 2003). However, despite results of a survey showing ninety percent (90%) of 114 respondents indicating making choices was important, Agran, Storey, and

Krupp (2010) pointed out that providing consumers with choice-making opportunities does not in and of itself promote their self-determination. Agran et al. (2010) also posits, "for individuals who have limited experience in and opportunities to make choices, choice making does not come automatically and needs to be taught systematically" (p. 78). Studies support learning systemically transfers to the real life situation in which the skills are required which may have a positive effect on individuals and help establish a greater confidence when interacting with others, and may impact positively on their quality of life (Standen et al., 2001).

Self-determination as Determined by Others. Self-determination of adults with developmental disability is influenced, if not determined by mostly well-intentioned people. Agran et al. (2010) state "all major life decisions of individuals with intellectual disabilities have been 'other' determined – that is, determined by service providers, not service recipients." Renzaglia (2003) agreed, "because individuals with disabilities have historically had others in control of their lives, self-determination skills are a necessary counterpart to environmental supports for meaningful inclusion." A study conducted by Wehmeyer (2005) surveyed 1,219 teachers about their understanding and promotion of self-determination, found teachers working with students with mild cognitive impairments disproportionately indicated they did not think they had the authority or latitude to teach such skills and indicated that time was a problem.

Wehmeyer (2005) highlighted a study by Schalock et al., which presented results from 2,042 participants who were surveyed on the importance of Quality of Life core domains. Quality of Life core domains included: (1) emotional well-being; (2) interpersonal relations;

(3) material well-being; (4) personal development; (5) physical well-being; (6) self-determination; (7) social inclusion; and (8) rights (Lachapelle et al., 2005). Of all the quality-of-life core dimensions, The Schalock study showed professionals in the field of disability (773) and family members (491) rated self-determination as the lowest in importance to them. In contrast, the same study found that people with disabilities (778) ranked the importance of self-determination significantly higher than did professionals and family members. Both studies indicated that families and professionals rank the importance of self-determination lower than individuals with disabilities (Wehmeyer, 2005).

As the preceding literature has shown, individuals with disabilities experience limitations on opportunities to make choices and decisions based on their own preferences. What is intended by self-determination, almost universally, is that persons with disabilities, particularly people who exert little or no "control" in their lives, should be supported to increase their opportunities to exert such "control," and supported to succeed in those efforts through a myriad of supports, including learning skills that better enable them to do so (Wehmeyer, 2004).

Transference of Self-Determination from Second LifeTM to the Physical World

Standen (2001) stated, "While virtual worlds possess all the positive characteristics and are considered to be a safe area in which to acquire and practice skills, it is essential that skills learnt in this way transfer to the real world where they are required" (p. 291). Seventeen years later, studies suggest that virtual worlds are effective in facilitating the acquisition of skills and that these skills can transfer from the virtual to the physical world. However, research knowledge gaps continue to exist and current studies consistently suggest

that additional research is warranted (Balandin & Molka-Danielsen, 2015; Davis et al., 2009; Gilbert et al., 2013; Kleban & Kaye, 2014; Lachapelle et al., 2005; Nosek et al., 2016; Partala, 2011; Standen et al., 2001; Stendal & Balandin, 2015; Stendal et al., 2011).

While few studies explore how people with disabilities are using virtual worlds to develop self-determination, a great deal of existing research focuses on people with disabilities receiving specific therapy treatments in a virtual world. These studies are applicable to the present study as indicators of physical world application of treatments received in SL. For example, Wiederhold and Wiederhold (2000) conducted over 600 treatment sessions using virtual environments as an adjunct to traditional-cognitive behavioral therapy designed to treat specific phobias. Assessing patients' progress by using statistical analysis tools and descriptive case reports, this correlation study reached the conclusion that virtual reality therapy is effective and fits within established psychological theories and practice.

The Gerardi, Rothbaum, Ressler, Heekin and Rizzo (2008) study "Virtual Reality Exposure Therapy Using a Virtual Iraq: Case Report" identified a virtual reality based, early and efficient option to treat posttraumatic stress disorder (PTSD). The virtual reality simulation allows precise delivery and control of trauma-relevant exposure stimuli in a safe environment. At the conclusion of the treatment sessions, data shows the virtual reality exposure treatment of PTSD results in a substantial drop in self-reported PTSD symptoms. The study participant reportedly felt comfortable with the technology used in this form of treatment and found the treatment to be logical and credible thus supporting the use of virtual worlds for treatment.

Exploring further the success of virtual reality treatment options for PTSD, in 2008 the Virtual Reality Medical Center (VRMC) claims to have treated more patients with virtual reality therapy than any other center. In testimony to the U.S. Congress regarding the use of virtual reality to treat PTSD, VRMC stated, "We have been treating patients with VR therapy for the past 12 years and have an overall success rate of 92%. Success is defined as a reduction in symptoms, improved work performance, or the successful completion of a task which was previously impossible" (Macedonia, 2009).

Thompson and Fisher (2010) conducted a study that included combat-wounded amputees in recovery. The study explains that often after veterans move through the system of care they find themselves back in the home setting, with little access to peers. A peer support group for amputees, one in over one hundred twenty active peer support groups in SL, provided the peer support the individuals needed. The study found a leading advantage to peer support groups in the virtual world environment, is no set time for access. An individual can sign on at any time, day or night, and likely find someone to whom they can talk. The availability to peers and activities is not an advantage limited to this peer support group. The access to peers and activities not bound by time is applicable throughout SL.

Partala (2011) studied 258 active virtual world users' satisfaction of psychological needs both in SL and in the physical world. Respondents considered self-esteem and needs related to self-determination theory (autonomy, competence and relatedness) as their most important needs. Participants reported experiencing higher self-esteem in SL than in real life and found that self-esteem established in SL carries over into real life behavior.

These studies suggest researchers and therapists have successfully used virtual environments to study and treat psychiatric and behavioral issues for almost two decades. Additional treatments have addressed social phobia, agoraphobia, and fear of public speaking. Second Life™ has proved to be a desirable environment for treatment because using shared virtual spaces and multiuser Internet worlds, clinicians can accompany the patient, observe social interactions, and act as an advisor (Macedonia, 2009). Similar to the online, in-world clinician, the present study found the use of in-world mentors to be beneficial for individuals with developmental disabilities when learning how to navigate SL.

Boellstorff (2008) suggested in virtual worlds our humanity is thrown off balance, considered anew, and reconfigured through transformed possibilities for place-making, subjectivity, and community. Because the physical and virtual worlds are becoming interconnected, virtual worlds have the potential to become an additional environment to learn and grow (Beals, 2010). With the ability to custom design virtual worlds so that a particular task can be performed until is it familiar, virtual worlds are being used to repeat specific social situations to promote knowledge and understanding that may be used in the physical world (Stendal et al., 2011). Expanding on what we know is "real," computers change not only what we do, but how we think about ourselves and the world (Savin-Baden, 2010).

As previously mentioned, minimal knowledge has been established on the intersection of virtual and physical worlds as lived by adults with developmental disabilities. Boellstorff (2008) provided examples of how virtual world behaviors can affect a user's physical world behaviors. Through avatar embodiment in SL, a resident learned that he was transsexual: "Pavia started coming out in the real world. I became her, she became me." Residents in SL

who were shy or withdrawn in the actual world, later acknowledge SL allowed them to be "more outgoing," a trait that could then transfer back to the physical world. A resident noted how "experimenting with appearance or behavior in SL potentially opens up new ways to think of things in real life." Yet another observed, "my offline self is becoming more like my avatar, personality-wise. It's like SL has grown on me and looped back". Friendships initiated in SL are said to not prejudge persons based on factors like gender, race, and age. As one resident put it: "in real life, you get to know someone from the outside in, but in SL you get to know them from the inside out." In the physical world, specific activities and tasks are carried out through direct manipulation. Virtual worlds can replicate this relationship, using realistic tasks that require skills similar to those that would be used to complete those tasks in the physical world (Mikropoulos & Natsis, 2010).

Through examples of studies showing virtual worlds have successfully been used to affect cognitive functions such as planning, decision-making, judgment and social conduct, it has been determined that SL is an environment conducive to treatment. In addition, the data collected and presented in Chapter four in the present study, suggest activities in Second Life™ may also influence the transference of self-determination from Second Life™ to the physical world

Theoretical Orientation for the Study

The theoretical foundation for the present study was Causal Agency Theory (CAT). Intending to move beyond the confusion and misunderstandings associated with the term "self-determination," Wehmeyer (2004) developed a theory and practice that focused more on

the outcome that people live self-determined lives rather than historical constructs of self-determination referring to a set of practices or a way to deliver services or supports. To accomplish this end, Wehmeyer (2004) suggested three questions as focal points to CAT:

1. What opportunities exist for people to exert control and how can we provide more such opportunities?

2. What skills and capacities do people need to take advantage of those opportunities?

3. What supports will enable the person to overcome barriers and limitations?

This early Causal Agency Theory had two primary operators, capability and challenges. Each operator acted as a catalyst to action resulting in an individual being more or less self-determined. Capability is comprised of *causal capability,* referring to the mental or physical capacities involved in making something happen and *agentic capability,* referring to the mental or physical capacity that enables a person to direct causal action. Further refined, causal capability has two components: causal capacities (the knowledge and behavioral skills necessary to express causal capability) and causal perceptions (the perceptions and beliefs about oneself and one's environment that are necessary to express causal capability). Agentic capability also has two components: agentic capacity (the knowledge and skills needed to direct causal action) and agentic perceptions (the perceptions or beliefs about oneself and one's environment that enable one to act) (Wehmeyer, 2004).

Martin (2004) defined human agency as "the capability of individual human beings to make choices and to act on these choices in ways that make a difference in their lives" (p. 135). Social cognitive theory does not see human agency and social structures as two separate concepts. Instead individuals, through their human agency, and social systems

influence and contribute to each other. Bandura (2006) adds, "Social cognitive theory adopts an agentic perspective toward human development, adaptation, and change. To be an agent is to influence intentionally one's functioning and life circumstances" (p. 164). A belief in human agency supported the idea that people are actively engaged in their lives, not just byproducts of the events surrounding them (Bandura, 2006). Chen (2006) explained, "Bandura defined human agency as a combination of human capacity and potential that assists a person to exercise some control over the nature and quality of his or her own life, including aspects such as forethought; self-regulation of motivation; affect; and action through self-influence, self-awareness, meaning and purpose in life" (p. 131). The goal of agency is to create and implement plans, which will bring about positives in one's life. Agency allows people to adapt to diverse situations including biological limitations they may face (Bandura, 2006).

In reaction to new research data, the emergence of positive psychology, and the continued need to better understand how a person becomes self-determined, CAT was refined over time (Shogren et al., 2015). Building on the human agentic behavior aspects set forth in the early CAT, Shogren et. al. (2015) suggested self-determined action should not simply imply control over events or outcomes but rather refer to the degree to which action is self-caused. Causal Agency Theory suggests whether or not a self-determined action is self-caused can be assessed by determining whether the action was (1) a conscious choice based upon a person's preferences (Volitional Action), (2) self-regulated and self-directed (Agentic Action), and (3) the person acted with self-awareness and self-knowledge in an empowered, goal-directed manner (Action-Controlled Belief) (Shogren et al., 2015). The iterations of

CAT provide a well-suited framework for virtual world based research. Bandura (2006) noted:

> Life in the rapidly evolving cyberworld transcends time, place, distance, and national borders and alters our conceptions of them. People now have instantaneous communicative access worldwide. It is transforming how people communicate, educate, relate to each other, and conduct their business and daily affairs. These transformative changes are placing a premium on the exercise of human agency to shape personal destinies and the national life of societies (p. 175).

The root of CAT focuses on how people become *causal agents*, and suggest people who are self-determined are people who act purposefully and with authority to make or cause things to happen in their lives rather than others (or other things) making them act in certain ways (Shogren et al., 2015). This is supported by Bandura (2006) who held that as individuals improve their skills and beliefs regarding their self-efficacy (one's belief in one's ability to succeed in specific situations or accomplish a task), they are able to create more options for themselves and are more capable of reaching their future goals than those individuals with less agentic control.

Causal Agency Theory provided a useful lens for to reframe possibilities for self-determination in a technology driven world. The CAT framework provides support that virtual world activities present opportunities for an individual to be a causal agent consistent with their own values, preferences, or interests, and not the values, preferences, or interests of others. The present study begins to address the need for research into less conventional paths to self-determination for adults with developmental disability. Consistent with CAT, the study has the potential to provide new opportunities for people to exert control, introduce skills that expand a person's capacity for new opportunities, and identify supports that enable

a person to overcome barriers and limitations in new opportunities. Additionally, the qualitative, case study method being employed in the present study has the potential to show virtual worlds provides the opportunity to engage in self-caused self-determination.

