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THE ROLE OF EMBODIED METAPHOR IN THE RELATIONSHIP BETWEEN
VESTIBULAR DYSFUNCTION, ANXIETY AND THE SELF

A Dissertation

Submitted to the McAnulty College and Graduate School of Liberal Arts

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Philosophy

By

Kaitlyn Abrams

December 2021

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Kaitlyn Abrams

2021

THE ROLE OF EMBODIED METAPHOR IN THE RELATIONSHIP BETWEEN
VESTIBULAR DYSFUNCTION, ANXIETY AND THE SELF

By

Kaitlyn Abrams

Approved September 10, 2021

Alexander Kranjec, PhD
Professor of Psychology
(Committee Chair)

Roger Brooke, Ph.D., ABPP
Professor of Psychology
(Committee Member)

Gregory F. Marchetti, P.T., M.S., Ph.D.
Assistant Professor of Music
(Committee Member)

Kristine L. Blair, Ph.D.
Dean, McNulty College and Graduate
School of Liberal Arts

Dr. Elizabeth Fein
Chair, Psychology Department
Professor of Psychology

ABSTRACT

THE ROLE OF EMBODIED METAPHOR IN THE RELATIONSHIP BETWEEN VESTIBULAR DYSFUNCTION, ANXIETY AND THE SELF

By

Kaitlyn Abrams

December 2021

Dissertation supervised by Dr. Alexander Kranjec

There is considerable evidence that vestibular dysfunction and anxiety are correlated. Clinical and philosophical arguments suggest that a loss of sense of self, experienced through symptoms like derealization and depersonalization, might contribute to this relationship. The present study used a mixed methods approach, including Systematic Metaphor Analysis, to analyze written short answer and quantitative survey data from one hundred and thirteen participants with vestibular disorders. The Systematic Metaphor Analysis revealed several primary metaphor concepts which elucidated the connections between concrete experience and abstract concepts in vestibular dysfunction. These included metaphors of Agency, Stability, Orientation, Self-Object, and Figure-Ground. Primary metaphors for each of these broader concepts were used to interpret quantitative results and to expand and explore phenomenological structures common to

the experience of vestibular disruption. I argue that vestibular function is central to “grounding” perceptual experience by organizing the relationship between the body, self, and world. Implications for embodiment philosophy, including the importance of vestibular function in maintaining a “ground” of experience as well as clinical implications, such as the quality of dissociative symptoms for patients with vestibular dysfunction, are discussed.

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TABLE OF CONTENTS

	Page
Abstract.....	iv
Acknowledgement	vi
List of Tables	x
Introduction.....	1
Literature Review.....	3
Overview of Clinical literature.....	3
Relationship Between the Vestibular System and Anxiety.....	6
Relationship Between Vestibular Dysfunctions and Disruptions in the Sense of Self.....	8
Overview of Philosophical Literature.....	9
Metaphor and Representation of the Body-Space Relationship.....	13
Methodology.....	18
Method.....	23
Participants, Sample Size and Recruitment Procedures.....	24
Design.....	25
Materials.....	25
Procedure.....	29
Approach to Quantitative Analysis.....	29
Approach to Qualitative Analysis.....	30
Results.....	34
Demographics.....	34

Description of Etiologies.....	34
Quantitative Results.....	38
Descriptive Statistics for Individual Measures.....	38
Hypothesis testing.....	39
Experimental vignette results.....	43
Qualitative Results.....	45
Symptom Onset.....	47
Symptom Experience.....	62
Symptom Mitigation.....	73
Cognitive Experience.....	81
Summary.....	90
Implications.....	93
Embodiment Theory: Vestibular Function Provides the Ground for Perceptual Experience.....	93
Clinical Implications: The Language of Self, Anxiety, and Dissociation	101
Language and Diagnosis.....	101
Self-efficacy.....	102
Anxiety.....	103
Characteristics of Dissociation with Vestibular Patients.....	105
Cognitive Metaphor Theory: Methodological Implications.....	108
Limits of the Study.....	112
Conclusion.....	114
References.....	116

Appendix A.....126
 Study Procedures.....126
Appendix B.....127
 Recruitment Script.....127
Appendix C.....129
 Informed Consent Agreement.....129

LIST OF TABLES

	Page
Table 1. <i>Inclusion and Exclusion Criteria</i>	24
Table 2. <i>Metaphor Primes Developed for Use in the Experimental Conditions</i>	27
Table 3. <i>Table of Etiologies Represented In The Sample</i>	35
Table 4. <i>Descriptive Statistics for the Dizziness Handicap Inventory Subscales</i>	39
Table 5. <i>Descriptive Statistics and Correlations for Study Variables</i>	41
Table 6. <i>Symptom Domain and Related Primary Metaphors and Themes</i>	46

Introduction

The following dissertation explores the phenomenology of vestibular dysfunction and its relationship to anxiety and representations of the self. The study methods and conceptual rationale are oriented around Lakoff & Johnson's (1999; 2008) "grounded cognition" model, which holds that abstract concepts and affects are metaphorically grounded in concrete, embodied experiences.

The existing clinical literature suggests a strong relationship between vestibular disorders and anxiety. A connection also exists between vestibular dysfunction and dissociative symptoms such as derealization and depersonalization (Renaud, 2015). However, the interplay between vestibular dysfunction, anxiety and dissociative symptoms has not been well-investigated. Despite this, relations between these phenomena have strong theoretical grounding in the philosophical literature, particularly in the phenomenology of embodiment. The work of "embodied cognition" philosophers, such as Merleau-Ponty and Lakoff & Johnson, offers theoretical avenues for understanding how anomalous embodied experiences, such as vertigo, might give rise to anxiety and a loss of sense of "self."

This study explored these correlated experiences through a mixed methods approach, including a first-person methodology to understand how patients with vestibular disruption use metaphor to describe their experiences. A correlational and quasi-experimental approach was then be used to test the hypotheses of grounded cognition, which suggest our embodied experiences lay the template for more abstract experience (such as language, affect, cognition,

etc.). In addition to hypothesis testing, this survey data provided another means of interpreting the qualitative results.

Phenomenologically informed research with this population offers important opportunities. First, centering personal narratives could significantly deepen the understanding of these individuals' experiences as well as inform clinical intervention and rehabilitation. There is, to my knowledge, no qualitative research exploring the experiences of anxiety and dissociation with patients with vestibular dysfunction. Working with participants who are differently embodied may also serve to further theoretical understanding of embodiment philosophy. Clinically, understanding how the cognitive and linguistic framing of vestibular dysfunction interacts with anxiety may inform novel approaches to rehabilitative and psychotherapeutic intervention in this population. Additionally, the relationship between anxiety, vestibular dysfunction, and dissociative symptoms is understudied with clinical populations. This work may also inform how vestibular dysfunction and perceived handicap might be shaped by psychiatric symptoms. More exploratory research could help clinicians distinguish between differing psychiatric processes in this population.

Research with patients experiencing vestibular dysfunction may serve an important role in providing empirical evidence to support broader ideas related to embodiment and language. There is a need for embodied cognition research that engages participants with disabilities or other different embodiments. Findings from this study using a patient population could offer support and avenues of critique of Lakoff & Johnson's work, support for which has primarily come from research with non-clinical populations.

Literature Review

Overview of Clinical Literature

The heart of the vestibular system lies in the small, intricate pathways of the inner ears. These vestibular receptors work to detect head position and movement. Information from these receptors become “immediately multisensory and multimodal” in the central nervous system as the vestibular system coordinates information from the eyes, motor, and proprioceptive systems to inform us about our body’s position in space (Angelaki & Cullen, 2008). This coordination of head position, motion, and other sensory inputs gives rise to our sense of balance, spatial orientation, and body schema. As such, the well-tuned vestibular system allows us to efficiently orient in space. This underlies our ability to navigate, anticipate our own body position, and remain oriented. In short, by integrating multisensory information, the vestibular system mediates a harmonious relationship between body and world.

Disorders or dysfunctions of the vestibular system create conditions for disorienting, unreliable, or incongruent perceptual relationships with the world. Vestibular dysfunction has diverse symptomologies and etiologies. Typically, these include experiences of vertigo and dizziness as well as difficulties with balance, proprioception, and spatial orientation. These experiences are not uncommon. Perhaps the reader has had an occasion of dizziness while looking down from a height? Or illusory self-motion when a train next to your stopped train starts to pull away from the station? Such “normal” experiences of vestibular symptoms are common with an estimated 35% of adults over age 40 in the United States exhibiting evidence of balance disruption (Agrawal et al., 2009). That estimate increases to 85% in adults over 80 years old (Agrawal et al., 2009). Disruptions in vestibular functioning can accompany an array of

etiologies, ranging from benign and transient to severe and chronic. Additionally, other clinical syndromes such as diabetes, cerebellar disorders, or stroke can result in increased symptoms of vestibular dysfunction. A more in-depth look at specific etiologies relevant to the study sample will be offered in the results section.

Though “everyday” vestibular irregularities are common, disruptions in vestibular functioning can reach a point where is categorized as pathological. Vestibular disorders are broadly divided into two categories: peripheral and central disorders. Central disorders are vestibular disorders caused by damage to the brain and central nervous system, for example brain stem injury that leads to persistent experiences of imbalance. Peripheral disorders are characterized by injury to or dysfunction of vestibular structures that are not part of the central nervous system. This most commonly includes disorders of the inner ear or structures of the eye.

In 2006, the Committee for Classification of Vestibular Disorders of the Bárány Society met to formalize a classification system for the diagnosis of vestibular disorders (Bisdorff, Von Brevern, Lempert & Newman-Toker, 2009). This included a description of the phenomenology of specific symptoms as well as how these track to specific diagnoses. Though there is some overlap in symptom presentation between peripheral and central vestibular disorders, there are several distinctions that aid in diagnosis as well as determining a course of symptoms and treatment. For example, all vertigo generally arises from a sudden “mismatch” between neural activity. However, the source of the “mismatch,” whether it is from a peripheral or central source, is what determines how an episode unfolds over time, as well as the shape of other accompanying symptoms (Bisdorff, Von Brevern, Lempert & Newman-Toker, 2009).

The vertigo experienced in peripheral disorders typically takes the form of “external vertigo;” objects in the room or the room itself appears to move. Symptoms of peripheral disorders are experienced as episodic, come on suddenly, are tied to triggers and often resolve within a day. Often, patients who suffer from a peripheral disorder can describe the first time they experienced symptoms. Peripheral symptoms are likely to include experiences that point to the involvement of peripheral structures, such as auditory or visual disturbance (Shepard, 2009).

This contrasts with “internal vertigo” which, broadly, is experienced in dysfunction resulting from central disorders. These experiences are characterized by a sensation of “spinning within the patient’s head,” of “self-motion” (Shepard, 2009; Bisdorff, Von Brevern, Lempert & Newman-Toker, 2009). With respect to symptom onset, patients with central disorders describe a more subtle or vague onset of symptoms that do not resolve. Central symptoms can include experiences that point to central nervous system involvement such as lack of coordination, difficulty swallowing, and trouble speaking (Shepard, 2009).

A range of common peripheral and central disorders affect the vestibular system. But the most frequent is a peripheral disorder known as benign postural positional vertigo (BPPV), which occurs when sudden changes in head position trigger bouts of mild to intense vertigo and dizziness. Estimates of the lifetime prevalence of BPPV range from 2.4%-3.9% (von Brevern et al., 2007; Kerber, et al., 2013). This condition is often idiopathic, meaning there is no underlying pathology or cause and that symptoms are often intermittent. Other vestibular disorders, such as vestibular neuritis, arise from underlying inflammation of the vestibular nerve, causing dizziness and vertigo.

Many vestibular disorders, even those of benign etiology, are experienced as quite disabling. Research suggests that vestibular symptoms, such as vertigo and dizziness, have a significant impact on quality of life (Neuhauser, Radtke, Von Brevern, Lezius, Feldmann & Lempert, 2008). Results from a quality-of-life study with patients with active Ménière's disease, a chronic vestibular disorder, suggest that the vertigo associated with Ménière's is one of the most debilitating conditions that does not require institutionalization (Anderson & Harris, 2001; Yardley, Dibb & Osborn, 2003). These symptoms can also put patients at risk for other negative health outcomes, such as increased risk of falls and avoidance behaviors (Neuhauser, et al., 2008).

Relationship Between Vestibular System and Anxiety

Part of what appears to be especially disabling about vestibular disorders is a high co-occurrence of psychiatric symptoms. The relationship between psychiatric disturbance and vestibular disorders has been well-established (see Jacob & Furman, 2001 for review; Jacob, Redfern & Furman, 2008). Vestibular symptoms, such as dizziness and vertigo, have been strongly associated with anxiety in particular (Polak, Klein, Rafael & Rabey, 2003). Estimates on the comorbidity of dizziness and anxiety symptoms range from 11% to 28.3% in community samples (Yardley, Owen, Lazarus & Luxon, 1998; Wiltlink, et al., 2009). These connections are particularly salient in clinical work as psychological distress is one of the primary determinants of lower quality of life ratings and higher disability ratings in vestibular patient populations (Yardley, Owen, Lazarus & Luxon, 1998). Other factors that contribute to a patient's perceived level of handicap include fear avoidance, increased fall risk and chronicity (see Yardley, 2000

for review). Combinations of symptoms, such as experiencing dizziness and imbalance concurrently, also contribute to increased anxiety (see Yardley, 2000 for review).

Though the literature demonstrates that anxiety and vestibular dysfunction often co-occur, this relationship is not exclusive. Anxiety can occur in the absence of vestibular symptoms and vice versa. Anxiety can both predispose patients to vestibular symptoms and arise secondary to the onset of vestibular disorders (Staab & Ruckenstein, 2003). As a result, several explanations have been proposed for the relationship between anxiety and vestibular dysfunction. Biomedical discourse focuses largely on the close neuroanatomical interconnections between the vestibular and limbic systems, the limbic system being involved in the regulation of emotions. In fact, research suggests that stimulation of the vestibular system is an effective therapy for stress-related disorders such as conversion disorder and mania (see Rajagopalan, Jinu, Sailesh, Mishra, Reddy & Mukkadan, 2017 for review). Psychogenic explanations for vestibular symptoms suggest primarily psychiatric causes. Dizziness has long been recognized as a symptom of anxiety and panic disorders and cross-sectional studies suggest that approximately 20%-25% of cases of chronic dizziness occur in the absence of neurotological disorder (Kroenke, Lucas, Rosenberg & Scherokman, 1993).

Current consensus utilizes the classification of functional dizziness, which describes the subjective experience of vestibular symptoms regardless of structural abnormality or pathophysiology (Dietrich & Staab, 2017). A primarily psychogenic origin of functional dizziness is suggested when subjective dizziness and imbalance occurs despite normal clinical performance on vestibular measures. Psychogenic dizziness and imbalance symptoms can follow provocative situations, occur during times of increased stress, or arise as in response to a

patient's postural overcompensation (Brandt, 1996). Certain personality characteristics, such as obsessional features, high neuroticism and low extraversion also contribute to a "hallmark" profile of functional dizziness (Brandt, 1996; Dietrich & Staab, 2017). These functional disorders are also distinguished from primary psychiatric disorders.

These findings suggest that the relationship between anxiety and vestibular symptoms is bidirectional, with the question of causality being one of the "chicken or egg" variety. Studies suggest that patients with panic disorder often have subclinical vestibular dysfunction and neurological or inner ear abnormalities (Jacob, Furman, Durrant, & Turner, 1996; Jacob, Lilienfeld, Furman, Durrant & Turner, 1989). Additionally, there is evidence to support the effectiveness of antidepressants to mitigate chronic dizziness as well as evidence to support vestibular rehabilitation as an effective intervention for anxiety (Staab, Ruckstein & Solomon, 2002; Zimatore, Badaracco, De Angelis & Tufarelli, 2007). Causal bidirectionality between anxiety and vestibular symptoms, despite their considerable overlap across etiologies, suggests that their relationship is important. While the present study did not attempt to untangle the nature of their causal relationship, the intention is to further explicate the connection between these often-debilitating symptoms through patient experiences that are rich in their descriptions of both anxiety and vestibular dysfunction.

Relationship Between Vestibular Dysfunction and Disruptions in the Sense of Self

In addition to anxiety, evidence suggests that patients with vestibular disorders also experience disruptions in their "sense of self," which can lead to a range of consequences such as personality changes and dissociative symptoms (Smith & Darlington, 2013). Patients with vestibular disease report symptoms of derealization and depersonalization at a significantly

higher rate than controls (Sang, Jauregui-Renaud, Green, Bronstein & Gresty, 2006). Whereas derealization describes subjective experiences where the outside world is felt to be not quite “real” depersonalization is defined by “subjective experiences of unreality in one's sense of self” (Simeon, 2004).