Synthesis of the Research Findings

The use of prior research in many studies is intended to support or disclaim existing theory. However, Maxwell (2005) emphasizes other uses for existing research include: (1) developing a justification for the study (2) informing decisions about methods (2) providing a source of data and (4) helping generate theory. For the present study, existing research supported the need for additional research in less conventional ways of gaining self-determination, reinforced that case studies relying on self-reported experiences of adults with developmental disability were underutilized, provided data on existing theory, and aided the researcher in generating knowledge for a less common theory applied to self-determination.

The meaning and context of self-determination varied by study. Nevertheless the objective that self-determination embodies an ideal that people with disabilities are free to direct their own lives was unfailing. Studies continue to show that despite ongoing efforts in many different arenas, individuals with disabilities continue to exhibit lower levels of self-determination than their non-disabled peers. One barrier may be that while individuals with disabilities place a high level of importance on self-determination conventional opportunities to develop self-determination continue to dominate the landscape. Conventional methods such as support by family, friends, and professionals, activities in the community, or school and work settings, are not always available to adults with disabilities. The systemic and judgment

free learning convention available in SL is unique, broadly available, has been proven successful, and yet remains grossly underutilized in developing self-determination. Ju et al. (2017) provide support that more systemic approaches to self-determination training need to be explored. There is evidence that virtual worlds can provide opportunities for adults with disabilities to reflect on one's own identity and gain self-determination without influence by others. The success of virtual worlds as a general treatment platform, whether to address self-esteem, depressive symptomology, PTSD, or other treatment needs has been established in prior studies. These studies indicate the perceptions and beliefs held by adults with developmental disability could be influenced by systematic learning activities in SL. This includes but is not limited to activities in virtual worlds that provide opportunities for individuals to be causal agents and direct their own lives, thereby engaging in self-determination.

Causal Agency Theory sets forth that self-determination refers to the degree to which action is self-caused. A focus is placed on creating opportunities for people to exert control, providing the skills necessary to take advantage of those opportunities and identifying the supports necessary to overcome barriers and limitations. Literature heavily focuses on research identifying self-determination more so than creating new opportunities and building new skill sets. The application of CAT in this study supported the present study's assertion that adults with developmental disability have a need for less conventional environments that can influence self-determination outside of conventional opportunities pre-determined by others; the use of SL as an environment for self-determination provides the opportunity for adults with developmental disability to exert control in their lives consistent with self-

determination and override dynamics that can prevent them from acting freely; and that gatekeeping may present barriers for adults with developmental disabilities to enhancing self-determination.

CHAPTER 3. METHODOLOGY

This chapter presents details on methodology for conducting this research based on the purpose and research questions of the study. The purpose of this qualitative case study was to investigate whether activities conducted in Second Life™ can influence self-determination. The research methodology that was appropriate to address the purpose is qualitative. The case study research design is suitable to examine the effectiveness of participant activities in SL. In the chapter, the details and justification of the process involved in conducting a qualitative case study will be presented. This chapter begins with a purpose of the study, and proceeds into details related to the research design, target population and participant selection, procedures for data collection, instruments, research questions, data analysis, and ethical considerations.

Purpose of the Study

The purpose of this qualitative case study was to investigate whether activities conducted in Second Life™ can influence self-determination. By conducting a case study, the researcher could contribute to existing literature by identifying behaviors of participants indicative of self-determination (problem solving, relationships with others, and self-awareness). The findings may contribute to positive social change by serving as a basis to expand conventional notions of where and how one can develop self-determination.

Research Design

There are three types of methodology to choose from when conducting research: quantitative, qualitative and mixed methods (Creswell, 2014). The methodology to be used for this study is qualitative. A desirable purpose of qualitative research that applied to this

study was the element of interpretation enabling the researcher to (a) gain new insights about a particular phenomenon (b) develop new concepts or theoretical perspectives about the phenomenon and/or (c) discover the problem that exists within the phenomenon (Leedy & Ormrod, 2010). Furthermore, qualitative research identifies perspectives held by different individuals giving each perspective equal validity, or truth. This is different from quantitative research, which focus on explaining how one variable affects another, gathers numeric data, and describes trends, comparing group differences, or relating variables (Creswell, 2008). For this study the phenomenon of interest was opportunities for self-determination of adults with developmental disability.

There are multiple research designs that could be used for a qualitative study: phenomenology, ethnography, grounded theory, narrative inquiry, and case study. While each approach is different, Leedy and Ormrod (2010) identified two characteristics all qualitative studies have in common: they focus on phenomena that occur in natural settings and they involve studying those phenomena in all their complexity. Phenomenology was not chosen because phenomenological studies focus on the perceptions and understandings of a group or culture of an event (Leedy & Ormrod, 2010). Ethnography was not chosen because ethnographic research intends to understand patterns of a culture-sharing group (Creswell, 2008). Grounded theory was not chosen because grounded theory studies are useful when current theories about a phenomenon are either inadequate or non-existent (Leedy & Ormrod, 2010). Narrative inquiry was not chosen because narrative inquiry focuses on a chronological life story that is retold by the researcher (Creswell, 2014; Creswell, 2008). Case study was selected for the present study because it is useful to investigate little known

situations, it can generate preliminary support for hypothesis, and is a good method to challenge theoretical assumptions.

Case Studies

After reviewing all the approaches to conduct qualitative research, a multiple case study was selected. Case studies allow the researcher to develop an in-depth analysis of an activity with data bounded by time and the activity (Creswell, 2014). Leedy and Ormrod (2010) inform us that researchers often study two or more cases, often cases that are different in certain key ways, to make comparisons, build theory, or propose generalizations. A case study is appropriate for learning more about a little known or poorly understood situation (Leedy & Ormrod, 2010).

A multiple case study was the appropriate research design for this study because the research focused on exploring the experiences and perceptions of one homogenous group (adults with DD) regarding a specific phenomenon (self-determination). This study was bound by the period of time it took the participants to complete specific categories of activities in Second Life™. This study includes two cases where the participants were different in their personal experiences within SL: one participant was new to SL and one participant was a long term resident of SL. This study intended to learn about the minimally studied use of SL to influence self-determination.

Leedy and Ormrod (2010) informed us that sources of data are limited only by the researcher's open-mindedness and creativity. However, data and methodology are considered inextricably intertwined. Quantitative researchers seek to develop generalizations that contribute to existing theories. On the other hand, qualitative researchers seek to better understand complex situations and the data may or may not be generalizable beyond the

population studied (Leedy & Ormrod, 2010). Data collection for this case study included participant surveys, field observations, participant semi-structured interviews and a post – study survey exploring gatekeeping.

Addressing Issues of Rigor

Reliability. The repeatability and consistency of measures enhances reliability. Concerns of reliability in this study are present with the subjectivity of field observations and self-reporting. While every measurement has an error component, the limited testing and minimal validity of Second Life™ as a treatment platform may contribute to random error (noise) of the data. Pilot testing data collection and instruments is one way to reduce measurement error. A pilot test of study instruments was conducted with one participant, an adult male with an undisclosed disability, who agreed to conduct an interview as an avatar from his "residence" in Second Life™. Intended to identify needed revisions to instruments and considerations during the actual study, the following was identified during the pilot study and subsequently addressed to minimize repetition in the actual study:

- Technical difficulties (lagging internet, spontaneous glitching)
- Prolonged interview time
- Using the chat feature presented barriers to the free flow of conversation that is necessary to elicit rich data

Validity. Johnson, Onwuegbuzie and Turner (2007) contend important issues for research includes the credibility, trustworthiness and validity. Researchers should design and conduct studies based on consideration of the types of validity presented specific to the research method and design. Regardless of research design, threats to validity of any kind threaten the study and places conclusions at risk. Recognition of threats before and during

the study allows the researcher to develop strategies to strengthen the study and overcome threats to validity.

To ensure the internal validity the researcher must take whatever precautions they can to eliminate *other* possible explanations for the results observed (Leedy & Ormrod, 2010). Especially significant when identifying cause-and-effect relationships, the semi-structured post study interviews intend to explore other possible explanations for self-determination results. For example, participants were asked to describe specific links in the Second Life™ activities to physical world activities and outcomes as a contrast to activities they may have engaged in outside of the study that contributed towards enhanced self-determination.

Target Population and Participant Selection

Participant Recruitment

The target population for this study was adults with developmental disabilities. For the purposes of this study an adult was defined as a person over the age of 18 years old and developmental disability was defined in accordance with the Developmental Disabilities Assistance and Bill of Rights Act of 2000. The inclusion criteria were (1) being an adult, (2) with a developmental disability and (3) having access to a computer with Internet service. No specific computer skills were required. By meeting these criteria, the participant was able to provide in-depth information on the study's topic. The selection of participants was to be purposeful and intentional. Up to 15 participants were intended for the study. The pool of participants, adults with developmental disabilities, appeared to be vast and accessible through indirect access with disability specific entities. However, direct access to adults with disabilities proved to be problematic.

Participants for the study were recruited from Centers for Independent Living (CILs), State Councils on Developmental Disabilities (DD Councils), and community-based organizations related to disabilities. Two hundred and nine individuals and organizations received direct emails with information about the study and a request to make available a study participant invitation flyer to adults with developmental disabilities. Direct emails were sent to:

- CILs located in the Commonwealth of Virginia (16) and the State of New York (23). Centers for independent living are consumer-controlled, community-based, cross-disability, nonresidential, private nonprofit agencies who receive federal funding to provide, at a minimum, the following independent living (IL) core services: (1) Information and referral; (2) IL skills training; (3) Peer counseling; (4) Individual and systems advocacy; and (5) Services that facilitate transition from nursing homes and other institutions to the community, provide assistance to those at risk of entering institutions, and facilitate transition of youth to postsecondary life. Centers for independent who received participant study invitations were State funded by Title VII, Subchapter B of the Rehabilitation Act, as amended.
- DD Councils in 50 States and the District of Columbia (excluding territories). Emails were sent to each of the DD Council's Executive Directors and Chairpersons (104). DD Councils are federally funded, self-governing organizations charged with identifying the most pressing needs of people with developmental disabilities in their state or territory; are committed to advancing public policy and systems change that help these individuals gain more control

over their lives and; focus on empowering individuals through activities that teach self-advocacy skills and support self-determination. By empowering individuals and their families to both advocate for themselves and seek long-term solutions through systems change, DD Councils are creating an environment of self-sufficiency, self-determination, inclusion, and acceptance (www.acl.gov).

- The ARC State, District of Columbia and local chapters (where no state chapters were evident) (54), all staff members of the ARC national Program Innovation Group (9) and all staff members of the Chapter Leadership Development Group (3). The ARC is the largest national community-based organization advocating for and serving people with intellectual and developmental disabilities and their families. The ARC encompass all ages and more than 100 different diagnoses including Autism, Down syndrome, Fragile X syndrome, and various other developmental disabilities (www.thearc.org).

The study invitation email suggested a benefit to the CILs included introducing an alternative service and training delivery method for individuals with developmental disabilities. Study participant invitation flyers were also posted on ten (10) community Facebook pages related to disability. These included, the Idaho Self Advocacy Leadership Network, Green Mountain Self Advocates (Vermont), Self Advocates of Indiana, The Self Advocate Council of Thunderbay Ontario, Self Advocate Coalition of Kansas, Pennsylvania Advocacy and Resources for autism and Intellectual Disability, International Down Syndrome Coalition, Summit County Developmental Disabilities Board (Ohio), People First of Nebraska and, Living Well Disability Service (Minnesota). A study participant invitation

flyer was also posted on the researcher's public facing Facebook page and was available for public sharing.

An unexpected limitation revealed itself during the participant recruitment phase. Most studies that involve individuals with disabilities and Second Life™ seek their participants exclusively from within SL (Bloustien & Wood, 2015; Gilbert et al., 2013; Kleban & Kaye, 2014; Nosek et al., 2016; Partala, 2011; Stendal & Balandin, 2015). This study sought participants exclusively outside of SL. As a result, the receivers of the participant study invitation made the participant recruitment phase susceptible to gatekeeping.

Purposeful Selection of the Participants

Eligible participants were adults (18+ years old), male or female, who self-reported a developmental disability. The original goal was to obtain 15 active participants in SL from multiple states and representing an urban/rural mix. No previous computer, virtual reality, or SL experience was required. Conversely, experience with computers, virtual reality or SL did preclude an individual as a participant. The participant invitation requested interested individuals contact the researcher directly expressing an interest in the study. Eleven individuals (not all were eligible participants themselves, but seeking information on behalf of others) responded to the researcher and expressed an interest in the study. Interested individuals received an email from the researcher asking (1) were they over 18 years old (2) did they have a developmental disability and (3) did they have access to a computer for the duration of the study? If all answers were yes, the individual was accepted as a participant and subsequently emailed a consent form and pre-activity survey). Eight eligible participants returned the consent form and pre-activity survey back to the researcher either via email or

regular mail. Two participants completed the case study taking part in all required study activities.

Table 3.1 – Selection of Participants

Steps taken	Number of individuals
1. Individuals responding to invitation flyer	11
2. Individuals completing and returning consent form	8
3. Individuals completing pre-activity survey	8
4. Individuals establishing avatar in Second Life™	4
5. Individuals completing some study activities in Second Life™	4
6. Individuals who completed all study activities in Second Life™	2

Ethical Considerations

Informed Consent

Once identified as a possible participant for the study, the researcher emailed the Informed Consent Form to the individual before beginning the research. The Informed Consent Form was approved by the University of Idaho's IRB. The researcher followed up with participants via email to determine if there were questions about the Informed Consent Form. When the researcher met with participants in SL for the first meeting, the researcher reminded each participant about the nature of the study, the methodology used, their rights to confidentiality, their voluntariness to participate in the study, and their right to withdraw from the study at any point without penalty.

Safety of the Participant

The primary research location for participants in SL was Virtual Ability Island (VAI), a monitored space specific for persons with disabilities. An adult with developmental disability utilizing any virtual reality platform raises general concerns regarding the safety of the participant. Second Life™ has extensive Terms of Service and Community Standards, which intend to set a minimum standard of behavior in SL. However, as described by Vanacker and Heider (2011) "certain people, just like in real life, find pleasure and satisfaction in breaking norms or harassing other people" (p. 78). The people taking this action are called griefers and the behaviors are commonly referred to as "griefing." SL defines a griefer as a SL resident who harasses another SL resident (www.secondlife.com). Griefing activities can include but are not limited to, abusive use of messages, invasion of space through unwanted sounds or objects and avatar pushing. When reported to SL, depending on the severity of the griefing, the griefer may have their account suspended or even terminated. Participants were specifically informed about griefing and how to respond to griefing during their VAI orientation activity and during the initial meeting on Employable Island with the researcher in SL. There were no griefing reports by participants made to the researcher during this study.

Participant Confidentiality

Because this study utilized non-random sampling, interviews, and field observation, anonymity could not be considered. However, the following were adhered to throughout the process of data collection, analysis, and dissertation writing:

- Participants were assigned pseudonyms, which are different from their avatar names they chose for the study. This effort would minimally provide

anonymity in SL should the participants choose to remain active in SL after the study ended.

- Participant's legal names, avatar names, and pseudonyms were kept in separate files from the interview data and stored in a locked cabinet.
- Printed transcripts and any potentially identifying data were stored in a locked cabinet. The researcher will store the data for three years and will shred the data at the end of the three-year period.
- Digital information such as emails, email addresses, audio recordings, chat logs and research generated SL data were stored on the researcher's computer which is password protected. This digital information will be erased at the end of the three-year period.

Compensation

Participants who completed the study received 2000 Linden (L) in their SL account from the researcher. The participants were able to purchase whatever item they wanted in SL with the Lindens. The exchange rate at the time of compensation was approximately $1 = 248L. Total compensation to each participant was approximately $8.00.

Procedures

Participants for the study were recruited from Centers for Independent Living (CILs), State Councils on Developmental Disabilities (DD Councils), and community-based organizations related to disabilities through direct email and Facebook postings on disability-related organization pages and the researcher's public facing page. Interested individuals were invited to contact the researcher for additional study information to help the individual

decide if they would like to participate in the study. Once participants were accepted for the study, they were provided a consent form by email or regular mail. Participants were then requested to complete and return the pre-activity survey (7 surveys returned).

The pre-activity survey was comprised of an age and disability self-report verification and the Self-Determination Scale (SDS). The researcher required the pre-activity survey be completed and received before the participant continued with further study activities. Once received, instructions were provided via email on how to begin their activities in Second Life™. The first step was to establish a free account in SL and the second step was to create an avatar once an account was established in SL. Once completed, participants were instructed to use the Virtual Ability Island (VAI) website at virtualability.org as their entry point into SL.

Before the study began, the researcher discussed the use of VAI as a point of entry for the study participants, with the coordinator of VAI, known by her avatar as Gentle Heron. Participants Entering SL through VAI rather than the public SL entry portal ensured participants landed at login directly on Virtual Ability Island, a safe online community of support specific for people with disabilities and their families, friends, and caregivers. Study participants continued to actively visit VAI at their leisure throughout the study.

Once the researcher confirmed that the participant had an active SL account and an avatar, the researcher arranged to meet the participant on Virtual Ability Island. The participant then learned to teleport to Independence Island at the location of EmployAble: A World Without Barriers (EmployAble). EmployAble was a pilot model Virtual Employment Orientation and Support Center for people with disabilities, funded by the Kessler Foundation and developed by the Center on Disability Studies at the University of Hawai'i.

Before the study, the researcher received permission from the pilot study investigators to use the location for activities related to the present study.

On Independence Island, the researcher met the participant, provided a general orientation of how the study would flow, discussed next steps, answered questions, and reviewed the voluntary nature of the study and the opportunity to leave the study without penalty. Activities in SL were grouped in six categories (1) Second Life™ Orientation (2) health and wellness (3) a social event (4) a Second Life™ field trip (5) disability awareness and (6) participant choice. These six activity categories were intended to correspond with the self-determination components of (1) problem solving, (2) relationships with others and (3) self-awareness. Participants were asked to complete the activities as independently as possible. If someone other than an identified study mentor provided support to the participant, care was given to ensure the participant was self-empowered during the activity participation and completion. For their ongoing reference, participants received an SL Notecard that included optional activity choices for each of the six activity categories.

The first activity to be completed by the participants was the VAI orientation activity. VAI orientation taught residents how to navigate their avatar within SL, avatar safety, and general SL familiarization. After completing the VAI orientation, participants could choose their own order of activity completion. Participants were also provided access to "picks" on the researcher SL profile to help them locate different activities and events that pertained to the study categories. A pick is a SL location in a resident's profile that they have chosen to display. A participant could simply click on the pick and their avatar would be teleported to that location. Sample pick choices included:

1. SL Orientation (P)

2. Health and Wellness

    - Health Info Island (P)

    Other options might include:

    - Weekly workouts for lazy bums Tues 2:30 SLT
    - Always better together 1PM SLT – VAI Sanctuary Café

3. Social Event

    - Club Accessible (P)

    Other options might include:

    - VAI Social in inWorldz Thurs. 1:00SLT
    - Weekly campfire (VAI) Wed 11:00 SLT
    - Show and Tell (VAI) Saturday 1:00 SLT

4. SL Field Trip
5. Disability Awareness (P)

    - EmployAble – Skill Builder – Access Info – CILs (P)

    Other options might include:

    - Health Info Island- ADA, support groups, disability history, disability heroes

6. Participant Choice

Participants also had the opportunity to find their own activities and islands of interest in SL based on their own SL experiences, recommendations provided by other SL residents, or SL activity or location searches. The researcher met with the participants periodically in SL to assess progress and answer participant questions.

VAI mentors were available throughout the study period to assist the participants one-on-one at the request of the researcher or the participant. VAI mentors are individuals with disabilities who are trained to provide in-world support to new residents of SL with disabilities. This can include learning how to navigate the avatar, how to use assistive technology within SL, or providing ideas or accompaniment to locations and activities in SL.

The study project period was intended to be open for a period of six (6) weeks, during which all participants would be completing activities at the same time in SL. Having all participants engaged in SL during the same time was intended to provide the benefit of peer support during the study activities. However, once the study was underway, it was determined a rolling entry into the study benefitted participants who were ready to begin right away. Once the study began, it was also determined that six weeks was not enough time for some new to SL to complete the activities. These factors combined resulted in a change to a rolling entry with completion timelines determined by the participant as long as all activities could be completed prior to the study's data collection end date of June 30, 2016. This allowed participants ample time to complete the activities at their own pace.

A post-activity semi-structured interview and a post-activity survey were administered at the completion of the individual participant's six (6) activities. Participants received 2000 Linden in their SL accounts for completing the study (value approx. $8.00).

Instruments

Instruments for the present study included the Self-Determination Scale (SDS) utilized in pre- and post activity participant surveys, and semi-structured interviews conducted at the conclusion of all SL activities. Data was also collected through field

observation and SL chat logs. Permission was obtained from the University of Idaho Institutional Review board to administer the instruments during the study.

Deci Self-Determination Scale

It is difficult, if not impossible, to measure self-determination without some self-report indicators (Wehmeyer, 2005). It is also important to choose a reliable and validated instrument and methodology to capture self-report indicators and to assess treatment effectiveness of a study. This study utilized the Deci Self-Determination Scale (SDS) as the instrument of choice as the pre- and post-activity survey. The scale description explains the SDS was designed to assess individual differences in the extent to which people tend to function in a self-determined way. The SDS is a short, 10-item scale, with 2-item subscales. The first subscale is awareness of oneself, and the second subscale is perceived choice in one's actions. Either the subscales can be used separately or they can be combined into an overall SDS score. (selfdeterminationtheory.org). The present study combined the responses into an overall score for each participant.

Application of the SDS as a pre and post activity survey was intended to assess differences in the extent to which participants functioned in a self-determined way before and after their activities in SL. The only difference between the application of the pre and post activity surveys was that the pre-activity survey included statements prompting participants to confirm their study eligibility and includes an indicator for the researcher on the participant's potential need for support within SL (Appendix A).

Use of the SDS improved instrument fidelity because it is a normed instrument. However, one major drawback to utilizing the SDS was that while it has been normed to the population of adults, as of the date of this study, it had not been normed specifically to adults

with developmental disability. A disadvantage to using a non-normed survey is the inability to compare data and draw generalized conclusions. An advantage to using a non-normed survey is the opportunity to begin norming a new instrument that can be more broadly used in future research efforts.

The subjective results produced by a non-normed survey are strengthened by the inclusion of self-report semi-structured interviews that intended to demonstrate variations in self-determination before, during, and after study activities. The SL activities selected relate to questions measured on the SDS. To provide an indicator of construct validity, application of the same instrument occurred before and after the activities. Participants were provided a pre-activity survey to establish how the participants situated themselves with self-determination before the study activities. A post-activity survey was provided to determine how the participants situated themselves with self-determination after completing the study activities in SL. Descriptive data in Chapter four provides pre- and post activity survey results.

Interviews

Interviews included semi-structured interviews and informal discussions between the participant and researcher during field observations. Interview data was captured either via audio recording or SL chat logs. Interviews were not video recorded. Limited follow-up and communication throughout the study occurred through email.

At the end of completing activities in the six study categories a semi-structured interview explored experiences in SL of the self-determination components problem solving, relationships with others, and self-awareness. The questions in the semi-structured interview were also directed towards answering the research questions of the study. In addition,

questions explored the concept of acquired abilities and the transference of skills from SL to the physical world. The question protocol provided structure to the manner by which the interviews were carried out.

Systematically exploring the categories of (1) Second Life™ Orientation (2) health and wellness (3) a social event (4) a Second Life™ field trip (5) disability awareness and (6) participant choice, participants were asked the following five questions for each category:

(1) How did you find the activity/event? Did you have any problems at the activity/event? If yes, what was the problem/outcome? Did you fix the problem? Did someone help you fix the problem*? (Self-Determination component of Problem Solving)*
(2) Did you encounter anyone at the activity/event? If yes, who? Did you interact with them? If yes, how? Did you interact with them outside the activity/event? If yes, how? Did you interact with anyone in SL outside the activity/event categories? (*Self-Determination component of Relationships with Others)*
(3) What did you like about the activity/event? What did you not like about the activity/event? Describe something you learned about yourself because of this activity/event? (*Self-Determination component of Self-awareness)*
(4) What did you learn how to do within this activity that was something new to you? Describe what this new ability/skill consisted of. (*"Acquired Abilities")*
(5) Was there anything you did in this activity/event that helped you do something better or for the first time in the physical world? *(Transference of skills from SL to PW)*

Because the interviews were semi-structured, the researcher was allowed to ask as many questions as appropriate for each of the main items in the interview protocol. This allowed for in-depth exploration of the answers of the participants in order to have a holistic understanding of the phenomenon being studied. The semi-structured interviews were conducted in SL with the participant and researcher meeting on Independence Island to conduct the interviews.