Experimental research suggests a link between the vestibular system and symptoms of derealization and depersonalization. Stimulation of the vestibular systems in healthy participants produced similar symptoms related to “loss of sense of self” (Sang, et al., 2006). Anxiety appears to influence subjective personality change in patients with vestibular dysfunction as well. One study suggests that the presence of anxiety made depersonalization and derealization symptoms more severe and more frequent for patients with vestibular disorders (Kolev, Georgieva-Zhostova & Berthoz, 2014).

Overview of Philosophical Literature

One way of understanding the connections between vestibular symptoms and a disrupted “sense of self” is through literature on the phenomenology of the body. This section begins with an introduction to Merleau-Ponty's embodied phenomenology and moves towards relevant philosophical concepts to illustrate how concrete disruptions in bodily experience can affect more abstract experiences, such as self-awareness, cognition, and consciousness. The importance of these concepts to understanding how vestibular disorders may contribute to the experience of “self” will be explored through an outline of philosophical embodiment theories.

Much of the conceptual grounding for work in “embodied cognition” is attributed to the philosophy of Merleau-Ponty. In his work, *The Phenomenology of Perception*, Merleau-Ponty

(2011) posited a theory of consciousness which is centered in participatory perception. The body, according to Merleau-Ponty (2011), actively engages in the act of perception, rather than perception occurring through a series of mechanistic, stimulus-response reactions. Merleau-Ponty (2011) rejected the idea of “mind” as transcendent from the body, a thesis which complicated the naturalist-pragmatist idea of a hierarchical model of cognition. Instead, Merleau-Ponty centered bodily perception *as* consciousness in active relation to the world.

Making sense of the connections between vestibular dysfunction, anxiety and body schema engages a rich philosophical legacy. One valuable contribution to understanding the importance of intact vestibular function to the experience of self is in Erwin Straus’s (1952) phenomenological analysis of verticality in *The Upright Posture*. This work provides an important philosophical foundation for the embodied relation to space. In his analysis, Straus emphasizes that human physiognomy necessitates moving through space in an “upright” way. Being vertically oriented requires psychologically and physically negotiating opposing forces, like gravity. Failing to negotiate these may result in stumbling or falling. He writes, “[The upright posture] contains a psychological element. It is pregnant with a meaning not exhausted by the physiological tasks of meeting the forces of gravity and keeping the equilibrium” (Straus, 1952, p.530). This touches on the idea that physical experience is imbued with psychological meaning and vice versa. Straus also introduces that the psychological importance of upright, embodied experience is illuminated linguistically. He points out the double meaning of “upright;” both to “stand on one's own feet” as well as, “the moral implication, not to stoop to anything, to be honest and just, to be true to friends in danger, to stand by one's convictions” (Straus, 1952, p. 532). Thereby, disruptions of these negotiations, such as through paralysis, disease or prosaic experiences of imbalance have both physical and psychological consequences.

Straus argues that the human sense of “self” and self-efficacy is itself informed by remaining upright, that is, by maintaining balance. He writes, “A biologically-oriented psychology must not forget that upright posture is an indispensable condition of man's self-preservation” (Straus, 1952, p. 532). Straus suggests that because our verticality puts us in relation to competing downward physical forces that put us at risk for falling, anxiety and balance inherent in the human sense of self. Individuals, such as those with ongoing vestibular dysfunction, who are in constant battle against this equilibrium or for whom the battle is a losing one, are likely to experience psychological consequences, changes in the self and a perceived lack of self-efficacy.

Building on these philosophies, contemporary neuropsychological inquiry understands cognition as an emergent consequence of an organism’s interaction with its environment (Johnson, 2007). The “embodied approaches” hold that the body plays an active role in cognition and perception. Echoing Merleau-Ponty, in embodied cognition, the “key assumption [is] that the body functions as a *constituent* of the mind rather than a passive perceiver and actor *servicing* the mind” (Leitan & Chaffey, 2014). Interaction with the environment does not afford the possibility of cognition rather, in embodied approaches, the interaction is cognition.

An example of how these embodiment philosophies is employed in contemporary neurophenomenology, I will introduce the ideas of “body schema” and “body image.” The concept of body schema has been taken up in myriad ways in psychological, medical, and philosophical research. In the work of Merleau-Ponty (2011), “body schema” describes the unconscious experience of our bodies. It refers to the regulation and experience of pre-reflective action in goal-directed behavior. The definition of “body image” is more controversial. I have

borrowed from Gallagher's (2005) neurophenomenological definition of "body image." To contrast body schema and image, body schema is catching a fly ball -- attention is on the ball, our movements flow towards the goal and we are not thinking "about" our bodies. In body schema, the awareness of the body *per se* becomes "hidden" behind the actions oriented towards the goal (Gallagher, 2005). Body image refers to the conscious thoughts, feelings, and perceptions that we have about our bodies. Body image is learning a new dance step -- we think about where our right foot should go next, we look in the mirror to see if our form is correct and adjust. In body image, our attention is directed towards our body itself.

The vestibular system contributes to *body schema* by coordinating multisensory information about our body position in relation to space. Fluid coordination of this information allows a harmonious relationship between body and space. This congruency allows for the completion of goal-directed behavior without having to think "about" the body itself; the "actions can be hidden behind the goal." In other words, fluid, harmonious sensory information that allows for orientation and accurate perception as to the body's position in space contributes to an intact body schema. Because the body schema relies on coordination between body and world, in Straus's words (1952), the body schema is not "a concept or image which a person has of his own body...the body-scheme is also experienced as an I-world relation."

Coherent body representation, as evidenced by an intact body schema, influences experiences of "body ownership" wherein our body feels like it "belongs" to us and we feel agency over our movements (Lopez, et al., 2008; Metzinger, 2007). Having a sense that our bodies and its parts are "ours" is a key component of self-awareness. Feeling my body as "mine" underscores control of body movements, agency, and internal representations of self (see

Tsakiris, Schütz-Bosbach & Gallagher, 2007 for review). As our bodies constitute our experience of the world, disruptions of the body schema, such as those experienced in vestibular dysfunction, can produce feelings of disembodiment affecting our representations of “self” (see Lopez et al., 2008 for review).

Overall, philosophical theories of embodiment suggest that body schema is predicated on a congruent relationship between body and space. An intact body schema is central to experiencing bodily control and internal representations of self as well as a sense of ownership over one’s body and movements. Vestibular dysfunction may disrupt the body-space relationship, resulting in effects to body agency and self-experience.

Metaphor and Representation of Body-Space Relationship

There are many avenues through which to explore the embodied experience of self. The methods and conceptual rationale for this study are oriented around Lakoff & Johnson’s (1999) “grounded cognition” model. Their work arises from cognitive linguistics which holds that abstract concepts and affects are grounded metaphorically in our bodies’ interactions with natural forces. In cognitive metaphor theory, the term “metaphor” is not used to refer to a poetic or literary device as most people commonly understand the term. Simply put, according to *cognitive metaphor theory*, we use concrete body experience to inform our understanding of abstract concepts (Lakoff & Johnson, 1980). In this way, metaphors provide a productive structure for grounding thought in everyday experiences (Lakoff & Johnson, 1980) Lakoff & Johnson (2008) write, “Metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.” In this way, metaphor use reveals a “cognitive

unconscious,” which is both evident in our “automatic” use of metaphor and in the shared pool of metaphors from which we draw to describe experience. Analyzing and contextualizing these metaphors can be an entree to the unconscious structures of embodied phenomena.

For an example, we have experience of our bodies in different situations that inform metaphors such as “I’m out of it today.” “Out of it” is understood to express feeling like “not myself.” These specific metaphors cohere around the metaphor that the “self” is an object, and in particular, a kind of container. Our concrete experience tells us that objects can be contained within containers; when they are outside or spilling out, they are uncontained. The more abstract experience is that being “not myself” is being “outside” of the self-container that usually organizes my experience. This is also evidenced in Straus’s (1952) reflections on what it metaphorically and literally means to be “upright.” We have a concrete experience of “standing tall,” being visible, balanced on two feet and being vertically oriented, which can aid us in imaging the more abstract concepts of morality: being an “upright citizen.” In metaphoric language, we rely on an “image-able” experiences (a container, someone standing tall) to help us grasp more abstract concepts (not feeling like myself, morality).

There have been several novel empirical studies which provide support for Lakoff & Johnson’s model. As an example, one study of neurotypical participants were invited to two experiments (Casasanto & Dijkstra, 2010). The first experiment asked participants to recall either positive or negative autobiographical memories while moving a set of marbles up and down (Casasanto & Dijkstra, 2010). Participants were able to retrieve more memories when the movement was congruent with the emotional valence of the memory (i.e., up for positive memories, down for negative) (Casasanto & Dijkstra, 2010). The implication of the Casasanto &

Dijkstra (2010) study is that our embodied knowledge of verticality (i.e., “up and down”) interacts with the mental representations of emotional “up and down.” This suggests that the interplay of motoricity, perception and cognition contribute to the formation of abstract representation.

Empirical support for grounded cognition hypotheses relies primarily on non-disabled samples. A critique of Lakoff & Johnson is that their work assumes a universalized human body when discussing how concrete experience grounds abstract concepts (Scully, 2012). Researchers in disability studies have highlighted the need for “embodied cognition” models to include inquiry into “anomalous” bodies and different kinds of embodiment (Scully, 2012). For one, the universality of physical forces, like gravity, inform a sense of shared experience. We all interact with gravity. However, this can be totalizing, as the relationship of our bodies to gravity might change depending on our bodily capacity, the environment, the heuristic of a story (or poetry) or an imaginary realm. Though Lakoff & Johnson touch on the cross-cultural validity of the basic structures of embodied representation through metaphor, there is plenty of room for dialogue and critique. Metaphors grounded in a “universal human body” may limit understanding of how different embodiments engage metaphor.

Grounded cognition models offer another way of conceptualizing somatopsychic and psychogenic explanations of embodied experience. Complicating the directionality concepts that underscore psychogenic versus somatopsychic models, grounded cognition implies the bidirectionality of embodied experience, cognition and affect. Examining metaphor fits conceptually with the multisensory and multimodal nature of vestibular signals, as metaphor itself is an example of, “cross-domain conceptual mapping” (Lakoff & Johnson, 2008, p. 57).

The relationship is also interactional; examining metaphor use allows for the exploration of the representational relationships and meanings between anxiety, dissociation and vestibular experiences.

Two relevant examples that explicate a relationship between vestibular dysfunction, anxiety and self-representation from Lakoff & Johnson's work are the metaphors of the self and metaphors of the mind. They write, "There are ways in which we try to control our bodies and in which they 'get out of control'" (Lakoff & Johnson, 1999, p. 267). There are a few metaphor "concepts" which are evident in the vestibular patient literature. Many can be tracked onto broader metaphor concepts which refer to self-location. One is the *self-as-container* metaphors, where the self, or instance of the self, can be "located," for example the metaphors of feeling "out of balance" or "out of it." These are locational in that they imply a "place" and describe the location of the experienced self as being "out." Another example is present in the research literature where patients with vestibular dysfunction endorsed a variety of metaphors to describe their symptoms such as feeling "spacy" or "spaced out" (Zolev, Georgieva-Zhostova & Berthoz, 2014). These are also metaphors of self-location, "spacy" meaning the experienced "self" is not quite on Earth any longer. These "locational" metaphors, gained from looking at the larger clinical discourse, might imply that vestibular function contributes to self-location. Through the analyses below, I will continue to deconstruct common metaphors in patient narratives to understand what structures metaphors used by participants reveal about vestibular experience.

As has been summarized here, vestibular disorders, anxiety, and sense of self are fundamentally interrelated. This project aims to understand how mismatches in body-space relationships, such as is seen in vestibular symptoms, are represented through metaphor. The

representational nature of metaphor seems apt to illuminate the meanings of incongruent body-space relationships, particularly as understood through anxiety and dissociative symptoms. Through an exploration of how concrete experience informs abstract concepts, the cognitive linguistic model offers a conceptual match to the multimodal and multisensory nature of vestibular experience. As a phenomenologically informed project, my goal is to elucidate some. To this end, the study had the following aims:

1. To gather quantitative survey data from a vestibular patient population on measures of perceived handicap, anxiety and depersonalization-derealization symptoms. Hypothesis testing was done to assess how these measures influence one another and are correlated.
2. Systematically analyze the types of metaphors typically used by participants with vestibular disorders to describe their experiences through collection of qualitative, narrative data from a vestibular patient population. A collection of primary metaphors was developed.
3. Experimentally test the principles of cognitive metaphor theory by framing vignettes with vestibular metaphors and assess their effect on self-reported anxiety in the vestibular patient population.
4. Assess individual and sample-level differences in quantitative survey data to interpret metaphor themes which emerge from the qualitative, narrative data.

A final aim is to center ethical practice by engaging first-person methodologies to provide individuals with anomalous embodied experience a voice in the grounded cognition literature. In the following section, I will outline the methodology and methods used in this study.

Methodology

“Mixed method” models often contain inherent epistemological and ontological frictions. Natural science models have an epistemological commitment to objectivism and positivism, whereas phenomenological inquiry typically relies on constructivist and interpretivist paradigms. While some have argued there is an insurmountable incompatibility which prevents combining these disparate approaches, others have employed considerable creativity in designing psychological and philosophical research which combines both.

This study employed Gallagher’s (2003) “front-loaded” phenomenology, which seeks to embed phenomenological principles into experimental design. This method informs the design of the study to elicit experience and to vary experience through investigation. “Front-loaded phenomenology...incorporates a dialectical movement between previous insights gained in phenomenology and preliminary trials that will specify or extend these insights for purposes of the particular experiment or empirical investigation” (Gallagher, 2003; Zahavi, 2009). For example, many studies regarding experiences of agency and body ownership have employed this methodology. In one study, participants engaged in a version of the “rubber hand illusion” (RHI; Kalckert & Ehrsson, 2012). Participants were able to voluntarily control the index finger of the rubber hand. The experiment was then varied to introduce different iterations of the illusion, to determine when “ownership” and agentic control of the hand could be established and dissociated (Kalckert & Ehrsson, 2012). The design of the study was intended to incorporate theory of complex phenomenon of embodied agency and varied the conditions to further expand the understanding of this experience.

In keeping with this tradition, this study is a mixed methods design that includes qualitative, systematic metaphor analysis methodology, including the use of a structured questionnaire. Centering individual experience shows fidelity to phenomenology and offers a contrast to the positivistic natural science approach which seeks to “objectify” experience. Hearing from participants first-hand and interpreting their experiences subjectively, offers the possibility of multiple meanings and perspectives to arise. Ethically, it engages an underrepresented population in exploring their lived experience. The quasi-experimental second stage of the design was intended as another way to interpret subjective experience through objective methods.

Data collection and interpretation was based on a method of systematic metaphor analysis by Schmitt (2005). Schmitt’s (2005) methodology was developed as a “workable system” to approach qualitative research based on Lakoff & Johnson’s (1999) work. The cognitive linguistic model holds that metaphors are not isolated phenomena; rather, they often track to a limited pool of basic “metaphorical concepts.” For example, items endorsed by vestibular patients such as feeling “spaced out” or feeling “out of it” track to Lakoff & Johnsons’s (1999) basic locational metaphor of “the self as container” (p. 275). The approaches to eliciting metaphors outlined above are also discussed in his methodology. Schmitt’s outline is a general procedure for the “reconstruction of metaphorical points of view” of the participant. Analysis of individual metaphors was oriented towards organizing individual turns of metaphor first into metaphor concepts and then into broader metaphor themes.

Schmitt (2005) suggests a few broad steps of analysis and interpretation. First, is identifying a topic of interest. Second is gathering a collection of individual “background”

metaphors, which situates the metaphoric use in a “cultural” context. Background metaphors are those which are found in the clinical literature. These serve to set a “background” of conventional metaphor use which can then be compared with the metaphor use in the study sample. For this study, background metaphors were collected in the process of literature review, an examination of clinical materials such as symptom inventories and informal patient descriptions (YouTube, written patient testimonials, blogs etc.). This provided grounding for the phenomenon of the use of metaphor in vestibular disorders, as well as attuning me to broader themes across discourses as well as competing metaphorical usage.

The cognitive linguistic model holds that metaphors are not isolated phenomena; rather, they often track to a limited pool of basic “metaphorical concepts.” I looked to Schmitt’s procedure for the “reconstruction of metaphorical points of view” of the participants, by assessing for common underlying linguistic structures in these metaphors. I then pooled the individual metaphors and considered what broader concepts these common structures created. From these, “primary metaphors” were developed.