Post-Study Gatekeeping Survey Monkey™ Survey

The researcher had concerns that gatekeeping may have prevented a more robust sample of applicants for the study. To investigate the issue, at the completion of the study, a survey participation request was emailed via Survey Monkey™ to individuals and organizations that received the initial request to make available the participant invitation flyer to adults with developmental disability. The survey included the following five questions intended to determine whether the invites had been made available to others, and if not, why not, and thoughts about adults with developmental disabilities being in Second Life:

1. Did you extend the invitation to participate in the study to adults with developmental disabilities?
2. If you answered NO to Question 1, please select the responses that most closely fit your reason(s) (multiple responses may apply).

    a. I do not remember receiving the study participant request.
    b. I did not read the entire study participant request.
    c. The benefit of the study was not clear to me.
    d. Certain study activity categories did not seem appropriate for adults with developmental disability (SEE Q. 3)
    e. I had concerns about the use of a virtual world platform.
    f. I had concerns about the skill level required for participants to complete the study.
    g. I had concerns of safety and well-being while the participant was online.
    h. I had concerns about protecting the identity and identifiable information of the study participant.
    i. I had concerns parents/guardians would not be in favor of the study.

3. If you selected certain study activity categories were not appropriate for adults with developmental disability in Q2, please identify the study categories not appropriate for adults with developmental disability (multiple responses may apply).

    a. N/A
    b. Second Life Orientation
    c. Health and Wellness
    d. A Social Event
    e. A Second Life Field Trip
    f. Disability Awareness
    g. Participant Choice

4. Do you believe the use of a virtual world platform is an acceptable place for adults with developmental disability to learn to be more self-determined?

    a. Yes
    b. No

5. Please provide any comments you think would be helpful to the next researcher exploring the use of virtual reality platforms for adults with developmental disability.

Data Analysis

As discussed in Chapter four, analyzing data from a qualitative approach using case studies can be difficult because there is a lack of generalizability (Leedy & Ormond, 2010). Therefore, for case studies, it is important the data analysis include drawing conclusions that may have implications beyond the specific case that has been studied.

Leedy and Ormrod (2010) state, "there is usually no single "right" way to analyze the data in a qualitative study" (p.152). However, it is important the data analysis include drawing conclusions that may have implications beyond the specific case that has been studied. Creswell (2014) suggests the following process for gathering, analyzing and illustrating qualitative research.

1. Collect raw data.
2. Organize and prepare the data for analysis.
3. Read or look at all the data.
4. Start coding all of the data.
5. Use the coding process to generate a description of the setting or people as well as categories or themes for analysis.
6. Advance how the description and themes will be represented in the qualitative narrative.

7. Make an interpretation of the findings or results.

By following this process, data was collected through pre and post activity surveys, observations, and semi-structured interviews. In addition, a post-study survey was distributed to collect data from individuals and agencies that received participant study invite flyers. Chat logs and transcripts from audio recordings of interviews with participants were reviewed and coded for themes that described (1) identity (2) choice-making (3) self-determination (4) Second Life™ versus physical world (5) problem solving (6) relationships with others (7) self-awareness and (8) other. These themes were synthesized into a rich description that presented the experiences of the participants in the study.

Pre and Post Activity Surveys

Participants were provided a pre-activity survey after returning the study consent form but before beginning study activities. When participants completed the study activities they were provided a post-activity survey. Both surveys included the Self-Determination Scale. The surveys were returned to the researcher pre-and post activity and were used in a comparative analysis to assess self-determination before and after study activities. Use of the Self-Determination Scale as part of the pre and post activity surveys was intended to determine whether a measurable change in self-determination could be revealed post-activities in SL. This effort included identifying SL activities that related to questions measured on the SDS. Use of the SDS did not substantially add to the present research by answering the research question and/or sub-question. The research highlighted if an individual scores as very self-determined at the on-set of an activity (as was the case for the two participants in the present study), it does not leave room to move the measurement of self-determination in a meaningful way.

Field Observations

Throughout the study the researcher met with participants in SL to provide study guidance, answer questions or concerns, and to ensure participants were moving through the study activities at a reasonable pace. The researcher took notes, audio recordings and saved chat logs of the interactions. The field notes, audio recordings and chat logs were later reviewed and analyzed for themes related to the study purpose and questions and intended to provide thick, rich data including data presented in the participant's own voice. In addition, the field observations provided the opportunity to capture meaningful data related to themes identified for the research question and sub-question. Field notes, audio recordings, and chat logs triangulated evidence that the participants had opportunities and acted on opportunities that supported self-determination.

Interview Data Analysis

Interviews that comprised the case studies were conducted with each participant after the assigned activities in SL were completed. The participant assigned the pseudonym Rocky was interviewed and responded via the chat log feature in SL. The chat log was then imported into a Word document prepared for coding and printed. Seventeen pages were generated for coding. The participant assigned the pseudonym Hawk, was interviewed, and responded using the voice feature in Second SL. Hawks interview was recorded using the Apple Recorder feature. The audio files were submitted to Rev.com, a professional online transcription company. Sixty-four pages of transcript were generated for coding.

To begin the coding process, nine words and phrases were identified that would provide the context for analysis and contribute towards informing the study's questions, whether activities conducted in SL by adults with developmental disabilities can influence

self-determination and additionally whether self-determination in SL can transfer to the physical world. The words and phrases included: (1) identity, (2) choice-making, (3) self-determination, (4) Second Life™ v. physical world [intended to capture the transference of skills from Second Life™ to the physical world], (5) problem solving, (6) relationships with others, (7) self-awareness, (8) themes that directly support/refute the study question, and (9) other. The researcher analyzed the transcripts by going through each line of text and hand coding numbers in the margins of the transcripts that corresponded to the assigned numbers of words and phrases selected to inform the data analysis. The Other category was applied to issues or themes that were originally not anticipated or themes not relevant to the study question. Analysis and coding of the transcripts were intended to inform the self-determination components of: *problem solving, relationships with others and self-awareness*. In addition, overlap of coding was sought to inform the research sub question of transference of skills from SL to the physical world.

CHAPTER 4. FINDINGS

Following an in-depth description in Chapter three regarding how the data of this study was gathered, Chapter four provides a description of findings of the two participants who completed all the study activities in Second Life™ and participated in post-activity semi-structured interviews. In an effort to enhance the outcome, conversations with participants are reflected throughout the study. The semi-structured post activity interview provided the voice of the participant and contributed towards measuring the effectiveness of the participant's activities. The conversations and semi-structured post-activity interviews are intended to provide thick, rich data speaking to the participant's personal experiences within SL, the completion of activities and any cross over the SL activities had in the physical world. Because participants worked at their own pace, the post-activity surveys, and interviews occurred at different times for different participants. All methods of data capture were given equal status during analysis.

Rocky is the pseudonym given in this study to the participant from Utah. The state of Utah includes a portion of the Rocky Mountains therefore it seemed an appropriate pseudonym to protect both his SL avatar name and real name. Hawk is the pseudonym given in this study to the participant from Montana. This participant's avatar often includes characteristics that are avian in nature therefore it seemed an appropriate pseudonym to protect both his SL avatar name and real name.

The Researcher

In qualitative research, the researcher is often a key instrument themselves by collecting data through examining documents, observing behavior, or interviewing

participants (Creswell, 2014). Because qualitative research is interpretative research, it is important for the researcher to be self-reflective and identify researcher reflexivity that shapes interpretation during the study

The researcher in the present study is an individual who has worked in the disability field since 2000. After graduating law school in 2000, the researcher worked for twelve years at a non-profit agency that was part of the national Protection and Advocacy System (P&A). The P&A system is a nationwide network of congressionally mandated, legally based disability rights agencies. P&A agencies have the authority to provide legal representation and other advocacy services, under federal laws, to all people with disabilities, empowering them and advocating on their behalf (www.ndrn.org; www.acl.gov). In this position, the researcher witnessed many opportunities whereby adults with developmental disability who were capable of their own decisions, had those decisions superseded by a well intended "other."

In 2012, the researcher accepted a position with the United States Department of Education (DoED) overseeing the nation's State Vocational Rehabilitation programs. These public rehabilitation agencies provide rehabilitation services to individuals with disabilities under the Rehabilitation Act of 1973, as amended. In this position, the researcher worked to identify and provide solutions for many barriers encountered by people with developmental disability to successfully gain or maintain employment. Barriers included access to transportation (accessible or otherwise), stigma of hiring people with disabilities, attitudinal barriers from well-intended family, friends, and service providers, and minimized opportunities to decide for oneself what career path would be followed.

In 2013, the researcher's position with the Vocational Rehabilitation Program changed to the Independent Living Programs. Independent Living Programs (IL) are consumer-controlled; community-based programs that are intended to provide services that maximize independent living for individuals with disabilities. Self-determination is the hallmark of independent living. Unfortunately, the services and service impact are often limited by funding issues. All experiences combined, the researcher is a strong advocate for self-determination, reimagining processes to ensure the greatest impact of funds, and moving beyond conventional thinking to accomplish goals whether big or small.

Throughout the study the researcher remained self-reflective and avoided interpretations based on recognized held attitudes, biases, beliefs, and understandings. To ensure the researcher's held attitudes, biases, beliefs and understandings did not influence the participants, the researcher did not share her personal experiences with the participants. In addition, the researcher avoided summarizing the participants' responses in her own words during observations or the semi-structured interviews.

Case Studies

The cases for this study were two adults with developmental disability, specifically Autism spectrum disorder. A key distinction between the participants includes their experience in SL prior to the study. Rocky was a new resident to SL and Hawk was a long time resident in SL. Each case provides insight into the research question: How can activities in virtual worlds influence self-determination of adults with developmental disabilities. Each case also helps inform the sub-question: How can self-determination experienced in a virtual world transfer to the physical world? Through case study, the

current study contributes to existing literature by providing first person experiences in a virtual world indicative of self-determination characteristics (problem solving, relationships with others, and self-awareness).

Rocky's Story

Rocky was a 30-year-old adult male who lived in Utah diagnosed with self-disclosed Autism spectrum disorder. Before participating in this study, Rocky had not been in SL. Rocky began the study by signing a consent form and completing the pre-activity survey. Once the researcher received the consent form and the pre-activity survey, Rocky was provided via email, instructions for accessing SL and developing his avatar. This email officially began what was considered the study period. During the study period, Rocky completed the pre-activity survey, six study activities in SL, the post-activity survey, and semi-structured interviews. His case study period was approximately 11 weeks.

Semi-Structured Interview. At the end of completing activities in the six study categories a semi-structured interview explored experiences in SL of the self-determination components problem solving, relationships with others, and self-awareness. In addition, questions explored the concept of acquired abilities and the transference of skills from SL to the physical world. Systematically exploring the activity categories of (1) Second Life™ Orientation (2) health and wellness (3) a social event (4) a Second Life™ field trip (5) disability awareness and (6) participant choice, Rocky was asked the following five questions for each category:

(1) How did you find the activity/event? Did you have any problems at the activity/event? If yes, what was the problem/outcome? Did you fix the problem? Did someone help you fix the problem*? (Self-Determination component of Problem Solving)*

(2) Did you encounter anyone at the activity/event? If yes, who? Did you interact with them? If yes, how? Did you interact with them outside the activity/event? If yes, how? Did you interact with anyone in SL outside the activity/event categories? (*Self-Determination component of Relationships with Others)*

(3) What did you like about the activity/event? What did you not like about the activity/event? Describe something you learned about yourself because of this activity/event? (*Self-Determination component of Self-awareness)*

(4) What did you learn how to do within this activity that was something new to you? Describe what this new ability/skill consisted of. (*"Acquired Abilities")*

(5) Was there anything you did in this activity/event that helped you do something better or for the first time in the physical world? *(Transference of skills from SL to PW)*

Beginning in the health and wellness category, Rocky visited Health Info Island and participated in a virtual chi quong class. Of the class Rocky stated, "The Chi quong class taught me a little bit about how to relax and not get stressed." When asked by the researcher if there was anything he did during the health and welfare activity that helped him do something better or for the first time in the physical world, Rocky responded, "Nothing I can think of." However when subsequently asked, "Do you think learning how to relax and not be stressed might help in the physical world?" Rocky responded," Yes I think so." This may indicate that individuals themselves do not recognize the transference of skills between SL and the physical world.

In the social event category, Rocky participated in two activities: the Virtual Ability Island Christmas party and a field trip to Portal Park. When asked, "What did you like about either or both of these activities?" Rocky responded," They were really fun. The portal park had an awesome Ferris wheel and the Christmas party had some fun dancing." In response to the question of something he learned he said, "how to socialize a little better." However, when asked if there was anything in the activity that helped him do something better or for

the first time in the physical world, he responded, “None that I can think of.” To avoid the risk of leading the participant on answers to questions, the researcher did not pursue the line of questioning more deliberately. This would likely be of benefit in future research if it is determined a conscious skill carryover over subconscious skill carryover is the desired outcome.