Primary metaphor structures included the concrete experience in which the metaphor is situated and the abstract concept to which the metaphor tracks. An example of a primary metaphor might be “knowing is grasping” which is grounded in the concrete experience of holding something in one’s hand and tracks to a more abstract concept of “holding” information “in mind.” Another, relevant to this study, would be “symptoms are external forces” which tracks to the concrete experience of being impacted by forces/objects and the more abstract concepts that symptoms can “hit” you. In this study, these primary metaphors were developed and examined in different contexts to elucidate aspects of experience.

In addition to the qualitative and survey data, this study utilized a phenomenologically informed quasi-experimental design. As will be described in detail below, metaphor concepts such as “self-as-container,” distilled from qualitative analysis of public patient testimonies and Lakoff & Johnson’s work were used to generate different vignettes. Written vignettes were chosen to keep the method on the same cognitive-linguistic plane of the “stimuli.” Three conditions were developed: two “provocative” conditions using either the self-as-container or balance metaphors and a “literal” condition. Metaphor and literal primes were normed for similarity in meaning.

To minimize confounds, each condition utilized the same “template” vignette. Metaphorical or literal language was input throughout the vignette to “frame” the vignette while making the scenario consistent across conditions. The vignette paradigm is developed from Thibodeau & Boroditsy (2011) which used “virus” or “beast” metaphors to frame a template vignette about crime and then asked participants to make social judgements. Thibodeau & Boroditsky (2011) found that metaphor frames influenced the kinds of social judgements participants made about crime and which strategies they chose to employ to manage crime. The current study employed this dual metaphor paradigm to frame a template vignette about a potentially anxiety-provoking scenario. The analogue to the Thibodeau & Boroditsky (2011) study in this case was to determine whether metaphor frames influence affect and affective reasoning, as measured by anxiety ratings and strategies to control anxiety.

In sum, the methods below are part of a phenomenologically-informed approach to mixed methods analysis. This includes gathering of quantitative data and a systematic metaphor

analysis of qualitative data. This systematic metaphor analysis was also used to generate an experimental approach aimed at determining whether relevant metaphor frames will influence participant affect.

Method

Participants, Sample Size and Recruitment Procedures

The online study survey was accessed by 265 respondents. A total of 113 eligible participants with a self-reported history of vestibular disorder diagnosis completed the survey. These 113 participants provided the data which was included in the final analyses. Additional demographic and clinical description of the sample is included in the Results section below.

Prior to informed consent, participants were screened for eligibility (see Table 1). Given the linguistic nature of the study, participants with severe cognitive deficits were excluded as were non-native English speakers. As this study is primarily interested in experiences of vestibular dysfunction, participants who have vestibular symptoms consequent to other primary diagnostic concerns (such as schizophrenia, mania, TBI, dementia, etc.) were excluded. Participants were recruited online, primarily through the email newsletter of the Vestibular Disorders Association. As this investigation concerns the effect of metaphor use in this specific clinical population, only individuals who reported having been diagnosed with a vestibular disorder were included. Information about diagnoses was collected but no exclusions or inclusions were made primarily based on etiology of vestibular disorder.

Table 1*Inclusion and Exclusion Criteria*

Criterion	Inclusion	Exclusion
Language	Native English speakers	Non-native English speakers
Age	>18	<18
Diagnosis	Primary vestibular diagnosis	Other primary diagnoses (i.e., TBI, serious mental illness, stroke, dementia)
Cognitive status	No self-reported history of severe cognitive deficits	Self-reported history of severe cognitive deficits

Recruitment materials, distributed online, included a brief overview of inclusion and exclusion criteria as well as a link to the online survey itself. By this mode of recruitment, collection of potentially identifiable information was limited. Identifying information obtained during recruitment, such as a potential participant's email address or identifying information in their narratives, was kept in a password-protected database.

Following screening for eligibility, participants provided informed consent. The informed consent document, which outlines expectations for the participants, an outline of risks/benefits, privacy information and a statement on voluntariness preceded any collection of study data (see Appendix C). Participants were informed of their rights as a participant. Participants were provided with the phone and email address of the investigator if they have any questions before consenting to the study. Participants gave consent by electing to continue to the study materials.

Participants were informed that they can withdraw their consent at any time by discontinuing the online survey. Incomplete survey data was not used in the analysis.

This study followed the ethical and legal guidelines outlined by the Duquesne University IRB. Every effort was made to minimize risks to subjects and protect participant privacy. Possible risks to participants included increased anxiety during surveys or while answering questionnaires. Participants may not have benefited from their participation in the study. Participants were entered into a drawing to win a gift card for their participation.

Design

This project employed a mixed methods approach, with survey data and narrative responses from a sample of patients who have been diagnosed with a vestibular disorder/vestibular dysfunction. Design was correlational, with a between groups design for the experimental manipulation. The study gathered data in one online survey that included qualitative data from a structured questionnaire and quantitative data from a clinical battery, described below.

Materials

Materials for the study fell into three categories. First were the clinical measures to collect quantitative survey data. Second was the structured questionnaire used to collect qualitative data about participants' experiences with vestibular dysfunction. Third was the vignette and follow-up questions, used to experimentally determine whether metaphor framing affected participants' scores on a post-vignette anxiety scale.

The clinical measures included the Dizziness Handicap Inventory (DHI; Jacobson & Newman, 1990), a well-validated measure of subjective experience of the functional interference of dizziness and the Vestibular Activity and Participation (VAPS; Alghwiri et al., 2012), a well-validated self-report instrument which assesses the extent to which an individual's activity is restricted by vestibular symptoms. The Derealization and Depersonalization Inventory (Cox & Swinson, 2002), a reliable measure of these symptoms in clinically anxious populations as well as the Beck Anxiety Inventory, a clinical measure of anxiety (BAI; Beck & Steer, 1993) was also be administered.

Metaphor primes for the short answer questions and vignette were developed adapting Schmitt's (2005) qualitative method. Metaphors used in public testimonies/blogs of patients with vestibular disorders as well as clinical materials (questionnaires, etc.) were also included. Metaphors developed from this phase were normed for equivalency to literal counterparts via online survey, using a predeveloped paradigm for norming metaphor with their literal equivalents (Buhrmester, Kwang & Gosling, 2016; Cardillo, Schmidt, Kranjec & Chatterjee, 2010). The experimental conditions for the study were then drawn from these preliminary metaphors to create the "balance" metaphor primes, the "self" metaphor primes, and the literal primes. These are outlined below (see Table 2).

Table 2

Metaphor Primes Developed for Use in the Experimental Conditions

Balance	Self	Literal
Off-kilter	Out of it	Distracted
Off balance	All over the place	Negatively
Keep yourself grounded	Keep yourself together	Keep yourself calm
Disoriented	Falling apart	Confused

Participants were presented with an online, structured questionnaire in which they are asked to write short answers to open-ended questions. The open-ended format was intended to elicit the kinds of metaphors these individuals use to talk about their experiences. This elicitation was done in two ways, in accordance with Schmitt's (2005) guidelines. First, basic metaphor concepts, described above, were used to frame the questions. Second, participants were asked to describe different elements of their experiences including experience of symptom onset, experience of symptoms themselves, situations that trigger anxiety and strategies they use to mitigate their symptoms. The questionnaire was structured using both approaches to elicitation to generate a maximum amount of metaphor material. The purpose of the structured questionnaire was to engage participants in elaborating their experiences of vestibular symptoms, anxiety, and their sense of self. The questionnaire (showing **balance/self**/literal versions) is reproduced below:

1. Can you describe a particular experience when your vestibular disorder made you feel [**out of it/off-kilter**/less able] to function?
2. With regard to your vestibular difficulties, can you tell me about particular places that make you feel [**unstable/like you're not yourself**/irrational]?
3. Can you describe a general activity that is likely to [**throw you off/cause you to feel out of control of yourself**/exacerbate your anxiety]?
4. What strategies do you use to [**stay on balance/pull yourself together**/manage your symptoms] when you are in a potentially triggering situation?

This survey included an experimental manipulation based on vignettes with metaphor frames. Participants were assigned to an experimental condition, as outlined above. The Participants were asked to read a short vignette about giving a presentation at work and then rate “how anxious would this scenario make you?” on a 7-point Likert scale. The vignette (showing **balance/self**/literal versions in {...}) is reproduced below.

Today you have to give an extremely important presentation at work. As you begin, you notice you feel {**off-kilter/out of it**/distracted} and that people are giggling. Knowing that stress can {**throw/send/affect**} a person’s whole performance {**off balance/all over the place**/negatively}, you try to keep yourself {**grounded/together**/calm}. However, as you continue, it feels like {**you're falling apart/disoriented**/becoming less calm}. Even though you continue to speak in front of your coworkers, bosses and clients, you suddenly feel like you’re not okay. Your boss interrupts you so abruptly it {**makes you feel even more disoriented/makes you feel even more out of it**/confuses you}. While she’s asking you a question about your work, it crosses your mind that she thinks you’re mentally ill.

In addition to rating anxiety, participants were also asked to choose, from a limited set of options, how they would deal with their anxiety if they were to be in that position. These options included, “find something to lean on to steady yourself physically,” “gather yourself,” and

“count to 10.” Lastly, participants were asked which element of the vignette would be most anxiety provoking for them.

Procedure

Prior to subject recruitment and data analysis, preparatory work was conducted to collect background metaphors and develop the experimental vignette, as described. Metaphors used in the vignette were normed for comprehension and meaning via online survey. The study materials were then developed into a battery on the online platform Qualtrics. After obtaining appropriate IRB approvals, recruitment began via online communities, primarily the email newsletter of the Vestibular Disorders Association.

Following informed consent, participants were randomly assigned either to the control or literal primes) or experimental conditions (metaphor primes) for the experimental portion of the study. Participants then completed the study materials, which included the quantitative measures and structured questionnaire. Participants were also asked to read the experimental vignette and answer questions related to the vignette, as described above. The order in which test materials were presented was randomized. Upon completion of the battery, participants were shown a screen thanking them for their participation. A schematic of the study procedures is included in Appendix E.

Approach to Quantitative Analysis

Following data collection, demographic characteristics of the sample as well as descriptive statistics for the primary measures were recorded. Correlations between the primary measures (BAI, DHI, VAPS & DDI) were analyzed.

A non-parametric, independent samples Kruskal-Wallis test was used to determine whether levels of handicap had an impact on differences in distributions on the clinical measures as well as the post-vignette anxiety rating. This was done by stratified the Dizziness Handicap Inventory scores into “low, medium and high” groups. Cut-off for inclusion of these groups is based on clinical interpretation of the Dizziness Handicap Inventory (mild handicap= \leq 34, moderate handicap = 36-52, severe handicap = $>$ 54; Whitney, Wrisley, Brown & Furman, 2004). An outline of these results is described in more detail in the results section below.

Approach to Qualitative Analysis

As a way of orienting myself to the qualitative data, I first organized the narratives by participant. This served to portray a sense of each individual and their unique experience. I then organized the narratives by question to understand how specific prompts, intended to capture participant descriptions of elements of symptomology, pulled for specific metaphors. These included questions regarding experience of symptom onset, triggering stimuli, experience of symptoms themselves, and strategies patients use to manage their symptoms.

In working to analyze the participant narratives, I realized just how often metaphor is deployed in language. This, at times, made it difficult to discern how to group individual metaphors. The pervasiveness of metaphor in everyday language also necessitated making my own choices about how and which metaphors to include and how to be systematic about these choices. Additionally, metaphor itself is multimodal; I found specific instances in which one metaphor could be applied across concepts. As will unfold in the following sections, the process by which themes emerged from participant narratives involved a hermeneutic process that identified individual metaphors and their use within specific contexts.

While working through this interpretation, I allowed my knowledge of the clinical language, embodiment philosophies, and the quantitative data from these participants to shape my understanding. I began by cataloguing figurative language use in the narratives. This included noting metaphor use (“I am anchored”) as well as simile use (i.e., “like walking on a boat at sea”). While I primarily used the individual metaphors to develop broader metaphor concepts, the other figurative language was powerful and helped to situate participants’ lived experience.

Adjustments to Schmitt’s Method. These adjustments to Schmitt’s (2005) method were based on the unique characteristics of my dataset. First, I had to work with a broad but relatively shallow pool of qualitative data. The short-answers from 113 people meant I was seeing metaphor used to answer specific question about symptoms, rather than seeing how symptom-infused metaphor might seep into descriptions that were not explicitly about symptoms.

Secondly, I had not considered that I would run into as much simile use as I did. Schmitt makes no mention of simile, and I was not quite sure what to do with it initially. Simile use was often a referent to bodily experience in the same way that metaphor use is. I prioritized metaphor as the primary data for analysis. I used this prioritization to decide whether and when to include simile use in the concept/theme formation. My “test” was whether or not “metaphor vehicle” in the simile was comparative or categorical (Sam & Catrinel, 2006). So, for example, I included, “I felt like I was walking on a trampoline” as “trampoline” related to a comparative metaphor of “unsteady ground” which could be mapped onto a broader metaphor concept. Contrastingly, similes of “drunkenness” were too categorical and too broad; I could not generate one specific metaphor referent as the experience of “drunkenness” could mean a broad category

of experiences. I did not include categorical simile in my metaphor concepts but did take these categorical similes on their own terms when it seemed important to understanding aspects of experience.

Third, I found it impossible not to assess the quality of metaphors in producing metaphor groups and themes. Schmitt does not reference this per se, rather, he outlines a method that groups concepts together by primary metaphor structure. Because of just how many participants I had, I found this 1) not particularly generative and 2) extremely uneconomical. To adjust for this, I needed to make informed decisions about where to start orienting my metaphor search. As you will see below, I began by considering metaphor in the context of replies to specific questions and descriptions of symptom experience. My method followed Schmitt's recommendation to first assess for underlying metaphor structures to elucidate underlying primary metaphors. I then considered the context or quality of how these primary metaphors were used to move from "concept" to broader themes. This process unfolded naturally, as will be shown in the case of developing a theme related to moving from the primary metaphor, "symptoms-are-forces" to iterations of experience captured by "symptoms-are-threatening-forces." This is an expansion of Schmitt's method, though still faithful to the core components of his method.

Finally, I had to make my qualitative data functional for mixed methods interpretation. The most economical way to do this was to identify metaphor concept/themes and then "code" individual responses for the presence, absence, or combinations of specific metaphors. This allowed me to produce "subgroups" of participants. An example of subgroups would be participants who framed symptom onset as a "threat" versus those who did not. This allowed me

to make comparisons between subgroups on certain measures and answer questions like, “did participants who employed threat language report higher mean scores on the BAI?”

Though I looked at descriptive statistics for these kinds of post-hoc analyses, I did not make any statistical inferences based on the results. These analyses were purely exploratory. The aim of this mixed methods approach was not to do hypothesis testing but rather to use both kinds of data to interpret one another. My hope is that reporting descriptive statistics mixed with the qualitative results will generate potential future directions for inquiry, rather than imply replicable results or generalizable conclusions.

My aim in using both a mixed methods approach is to use one set of data to inform and interpret the other. As such, the discussion of qualitative results will weave the discussion of quantitative and qualitative results together. At times, subgroup and individual scores were used to further explore and interpret the qualitative results. The analysis is aimed at providing evidence for the suggestion of how psychiatric symptoms and perception of handicap influences the embodied experience of vestibular dysfunction.

The purpose of this data is two-fold. The first was to give voice to participant experience and deepen an understanding of their experience through systematic metaphor analysis. The second was to generate meaningful metaphors that are consistent with participant experience, through which to interpret the results of the quantitative portion of the study. My aim during this analysis was in service of the broad question that guides the project: Can interpreting language use help us understand how and why vestibular patients experience this cluster of anxiety, subjective handicap, and depersonalization-derealization symptoms?

Results

The following presentation of results is broken down into a reporting of the quantitative data followed by an integrated results and discussion incorporating the mixed methods findings.

Demographics

A total of 113 participants completed the survey, all who were included in the analyses. The average age of the participants was 56.12 years (range = 26 - 87). Due to experimenter error, the gender of 16 participants was not recorded. However, the gender-recorded sample was predominantly female (female $n= 78$; male $n=19$). Using the 97 participants who did report their gender, there were no significant gender effects on the means of any of the outcome measures.

Description of Etiologies

Participants reported a diverse range of etiology for their vestibular dysfunction. The most reported etiologies were Ménière's Disease ($n= 25$), multiple etiologies ($n=21$), BPPV ($n=15$) and vestibular migraine ($n=10$). Most of the sample reported peripheral etiology ($n= 111$) with a minority of the sample reporting central vestibular dysfunction ($n= 3$). The etiological characteristics of the participants are summarized in Table 3.

Table 3*Table of Etiologies Represented In The Sample*

Etiology	Frequency	Percent
Ménière's disease	25	22.1
Multiple etiologies (peripheral)	21	18.6
Benign Paroxysmal Positional Vertigo	15	13.3
Vestibular Migraine	10	8.8
Labyrinthitis/Neuritis	10	8.8
Unknown Peripheral Vestibular Dysfunction	9	7.9
Vestibular hypofunction	6	5.3
Persistent Postural-Perceptual Dizziness	3	2.7
Acoustic Neuroma	3	2.7
Central Vestibular Disorder	3	2.7
Cervicogenic Vertigo	3	2.7
Bilateral vestibulopathy	2	1.8
Visual-ocular reflex disruption	1	.9
Ramsay-Hunt syndrome	1	.9
Oscillopsia	1	.9

The overwhelming majority of the participants in the sample had diagnoses that are considered “peripheral vestibular disorders” ($n=110$). This is consistent with epidemiological trends. As mentioned above, peripheral vestibular disorders are those whose symptoms arise because of injury to or dysfunction of the “peripheral” structures of the vestibular system, such as the inner ear, peripheral nerves, or eyes. This type of vestibular disorder contrasts with the

“central vestibular disorders” where symptoms arise because of injury or dysfunction the brain, brain stem or other structure of the central nervous system.

As this sample overwhelmingly included those with peripheral vestibular diagnoses, I will dedicate most of this discussion to those. Peripheral vestibular disorders include a wide array of diagnoses. The most represented in this sample was Ménière's disease, symptoms of which include episodic vertigo, hearing loss and tinnitus as well as a feeling of pressure in the ear. Ménière's can be experienced as “typical” with both cochlear (i.e., hearing loss) as well as vestibular symptoms, or “atypical” in which only one set of symptoms is present. Symptoms can last minutes, hours, or days and are caused by improper draining or absorption of endolymphatic fluid in the inner ear. The second most endorsed diagnostic category in this sample were “multiple etiologies” ($n=21$). These were all exclusively an overlap of peripheral diagnoses (for example, Ménière's disease and vestibular migraine).

A diagnosis of Benign Paroxysmal Positional Vertigo (BPPV) was the next most common diagnosis in the sample ($n=15$). As the name suggests, BPPV is a benign condition that is characterized by a sudden onset of vertigo, nausea and/or imbalance and because of a positional trigger. Symptoms are thought to be triggered when endolymph particles in the inner ear are moved or displaced because of turning, lifting the head or other head movements. BPPV most frequently has an idiopathic cause, though it can also come on because of head trauma, which can release tiny particles into the inner ear. BPPV can co-occur with other vestibular disorders, for example Ménière's. Episodes of BPPV typically occur in “spells” and frequently resolve within minutes. Movement sensations associated with BPPV are most commonly the

feeling of spinning, though a “floating” sensation is also common (Parnes, Agrawal, & Atlas, J, 2003).

The third most reported diagnosis was vestibular migraine ($n=10$). Vestibular migraine is marked by vestibular symptoms, like vertigo, unsteadiness, and nausea, with or without the presence of headache. Typically, people who suffer from vestibular migraines have a history of motion sensitivity, such as car sickness. The course and cause of episodes are like non-vestibular migraine, as they are occurred in time-limited episodes and brought on by specific triggers.

There are other disorders represented in this sample. Though I will not go into detail on each one, every diagnosis includes the experience of vestibular symptoms, meaning experiences of vertigo, dizziness, visual symptoms (i.e., bobbing vision), and/or postural symptoms (i.e., imbalance, falls, pulsion). Though there is considerable overlap in symptoms between different peripheral vestibular disorders, there are distinctions in sensation that are associated with etiologies. For example, vertigo associated with Ménière's is typically associated with a “spinning” sensation whereas vertigo associated with postural vertigo can be experienced as “non-spinning” (i.e., swaying) (Popkirov, Staab & Stone, 2017). Further, what is described by patients as “vertigo” or “dizziness” may include other experiences, such as disequilibrium, unsteadiness, and the sensation of falling. The presence of psychiatric comorbidities can also complicate the clinical picture, as anxiety or derealization can color the experience and description of symptoms.

Quantitative Analysis

I will first present the descriptive statistics and hypothesis testing results. Later, these results will be discussed with respect to qualitative results.

Descriptive Statistics for Individual Measures

Beck Anxiety Inventory (BAI). Scores on the BAI ranged from 0 to 50, with a mean of 19.74 and standard deviation of 18.28.

Vestibular Activity Participation Scale. Scores on the Vestibular Activity and Participation Scale ranged from 5 to 128 with a mean of 70.25 and a standard deviation of 23.80.

Dizziness Handicap Inventory (DHI). Scores on the Dizziness Handicap Inventory total ranged from 12 to 100, with a mean of 54.25 and a standard deviation of 19.94. The top score on the Dizziness Handicap Inventory is 100. Clinically, scores on the Dizziness Handicap Inventory are interpreted as representing mild (16-34 points), moderate (34-54 points) and severe (54+ points) handicap. The mean score on this measure indicates this sample experienced a moderate-severe level of handicap. The Dizziness Handicap Inventory consists of three subscales to assess for functional, emotional, and physical handicap. Descriptive statistics for subscale scores on the Dizziness Handicap Inventory are reported in Table 4.

Table 4

Descriptive Statistics for the Dizziness Handicap Inventory Subscales

Statistic	DHI Functional	DHI Emotional	DHI Physical
Mean	20.00	17.52	16.73
Median	20.00	18.00	18.00
Standard Deviation	8.09	8.38	6.11
Range	2-36	2-36	2-28

Derealization and Depersonalization Inventory (DDI). Total scores on the Depersonalization-Derealization Inventory ranged from 0 to 92, with a mean of 30.62 and a standard deviation of 18.28. A mean of 14.84 symptoms were reported, with a range of 0 to 28 symptoms endorsed. Consistent with previous literature utilizing this measure, the total number of symptoms reported was used as the basis for analysis. Scores on the DDI were higher in this sample than other vestibular patient samples (i.e., Toupet et al, 2019, Kolev, Georgieva-Zhostova & Berthoz, 2014).

Hypothesis Testing

Hypothesis 1: The relationship between scores on the Dizziness Handicap Inventory, Vestibular Activity and Participation Scales, Beck Anxiety Inventory, and Depersonalization-derealization Inventory will be correlated. Scores on these measures were correlated (see Table 5).

Pearson’s product moment correlation coefficient was used to determine the strength of the relationships between multiple variables. Interpretation for the size of the correlation

coefficients were based on Mukaka's (2012) guidelines. As relevant to this study, a correlation coefficient between 0 to .30 was considered negligible, .30 to .50 was considered low and .50 to .70 was considered moderate (Mukaka, 2012).

Moderate, positive correlations were found between scores on the Beck Anxiety Inventory and Dizziness Handicap Inventory BAI and Depersonalization-Derealization Inventory. Low, positive correlations were found between the Vestibular Activity and Participation Scale and Dizziness Handicap Inventory, the Dizziness Handicap Inventory and Depersonalization-Derealization Inventory and the Vestibular Activity and Participation Scale and Beck Anxiety Inventory. Negligible correlations were found between the Depersonalization-Derealization Inventory and the Vestibular Activity and Participation Scale. Scores on the DHI, Vestibular Activity and Participation Scale, BAI and Depersonalization-Derealization Inventory were all weakly, positively correlated with the post-vignette anxiety ratings.

Table 5*Descriptive Statistics and Correlations for Study Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Beck Anxiety Inventory	19.74	18.28	—				
2. Vestibular Activities and Participation Scale	70.25	23.80	.31**	—			
3. Dizziness Handicap Inventory	54.25	19.94	.46**	.51**	—		
4. Depersonalization-Derealization Symptoms	14.84	7.54	.51**	.24**	.41**	—	
5. Post-Vignette Anxiety Score	4.54	1.53	.34**	.29**	.19*	.30**	—
Average	--	--	.41	.34	.39	.37	.28

* $p < .05$. ** $p < .01$.

The second hypothesis tested concerned how perceived handicap, as measured by scores on the Dizziness Handicap Inventory would relate to anxiety levels, depersonalization-derealization symptoms and anxiety ratings on the “vignette” rating.

Dizziness Handicap Inventory scores were stratified into “low, medium and high” groups. As noted, cut off for inclusion of these groups is based on clinical interpretation of the Dizziness Handicap Inventory (mild handicap= ≤ 34 , moderate handicap = 36-52, severe handicap = > 54 ; Whitney, Wrisley, Brown & Furman, 2004). Most participants ($n=65$, 57.5%) reported severe levels of handicap. Moderate levels of handicap were reported by 23% of the sample ($n=26$) and low levels of handicap were reported by 19.5% of the sample ($n=22$).

A non-parametric, independent samples Kruskal-Wallis test was used to determine whether levels of handicap had an impact on differences in distributions on the measures as well as the post-vignette anxiety rating. There were no significant differences between levels of handicap and the post-vignette anxiety scores, $H(2)=4.48$, $p=.106$. Non-parametric tests found a significant difference in distributions and medians between levels of handicap on the Beck Anxiety Inventory, $H(2)=25.64$, $p=.000$; Vestibular Activity and Participation Scale $H(2)=26.68$, $p=.000$ and Depersonalization-derealization symptoms total $H(2)=17.28$, $p=.000$.

As expected, the median number of reported depersonalization-derealization symptoms increased with level of handicap. There was a statistically significant difference in median number of symptoms endorsed between mild (*Median*=8.50) and severe (*Median*=18.00) levels of handicap ($p=.002$). Median number of depersonalization-derealization symptoms for moderate handicap was 14.50 symptoms. The difference between mild-moderate and moderate-severe levels of handicap was not significant ($p=.05$; $p=.55$).

As expected, the median number of reported anxiety symptoms, as measured by the BAI, increased with level of handicap. The median anxiety score on the Beck Anxiety Inventory for mild levels of handicap was 11.50, moderate was 15.50 and severe was 21.0. There was a significant difference in median number of symptoms endorsed between mild-severe levels of handicap ($p=.000$) and moderate-severe levels ($p=.016$). The difference between mild-moderate levels of handicap on the BAI was not significant ($p=.073$). Median anxiety score between mild and severe levels of handicap was clinically significant as well, as this difference represented mild and moderate levels of anxiety, respectively. This interpretation is made based on normative values for the Beck Anxiety Inventory reported in Gillis, Haaga & Ford (1995).

Experimental Vignette Results

One post-hoc analysis was conducted. This hypothesis concerned whether self or balance metaphor conditions modulated anxiety self-reports, as measured by distribution comparison between groups on post-test vignette ratings.

Non-parametric comparison of distributions between conditions on post-vignette anxiety scores were not significant, $H(2) = 5.33, p=.070$. Further, analyses of literal versus metaphor conditions (both self and balance conditions) showed no significant differences on the post-vignette anxiety measure scores between conditions $H(1) = .125, p=.724$. The means of anxiety score for each group were as follows: balance ($M=4.12$), self ($M=4.21$), literal ($M=4.54$).

The average anxiety rating in this sample indicated the vignette, on average, appeared to provoke anxiety ($M=4.5, SD = 1.5$). This mean corresponded to “moderately anxious” and “very anxious,” per the scale. Participants were asked to choose, from a limited set of options, which strategy they would use to assuage their anxiety if they were in the situation described by the vignette. Most participants (48.7%) chose the option “find something to lean on to steady yourself,” with another large proportion (40.7%) choosing “gather yourself,” and the smallest proportion (9.7%) choosing “count to ten.” Participants were then asked which element of the vignette they would find most anxiety-provoking. A portion of the sample did not answer this question ($n=31$). There were a few consistent elements of the vignette which participants found most distressing. Though the vignette was not specifically about experiencing a vestibular attack, some participants ($n= 18$) named onset or feelings of vestibular symptoms as a primary source of

anxiety. Participants may have been primed for this, having just answered a battery of questions related to their vestibular symptoms and/or using the vestibular metaphor primes. Most commonly ($n=37$), participants named fear of embarrassment and the perception of being mentally ill as the most anxiety-provoking element of the vignette. Public speaking ($n=6$) and being interrupted ($n= 14$) were also commonly reported. Other elements that provoked anxiety were “inability to focus” ($n=2$), “not trusting my perceptions” ($n=2$), “fear of the unknown” ($n=1$), “being unable to communicate” ($n=1$), and “being confused” ($n=1$).

Analysis of the experimental intervention was largely kept separate from the further analyses below. However, consideration for why the metaphors used to frame the vignettes did not produce results is interwoven in the presentation of qualitative results. Additionally, the metaphors used to frame vignettes were also used to frame question prompts. These metaphors did apparently resonate with participants, as will be discussed. These prompts and their metaphor frames did elicit descriptions of aspects of vestibular experience and generate further metaphorical language in experiential descriptions.

Qualitative Results

I received a wealth of responses from participants. Each of the 113 individuals who completed the survey took the time to write answers to the narrative prompts. Many of these were detailed descriptions of experience, however some participants chose to answer in short sentences or single words. As such, a portion of the responses did not include metaphoric language for analysis ($n=12$). The remaining pool of stories ($n=101$) included rich, experiential descriptions that allowed the opportunity to assess how vestibular patients broadly use metaphoric language to explain the interaction of vestibular symptoms, anxiety, and their sense of self.

In the following section, I will present the results from these participant narratives and consider the influence individual and sample differences on the quantitative measures as these themes emerge. This section is intended to allow the reader to understand how themes emerged through the analysis. This section will additionally provide some discussion of these findings as they emerged. These results will be used to inform the implications presented in the final chapter.

Results are organized by four domains of patient experience, in accordance with the short answer prompts. These are 1) *symptom onset* 2) *symptom experience*, 3) *symptom mitigation* and 4) *cognitive experiences*. They are summarized below along with the primary metaphors that structure each domain as revealed by the analyses (see Table 6).

Table 6*Symptom Domain and Related Primary Metaphors and Themes*

Symptom Domain & Metaphor Themes	Primary Metaphors
Symptom Onset Agentic Metaphors	<i>Symptoms-are-external forces</i> <i>Symptoms-are-threatening-forces</i> <i>Symptoms-are-uncontrollable forces</i> <i>Symptoms-are-acquisitions</i>
Symptom Experience Stability & Orientation Metaphors	<i>Being stable</i> <i>Being oriented</i> <i>Drunkenness</i>
Symptom Mitigation Object Metaphors Cognitive Experience Figure-Ground metaphors	<i>The self-is-a-physical object</i> <i>Thinking-is-perceiving</i>

Symptom Onset

To begin: what exactly is a symptom? I approached this question through participants' experiences of the onset of the experiential changes that might be called "symptoms." This is the place where patients recognized that experience has somehow become "different." Participants were asked to describe a situation or experience that made them feel "out of it," "off-kilter" or "less able to function." To better understand what counted as a "symptom," I looked to the narratives that included descriptions of how these changes began or were triggered, aka descriptions of "symptom onset." I then identified metaphor use within these descriptions.

Most participants offered narratives about their experience of symptom onset ($n=92$). Many individual metaphors used to describe this changing set of experiences could be grouped into a metaphor concept related to Agentic Control. Two main primary metaphors in this concept were *symptoms-are-external-forces* and *symptoms-are-acquisitions*.

The following structure is used to help understand how specific metaphors are rooted in embodied experience by elucidating the primary metaphor, abstract concept, and the concrete embodied experience from which the metaphor arises. An example is included for each.

Metaphors that captured "*symptoms-are-external-forces*" followed this primary metaphor structure:

Primary metaphor: Symptoms are forces
Concrete experience: Feeling of being impacted by external forces or objects
Abstract concept: Being emotionally and experientially "impacted" by symptoms
Examples: "It came on suddenly," "it hit me"

The *symptoms-are-acquisitions* metaphors followed the structure of:

Primary metaphor: Symptoms are acquisitions
Concrete experience: Taking possession of an object
Abstract concept: Emotional and experiential changes can be understood as additions or losses
Examples: “I got dizzy,” “I had an episode,” “I lost my balance”

I grouped these together as “Agentic” metaphors because symptom onset, as will be shown in the analysis below, seemed to be marked by varying degrees of a loss of agentic control of the body. Deconstructing these metaphors further, *symptoms-are-external-forces* metaphors contained the meaning that 1) forces are causal and 2) forces are experienced as having their own agency. *Symptoms-as-acquisitions* contain the meaning that 1) symptoms are objects 2) as objects, symptoms do not have their own agency. Occasionally, both metaphor concepts were present together, such as, “I was *getting* a vertigo *wave*,” or, “I was *having* a drop attack” but this was less common.