For the field trip activity, Rocky visited Machu Pichu and the Grand Canyon. He enjoyed learning more about each location by reading the available information boards he encountered as he walked around exploring. Machu Pichu was a location he was provided by another avatar, Shyla, who he met at one of the social events. This was a positive indicator of relationships with others.

Visiting Health Info Island fulfilled the disability awareness activity. Here Rocky learned definitions of several disabilities, how to help people with disabilities, and the history of disability rights. However, when asked if there was anything he learned that would help him do something better or for the first time in the physical world, the response was, “none I can think of.” When prompted with, “do you think you have a better awareness of other disabilities or the same?” Rocky responded, “Better awareness.” This again indicates that the individual in SL may not completely recognize the carryover effect of activities and experiences in SL to the physical world.

The last category of participant choice was fulfilled by Rocky by visiting Big C’s Custom Bikes. An adventure he undertook with his VAI mentor Polaris, at Big C’s Polaris helped Rocky learn how to have his avatar ride a bicycle. Rocky noted, “Learning how to ride the bike was a little tricky and then Polaris showed me how much fun it was.” At the

conclusion of the study questions, Rocky was not sure if he would stay in SL after the study although he states, “This was fun.”

Problem solving. Immediately upon entering the study period, Rocky engaged in opportunities to utilize problem-solving skills. To begin the study, participants were requested to choose one of three options to get started: Option 1 would be selected if a participant was already a resident in SL and had an avatar they would like to use during the study; Option 2 would be selected if the participant did not already have a SL account and avatar, and desired to create their own avatar using the SL template process and; Option 3 would be selected if participants preferred the researcher created the participants account and avatar in SL. By choosing this option, the participant’s access to the account and avatar would end at the study’s conclusion. Rocky chose Option 2, which prompted him to access SL through the provided link, create his avatar, including avatar name and characteristics, and provided the option to begin the first activity, SL orientation on Virtual Ability Island (VAI). Rocky was provided further instructions that once the VAI orientation was completed, he would inform the researcher who would set up a meeting in SL to answer questions related to study activities.

Rocky successfully entered SL, designed his avatar, and landed on Virtual Ability Island to complete orientation. At that point in time, Rocky reached out to the researcher via email for assistance. The researcher scheduled a mutually agreeable date and time and met Rocky in SL on Virtual Ability Island. The researcher briefly discussed how the orientation would help Rocky learn to maneuver his avatar, interact with others, and show him how to teleport his avatar to different areas of SL. At the researcher’s suggestion, Rocky accepted being assigned a VAI mentor, avatar Polaris Grayson, who helped him complete the

activities in the VAI orientation. After completing orientation, Rocky sent an email to the researcher expressing: "I wanted to let you know I am having fun in SL. It's really cool and the study is awesome. Is there any islands that you want me to explore that has people with disabilities on it? I'm just curious is all."

As part of his SL activities, Rocky visited Machu Picchu and the Grand Canyon. Information available at each location, presented the opportunity for him to learn more about the history and geographical significance of each location. Rocky discussed enjoying his SL orientation where he learned to control his avatar and take pictures. When asked what he learned about himself completing the orientation, he responded, "That I can control my own avatar and I can go places with it." Rocky found activities by accessing the VAI calendar of events, other SL residents, researcher provided pick links, and event messages received in SL. Rocky was particularly pleased that with the help of avatar mentor Polaris, he was able to learn how his avatar could ride a bike.

Problem solving occurred throughout Rocky's study experience in SL. This included learning key functions on the keyboard to move an avatar and fully utilize options such as flying, jumping and riding a bicycle, learning how to use the camera feature to capture pictures in SL and learning to navigate around the many islands of SL. Navigating around the islands of SL was a critical component to the study because activities related to the six study categories were completed in different places around SL.

Relationships with others. Studies have found that the development of friendship and socialization may positively affect self-determination (Ju et al., 2017). One way SL provides the opportunity to build relationships with people is the anonymity of avatars allows a person to provide as much or as little personal information about themselves as they are

comfortable sharing. For example, the mentoring activity between Polaris and Rocky gave Rocky the opportunity to begin building a personal relationship through contextual personal information sharing:

Polaris: need a min[ute] turning on dragon speech

Rocky: No worries

Polaris: I have multiple sclerosis so if I type too much my hand gives out

Rocky: That's ok

During orientation Rocky asked Polaris, "One question, how do I be friends with someone for example like you Polaris?" This question on a technology driven platform like SL may have two meanings and answers: (1) how does a person get to know another person, begin building a relationship and establish a friendship and (2) what steps within the platform are required to identify the resulting "friend" status? A quick exchange describing the latter provides insight into how friendship status may be garnered in SL:

Polaris: right click on me and choose add friend from the pie

Rocky: Got it

Polaris: there you go

Rocky: Thanks Polaris

This interaction shows problem solving skills, the willingness to socialize and build a relationship, and the opportunity for proactivity in building relationships. After orientation was completed, Rocky participated in several social activities and initiated or responded to relationship building efforts with other avatars in SL. In addition to working with SL mentor Polaris, Rocky engaged with other avatars during several activities and events. For example, at a Christmas party on VAI he said there were fun people and that the party included "some

fun dancing." Rocky met avatar Shyla at an SL campfire social and subsequently joined Shyla on excursions to Machu Picchu and the Grand Canyon. When asked to describe something he learned about himself by participating in SL activities, Rocky noted "learning how to socialize a little better."

Self-awareness. Attributes of self-awareness include openness to experience, cognitive complexity, affective responsiveness, purposefulness, proactivity, and integration (Akridge, 1985). Ju et al. (2017) conducted a literature review on self-determination and academic success of students with disabilities in postsecondary education. The study found self-awareness to be an important factor to postsecondary success. Major components of self-awareness include self-monitoring, self-instruction, self-assessment, and self-reinforcement (Akridge, 1985). Second Life™ offers the opportunity to engage in the major components of self-awareness. It is not uncommon to learn self-awareness by having it role modeled by others. The following exchange is an example of self-assessment and role modeling that occurred between Polaris and Rocky:

Polaris: what's the goal of the game

Rocky: I'm not sure I'm only new to this

Polaris: We were all new once

Polaris: I have been in 12 years and I am still learning

Rocky: That's pretty cool

Polaris: yes, that is why I like SL

Akridge (1985) tells us that self-awareness includes social skills that have been directly taught and spontaneously generated social skills, reflects the creative process, and reflects an individual's self-concept. Rocky provided examples of opportunities in SL to

develop self-awareness, and examples of self-awareness informing choice making in SL. For example, after participating in SL activities related to disability awareness, Rocky learned more about himself and expanded his awareness of other disabilities. He shared, " I did learn more abut disabilities and their definitions. It was amazing learning about the ADA [Americans with Disabilities Act] and the different disabilities. And learning about how we can help people with disabilities." Rocky stated the chi quong class he participated in "taught me a little bit about how to relax and not get stressed." Rocky agrees he has a better awareness of disabilities after his activities in SL.

Transference of skills from Second Life to the physical world. Chapter three described the lack of research and knowledge that addresses the transference of skills from SL to the physical world. This study endeavored to fill some of this research gap by exploring areas of transference. In Rocky's case, it appeared there was no overt awareness of the influence of SL on self-determination in SL or the physical world. However, that does not mean that transference did not occur. It does mean that future research could be enhanced by deliberate activities that measure transference from a virtual world to the physical world. During Rocky's experience in SL, several examples were brought forward that supported transference could occur between SL and the physical world and vice versa. One example includes a conversation between Polaris and Rocky on griefers:

Polaris: okay let's talk about griefers

Rocky: OK

Polaris: they are people who take great joy out of causing problems for other people

Rocky: That's no fun

Polaris: think of this as an extension of real life

Rocky: Wow

Polaris: there will always be people who cause problems for other people

Rocky: I understand

Polaris: there is one important rule about Second Life, there are people behind these pixels

Rocky: Ok

Polaris: they just transfer their mentality to SL

Rocky: I see

Polaris: one thing about being in so long is I have seen all sides to people

Rocky: Oh

Polaris: the good comes out in people and the bad

Rocky: Yikes

Polaris: common sense is very important just like in real life

Rocky: I understand

Polaris: when you are talking about someone be careful with your words

Rocky: okay

An additional example was captured during a conversation between Polaris (mentor) and Rocky on griefers, Polaris contrasts behavior choices in SL with behavior choices in the physical world.

Polaris: Okay Let's talk about griefers. They are people who take great joy out of causing problems for other people. Think of it as an extension of real life. There will always be people that cause problems for other people.

Rocky: I understand

Polaris: There is one important rule about SL, there are people behind these pixels. They just transfer their mentality to SL. Common sense is important just like in real life.

Rocky: Ok. I understand.

Responses to questions related to specific activity choices in SL indicate Rocky learned ways to relax and not be stressed, and that he expanded his disability awareness knowledge base. It is reasonable to conclude that the application of these new skills and awareness's would not be limited to SL and would transfer to the physical world.

Rocky's overall responses indicate he did not experience any problems finding or completing activities in SL. He found activities to complete in the six categories through either the Notecard provided to him by the researcher, postings in SL on the VAI calendar or word of mouth from other SL residents. Rocky admits, "learning how to navigate the avatar that was hard." However, he enjoyed controlling his own avatar and going places with it, and expressed he liked learning about how to use the camera, and the new ability to find different objects in SL like birds.

In addition to focusing on the self-determination characteristics of problem solving, relationships with others, and self-awareness, the researcher identified several themes during interview coding related to the research question and sub-question: (1) identity, (2) choice-making, (3) self-determination, (4) Second Life™ v. physical world [intended to capture the transference of skills from Second Life™ to the physical world], (5) problem solving, (6) relationships with others, (7) self-awareness, (8) themes that directly support/refute the study question, and (9) other. For Rocky the top three themes in order of times identified were (1) self-determination, (2) relationships with others, and (3) problem solving.

Pre and Post Activity Survey.

The pre and post activity survey included the Self-Determination Scale (SDS). A short 10-item scale with 2-item subscales, the SDS is intended to assess awareness of oneself and the perceived choice in one's actions. In the present study it was intended to assess differences in the extent to which participants functioned in a self-determined way before and after their activities in SL. As previously stated, the difference between the pre and post activity survey was that the pre-activity survey included questions that verified study eligibility and provided an indicator for the researcher on the participant's potential need for support within SL. Rocky's responses reflected he was a person with a developmental disability, identifying his disability as Autism. Rocky indicated he had not been in Second Life before, did not need another person to help when using a computer, if someone helps him use a computer he is still the boss of what happens, and knew a little bit about self-determination. Rocky's responses to the SDS questions indicate Rocky functioned in a self-determined way pre and post study activities. With a score of 50 being the highest attainable, Rocky scored a total of 44 points pre-activity and 45 points post-activity. Post-activity questions 4, 5, and 6 reflected slight increases in self-determination and question 8 reflected a slight decrease in self-determination. It cannot be determined whether the activities of the study influenced the increase in overall score.

Hawk's Story

Hawk was a 33-year-old adult male who lives in Montana diagnosed with self-disclosed Asperger syndrome. Hawk completed the pre-activity survey, six study activities in SL, the post-activity survey, and semi-structured interviews. Before participating in the study, Hawk had extensive experience in SL, entering SL in 2009 and engaging in SL as an

active resident. Hawk began the study by signing a consent form and completing the pre-activity survey. Once the researcher received the consent form and the pre-activity survey, Hawk was provided via email instructions for accessing SL and developing his avatar. Hawk selected Option 1which was intended for those study participants who were already a resident in SL and desired to use their established avatar during the course of the study period. This email officially began what was considered the study period. The study period was approximately 7 weeks. Hawk did not encounter any particular barriers that delayed his overall study experience. While Hawk completed the specific study activities in approximately seven weeks, because of his extensive knowledge and experience in SL, the researcher engaged with Hawk several times in SL after completion of the study activities for the purpose of obtaining additional perspectives and rich descriptions of the disability experience within SL.

Unlike the chat log data collection used during communication with Rocky, Hawk preferred to use the voice feature in SL. This resulted in the researcher actively taking notes and recording the conversations. A paid, professional transcription company subsequently produced transcripts of the recordings for the recordings. The researcher met with Hawk primarily on Independence Island during and after study activity completion. It was more difficult obtaining information about Hawk's direct experiences and feelings towards his activities in SL. The researcher believed this may have been attributed to Hawk's experience and sophisticated knowledge of Second Life™, a high degree of self-determination before the study, or attributes related to Autism spectrum disorder. However Hawk provided valuable insight and general experiences that were valuable to consider during the present study and provided considerations for areas of future research.