I will use Barbara’s narrative, a 69-year-old woman with Meniere’s disease, to illustrate the agentic nature of the *symptoms-are-forces* metaphor:

My attacks are totally disabling. I am unable to do ANYTHING until I am medicated enough for it to finally end which is usually hours later. I can’t open my eyes or move because if I do, I will violently vomit. The attack also impairs me for a few days after also.

Here Barbara imbues “attacks” with agency which cause a loss of body control for her. They cause her to feel “totally disabl[ed] and “impair” her. She notes an awareness that symptom onset is marked by this loss of bodily control, as she physically struggles to do “anything”

including opening her eyes during attacks. Through this metaphoric language, Barbara is communicating a high degree of perceived loss of bodily agency, which may relate to the severe levels of anxiety, handicap and depersonalization-derealization symptoms she endorsed on the quantitative measures.

The Agentic control metaphors spoke to symptom experience as a sudden, unpredictable change in the relationship between individual and their expected experience. As evidenced in Barbara's account, this change often translated to an impact on perceived bodily control. The shared "primary experience" in this metaphor is the experience of being impacted by an external force. Being impacted by external forces often has the effect of altering one's experience, such as being impaired. The agency assigned to the symptom-forces is also evident in the grammatical structure of this metaphor concept. The force, in this case the symptom, is the subject of the sentence (I.e., attacks) which acts on the object of the force (i.e., "me"). To illustrate this further, one participant wrote, "Vestibular neuritis attack hit Sept. 23, 2018." The symptoms of vestibular neuritis (subject) "hit" this participant (object), which elucidates an experience of being forcefully impacted by symptoms on that day.

When symptoms are external forces, they cause other events that mark vestibular dysfunction and changes in embodied experience to occur (i.e., dizziness, vertigo, etc.). Framing symptoms as external forces implies that symptoms have agency as they cause changes in the experiencer. This may also imply a loss of agency for the experiencer, as in the participant example, "the vertigo attacks pull me down." This statement implies the participant is experiencing the "vertigo" as taking some control over their body movements.

Symptoms-are-threatening-forces. As might be obvious looking at the participant examples above, many of the *symptoms-are-external-forces* metaphors took on a particular quality. The quality of the symptom “force” on the self were marked by descriptions of vestibular disruption as sudden, assaultive, or antagonistic. This is also evident in metaphoric clinical parlance which commonly refers to “*attacks* of vertigo” or “drop *attacks*.” Most straight forward is the experience of disruption as an *attack*, as “attacks” are events that come from the outside and negatively impact the subject with force.

Examples of this in participant narratives included:

“It hit me”

“My balance is challenged”

“My symptoms disable me”

“My symptoms are aggravated”

“I am thrown off”

“My system becomes taxed”

“My vertigo attacks pull me down to my left side”

The quality of the descriptions of experience seemed to form a metaphor theme of “threat.” In the above examples, the negative “impact” of these forces often referred to feeling a loss of bodily control. In analyzing participant narratives, I coded participant responses for the presence of “threat language” when their descriptions included the *symptoms-as-external-forces* metaphor structure as well as a descriptive quality of the *forces* being antagonistic or assaultive. Nearly half of participants who used metaphoric language employed “threat language” to describe the experience of their symptom onset ($n=43$). As noted in the methods, this qualitative data was made functional for means comparison by coding for the presence and absence of threat

language. This resulted in two subgroups; those who employed threat language and those who did not.

Descriptions of “attack” and “force” are consistent with the sudden-onset and time-limited nature of many peripheral vestibular episodes, where there is remittance and an onset of disruption. The remittance is important, as that appears to be part of what generates threat for patients: for symptom *onset* to be experienced, there must be a time with fewer or no symptoms. Consistent with this, many participants spoke to the experience of having periods of “attack” and remittance. Cynthia described her experience of symptom-onset this way:

One morning I awoke and could not get out of bed without falling. I could not walk or stand. My husband called an ambulance which took me to the local hospital where the diagnosis was "vertigo", and I was given meclizine which did not work very well. Afterward, I spent about 10 years with no real help, enduring these attacks which came on with no warning. When I felt an attack coming on I panicked until I realized I just had to keep going. The nature of these attacks has changed to unbalance but I still panic when I get one.

Here Cynthia uses, *symptoms-as-external-forces* metaphor (“it came on”). This is couched in a description of “attack” with “no warning,” which speaks to the language of “threat.” As exemplified in this narrative as well as Barbara’s, threat language seemed relevant to the interplay of anxiety and vestibular dysfunction. Threat language appeared to rely on the symptom onset feeling sudden, unpredictable, and out of her control. Feeling an attack “coming on” created a sense of panic. She outlines how her experience changes in the beginning of her response; a symptom for her counts as an experience where her body control is severely impacted. For Cynthia, symptom onset results in being unable to walk or stand. This experientially was met by panic, perhaps as a function of a loss of ownership over her body. She

reclaims some autonomy by “realiz[ing] [she] had to keep going,” which I take to mean both physically moving forward as well as emotionally, so as to not be “controlled” by symptoms.

Some participants, as the participant above, describe the causal connections between the onset of their vestibular symptoms and anxiety directly. Cynthia makes a clear connection between her vestibular symptoms of vertigo and “unbalance” causing feelings of “panic.” Cynthia reported moderate levels of anxiety on the Beck Anxiety Inventory. This is in the context of her symptom presentation change to “unbalance” as well as having 10 years of experience navigating vestibular symptoms. Despite this she still reports “panic,” and frames these as “attacks.”

Fear and panic are common responses to experiencing threat. I expected those who framed their symptoms as “threats” to report higher anxiety than those who used other metaphoric language, such as *symptoms-are-acquisitions*. Framing *symptoms-as-acquisitions* may suggest more “self-control” than in the *external forces* metaphors. To see if threat language framing had an impact on anxiety, I looked at mean Beck Anxiety Inventory scores for the subgroups mentioned above: those who used threat language in their description of symptoms ($n=42$) and those who did not ($n=46$). The remainder of the sample either did not discuss symptom onset or did not employ metaphor. For those who used “threat language,” means on the Beck Anxiety Inventory were slightly higher than for those who did not use threat language ($M=22.21$ versus $M=17.89$; BAI $SD=18.28$). As mentioned, I offer these mean differences to explore and interpret the qualitative data without making statistical inferences on these post-hoc analyses. My aim is to richly describe the data in this project, which includes using descriptive statistics.

When looking at the narratives of “highest anxiety” participants, meaning those who scored at least one standard deviation above the mean on the Beck Anxiety Inventory ($n=11$), 6 employed threat-language, 2 employed non-threat language and 3 either did not describe their experience of symptom-onset or did not use metaphor. Let us look at the words of one of the highest anxiety participants, Stan, who employed threat language:

Within 6 months vertigo attacks began. Some episodes severe enough to leave me on the floor vomiting and unable to walk. I was under the care of a top ENT doctor who warned me that I would progress into vertigo stage.

Stan describes vertigo episodes as “attacks,” and employed an agentic metaphor in the wording of, “leaves me on the floor” in a debilitated state. This is consistent with threat language implying a loss of agency by the experiencer. As with Cynthia’s testimony there is a sense of feeling somewhat helpless, with symptoms causing severe disruptions in their lives (unable to walk here, needing an ambulance in Cynthia’s case). The vulnerability inherent to potentially experiencing attack also extends to the help they are receiving. Cynthia notes she went ten years “with no real help” and Stan touching on further “threat,” in the form of a warning from an ENT doctor that his symptoms would progress.

To summarize this concept to now, participants appeared to experience symptoms as distinct shifts in experience, often marked by a loss of bodily agency. As such, metaphors to describe symptom onset were categorized as Agentic Control metaphors. Within this concept were primary metaphors which described these experiential shifts as either external forces which impact them or objects that they acquire. The sudden, disabling loss of bodily agency was conveyed in the metaphor, *symptoms-are-threatening-forces*. Experiencing symptoms as threats may affect anxiety, as fear, anxiety and vulnerability are often responses to threat. This anxiety

could be related to anticipated “attack” or indicate the anxiety that arises from experiencing a greater degree of perceived loss of bodily control. These metaphors reveal a structure related to agency, which implies that intact vestibular function aids in an experience of agentic, body control. Next, I will build on the *symptoms-are-forces* metaphor to outline how forces being perceived as uncontrollable impacted patient experience.

Symptoms-are-(un)controllable forces. Borrowing again from Cynthia’s narrative, the language of “no warning” was often coupled with the use of threat language. Vestibular symptoms can occur spontaneously, be tied to specific triggers, or be experienced as constant (Bisdorff, Von Brevern, Lempert & Newman-Toker, 2009). Because the language of threat often included the element of attacks as being unpredictable, I also assessed participant narratives of symptom onset for metaphors of whether attacks seemed “spontaneous” or were “triggered.” As an example of language used to describe “spontaneous” onset, one participant wrote:

I was 17 when I was first diagnosed. I was working in an ice cream shop that would get really busy. I’d be working and out of nowhere experience extreme dizziness and pain in my ears. I would have to sit down otherwise I would vomit or pass out. I couldn’t do my job due to this.

In this narrative the phrase “out of nowhere,” tracks to the experience of *symptom-as-external-forces* as onset comes from outside the self and causes an impact to the experiencer. These forces caused changes to agentic control of the body as illustrated by the phrase, “I had to sit down otherwise I would vomit or pass out.” I considered descriptions like these “spontaneous” as they lacked an expression of a causal relationship between one event and another as part of symptom onset (event → symptoms). In other words, spontaneous onset did

not seem to be “triggered” by other events. They seemed to occur “out of nowhere” or “with no warning.”

I was curious about how the experience of spontaneous onset impacted the use of threat language. It seemed likely that those who had difficulty anticipating attacks due to spontaneous onset, might experience them as more threatening, due to a lack of control in managing triggers. In addition to symptoms onset descriptions, I had asked participants about their understanding of places and activities that are triggers for vestibular disruption. I noted whether participants had “well-defined” or poorly defined triggers. Here is an example of well-defined triggers:

Drinking anything with caffeine will trigger a vertigo attack. I can't have anything that contains more than about 10 mg of caffeine in one sitting. If I'm at a birthday party, I have to have smaller portions of cake and ice cream. I've found too much sugar definitely results in a bit of ear pressure.

These are clear triggers as this participant names specific stimuli, in this case caffeine, as predictably causing vertigo. Clear triggers also implicitly offer the participant a means to controlling symptom onset, as in this case, this individual can avoid caffeine and sugar and expect to experience less vertigo.

I also noted where individuals named unclear triggers or more spontaneous onset. Returning to Stan, he wrote, “it doesn’t really seem to matter, an attack can happen regardless of where or what I am doing. Although, screen movement, computer or tv can help to trigger an attack.” For Stan, attacks are largely unpredictable and lack a clear trigger, though he does note that “screen movement” can be triggering. His statement largely conveyed a sense even if he avoided screens, he would still be at risk for experiencing episodes.

I also included diffuse or especially broad descriptions as unclear triggers such as, “Whether it is trying to navigate through groups of people, walking through a parking lot, or visually scanning items in a store my system becomes taxed, and I start to feel off.” This participant names a broad category of experiences which can be aggravating to her. She communicates that there is no clear behavioral intervention to stave off symptom onset, short of completely avoiding parking lots, shopping, or moving through groups of people, an approach named “fear avoidance” in the literature (Dunlap, et al., 2021). These stand in contrast to the “caffeine” example above, as those with less-defined triggers the participant is expressing that they are less able to control onset through behavioral change and/or the onset of symptoms is unpredictable.

As might be expected, most participants who described spontaneous onset of symptoms did not describe well-defined triggers. Knowing one’s triggers seemed to me a pathway to feeling in-control of symptoms, especially as the *symptoms-as-force* and threat language imply a that the experience of symptoms is marked by a sudden loss of agentic control of the body. Again, I did a simple coding of responses to indicate narratives that conveyed clearly defined triggers and those that indicated unclear or diffuse triggers. Most participants discussed triggers ($n=84$), with about half endorsing well-defined triggers ($n=44$) and half expressing unclear or diffuse triggers ($n=40$). In exploring how understanding of triggers might influence anxiety, I noted those who had well-defined triggers had lower mean scores on the Beck Anxiety Inventory than those who had poorly defined triggers ($M=17.3$ versus $M=23.4$). Anxiety may be influenced by a lack of self-efficacy in being able to control symptom onset. This is consistent with the individual patient narratives above, as the participant who named caffeine as a primary trigger reported a relatively low levels of both anxiety and subjective handicap (BAI=13; Dizziness

Handicap Inventory total score =34). Stan, who noted feeling that an “attack can happen regardless of where I am or what I’m doing,” reported a severe level of anxiety (Beck Anxiety Inventory score = 50; more than 1 SD above the average of 19.74) and a moderate level of subjective handicap (Dizziness Handicap Inventory total=46).

I wondered then how “threat language” and perceived control over symptom onset might interact. Of the participants who used “threat language,” the majority indicated “spontaneous” onset of symptoms ($n=25$, 58.2%). The remainder reported “triggered” symptoms ($n=14$, 32.5%) or unremitting symptoms ($n=4$, 9.3%). Of those who used “non-threat” language, most described spontaneous onset ($n=20$, 47.6%), followed by triggered onset ($n=17$, 40.4%) and a smaller portion of unremitting symptoms or symptoms with no clear onset ($n=5$, 11.9%).

The use of threat language combined with a description of unclear triggers had an impact on level of anxiety. Here is a participant example illustrates threat language combined with an unclear description of triggers:

One experience with vertigo kept me so unable to function. It was in the morning, I had showered, and while walking to iron my clothes, it hit me. I sat down and waited for the dizziness to pass. Hours passed before I was able to move and finally crawled back to bed.

I have tried to narrow it down to certain activities, like boating. However, vertigo hits whenever. Sometimes it is because I am tired or stressed. Sometimes it is because I have gotten up too quickly.

This participant, a 62-year-old woman diagnosed with Benign Paroxysmal Positional Vertigo, scored a 41 on the Beck Anxiety Inventory which put her in the “severe” range. She used threat language (“*It hit me*”), a spontaneous onset (“*vertigo hits whenever*”) and an

expression of unclear triggers (“*I have tried to narrow it down...*”). Though I am speculating about the source of her anxiety, this narrative suggests experiencing a lack of self-efficacy, in part because she does not have a sense of control over when symptoms will come on or for how long. This was consistent with her Dizziness Handicap Inventory scores, which corresponded to a severe level of handicap (DHI total = 90). This lack of control might speak to a vulnerability, which is conveyed in her use of threat language. This participant might provide insight into the findings in the quantitative data, which suggested that higher anxiety increases perception of handicap. Feeling more vulnerable to uncontrollable forces may create the sense that she is less able to control her symptoms or engage in her preferred activity.

This interplay of control over symptoms and threat came through in a few other narratives including:

When I had a drop attack and fell to the ground without warning and immediately just as I was crossing at a streetlight.

Most public places, indoors that are crowded. Most especially where many sounds are simultaneously buzzing. The spatial awareness is a challenge. Pubs and restaurants are out. Retail Stores can be a challenge.

This is a narrative of a 43-year-old woman diagnosed with Ménière's disease. Here she demonstrates a few examples of threat language (“*drop attack,*” *awareness is challenged,*”) as well as spontaneous onset (“without warning”) and diffuse triggers (“most public places,” etc.) Broadly, her narrative conveyed a profound loss of bodily agency, as she experienced, “fall[ing] to the ground without warning.” This participant also scored in the “severe range” on the Beck Anxiety Inventory and the Dizziness Handicap Inventory (BAI=28, DHI=58). Of the participants who reported the most anxiety, meaning a Beck Anxiety Inventory score in the

“severe” range ($n=26$), most used threat language (57.7%), had unclear triggers (66.7%) and reported spontaneous onset of symptoms (60.0%).

What about patients with less anxiety? I was curious about how those with minimal reported anxiety spoke about their experience of symptom onset. I examined responses from those individuals who reported the lowest levels of anxiety, meaning a Beck Anxiety score of 7 or below ($n=12$). Within this subsample, there were two instances of “symptoms as force” metaphors: “it *came on* suddenly,” “it sends me into vertigo,” “brain fog settled in,” “the ground *was dropping out* under my feet.” Notably, the use of these descriptions did not include the more active, antagonistic, “threat” verbs and instead used more passive language of “came on suddenly,” “settled in,” and “dropped out.” This could relate to a lower level of perceived loss of bodily control; “sends into vertigo” is a measure of expressed severity from Stan’s example of “leaves me on the floor.” One of the participants who reported low levels of anxiety described their experiences as “attacks,” which was the only threat language noted. Others used the word “episodes” or did not name the experiences. The remainder employed *symptoms-are-acquisitions* metaphors, for example, “I would *have* brief moments of off-balance feelings.” Most had defined triggers (86.7%). Half of this subset described spontaneous onset, while the remainder was split between unremitting symptoms and triggered onset. These findings may imply that Agentic control metaphors may reflect a continuum of experience. A high degree of perceived loss of body control during attacks seemed to relate to more threat language as well as high perceived anxiety and handicap. Narratives that conveyed less loss of perceived body control seemed to utilize metaphor that reflected a higher degree of agency, and less reported anxiety and perceived handicap.

Interestingly, despite endorsing minimal anxiety on the Beck Anxiety Inventory and a low level of perceived handicap, Cathy, the participant who used “the ground was dropping out,” connected this experience of symptom onset to fear, anxiety and vulnerability:

I have felt scared, especially when I didn't know why the ground was dropping out under my feet and why it felt like I was always living on a boat. I also have fallen into deep periods of anxiety, depression, and helplessness.

Again, here Cathy is describing an embodied experience but does not comment directly on a severe loss of bodily agency. Interestingly, when asked about triggering situations, Cathy outlined clear triggers for her anxiety rather than her vertigo symptoms. These included, “Watching movies that include fast edits, bright strobes and lights.” Cathy expresses feeling scared and relates it directly to the experience of unexpected sensations. Some participants expressed the symptoms themselves creating feelings of fear and anxiety, while others named anticipation of attacks as anxiety-provoking. Cathy uses threat language and descriptions of spontaneous onset of vestibular symptoms in her description here. As noted, the use of threat language here is slightly more passive, as in, the “ground dropping out” has a different quality than symptoms “hitting.” However, the “ground is dropping out,” is expressive in a similar way, as it conveys an (obvious) loss of “grounding.” This may be a more concrete way to discuss psychological experience as it provides an “image” for how her symptoms cause confusion and helplessness, which then creates anxiety. She acknowledges periods of psychiatric effects and feeling “helpless,” specifically around “not know[ing] why” she becomes un-grounded. In a later response to a question about what strategies she uses to deal with her symptoms, there is a clue as to why her current level of anxiety might be low. I will return to Cathy’s experience further along.

In this section, I outlined a metaphorical concept of Agentic Control which help deepen participant experience of vestibular symptoms. Many participants experienced symptoms as external forces, which impacted bodily control and could be qualified by differing levels of threat and controllability. By participant narrative as well as looking at some of the quantitative results, experiencing a greater perceived loss of bodily control related to description of symptoms as more threatening and/or less controllable. This may be linked to greater experiences of anxiety and higher perceived disability. Participants who could name clear triggers conveyed a sense of “ownership” over symptoms in terms of experiencing them more frequently as acquisitions rather than threats. Expressions of self-efficacy came through in narratives where participants named an ability to maintain bodily control during symptomatic periods as well as control symptom onset.

Symptom Experience

At the heart of many vestibular symptoms is the experienced *sensation* of motion that does not match *actual* motion. As such, much of the lived experience of vestibular dysfunction relies on descriptions of movement and motion. As noted above, ways to describe the “motion” of vestibular symptoms can be diagnostically relevant, as they can offer a clue to etiology. As an example, vertigo can be experienced as a “spinning” sensation or as “non-spinning,” such as “swaying,” or “floating.” These sensations can also be described with reference to a subject and object of movement: in the environment (i.e., “the room spinning”) versus the self (i.e., “my head was floating”). While these descriptions are not conclusive of etiology, descriptions of motion conveyed by metaphors can offer a place to begin to examine where vestibular dysfunction may be expected and where it may indicate the influence of other factors, such as anxiety.

Many participants described the kinds of motion associated with their vestibular symptoms, with metaphor use that suggested the mismatch between actual and perceived motion can lead to feelings of being disoriented. As such, I organized these into a broad concept of Stability Metaphors, as participants used motion and stillness descriptions to describe symptoms. These descriptions were also employed to express becoming reoriented.

Primary metaphor: Being stable

Concrete experience: Experiencing that a stable environment is consistent and easier to navigate

Abstract concept: Feeling emotionally consistent, navigating self-experience

Example: “My *world* was *spinning* out of control,” “I try and stay still to regain balance.”

Spinning. As embodied cognition notes, often we use metaphor grounded in bodily experience to convey more abstract themes. “Spinning” in vertigo as it was the most used motion descriptor (82 instances of use by 17% of participants). The descriptor of spinning was present across peripheral etiologies. With the participants experiencing vestibular dysfunction in this sample, the metaphor use is non-abstract: “the room was spinning” conveys the sensation that the room is experienced as *literally* spinning. Yet participants in this study also express a more abstract “knowing” that the sensory experience is illusory motion. For this reason, dizziness and vertigo are sometimes referred to as disorders of motion perception (Barton, 2021).

Experientially, the sensorimotor experience of a “room spinning” violates conscious and unconscious assumptions about the stability of the environment. These “motion” metaphors are therefore under the Stability metaphor concept. Conventional use of that metaphor (i.e., “my world was spinning”) would be more abstract and convey a sense of a loss of orientation and consistency between self and environment. Consider this account, from a 35-year-old woman with Benign paroxysmal positional vertigo,

The first time I experienced BPPV was so scary. I felt like I woke up drunk, or I thought maybe I was having a stroke. When I rolled over in bed in the morning, the whole room just started spinning violently.

She is describing experiencing the room as “spinning” despite knowing this is impossible based on her previous understanding of how natural forces normally orient us. That it is “scary” speaks to the understanding that she can no longer rely on her perceptual experience as it is discordant with what she knows about her own normative perception; most profoundly it violates her assumptions that the surrounding room is stable. Her sensations do not match her other ways of “knowing.” She searches for reasons (drunk, stroke, etc) to explain why she is experiencing

this instability. I find this account interesting as well as it speaks to the existential level of terror (fear or stroke, “violent” spinning) that occurs when our perception is telling us something we “know” is not “true.”

We have all experienced the sensation of spinning, maybe as children before swinging a bat or maybe on a tilt-o-whirl at a carnival. The point of play-spinning is to induce disorientation, to experiment with the experience of the reliable “stillness” of the “regular” world. The above account conveys that sense of disorientation that comes with unexpected instability. The direct, non-abstract sensation of “spinning” gives rise to a) an implicit understanding of how consistent forces normatively orient us, b) experiences of being *disoriented* and related figurative language such as, “I can’t think *straight*,” “my world was spinning. ”

Above, I discussed the apparent importance of metaphors that conveyed a lack of agentic control over symptoms, told through external force language and spontaneous onset. In discussing the embodied experience of experiencing instability, experiencing the self and environmental as consistent and predictable seemed to be a key aspect of experiencing agency and self-efficacy. The quantitative data from this sample connects these as well. Perceived handicap might be understood as relating to self-efficacy and how much control patients feel over their own lives (Probst, et al., 2018). Levels of derealization affected level of perceived handicap, with those who reported severe levels of handicap reporting significantly more symptoms of dissociation than those who reported mild levels of handicap. Individuals who experience the environment as being unstable or inconsistent, may have more difficulty navigating physically and emotionally through their worlds.

The literal experience of spinning tracks metaphorically to more abstract concepts, for example, the conventional metaphor mentioned about of something “spinning out of control.” This is based in concrete experience that stable environments are easier to navigate and understand than shifting ones. I wondered about how this interaction between “spinning” and control appeared in this sample as well. Experiencing spinning appeared to track to participant experience of no longer being in control as well as a diminished sense of self-efficacy. One participant with oscillopsia described his experience this way:

Perhaps what is the most off-putting is I am a Naturalist, and have actually worked as an Interpretive Naturalist and outdoor educator, and now, when I look down. The world spins. The small insects and flowers that I used to be able to identify are in a bouncing swirling mess.

The perceived motion of spinning makes it difficult for him to do what he once did. Oscillopsia is literally defined as, “an illusion of an unstable visual world” (Tilikete & Vighetto, 2011). “Bouncing” and “swirling” disorganizes the perceptual field into a “mess,” as the environment is no longer still, making it more difficult to parse and identify. This is consistent with the stability metaphors, as this narrative implies that the world should be stable and the insects and flowers should, if not be still, be moving in a consistent and predictable manner. In communicating his visual experience metaphorically, he also conveys more abstract experience: he is no longer able to catalogue and identify objects in his world, making things a “mess.” The “off-putting” metaphor is also revealing as it serves as a locational metaphor: he may experience difficulties self-locating as he is no longer interacting with the world in the way he once did experientially and professionally. Consistent with a possible loss of identity and the experience of, this participant reported severe levels of perceived handicap (Dizziness Handicap Total = 54), moderate levels of depersonalization-derealization symptoms (Depersonalization-derealization

inventory symptoms endorsed = 16). Interestingly, he reported mild levels of anxiety (Beck Anxiety Inventory Score = 13). He writes that he has been living with his symptoms for five years and that they “don’t get worse but don’t get better either.” Perhaps a lower level of anxiety may be attributed to his adjusting to a bobbing world as a “new stability.” In fact, he writes, “I do wish it would go away and my life could return to ‘normal’ and the freedom I once had. But, really, could I ever grow my legs back if that were my disability?”

The experience of spinning is generally used in conventional metaphor to describe the experience of being overwhelmed or not in control. In part this is due to unconscious and conscious assumptions about the stability of the environment. Patients with vestibular dysfunction may experience a violation of this assumption more frequently, leading to disruptions in motion perception such as spinning. This may also this experience of literal spinning tracks to a sense of loss of control, as participants expressed cognitively or rationally “knowing” the room is not spinning but having the embodied knowledge of motion. This “disconnect” appears to relate to a loss of self of control over the environment, as prior embodied knowledge of how physical forces work seems disturbed. Likewise, this may influence some patients’ experience of their sense of control over aspects of themselves, including their body and self-efficacy.

Falling-- Orientational metaphors. Descriptions of “falling” and “dropping” were included as examples of orientational metaphors. As Straus (1952) outlined, in normative body comportment, we expect the consistency and stability of the “upright” and vertically oriented posture. The sensation of falling or fear of falling are slightly different than the illusory motion of spinning. The experience of “falling” is sometimes literal, rather than metaphorical. However,

I decided to include descriptions of falling and fear of falling as metaphors as those embodied experiences may give rise to more abstract affective and interpersonal effects.

Primary metaphor: Being oriented

Concrete experience: Standing upright in a vertical orientation and having immediate access to sensory apparatuses

Abstract experience: Confidence, ability to navigate emotionally & interpersonally, morality

Examples: "I stood up to them," "I'd have to lay under my desk at work for at least an hour to feel like I wasn't falling off the earth."

Falls are not uncommon in vestibular disorders, either because of challenges to maintaining balance or as part of a vestibular sequela known as "drop attacks." Drop attacks are linked to Ménière's disease and cause sufferers to experience sudden trips or falls without a loss of consciousness (Pyykkö, Pyykkö & Manchaiah, 2021). The severity of these "drop attacks" can vary. At their most mild these can be experienced as "trips;" at their most severe, they are experienced as sudden falls. Falling, drop attacks and the fear of falling came up in participant narratives ($n=23$). Fear of falling or experiencing actual falls is not asked about directly on measure of perceived handicap but is thought to contribute to experience limitation of social participation (Jørstad, Hauer, Becker, Lamb & ProFaNE Group, 2005). Given this, I was interested to see how the experience of fear of falling interacted with anxiety and perceived disability.

Of the four participants who reported experiencing drop attacks, most had been diagnosed with Ménière's disease ($n=3$). The other participant reported being diagnosed with "visual vestibular mismatch" (VVM). VVM is way of describing vertigo or dizziness that is triggered by visual stimulation. Though non-Ménière's-related drop attacks do occur, they are

less common, and the mechanisms are less understood (Ishiyama, Ishiyama, & Baloh, 2003). The participant with VVM reported drop attacks this way,

The most vivid experience I have is when the fire alarms began going off in the high school where I taught and every time the high pitch noise came out of the alarms, I would literally suffer a drop attack. It was terrifying for both me and my students because they did not know how to get me off the 3rd floor. I felt one hundred percent out of control for the first time in my life.

This experience does sound terrifying. Thinking of the symptom-as-metaphor, being “dropped” in this way speaks to onset as a loss of bodily agency and, more specifically, a loss of vertical orientation. As she tells it, she felt “one hundred percent out of control,” which speaks to the profundity of this loss of bodily agency and orientation.

Despite being diagnosed with a “vestibular-visual mismatch.” drop attacks can be “stimulus-induced” and occur in the presence of sudden or intense auditory or other sensory stimuli (Dreissen & Tijssen, 2012). This participant reported anxiety in the moderate range and her level of perceived handicap in the severe range. Her scores on the Dizziness Handicap Inventory functional subscale were more than one standard deviation above the mean, meaning she perceives her day-to-day life and activities to be more severely limited by her vestibular difficulties. Considering this with her narrative, she appears to attribute her functional impairments to her strategy of avoiding any situation where there may be loud or unexpected noises. She writes,

All family gatherings set off my anxiety because I know some of them will be loud, whether they can help it or not. I love my grandbaby more than life itself, but he is about to turn two and his screaming fits set me into a spin!

Here she does employ the stability metaphor of “spin” with a distinct trigger and anxiety around a potentially triggering scenario. She does not report in this response the fear of experiencing a drop attack again. She uses the motion of herself being “sent into a spin” which conveys loss, both in her own agency and her ability to connect with her grandbaby.

A few additional participants described experiencing falls because of their vestibular symptoms ($n=9$), while a greater number of participants reported fearing a potential fall because of their feelings of imbalance ($n=12$). Participants were not asked directly about falling, so there is some limitation in considering which participants chose to include falls as part of their narratives. Though I expected reported falls to have an impact on perception of disability. Assessing their narratives, the majority used threat language ($n=7$), which makes intuitive sense as falling or experiencing a drop attack implies a causal force “impact,” by symptoms, a loss of agency over the body as well as the real possibility of being hurt when falling. One participant who reported a mild level of anxiety and level of perceived handicap wrote,

During the period when I was having drop vertigo attacks, I felt like I had no control due to its unpredictability. Driving was out of the question, and I had to be careful to make sure I stayed away from walking in areas where I could be seriously hurt if I fell.

Based on her language, it appears that the drop attacks are no longer occurring, which may explain her relatively low level of anxiety and perceived handicap. Her story implies that during the time of active drop attacks, her functional impairment was higher. Again, the themes of “loss of agency” and violations of stability emerge, due to what is described as spontaneous onset, and the threat of falling. This loss of control and unpredictability appeared to impact her behavior and limit what she felt capable of doing.

In contrast, orientational metaphors in this population also served to describe resiliency in a few cases. One participant discussed getting herself out of a difficult situation, when she found herself having to navigate on ice in triggering visual conditions. She wrote,

...I finally figured out a way to Gerry rig my hiking stick and went straight home without finishing my walk. I was scared and yet very proud of myself for conquering that dilemma. My husband and father both yelled at me for being out in inclement weather, but I stood up to them and expressed pride and also found the humor in the situation.

In this case I find the metaphoric use of “*straight home*,” and “*I stood up to them*” to be particularly revealing, as they are directly orientational. In her experience, they may reveal that she was quite literally able to “go straight” and “stand up” after navigating away from the ice. She expressed this as a source of pride and resilience, despite receiving judgement from her family regarding her choice to go out in bad weather. Note in this account the re-orientational language is around “conquering” the dilemma and touches on the core elements of vestibular experience discussed thus far: agency, stabilizing the self/environment and re-orienting.

Drunkness. Some participants used figurative language about appearing “drunk.” Figurative language around *drunkness* gathers up the previously discussed metaphoric themes: bodily control, stability, and orientation. Despite not being a metaphor per se, this language came up so often, including in the clinical language, that it felt necessary to discuss.

The language of drunkenness, while often referring to bodily motion, struck me as important because it often inferred a social dimension to symptoms. Take these examples of how the drunk simile was used:

“[I fear] people laughing at me and thinking I'm weird or drunk. “
“I felt like a drunk wandering around!”
“Fear of publicly making a fool out of myself by appearing drunk (I am sober) keeps me isolated.”

These participants who used the “drunken” simile endorsed that some anxiety arose from fear of being perceived as “weird,” “or being made a fool of” or exhibiting the connotations of being “a drunk.” The fear of appearing drunk comprises this item on the Dizziness Handicap Inventory: “because of your problem, are you afraid others will think you are intoxicated?” Nearly two-thirds of the sample (64%) endorsed this item. Further, most participants (70%) endorsed feeling “embarrassed in front of others” because of their vestibular dysfunction.