Semi-Structured Interview. Like Rocky, at the end of completing activities in the six study categories Hawk engaged in a semi-structured interview with the researcher to further determine how the activities related back to: the self-determination components of problem-solving, relationships with others, and self-awareness; the concept of acquired abilities and; the transference of skills from SL to the physical world. Systematically exploring the categories of (1) Second Life™ Orientation (2) health and wellness (3) a social event (4) a Second Life™ field trip (5) disability awareness and (6) participant choice, Hawk was asked the following five questions for each category:

(1) How did you find the activity/event? Did you have any problems at the activity/event? If yes, what was the problem/outcome? Did you fix the problem? Did someone help you fix the problem? *(Self-Determination component of Problem Solving)*

(2) Did you encounter anyone at the activity/event? If yes, who? Did you interact with them? If yes, how? Did you interact with them outside the activity/event? If yes, how? Did you interact with anyone in SL outside the activity/event categories? *(Self-Determination component of Relationships with Others)*

(3) What did you like about the activity/event? What did you not like about the activity/event? Describe something you learned about yourself because of this activity/event? *(Self-Determination component of Self-awareness)*

(4) What did you learn how to do within this activity that was something new to you? Describe what this new ability/skill consisted of. *("Acquired Abilities")*

(5) Was there anything you did in this activity/event that helped you do something better or for the first time in the physical world? *(Transference of skills from SL to PW)*

Hawk provided general comments that were applicable to activities in the six study categories. Self-admitted, Hawk exclusively used the resources for basic activities and landmarks as provided by the researcher on the SL activities notecard. The timing of available activities was sometimes a problem for Hawk given his employment and social schedule. Additionally, Hawk resided in the Mountain Standard Time zone (MST) and

Second Life™ uses Second Life Time or Standard Linden Time (SLT), equivalent to Pacific Standard Time/Pacific Daylight Time (PST/PDT).

The activity location of choice for Hawk in SL was Healthinfo Island. At this location Hawk participated in activities that met the health and wellness, social event second life field trip and disability awareness components. Future research may benefit by requiring a different location be selected for each activity completed. An unintended benefit to Hawk's limited location choice, resulted in a rich learning experience for Hawk on issues related specifically to individuals with cross disabilities. For example, Hawk learned about mental health issues and the prevalence of suicide, and became more familiar with recognizing whether an individual's behavior may be a condition of their disability. Hawk explained one activity included scenarios where specific behaviors were exhibited and the participants could determine whether the behavior was the person being rude or a common trait to their particular disability. Learning about disabilities he was not familiar with, such as multiple sclerosis or dyslexia, held particular interest to Hawk. Referring to the opportunity to learn in SL Hawk states, "Most people don't work on bettering themselves. They should." Hawk stated the study activities, and being in SL generally, helped with his spelling and grammar, a needed skill for his job as a certified nursing assistant. Participating in a study was a new experience for Hawk.

Problem solving. In regards to general problem solving, Hawk did not experience any problems finding or completing activities. As a seasoned resident of SL, he was well equipped and able to successfully problem solve any issues related to the SL platform itself. Problem solving can take many forms and intensities. This study did not specifically define what aspects of a person's behavior would be determined as "problem solving" behaviors.

As such, the present study's problem solving spectrum ranged from thinking and taking actions necessary to develop one's avatar to Hawk presenting his attempts to problem solve via SL his uneasiness with what he describes as his generation's "lack of respect and sexualization of women." Hawk became curious about the phenomena when he began noticing online "with many games and stories, they always have slight variations and reactions to when you play a male character to a female character." Hawk's curiosity led him to make female avatars in SL to actually see if there was a difference between genders. He describes the outcome as follows, "Let's just say I was really surprised at the results I found. It shocked me and I understood why there are so many male gamers and why there are so few female gamers. I actually was embarrassed to even be a male at that point. It gave me a far greater respect for women."

As a result of this experiment, Hawk transcended virtual worlds, when he then also began to notice in the physical world that, "a lot of males of my generation really do only view women or only want women for sex." These realizations resulted in Hawk problem solving objectification of women in both virtual worlds and the physical world by taking a stand in support of women whenever the opportunity presented itself.

The experiences in SL that Hawk discussed included historical experience not just experiences bound by the study's period and suggested activities. For example, the researcher identified problem-solving skills when Hawk explained an event that occurred at a club in SL that prompted him to no longer visit the club because "immature people have really gone into SL, and have really been chasing away the mature people." Unlike Rocky who had one avatar in SL, Hawk had multiple avatars in SL. Hawk's avatars are anthropomorphic in characteristics because he prefers the vast customization choices that are

available. Hawk had a study experience whereby he entered the VAI with a self-disclosed intimidating dragon avatar. The VAI overseers told him that his avatar selection needed to be toned down to continue on VAI. Rather than discontinue the study, Hawk problem solved the situation and made avatar choices that were more favorable to VAI.

Relationships with others. An advantage to virtual worlds previously discussed in Chapter one, is the social availability of others that a person may not encounter in their physical world location. In regards to relationships with others as intended to be captured through the study activities, Hawk stated his focus during the study was on knowledge building activity more than social aspects of the activities. He acknowledged interacting with other residents for the purposes of the stated activity but did not further engage with the same residents outside of the stated activities.

Hawk discussed additional positive social aspects of SL that included: access to people, which is difficult in the physical world where he lives in a rural location, the ability to interact and share one's personal feelings with less chance of retribution, and the ability to minimize one's disability as a social factor. In regards to access to people he states, "My social interaction in real life is very limited, not because my disability's a factor in it, but more from the fact that I'm in an open ranch area in the mountains." Hawk laments he is too young to socialize with the people in his physical world area, "We're in a great spot for the type of work I do but not the best spot to have social connections to actually do things with. If anything I'm more of a homebody. That's another reason why I like SL. It gives me a chance to actually interact with people if I'm limited to do the interaction in real life." Hawk's rural location means for him there is little to do "except bar hopping, especially in the winter."

As a seasoned resident of SL, Hawk's history in SL included positive and negative engagements with others in SL. Hawk disclosed, " I've made some good friends in SL. To be honest, that's actually where I met my girlfriend before…. I'm looking for a new girlfriend, but I'm also staying open to the idea that I may meet another girlfriend in SL." According to Hawk, the socialization aspect of SL is important to recognize, "…humans are a pack-based species. Socialization is part of what a pack-based species needs to survive." Hawk states it's more comfortable to interact with people in SL than it is in the physical world because "what you do in Second Life stays in Second Life." An advantage in SL expressed by Hawk, is that even though a few people in SL recognize he has Asperger's Syndrome, "People won't use stuff against you. The benefit is that a person can be more open. It lets you experiment. I've never had anything I've said in Second Life used against me so far in real life."

Self-awareness. In regards to self-awareness, Hawk disclosed he has a high sense of self-awareness due to the ongoing tendency of individuals with Autism spectrum disorder to self analyze. In fact, Hawk did exhibit a keen sense of self-awareness throughout the study through his avatar choices, and his use of SL as a platform to improve skills that minimize any perceived negative impact of his disability. Hawk created many different avatars in SL, preferring anthropomorphic avatars to human avatars. He notes a person can be more creative with the vast customization options for anthropomorphic avatars that are not available for human avatars. He says, "The whole point of SL is to show your imagination, show who you are. It's showing a part of your personality that you cannot fill in real life. You are expressing yourself through your look and your appearance the way a painter expresses their feelings through art, or a songstress expresses their feelings through music."

Through his anthropomorphic avatars, Hawk exhibits aspects of what he considers to be his personality traits and individualism, “I can more easily show traits that are part of my personality with these avatars. Foxes are supposed to be cunning, playful, and mischievous. I have a high intellect and am very cunning, which is why I do that as a fox. Dragons are also meant to be intelligent, fierce, and wise. I find I tend to have a lot more wisdom than people around my age and I like the fact of pretending to be able to fly.”

Hawk discloses in the physical world he tends to favor “passive type clothing, casual or business casual” if he is going to an event. Interestingly, he chooses confident looking avatars because “that is more my personality.” He notes that avatar choices can show a part of your personality that you cannot fill in real life. “You are expressing yourself through your look and your appearance the way a painter expresses their feelings through art or a songstress expresses their feelings through music.” He chooses characteristics of foxes because they are supposed to be cunning, playful, and mischievous. He says, ”I have a high intellect and am very cunning, which is why I do that as a fox.” He chooses dragons because they are meant to be intelligent, fierce, and wise. He says, “I find I tend to have a lot more wisdom than people around my age….”

Hawk discussed the benefit of SL for people with Asperger’s and dyslexia to refine skills they are weak on, for example, spelling, and word choice. He points out, “In SL since everything is word oriented, it forces them to refine their skills a bit better, so it makes it easier so when they actually need it in real life they have it more refined to where they do it competently.

Hawk believes as a result of the study activities he is more aware of mental and physical disabilities specifically and he will be better able to recognize the signs of specific disabilities that were unknown to him before being a participant in the present study.

It should be noted that SL also has the potential of bringing to light negative aspects of a person's personality or individuality. For Hawk, he believes at times he and others can become over focused on SL. He says "this can feel like you are wasting time if you aren't actively learning something." In turn, he explains, "Self-esteem takes a hit if it feels like you aren't accomplishing something. Second Life™ is a good way to build self-esteem. Everything has a good and down side. Second Life™ is no exception."

Transference of skills from Second Life™ to the physical world. The data gathered through multiple conversations with Hawk during and post study activities, indicate activities in SL can influence self-determination in the physical world. In Hawk's case, there was overt awareness of the influence of SL on self-determination in the physical world. For example, Hawk discussed improving his physical world typing and communication skills and engaging in new experiences and relationships with minimum concern for risk. Second Life™ has improved his social interactions because he can analyze how people word things in their typing. He notes, "both of these are important because if you can't spell well it hurts your job prospects. Second Life™ lets you practice." Hawk says, "In SL since everything is more word oriented it forces people to refine their skills a bit better so it makes it easier so when you actually need it in real life you have it more refined to where you use it competently." Hawk states these skills improved his confidence, helped him build self-esteem, and enhanced his disability awareness.

The issue of minimized risk for people with disabilities in SL is a common theme for Hawk and he strongly believes experiencing situations in SL is helpful in the physical world, "One of the benefits of SL is they can be more open here than they can in real life without the fear of repercussions. Because of that they can actually see what the repercussion is and plan better, and that can build their self-esteem, and then they know how to handle situations and are prepared for it when it happens in real life, so they're not as timid or worried and it doesn't hit them as hard because they have some reference on how to deal with it if it happens."

Consistent with the case study for Rocky, in addition to focusing on the self-determination characteristics of problem solving, relationships with others, and self-awareness, the researcher identified several themes during interview coding related to the research question and sub-question: (1) identity, (2) choice-making, (3) self-determination, (4) Second Life™ v. physical world [intended to capture the transference of skills from Second Life™ to the physical world], (5) problem solving, (6) relationships with others, (7) self-awareness, (8) themes that directly support/refute the study question, and (9) other. For Hawk, the top three themes in order of prevalence were (1) other, (2) identity, and (3) self-awareness. In the Other category, Hawk discussed issues of griefing, enhanced privacy in SL as compared to the physical world, and gatekeeping. The researcher disregarded #8 (themes that directly support/refute the study question) from both participants coding results because all data gathered essentially supports or refutes a study question.

Pre and Post Activity Survey. Consistent with participant Rocky, the pre and post activity survey included the Self-Determination Scale (SDS). A short 10-item scale with 2-item subscales the SDS is intended to assess awareness of oneself and the perceived choice in

one's actions. In the present study it was intended to assess differences in the extent to which participants functioned in a self-determined way before and after their activities in SL. The only difference between the pre and post activity survey was that the pre-activity survey included questions that verified study eligibility and additional questions that assisted the researcher in determining the participant's potential need for support within SL. Hawk's responses reflected he was a person with a developmental disability, identifying his disability as Asperger Syndrome. Hawk indicated he had been in Second Life before, did not need another person to help when using a computer, if someone helps him use a computer he is still the boss of what happens, and knew a lot about self-determination. Hawk's responses to the SDS questions indicate Hawk functioned in a self-determined way pre and post study activities. With a score of 50 being the highest attainable, Hawk scored a total of 42 points pre-activity and 41 points post-activity. Only question One reflected a change (increase) in answer from pre-to post study. Hawk chose not to respond to question Two either pre or post study. A non-response receives a zero score. It cannot be determined whether the activities of the study influenced the decrease in overall score.

Post-Study Gatekeeping Survey Monkey™ Survey

To investigate the issue of gatekeeping, at the completion of the study, a Survey Monkey™ participation request was emailed to two hundred and nine (209) individuals and organizations that received the initial request to make available the participant invitation flyer to adults with developmental disability. The survey included five questions intended to determine whether the study invites had been made available to others, and if not, why? The survey also sought to capture general thoughts about adults with developmental disabilities

being in SL. Twenty-seven (27) respondents (13%) accessed the survey and provided data analyzed for this study.