I earlier conceptualized agentic and stability metaphors as relating to a loss of agency over the self or environment. “Appearing drunk” and feeling embarrassed represented to me a loss of agency within the social environment. There is not a stigma associated with vestibular dysfunction, per se. However, there is a stigma associated with “appearing” out of control. One participant wrote, “My balance fails me, and people do indeed notice. It’s embarrassing.” Here his metaphor use indicates a disconnection with and loss of control over a part of himself (“balance *fails me*”) which is seen and noticed by others.

Being “seen” as drunk or acting embarrassingly coincides with the often “invisible” nature of vestibular disorders themselves. Many patients spoke to experiencing a lack of understanding by others about their condition. This included family and friends as well as clinicians. That is, participants observable symptoms are often not understood as being part of a disease profile. What is observed is someone “unsteady,” “off-balance,” “wobbly,” or “swaying.” One participant wrote, “Fear of publicly making a fool out of myself by appearing drunk (I am sober) keeps me isolated.”

In summary, the experience of symptoms is multifaceted. The nature of the questionnaire elicited metaphoric descriptions of symptoms that arose from direct sensory experience. This led to uncovering stability and orientational metaphors which were discussed through the symptoms of “spinning” and “falling/dropping,” respectively. How violations of the “stable environment” assumption may impact derealization symptoms was discussed. The impact of falling on perceived handicap was assessed. A participant narrative was used to see how orientational metaphors can be used to reflect resiliency. The figurative language of “drunkenness” was also used as an example of how previous metaphor concepts of agency, stability and orientation may affect patients socially and relationally.

Symptom Mitigation

As shown above, participants often touched on body control and agency, particularly a loss of these, when discussing their experience of symptoms. Next, I looked at participant answers to a prompt asking about what strategies they use to mitigate their anxiety and vestibular symptoms. This prompt asked, “What strategies do you use to manage your symptoms when you are in a potentially triggering situation?”

Perhaps not surprisingly, the metaphors in those responses complemented the metaphors of control and motion found in descriptions of symptom experience. Metaphor use in the “strategies” responses often related to attempts at regaining control over the self, body, environment, or all three. Metaphor use consisted of the forced movement of the “self” to reconnect the “subject” and lessen symptoms. For example, “I *anchor* myself.” I considered these Self-object metaphors.

The structure of this metaphor included:

Primary metaphor: The self is a physical object
Concrete experience: Experiencing that having control over an object means being able to move that object physically
Abstract experience: Emotionally and cognitively “taking control” of oneself
Example: “I slowed myself down”

This metaphor structures the experience of “regaining” a sense of self-control by “moving” the self-object physically. This also included its complement, overlaid in Agentic metaphors: the experience of loss physical control as losing self-control. I will refer to this as “self-object” metaphors going forward. About a third of participants employed this metaphor

structure when discussing their strategies to deal with triggering situations ($n=31$). Examples included:

“I remove myself”
“I excuse myself”
“I distract myself”
“I brace myself”
“I give myself hope/time”

Of course, this phrasing is common in English. What is notable is that in this sample is that this metaphor structure was almost exclusively found in responses to a question about how participants manage their symptoms when they occur (31 instances in this prompt versus 4 uses in descriptions of symptom onset or experience). This might indicate something about the nature of the strategies used to maintain or regain a sense of control which, as explicated in previous sections, is often disrupted by vestibular symptoms. The self-object metaphors fell into two primary categories: cognitive (i.e., “I tell myself”) and movement (i.e., “I remove myself”).

Linguistically, the subject-self structure of these metaphors implies the outcome of the taking control of the self will be a realignment of subject and self. Whereas in earlier examples of “symptom” we have the symptom as subject acting on the self as the object (*symptom-as-force* metaphor), in the mitigation strategies it is no accident that the subject is the “entity” acting on an iteration of the self. In some ways, this transcends the actual meaning of the sentence, as in “I removed myself” as the “removing” is moving a body from one place to another but maintaining/regaining control of the self “myself” by the subject “I.” This linguistically refers to agentic control of the self. This additionally implies that embodied experience of symptoms includes some measure of self-objectification, as in symptom mitigation, the aim is to realign the self-object with the subject.

As noted, this structure was primarily used in responses where participants discussed what methods they use to minimize their symptoms. The subject-object-self alignment in this metaphor structure speaks directly to the experience of vestibular symptoms as a disconnection to an experience of self for a portion of patients. In this project, I used the Depersonalization and Derealization Inventory to assess symptoms of derealization and depersonalization symptoms, with the rationale that scores on this measure might provide insight into when participants experienced a divergence in their “selves.” Let us consider two accounts of individuals who reported high levels of depersonalization-derealization symptoms, one who employs “forced action’ of the self-metaphor in their mitigation strategy and one who does not to see how these metaphors operate in context:

Alice, a 34-year-old woman with vestibular migraines:

I use breathing exercises when I get overwhelmed in public and I explain to myself that I’m not in danger and my brain is just tricking me. I also explain to the person I’m with what’s going on so there’s a mutual understanding of the situation.

Zelda, a 61-year-old woman with Ménière's disease:

I have stopped going out, and also due to covid, it’s so sad that I have become a recluse. It’s very sad because I was such an independent, active woman. I also have extra anxiety because I live alone. When I have attacks, I end up having to call an ambulance and need to go to hospital often.

Though both participants reported severe levels of anxiety, Zelda reported a higher degree of perceived handicap, particularly in regards emotional effects because of her vestibular problem (approximately 2.5 standard deviations above Alice’s score on the emotional subscale of the Dizziness Handicap Inventory). They reported similar levels of perceived functional and

physical impairment. These two descriptions of strategies differ in some noteworthy ways. First, Alice elucidates a strategy for dealing with her symptoms using physical (breathing), cognitive (“I explain to myself”) and social (“I explain to the person I’m with”) components. Zelda’s strategies include avoidance and calling for an ambulance. The importance of having a mitigation strategy at all will be addressed in the coming section. Alice’s use of “forced action” is cognitive and offers a glimpse into how Alice is experiencing herself: “talking” through an aspect of herself that feels disparate (“my brain is tricking me”) but ultimately experiencing a sense of cohesion and self-efficacy. Zelda conveys a sense of feeling alienated from who she was/is and communicating the experience of not being able to rely on herself to manage symptoms. This difference may provide evidence for why, despite similar scores on most measures, Zelda reported a degree of emotional burden more than two standard deviations about the sample mean (DHI emotional subscale=36).

Symptom control is bringing the self-object into stillness. I noted that often the “quality” of the self-object metaphors used to describe symptom management included elements of “stillness,” which may echo back to broader concepts of stability and orientation. As noted above, primary symptom-as-metaphor of Stability related to a perceived loss of control over the self and environment, being marked by excess or unexpected motion. This implied a complement to experience symptom remittance: and re-orienting the self-object is symptom control.

The Stability and Orientation metaphor structure often worked in conjunction with Self-Object, as symptom mitigation was frequently related to experiences stabilizing or re-orienting the body and thereby the self. For example:

“I brace myself”

“I ground myself”
“I stabilize myself”
“I anchor myself”
“I slow myself down”

Here is the last quote in context:

I focus on my breath; I *slow myself down* and just focus on my surroundings or focus on one thing. *I tell myself* that nothing else matters except that moment, and the very next thing I am doing.

The context of the Self-Object metaphor is important, as it illustrates how other metaphor concepts dovetail. Stabilizing and Orienting in this context are in the effort of aligning the subject and self that had become “objectified.” I also interpret the “*focus on one thing*” as illustrative of the same principle: movement meant to align disparate elements and limit motion. This complements her description of symptom experience that includes illusory-motion language, “It feels like I’m walking on a moving walkway at the airport. But my balance is okay.” Her symptoms include a Stability metaphor, highlighting illusory movement. Her mitigation strategy includes the self-object metaphor of slowing *herself* down to counteract the illusory motion. This is a great example of how experienced motion, in the context of “symptom” relates to the abstract experience of self.

Metaphoric stabilization of the body and self were routinely used to describe strategies to mitigate anxiety and vestibular symptoms. The verbs “ground,” “compose,” “anchor,” etc., point to the existence of a primary metaphor of stabilization, which dovetails with *the self is an object*, as the self is the object being stabilized (or grounded, composed, or anchored). Of course, there are multiple ways to interpreting these metaphors. For example, “ground” and “anchor” might be organized by their common “downward” force, with “compose” not sharing that orientation. However, when considered in terms of the primary metaphor of self-object, these instances track

to a similar sense of the holding, organizing aspect of bringing oneself (or an object) into stability. This suggests the self-experience during vestibular disruption is one of instability and disconnection.

These examples reintroduce the aspects of natural forces that organize normative sensory experience. Anchor is not only a weight “down”, but it holds boats in place. Ground is not only “down,” but we experience the ground as still and constant as a function of gravity. In conventional use, metaphors of being “down” or “held in place” is sometimes used in ways to describe experiences of being burdened or “weighed down.” In this sample, metaphors of being “down” were frequently used to describe re-orienting and stabilizing forces. This again tracks to concrete experiences of being unstable and disoriented in vestibular dysfunction. The additional concrete experience is the feeling that the body has become misaligned from body intentions: the self or body then becomes “objectified” and attempts at mitigated physical symptoms reflects the move towards moving the body in line with the agentic self.

As seen in the “focus on one thing” example, strategies towards self-stability often included the streamlining of perceptual inputs by limiting the sensory field. I will touch on this in more depth in the next section, but here is one participant’s strategy:

I close my eyes and cover my lids when a scene with fast edits or bright lights occurs. In general, moving through life with the constant sensation of rocking and bobbing has taught me to relax and allow the experience, especially relaxing my shoulders. When it's really bad, I lay down - this doesn't make the sensation go away but it helps with the fatigue, and I can fully relax into the experience.

Here she counters “constant sensations” of movement with stability (“relaxing my shoulders,” “laying down”) and orientation metaphors (down). Most strategies to minimize

symptoms included a stilling of the sensory field, which is in direct response to the constant motion of “rocking and bobbing” that she experiences. The embodied experience is one of rocking and bobbing, which is experienced as fatiguing. She relaxes “into” the experience, a locational metaphor that aligns the self with the body experience. Though she does not explicitly state this, the implication is that the relaxation is not only physical but mental relaxation as well. This participant’s narrative communicates a sense of agentic control over her body during episodes as well as the ability to restabilize and reorient her body and her “self.” This constellation of metaphor use is consistent with her mild reported levels of anxiety (Beck Anxiety Score =7) and mild level of perceived handicap (Dizziness Handicap total score = 26).

A handful of participants ($n=8$) shared that they either do not have strategies to deal with their symptoms or the strategies they have do not offer relief. Metaphor use in this subgroup included two instances of “self-object”: “The best I have is millennial humor about my situation and trying to *force my way* through it” and “Nothing really [helps my symptoms]. I just pause and gather my wits.” Others detail experiences of avoidance or “withdrawal” from life: “My Ménière's has led me to withdraw quite a bit,” “I've become housebound because I can't find anything that helps” and “I can't [help my symptoms]. I tend to stick to a routine now, so I am not exposing myself to new places and experiences.” The remaining three participants simply said they do not have strategies. Looking at the means of this subgroup on the measures, scores on every measure were only slightly higher than the sample mean. This again might suggest that having the ability to control or deal with symptoms is related to perceived disability, as perceived handicap has a clinically significant impact on anxiety.

On an individual level, the participant who wrote about becoming “housebound” is a 31-year-old woman who has been diagnosed with vestibular migraines and persistent dizziness. She noted her triggers are diffuse: “Stores and shops. In people's houses. Going outside. Going into a store. Going to somebody's house. Anything social,” perhaps contributing to the perception that, to have a sense of control, a greater number of places and situations must be avoided. As may be expected she reported severe levels of anxiety (Beck Anxiety Inventory = 39), a severe level of perceived disability (Dizziness Handicap Inventory = 90) and endorsed a high number of depersonalization-derealization symptoms (number of symptoms= 27). Her level of perceived handicap on the Dizziness Handicap Inventory emotional subscale was especially severe relative to the sample mean (DHI emotional subscale = 36; sample mean=17.5, SD =8.3). This pattern of elevated scores was also demonstrated above in Zelda’s account earlier where her strategies include avoidance and calling an ambulance, as she also endorsed poorly defined triggers, a loss of agency over symptoms and difficulty restabilizing herself. Both participants employed threat language to describe their experience of symptom onset. They also touch on the socially isolating aspects of their disorder.

How vestibular patients describe their attempts at mitigation also define the experience of symptoms. This is shown through the primary metaphor of the self-as-object. The concrete physical experiences of trying to reorient and stabilize by adjusting the body or related to the abstract concepts that the self can be physically moved to become more aligned. This appeared to touch back on regaining body control, either my forced action of the “self” or by attempting to control the sensory field. As in previous sections, feeling able to enact control over the body, appeared to track to experiences of “self-control,” highlighted through degrees of anxiety and

perceived handicap. As a result, lack of strategy may have an impact on outcomes, particularly when paired with lack of clear triggers and threat language.

Cognitive Experience

As outlined above, symptom experience is shaped by many factors. Linguistically, the interplay of “subject” and “self” in metaphor can lend a clue to an important question for this project: how does vestibular dysfunction shape the experience of “self?”

In developing the metaphors used to frame the experimental vignettes, I relied on the “locational” metaphor structure “self-as-container.” I chose this as in clinical literature as well as patient testimonies online, I noticed symptoms were often described as making patients feel “not” themselves or “out of it.” Participants were asked directly about experiences that made them feel “out of it” or “not themselves.” Most participants responded to this prompt with a description of their vestibular symptoms, however a handful responded with descriptions of anxiety or depression. While some participants in this study spontaneously used *self-as-container* language in their responses (i.e., “out of it), by far the most common responses pertaining to altered self-experience was the metaphor of “brain fog.”

In western cultures, we often associate our experience of “self” with our cognition. In this sample, the terms “mind” or “brain” were frequently used as the “instances of self.” Participants described being “out of it” with descriptions of “fogginess” or “lack of mental clarity.” Metaphor use around this response was interesting, in that it most often reflected how the perception of an overwhelming sensory field impacted cognition.

A large portion of the participants reported feeling triggered by an “over-stimulating” sensory field ($n=47$, 41.5%). The remaining participants either did not report on their most triggering situations or mentioned other triggers, the most common of which being “positional” triggers (i.e., “looking up”).

Participants most often reported visual and aural stimulation as the most overwhelming. These broadly tracked to etiology, for example, participants with disorders involving the inner ear most frequently endorsed loud noises or many sounds as being triggering. Likewise, those with visual disorders often reported vision as the primary overwhelming modality. Participants reported visual stimulation, such as bright lights or colorful patterns as well as noisy or loud environments to be triggering. A few participants noted smell as a trigger, though smell was not endorsed as a primary trigger, rather as part of an array of sensory stimuli that can lead to symptom onset. As vestibular function is multimodal, it is not surprising that multiple senses would be included in descriptions of triggering stimuli.

The multimodal nature of symptoms came through in metaphor use as well. Metaphors of sensation would sometimes “cross modes,” as in this example, “I woke in the middle of the night in my dark room but could somehow still feel and ‘see’ the spinning.” In this case, the descriptions crossed sensory paths of vision and felt sense. The metaphor of “fog” may also be considered cross-modal as it can be both visually perceived as well as felt. The same is true for the metaphoric use of “white noise,” as an auditory phenomenon (noise) paired with a visual phenomenon (color). The multimodal descriptions of triggering stimuli may also be perceived as arising from an overwhelming sensory field, in which specific sensory modalities are difficult to parse.

Of those who reported feeling overstimulated by the environment, slightly more than half ($n=24$) referred to experiencing cognitive changes. These changes included visual metaphor descriptions such as, “brain fog,” “lack of mental clarity,” as well as more “literal” descriptions of cognitive functioning such as, “difficulty making sense,” “difficulty concentrating/focusing,” etc. As an example, here is a 59-year-old woman’s narrative:

I certainly have a loss of mental clarity - what I refer to as brain fog - when I am experiencing vertigo. This happens most often in large, loud, brightly lit places such as Walmart, Costco, a playground, or sports center etc.

I found the metaphor of “fog” revealing, as it conveyed a “thick” sensory field, which was experienced as impairing cognition. It contrasts with other common terms of being “out of it” for example feeling “spacy.” Here is a response from a 47-year-old participant who had been diagnosed with Bilateral dehiscence and Bilateral vestibular hypofunction:

When my vertigo and balance are bad, my cognitive functioning decreases, "brain fog". I miss words, pause mid-sentence to refocus my thoughts. In short, I feel as though my IQ dropped about 30 points.