In response to Question 1 “Did you extend the invitation to participate in the study to adults with developmental disabilities?” 26% of respondents said they did not extend the invitation to participate in the study to adults with developmental disability. For those that did extend the invitation, the survey does not provide insight into how the invite was distributed, where it was distributed, or who may have been the target for the invitation distribution.

Table 4.1 – Response to Question 1

Answer Choices	Responses	
YES	**74.07%**	20
NO	**25.93%**	7
Total		**27**

In response to Question 2 “If you answered NO to Question 1, please select the responses that most closely fit your reason(s) (multiple responses may apply)” five of the seven who responded NO to Question One submitted responses. This question intended to gain insight on why someone may not have distributed the study invitation. Prior to the study participant invitations were emailed a minimum of three times to each of the 209 individuals and agencies. The first emailing included the most detailed invitation explanation. Because this effort netted very few responses and participants, a shorter more concise explanation was subsequently emailed with the participant invitations. Still falling short of the desired results, several weeks later a third email was sent. The study invitation highlighted the study’s purpose as intending to learn whether the virtual world platform SL can help adults with a developmental disability become more self-determined in the physical world. The second and

third emails drew attention to the purpose by setting it as a stand-alone sentence in bold print. Each explanation also highlighted that computer skills and/or previous experience in SL is not needed. Despite these efforts, clear examples of gatekeeping activity can be noted in the survey responses.

Table 4.2 – Response to Question 2

Answer Choices	Responses
I do not remember receiving the study participant request.	20.00% 1
I did not read the entire study participant request.	40.00% 2
The benefit of the study was not clear to me.	40.00% 2
Certain study activity categories did not seem appropriate for adults with developmental disability. (SEE Q.4)	0.00% 0
I had concerns about the use of a virtual world platform.	20.00% 1
I had concerns about the skill level required for participants to complete the study.	0.00% 0
I had concerns of safety and well-being while the participant was online.	0.00% 0
I had concerns about protecting the identity and identifiable information of the study participant.	0.00% 0
I had concerns parents/guardians would not be in favor of the study.	0.00% 0
Total Respondents: 5	

Question 3 intended to capture additional insight from those who responded in Question One that they did not distribute the study invitation and additionally responded in Question 2 that certain study categories did not seem appropriate for adults with DD. However, zero (0) respondents made these two selections together. Eleven respondents selected N/A. This question may have been more informative if it had more broadly investigated whether respondents felt any of the stated activity categories did not seem appropriate for adults with DD.

Table 4.3 – Response to Question 3

Answer Choices	Responses	
N/A	**100.00%**	11
Second Life Orientation	**0.00%**	0
Health and Wellness	**0.00%**	0
A Social Event	**0.00%**	0
A Second Life Field Trip	**0.00%**	0
Disability Awareness	**0.00%**	0
Participant Choice	**0.00%**	0
Total		**11**

Twenty (20) of twenty-seven (27) possible respondents (90%) when asked "Do you believe the use of a virtual world platform is an acceptable place for adults with developmental disability to learn to be more self-determined?" answered the use of a virtual world platform is an acceptable place for adults with developmental disability to learn more about being self-determined. This data is consistent with data found in literature described in Chapter three that supports the use of virtual world platforms. However the responses appear to be inconsistent with the actual outcome of the participation request.

Table 4.4 – Response to Question 4

Answer Choices	Responses	
YES	**90.00%**	18
NO	**10.00%**	2
Total		**20**

The data gathered through Question 5 “Please provide any comments you think would be helpful to the next researcher exploring the use of virtual reality platforms for adults with developmental disability” were intended to gather data that might help inform future researcher on gatekeeping. The data shows gatekeeping can and does occur even in scenarios where individuals may have the best intentions. For example, Response Number 6 states, “I shared the request with adults with developmental disabilities that I personally knew were capable of participating in a Virtual World Platform. Those I knew had internet access and computer skills.” This statement indicates the individual made independent judgments on who would or would not be capable of participating in the study. The judgment was based on whatever level of skill this person assumed on needed to participate in the study. However, the invitation clearly stated individuals did not need to have Second Life experience and that in world support would be provided, as needed.

Table 4.5 – Response to Question 5

1	Without much more detail about the project, how it would work, how people would interact with it, I couldn't give an answer to 4
2	I simply forgot to respond to the survey and would like the opportunity to participate in the future.
3	We need more research and innovation on this area. It is naive to think people with developmental disabilities do not use or cannot use a virtual reality plat-form.
4	Appropriate: yes Accessible: well, that's ALWAYS the question!
5	I believe that such platforms may be helpful for individuals with developmental disabilities if they receive needed supports when using such platforms.
6	I shared the request with adults with developmental disabilities that I personally knew were capable of participating in a Virtual World Platform. Those I knew had internet access and computer skills.

7	We received so many requests from students for these types of surveys, that our members are overloaded and do not appreciate the survey. We therefore seldom, if ever, send them to our 11,000 member e-list.
8	I may have received it but overlooked it. It sounds great and a interesting way to increase SD in people with IDD. Perhaps some follow up and interesting examples. Or a short orientation video for people passing on the info to people with IDD so it would get our attention.

CHAPTER 5. DISCUSSION, IMPLICATIONS, LIMITATIONS, CONCLUSION

The purpose of this study was to investigate whether activities conducted by adults with developmental disability in SL can influence self-determination. The participants in this study were two adult males diagnosed with Autism spectrum disorder. The research question guiding this study was: How can activities in virtual worlds influence self-determination of adults with developmental disability? The research sub-question was: How can self-determination experienced in a virtual world transfer to the physical world? After conducting an analysis of the collected data, the researcher concluded that Second Life™ is an acceptable learning environment for adults with developmental disability; activities conducted in Second Life™ by adults with developmental disability can influence self-determination and; self-determination experienced in Second Life™ can be transferable to the physical world.

Discussion of the Results

The researcher sought to contribute to existing literature by identifying participant experiences in SL reflective of the self-determination components: problem solving, relationships with others, and self-awareness. The data collection process was adequate in answering the research question for this study. Data included participant pre and post activity surveys, field observation, and semi-structured interviews. The researcher found the semi-structured interviews and field observations to be the most useful in answering the research questions. Use of the Self-Determination Scale as part of the pre and post activity surveys was intended to determine whether a measurable change in self-determination could be revealed post-activities in SL. This effort included identifying SL activities that related to

questions measured on the SDS. However, if an individual completes the SDS and scores initially as very self-determined, the SDS does not measure additional growth in self-determination. As a result use of the SDS did not substantially add to the present research by answering the research question and/or sub-question.

Second Life™ as Learning Environment

Research supports the use of SL as a platform that is safe and useful in a variety of ways for people with disabilities (Baladin & Molka-Danielsen, 2015; Beals, 2010; Bloustien & Wood, 2015; Bullingham & Vasconcelos, 2013; Davis & Calitz, 2014; Davis et al., 2009; Gilbert et al., 2013; Kleban & Kaye, 2014; Nosek et al., 2016; Partala, 2011; Stendal & Baladin, 2015; Stendal, Balandin & Molka-Danielsen, 2011; Standen et al., 2001). However, existent research does little to explore the use of SL as a platform to develop self-determination. Further addressing the need for adults with disabilities to experience self-determination in unconventional ways, this study undertook the approach of utilizing the virtual world Second Life™ to explore experiences with self-determination (Ju et al., 2017; Shogren et al., 2015; Wehmeyer & Abery, 2013).

The case study results support SL as an enjoyable medium to experience new activities, gain feelings of independence, and supports the notion that virtual worlds offer a medium whereby people with autism overcome many physical world social barriers such as a high dependence on social cues (Balandin & Molka-Danielsen, 2015; Stendal & Balandin, 2015). This study extends the literature on the use of SL™ by individuals with disabilities. Existing research predominantly focused in the area of individuals with physical disabilities. This study brings new knowledge to the use of SL for individuals with disabilities by focusing exclusively on individuals with developmental disability.

Self-Determination Components

Problem Solving. The findings of this study support literature acknowledging the benefits of problem solving through choice making activities. Varying degrees of problem solving complexity are available and the experience is encouraged. Study Mentor Polaris reminds participant Rocky, "Trial and error is the best way to learn." Less complex problem solving might include choices made during avatar creation or basic activity selections. Navigating in and around SL and adopting avatar skill sets requires more complex problem solving. The most complex problem solving may include building personal relationships or making sense of social issues observed in both virtual and physical worlds such as female objectification. As previously noted, experimenting with identity tourism in SL, participant Rocky gained "a far greater respect for women" through experiences he gained problem solving SL for a short time as a female avatar.

However, it is interesting to note that the coding of semi-structured interviews for the participant who was a new SL resident indicated problem solving as a dominant theme (#3 of 9 themes), whereas for the participant who was the experienced SL resident, problem solving was the *least* identified theme. One possible explanation is that for new residents in SL, the new experiences offer more obvious instances of problem solving therefore the characteristic of problem solving is also more obvious and easier to identify and acknowledge. Whereas for an experienced resident in SL, the characteristic of problem solving becomes diluted by experience and the person loses sight of just how many instances of problem solving is encountered in any given SL activity.

Relationships with others. A limitation to developing relationships with others is often geography or lack of social events in a given community. Partala (2011) notes that one

advantage of virtual worlds is the opportunity to overcome these limitations. This study's data shows SL provides opportunities for adults with developmental disabilities to engage in relationships with others regardless of their physical world location or number of social events in their community. Whether simply engaging in relationship building, conversation with other avatars, or participating in social activity group dynamics, participants engage with other avatars on a regular basis in SL. This is a critical positive element in SL as we also contemplate the impact of gatekeeping on relationships, a focus on "otherness" in the physical world that often shapes relationships, and the opportunity for "identity tourism" that gives people the option to reveal as much or as little about their physical characteristics (Adams, 2010; Blasing, 2010; Vasconcelos, 2013).

Self-Awareness. Self-awareness includes an awareness of one's own personality or individuality. Literature shows elements of identity, "otherness", and levels of self-determination impact self-awareness. Danforth (2000) suggested a need for alternative ways for an individual with a developmental disability to establish and emphasize their identity. This study confirmed the Boellstorf (2008) conclusion that virtual worlds provide a total sense of control over ones self-representation. There are multiple instances whereby the present study's participants made self-representation likeness or difference references via their choices in avatar characteristics. As a result, this study brings new knowledge to the area of self-awareness for adults with developmental disability.

Acquired Abilities

The concept of acquired abilities was included in the present study as a possible way to reimagine abilities an individual can select in SL that may not be possible in the physical world. For example an individual who uses a mobility device in the physical world has the

option of avatar characteristics, for example a walking avatar, that do not require mobility devices. The research was intended to expand the knowledge on why someone may or may not choose to represent their particular disability in SL and the impact of "acquired abilities" on self-determination. Likely due to the small case study number and the nature of the participant's disability, the present study did not reveal any new or helpful knowledge on this concept.

Transfer of skills from SL to the physical world

One of the most critical findings in the present study is support for the notion that skills systemically learned or experienced in SL by adults with developmental disability can transfer from SL to the physical world. A great deal of research exists supporting the transfer of benefits from therapy treatments in virtual worlds to the physical world. However, few studies explore how people with disabilities are using virtual worlds to develop self-determination. The findings of this study go beyond the current research and present new evidence that characteristics of self-determination can transfer from SL to the physical world. This additionally supports Standen et al. (2001) who held a need exists for additional research to determine whether skills acquired or experienced in a virtual world can transfer to the physical world.

Relationship Between the Results and the Theoretical Framework

The theoretical framework for this study was causal agency theory. Causal agency theory sets forth that self-determination refers to the degree to which action is self-caused. The findings of this study provided support for CAT as applied to self-determination by extending understandings of actions that are self-caused and how self-caused actions may

influence the self-determination characteristics of problem solving, relationships with others, and self-awareness. CAT places a focus on creating opportunities for people to exert control, providing the skills necessary to take advantage of those opportunities, and identifying the supports necessary to overcome barriers and limitations (Wehmeyer, 2004). In contrast, a majority of literature related to self-determination heavily focuses on identifying self-determination more so than creating new opportunities to exert control and build self-determination. The application of CAT in this study supports the assertion that adults with developmental disability have a need for less conventional environments that can influence self-determination outside of conventional opportunities pre-determined by others; the use of SL as an environment for self-determination provides the opportunity for adults with developmental disability to exert control in their lives consistent with self-determination and override dynamics that can prevent them from acting freely; and that gatekeeping may present barriers for adults with developmental disabilities to enhancing self-determination.

Gatekeeping

An unexpected limitation revealed itself during the participant selection phase. Many studies that involve individuals with disabilities and SL, seek their participants exclusively from within SL (Bloustien & Wood, 2015; Gilbert et al., 2013; Kleban & Kaye, 2014; Nosek et al., 2016; Partala, 2011; Stendal & Balandin, 2015). Specifically seeking participants exclusively from outside of SL, as presented in the current study is unique. However, an unexpected consequence of not pursuing participants for the present study from within SL was the potential for gatekeeping by the receivers of the participant invitation.

Gatekeeping is defined and explained by Christensen (2016) as "A person who makes decisions about who gets to participate and who does not. Gatekeepers have the kind of

power to make hurtful decisions that result in shutting people out, thus marginalizing or patronizing them. In such cases, people with disabilities are denied both access and support…" (retrieved February 8, 2016). Walker & Read (2011) suggest gatekeepers are "Parties with an interest in ensuring that ethical standards are upheld and with some degree of influence over the granting of access to the potential study population" (p. 14). As stated in the Introduction, the social norms of society often result in individuals with disabilities being told by others what is possible, what their personal and professional limits are, what social activities they may participate in, and what future opportunities do or do not exist for them. Influencers with good intentions such as family, teachers, support staff, professional service providers, and friends often draw from their own opinions, experiences and their own interpretations of those experiences when deliberately or inadvertently influencing another person's self-determination. This results in that person of influence becoming a gatekeeper as defined here.

The sampling method applied in this study utilized people and entities who have access to adults with developmental disabilities, intending to net a broad demographic. However, evidence suggests, the poor participant response, may have been affected by gatekeeping. It was anticipated that the original two hundred and nine individuals and organizations would parlay into hundreds more individuals seeing and deciding for themselves whether the study was of interest to them. However, data would suggest broad access to the study by adults with developmental disabilities did not occur. Sparse research could be found that focuses on gatekeeping and its impact as specifically related to adults with developmental disabilities. However, studies including adults with developmental disabilities acknowledge similar gatekeeping concerns and suggest the need for further

research into this area (Balandin & Molka-Danielsen, 2015). The present study includes only a peripheral look gatekeeping. The effects of gatekeeping on adults with developmental disabilities is a recommended area for research.

The data collected in the post-study survey of individuals who received an email requesting they extend the study invitation to adults with developmental disability supports Balandin and Molka-Danielsen (2015) suggestion that

…there is a need to further explore virtual worlds as a context not only for people with disability but also to examine the views of other stakeholders including professionals and service providers on the use of virtual worlds, such as Second Life (p.1544).

The research needs around this issue are vast and multi-faceted. For example, the Balandin and Molka-Danielsen study included participants in Norway. Recruiting educators and adult students with intellectual disabilities proved difficult because staff in group homes were unsure about their own computer abilities or acted as gatekeepers to recruitment. In addition, it was determined that some prospective participants were not allowed Internet access in their own home (2015). Likewise in the present study, data reveals adults with developmental disability may not have fundamental access to computers or Internet. Additional research is recommended in the areas of gatekeeping activities and barriers to accessing technology experienced by adults with developmental disability.

Implications

Implications for Practice

Support for developing opportunities to develop self-determination in unconventional ways emerged from this study. Years after identifying the importance of self-determination

to the improved health and well-being of individuals with disabilities, barriers still exist for people with disabilities to live self-determined lives (Danforth, 2000; Wehmeyer, 2004; Wehmeyer & Abery, 2013). The self-determination discussion is relevant to important aspects of every day life such as secondary or post secondary education, employment, social activities, or an individual's own perception of identity and self-worth. As such, it is important to expand opportunities for self-determination. Renzaglia (2003) noted that even if self-determination skills were not learned in school, they could be learned later in life. However, despite research that supports the notion that self-determination develops across the lifespan, studies in self-determination overwhelmingly favor youth and adolescents (Test et al., 2000; Shogren et al., 2015). Available opportunities for adults with disabilities to function in a self-determined way should not be assumed. Ongoing opportunities should be made available for adults with disabilities to function in a self-determined way.

The success of virtual world platforms like SL should prompt active consideration for use by teachers, service providers, employers, and any professional who provides services or supports to adults with developmental disability. For example, secondary and post secondary teachers can use SL as a platform to teach skills and concepts in an engaging, interactive way with practical real world scenarios. Similarly, service providers such as centers for independent living, can use SL as a low cost platform to provide services such as independent living skills or peer counseling. Utilizing SL as a platform provides an opportunity to extend services to individuals who may be limited in otherwise accessing services for reasons such as proximity to a Center, lack of transportation or lack of direct support services. It also offers real life scenarios to practice a variety of skills, such as job interviewing, money management, or social engagement with limited risk. Employers can

use SL to teach new staff with disabilities aspects of a job such as such as practicing customer service, location of items within a store, or learning about marketing.

Implications for Research

This study provides new knowledge on how the use of virtual worlds, specifically SL, can be used to enhance the self-determination of adults with developmental disabilities. The findings suggest promising opportunities and a need for further research in the areas of: virtual world platforms as a means for living a more self-determined life in the physical world, broadening the range of developmental disabilities of participants in SL studies, and minimizing gatekeeping of adults with developmental disability related to computer and Internet access. With additional research in these areas, outcomes would likely further open the world of online platforms to adults with developmental disabilities and have a monumental impact on ensuring adults with developmental disability live self-determined lives.

Limitations

Several limitations were present in this study with some directly influencing the outcome. The first limitation was direct access to adults with developmental disabilities. It was difficult to gain direct access to adults with developmental disabilities because of a gatekeeping layer between the person with developmental disability and the research. Before the individuals could decide for themselves whether or not to participate in the study, a gatekeeping layer made a preliminary participation assessment. Despite clear language in the invitation that no computer skills were needed, the post study survey showed capacity/skill assessments were made and ultimately limited people's choice in whether or not to

participate in the study. This highlighted that intentional and unintentional barriers continue to minimize the possibilities for adults with developmental disability to fully navigate the world and all it has to offer. Additional research in this area is supported by Balandin and Molka-Danielsen (2015) who identified there is a need to further explore the view by stakeholders, professionals, and service providers on the use of virtual worlds by people with disabilities.

The second limitation was the lack of personal supports for an individual with developmental disabilities to engage within SL. Specifically, one early study participant was only permitted by caregivers to access the Internet under direct supervision. This greatly restricted Internet time available to the participant as caregiver time was often limited. Another early participant, who resided with his grandmother, did not have a personal computer in the household. This meant the participant was only permitted to limited access to a computer and the Internet while he was at his day treatment center. While at the day treatment center, because only one member of staff was interested in learning to navigate Second Life and support the study, when this staff person obtained different employment, the participant was not able to continue the study activities. Stendahl and Balandin (2015) noted similar findings that support staff and other close relatives often make choices for people with disability, and deny them the opportunity to access a computer or the Internet.

The third was accessibility. Accessibility is considered in terms of access to and within SL. An early participant with self-disclosed developmental and physical disabilities did not complete the study because using an IPad was more accessible for him than a desktop/laptop computer. Second Life™ is not currently compatible with the IPad platform. After several unsuccessful attempts to navigate the study activities via laptop computer,

despite one-on-one assistance from the researcher, the participant's physical and verbal barriers to the platform resulted in his departure from the study. With specialized assistive technology, SL can be more accessible to individuals with diverse disabilities. However, for the purposes of this study resources were not available to provide specialized assistive technology. This study did not engage in a comprehensive review of the specific accessibility strengths or weaknesses that impact the usability of SL.

The fourth limitation is generalizability of the findings. Findings from this study may be limited to the subset of adults with Autism spectrum disorder (ASD) within the population of adults with developmental disabilities. Developmental disabilities are far more inclusive than Autism spectrum disorder (DD Act, 2000). The Centers for Disease Control and Prevention include Autism spectrum disorder as a developmental disability, but further defines developmental disabilities as a group of conditions due to impairment in physical, learning, language, or behavior areas (www.cdc.gov). These conditions begin during the developmental period, may affect day-to-day functioning, and usually last throughout a person's lifetime. Participant selection was open to all developmental disabilities however, it should be recognized that the study only included participants with ASD.

The generalizability may be further limited due to the small number of case studies. Despite the small participant size, the findings of the study support the need to build upon the knowledge available and continue to explore the use of SL to influence self-determination of adults with developmental disabilities. The findings of this study may also be helpful to all adults with developmental disabilities as an example of non-traditional environments to enhance self-determination, which is not limited by disability.

Lastly, the Self-Determination Scale was revised during the present study. It is now known as the Perceived Choice and Awareness of Self Scale (PCASS). The scale includes the same questions but was renamed to better focus on feelings choice and being aware of one's own feelings. While seemingly minor changes, the change in construct would have been more applicable to the present study and may have reframed the application of the instrument had the change been implemented prior to the study.

Conclusions

It is important to expand the opportunities for adults with developmental disabilities to enhance self-determination. Wehmeyer and Abery (2013) have said the future needs of research in self-determination include examining the efficacy of interventions, developing valid and reliable approaches to actually observe the exercise of self-determination and those actions on the part of others that either facilitate or serve as barriers to it, and developing strategies and programs that have the potential to change the environment in such a way that more opportunities for self-determination and supports for its exercise are available. The present study included interventions in SL, developed an approach to observe the exercise of self-determination in SL, and included the observations of others that facilitated or served as a barrier to self-determination, and proposes a way to change the environment to support alternative opportunities for self-determination. Every community has its own barriers to certain opportunities to enhance self-determination. With social media exploding, virtual world presence, and ongoing growth of all things technology related, it should be the norm not the exception that adults with developmental disabilities have access to computers and

Internet to the same extent as their non-disabled peers. This study sought to determine the value behind ensuring adults with developmental disabilities have access to virtual worlds.

The purpose of the study was to investigate whether activities conducted by adults with developmental disability in SL can influence self-determination could create opportunities for adults with developmental disabilities to be their own causal agents. Applying causal agency theory the study confirmed SL might be used to create self-caused action resulting in self-determination. Virtual worlds provide opportunities whereby an individual can create change that is consistent with one's own values, preferences, or interests, and not the values, preferences, or interests of others.

The participants in this study completed six activities in SL in the categories of (1) Second Life™ Orientation (2) health and wellness (3) a social event (4) a Second Life™ field trip (5) disability awareness and (6) participant choice. These six activity categories corresponded with the self-determination components of (1) problem solving, (2) relationships with others and (3) self-awareness. Participants presented encouraging data from each of the six categories to support the three self-determination components.

Through the voices of the participants themselves, this study contributes to the research of self-determination by encouraging social change to embrace unconventional environments to live a self-determined life.

The work of an intellectual is not to mould the political will of others;
It is, through the analysis that he does in his own field, to re-examine evidence and assumptions, to shake up habitual ways of working and thinking, to dissipate conventional familiarities, to re-evaluate rules and institutions and to participate in the formation of a political will (where he has his role as citizen to play)
~Michel Foucault (1926-1984)

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APPENDIX A: Self-Determination Scale

I am a person with a developmental disability.	Yes	No
My disability is _____		
I have been in Second Life before.	Yes	No

Q. 1 Sometimes I need help from another person when I'm using the computer.

1 Not at All	2 A Little Bit	3 A Lot

Q. 2 If someone helps me use the computer, I am still the boss of what happens.

1 Not at All	2 A Little Bit	3 A Lot

Q. 3 I know about self-determination.

1 Not at All	2 A Little Bit	3 A Lot

Both the pre- and post activity survey included the following SDS 10-item scale:

Q. 1 A. I always feel like I choose the things I do.
B. I sometimes feel that it's not really me choosing the things I do.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 2 A. My emotions sometimes seem alien to me.
B. My emotions always seem to belong to me.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 3 A. I choose to do what I have to do.
B. I do what I have to, but I don't feel like it is really my choice.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 4 A. I feel that I am rarely myself.
B. I feel like I am always completely myself.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 5 A. I do what I do because it interests me.
B. I do what I do because I have to.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 6 A. When I accomplish something, I often feel it wasn't really me who did it.
B. When I accomplish something, I always feel it's me who did it.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 7 A. I am free to do whatever I decide to do.
B. What I do is often not what I'd choose to do.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 8 A. My body sometimes feels like a stranger to me.
B. My body always feels like me.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 9 A. I feel pretty free to do whatever I choose to.
B. I often do things that I don't choose to do.

Only A feels true	1	2	3	4	5	Only B feels true

Q. 10 A. Sometimes I look into the mirror and see a stranger.
B. When I look into the mirror I see myself.

Only A feels true	1	2	3	4	5	Only B feels true