The connection between “foggy” being “not myself” implied that the experience of self relates to being able to “see” oneself clearly. There is precedent for this metaphor concept in Lakoff and Johnson’s outline of “*thinking-is-perceiving*,” as we gain knowledge about the world through sensory perception. If the senses are impeded or overwhelming, this could mean the information we receive is not correct or difficult to parse. These metaphors use sensory modes to underlie the experience of the mind and cognition, for example the visual metaphor of “mental clarity” and the auditory metaphor of, “my head is buzzing.”

In thinking about what unites metaphoric description such as “fog,” “buzzing” and “noise” metaphors used by participants, I thought of the principle of Figure-Ground perception. Figure-Ground perception is a principle in Gestalt visual perceptual theory which says we perceptually group visual stimuli as either “figure” or “ground.” We do this largely unconsciously, where elements in the visual field become prominent in the foreground (figure) or become backgrounded (ground). Perceptually, this helps us to attend to relevant stimuli and parse complex visual scenes (Wagemans et al., 2012). “Fog,” “buzz” and “white noise” lack clear distinctions as to what perceptual objects are figure and which are ground. Contrastingly, “clarity” implies sensory objects that are distinct and marked by areas of contrast. As such, I conceived of these metaphors as falling under the concept of Figure-Ground metaphors, as they seemed to relate to difficulties sorting sensory figures from ground, resulting in a sensory environment that feels effortful to parse or overwhelming.

This led to metaphor concept of Figure-Ground metaphors, which included the primary metaphor:

Primary metaphor: Thinking is perceiving
Concrete experience: Gaining knowledge about the world through sensory perception
Abstract concept: having thoughts and keeping them in mind
Example: “loss of mental clarity”

Metaphors that contributed to this concept included:

“I feel thick-headed”
“White noise in my head”
“Loss of mental clarity”
“I felt very foggy”
“brain fog”

Sensory metaphors for mind and cognition are extremely common. This sample used these metaphors uniquely. He is an example from Roberta, a woman with Ménière's disease, of how “brain fog” was used to describe the cognitive effects of vestibular attack,

The most recent example of feeling out of it (which for me personally involves the feeling that is often described as "brain fog" which typically accompanies vertigo attacks) was less than a week ago after I experienced a rather sudden attack. Prior to the attack I was feeling mentally sharp and alert, but within seconds of the vertigo attack I felt as if I had difficulty concentrating and felt mentally sluggish for approximately two hours after my symptoms subsided. I usually feel particularly unstable while riding in a vehicle or inside large well lit spaces with lots of movement. These environments can trigger a vertigo attack.

In this example we see again a connection between a stimulating sensory environment (lots of movement, bright lights, stimuli of a car ride) and the onset of symptoms, including “brain fog.” She contrasted the experience of feeling “sharp and alert,” with an experience of feeling mentally dulled. Because the sensory field was difficult to parse due to vertigo, Roberta experienced a change in her ability to think. This happened quickly, suggesting her brain fog was not the result of fatigue, but rather a direct abstract effect of her concrete sensory experience. Even after the most acute symptoms subsided, the mental “sluggishness” continued. To touch on previous topics covered, Roberta uses the Agentic metaphor of threat language as well as the Stability metaphors of feeling “unstable while riding in a vehicle.”

Being able to parse the sensory field, such as seeing what perceptual “figure” is and what is “ground,” helps us attend to and perceive, and thereby “know,” stimuli accurately. I was curious if this sense of being “foggy” or losing the “clarity” between cognitive figure and ground might relate to the quality of dissociative symptoms that those with vestibular disorders experience. I looked at what the most endorsed items on the Depersonalization-Derealization

Inventory in this sample. The percentage of the sample which endorsed the item is listed. These included:

- “dizziness” (94.7%)
- “feeling of not being in control of self” (68%)
- “feeling as if walking on shifting ground” (77.2%)

- “thoughts seem blurred” (75%)
- “difficulty understanding” (64.9%)
- “difficulty focusing” (84.2%)
- “difficulty concentrating” (87.7%)
- “feeling spacy” (76.3%)

The first three listed here track broadly on to Agentic and Stability experiences, the next group of four can be related to cognitive functioning and the final one might relate to difficulties orienting/self-locating. For individuals who reported being triggered by sensory “overload,” these were also the most reported symptoms. These are juxtaposed with the least frequently endorsed items in this sample which included: déjà vu experiences, body/emotional numbness, feeling disconnected from emotions, changes in temporal perception and others appearing strange or unreal. In this sample of patients, vestibular dysfunction did not seem to impact experience of time, dulling of body/emotional sensations and did not seem to lead to experiences of “uncanniness.” Rather, this sample most frequently endorsed cognitive impairments, which may play a role in changing self-experience.

As mentioned in the orientational metaphors section, dissociation in this case may point to the disconnect between expected experience and perceived experience. It may be important to consider that symptoms of vestibular dysfunction (dizziness, feeling as if walking on shifting ground) are counted as “dissociative” experience in themselves. Beyond that, in the “brain fog” examples, there is a disconnect between what is expected of one’s cognition and actual

experience. Figure-ground relationships are normative. As in Roberta's case, the abrupt disconnect in her experience pre-and post- vertigo onset suggests this perceptual change creates a cognitive disconnect as well, in other words, how her brain "should" work.

An additional consideration is how anxiety might change the quality of derealization and depersonalization symptoms. Consistent with the sample-level findings connecting Beck Anxiety Inventory and Depersonalization-Derealization Inventory scores, individuals who reported the highest levels of anxiety (in the "severe" range), reported more derealization and depersonalization symptoms overall (19.31 symptoms versus 14.84 for the sample mean). While they endorsed the same most common symptoms as noted above for the greater sample, the most anxious individuals reported these additional symptoms at notably higher rates:

"surroundings seem strange or unreal"
"feel detached or separated from surroundings"
"feeling as though personality is different"
"feel confused or bewildered"

In contrast to the most endorsed symptoms in the sample, these items point to more experiences of "strangeness" in the environment, as well as what might be considered more "severe" examples of cognitive changes, escalating to confusion. Interestingly, most of the participants who reported severe anxiety did not include descriptions of overstimulation by the environment in their narratives (65.6%). However, this could relate to the earlier conclusion wherein the most anxious participants had difficulty elucidating their triggering scenarios at all.

As the correlational data suggests, most participants had approximately equal levels of derealization-depersonalization symptoms and anxiety (I.e., scoring in the "moderate" range on both measures). Dissociation had statistically and clinically significant impacts on anxiety, as

differences in depersonalization-derealization symptoms related to different clinical levels of anxiety. There were a handful ($n=4$) of participants who reported mild or no derealization-depersonalization symptoms but severe levels of anxiety. All four of these participants had diagnoses of Meniere's disease. On the contrary, no participants endorsed low reported anxiety and severe derealization-depersonalization symptoms. This suggests that anxiety can occur without the presence of derealization-depersonalization symptoms. This also suggests that, in this sample, anxiety is fundamentally connected to experiencing derealization-depersonalization symptoms.

Figure-ground difficulties may contribute to a sense that the world is distorted. Experiencing "brain fog" may mean that the sensory field is difficult to "know" giving rise to the more abstract experience of cognitive "fog" where information is not clear and thereby difficult to process. This is consistent with the quantitative measures that indicate most participants endorsed depersonalization-derealization symptoms that related to cognitive impairments. To see how anxiety may shape this effect, let us consider Emily's testimonial:

I certainly have a loss of mental clarity - what I refer to as brain fog - when I am experiencing vertigo. This happens most often in large, loud, brightly lit places such as Walmart, Costco, a playground or sports center etc. I experience an increase in anxiety when I am trying to navigate through a space that is unfamiliar and it requires visual acuity. Moving through an airport terminal, where I need to scan for gate numbers while lots of people move past me, is a good example. My vision is compromised when I am in motion and that causes anxiety.

Here she describes visually stimulating environments while experiencing vertigo, which impacts her ability to maintain visual "acuity." Feeling less equipped to navigate the world that is

creating a lot of motion, she becomes more conscious of her vision. She then directly relates this to becoming more anxious.

Many participants used powerful descriptions of experiencing the environment as “overstimulating.” Metaphors used to describe conscious, cognitive effects of “overstimulation” revealed a structure of which seemed to interfere with the ability to effectively parse figure and ground. This concrete experience of losing “clarity” of sensory information, seemed to map metaphorically onto cognitive experiences where it is difficult to know and process information. The effect that Figure-Ground difficulties may have on experiences of derealization was explored, as most participants endorsed some level of cognitive impairment. How anxiety may shape the experience of derealization was also touched upon.

Summary

In the previous sections, I have explored different aspects of vestibular patient experience by examining metaphor use in a clinical population. Patient narratives were analyzed using a systematic metaphor analysis, which provided a way to examine verbal reports of symptoms using metaphoric structure. Metaphor structure was used to deconstruct elements of patient experience and examine how impaired vestibular function relates to affect and altered self-perceptions. Qualitative results were interpreted with respect to metaphor, and results from quantitative batteries. The aim of the study was to see how metaphoric language use in this population may provide insight into the correlation between vestibular disruption, anxiety, and dissociative symptoms.

Analyzing metaphors used by these participants revealed some broad structures of vestibular experience. The core metaphor concepts here tracked to Agency, Stability, Orientation, Self-Object and Figure-Ground. In other words, participant narratives employed metaphor to suggest that vestibular function, through descriptions of dysfunction, is central to the experience of bodily agency, self-control, self-location, and the embodied grounding of cognitive experience. These were all explored in terms of how concrete physical experience gives rise to more abstract concepts. Examining participant metaphors highlighted the persistent dovetailing of these structures, as in the example of mitigation symptoms “re-stabilizing” the “self-object.” This study also worked to address how the abstract constructs of anxiety and depersonalization-derealization symptoms shape these broader metaphor concepts.

Some primary metaphors within these broader concepts were explored. These included symptoms-as-force relating to experiences of body control and agency, and the interaction of

anxiety and perceived handicap on the languaging of symptoms as “threats.” The absence and presence of threat language appeared to be influenced by anxiety, especially when coupled with spontaneous onset of symptoms with unclear triggers, as a function of perceived loss of bodily agency. The impact of relative loss of personal agency and control had effects on their experience of self and perception of self-efficacy.

The assumption of a stable environment was explored in terms of the metaphor “spinning.” This was related to exploring the violation of assumptions about the environment and how that might impact dissociation symptoms. Further, this loss of “stability” in the body-space relationship was explored through the concept of self-efficacy and perceived handicap.

Experiences of falling and fear of falling were examined for their impact on perceived disability. The figurative use of “drunkenness,” combined with symptom-metaphors played a part in understanding the social nature of disability in vestibular disorders, notably the loss of social agency, orientation and stability caused by vestibular symptoms.

The concept of self-objectification emerged to understand how mitigation of vestibular symptoms often implies a realignment of the “subject” with the “self” through the conception that the “self” is a physical object which can be moved. These were complements to the above broader themes, with mitigation representing reorientation between subject and self as well as these metaphors centering agentic control. Participants who reported having no strategy with which to address their symptoms were also considered.

Finally, the multimodal nature of vestibular function emerged through metaphors of “fog,” “noise” and “thickness.” These were conceptualized as Figure-Ground metaphors. These

were explored as ways to address the impact that “sensory overload” might have on cognition and other “self” experiences. These were further used to examine the quality of dissociative symptoms in participants with vestibular dysfunction. Quantitative data were incorporated to explore how anxiety might impact the experience of dissociation in this sample.

Implications

In this final chapter, I will discuss the implications of this study for embodiment theory generally, clinical work with vestibular patients, and cognitive metaphor research with disabled populations.

Embodiment Theory: Vestibular Function Provides the Ground for Perceptual Experience

What can metaphor use tell us about how vestibular function is structured? Metaphor concepts from participant narratives were used to understand how concrete, embodied experience tracks to more abstract or affective concepts. Deconstruction of the metaphors employed by this sample revealed that vestibular (dys)function is central to experiences of bodily agency, orientation and providing a “ground” for sensory experience by moderating the body-space relationship. The vestibular system appears to function as a means of allowing movement, orientation, and self-location to provide the “ground” for sensory “figure.” Moving and orienting are largely unconscious in normative vestibular function. When this body-space relationship is disrupted movement and orientation of the body becomes more conscious. This can have different effects. For example, when symptoms related to consciousness of a lack of bodily control, this diminished participants’ feelings of agency, resulting in increased feelings of anxiety, and perceived handicap. How these experienced physical and perceptual changes are described in metaphor provide a way to understand how vestibular dysfunction disrupts the *experience* of self, shaped by anxiety and derealization and depersonalization. Most of these metaphors are not unique to a vestibular patient population. However, employing certain metaphors in this patient population deepens and elaborates the structure of vestibular experience.

Vestibular function has not enjoyed much attention from phenomenological inquiry. Shoemaker (2004) suggests this may be because vestibular “sense” does not necessarily have a “field” by which objects of perception can be presented. As Wong (2017) suggests, it cannot be turned “off,” for example, like shutting your eyes and blocking the visual field. Vestibular function is always active. This is due to vestibular function being predicated on a consistent, unchanging natural force of gravity as well as it being multisensory. Gravity is one of the few, unchanging constant forces in perceptual experience and so, acts as an organizing force. This was highlighted through the Stability metaphors, as gravity informs our assumptions that the environment will be stable. Vestibular function itself is a “ground” of experience as it relies on the constancy of these forces and serves an integrative purpose.

Wong (2017) argues that an intact vestibular function is essential for self-location. However, in this study, self-location seemed to only be part of the vestibular picture. Participant metaphor use suggests the vestibular system is essential for agentic body control and providing a sensory “ground” of experience, in addition to self-orientation and self-location. Vestibular experience contained embodied assumptions about how space is structured; in this sample, metaphor touched on space as being stable as well as how bodily control is dependent on congruent body-space relationships.

Merleau-Ponty (2011) discusses the body-space connection directly. He writes,

Space, as well as perception as a whole, are marks, inscribed in the very heart of the subject, of the fact of his birth, of the perpetual contribution offered by his corporeality, and of a communication with the world more ancient than the one by way of thought. That is why space and perception engorge consciousness and are opaque to reflection. The variability of levels gives rise not only to the intellectual experience of disorder but also to the vital experience

of vertigo and nausea, which is the horrifying consciousness of our own contingency (2011, p. 234).

As noted, in vestibular disorders, space and perception are no longer “opaque to reflection.” Instead, space and perception become an object of consciousness, something that needs to be thought *about* rather than lived through. As he notes, vertigo and nausea highlight the precarity of our relationship with space. Merleau-Ponty additionally notes that our perception and attendant emotional, physical, and cognitive experiences are not directly causal, but are dependent on our “contingent” relationship to space. He writes,

In reality, the reflexes are never blind processes: they accommodate themselves to the "meaning" of the situation, and they express our orientation toward a "behavioral environment" just as much as they manifest the action of the "geographical environment" on us...The reflex itself makes the stimuli exist as a situation, and it stands in a relation of "knowledge" to them; i.e., it prefigures them as that which it is destined to confront (p.82).

This is important in being able to approach anxiety and vestibular dysfunction less focused on causality and more focused on the changing “meanings” of a situation. For example, anxiety that arises secondary to vestibular disease might represent an accommodation to the changing “meaning” of the situation. The changed meaning is apparent in the violations of assumption about space and body-space relationship loses its “orientation.” The situated experience of imbalance leads to the “horrifying consciousness” of our dependence on space to be consistent with our assumptions. Understanding anxiety in this context allows deeper insight into how elements of experience form a milieu, beyond for example, the anatomical implications of vestibular-limbic interaction. It offers an alternative view on incongruent body-space information as a “slip” in the relationship of body knowledge to stimuli (Merleau-Ponty, 2011).

This is evident in the experiential metaphor of “spinning” and its abstract experience of anxiety and losing control.

This experiential disconnect that occurs during vestibular dysfunction plays to Merleau-Ponty's (1968, 2013) conception of “perceptual faith.” Normative perception includes an ability to be taken-for-granted. Perceptual faith is the “prereflective” nature of perception; we do not have to think *about* perceiving, we just perceive and experience the perceptual world as “given.” However, in this sample of participants, their experiences speak to a distinct disruption of this “faith.” This is particularly salient for most individuals in this sample who experience episodic symptoms. In their narratives they discussed onset and then a “symptom,” “episode” or “attack” is defined by a sudden loss of bodily control, which may be interpreted as an embodied loss of perceptual faith. The world is no longer just *there*. Natural forces do not work in a way they are expected. These are all evidence of a disrupted body schema and goal-directed behavior becomes challenging or impossible. As in the case of “false motion” metaphor of *spinning*, there is a duality to embodied experience: the body knowledge that informs how certain experiences are supposed to feel and the actual experience that violate these understandings. A deeper understanding of vestibular dysfunction strengthens the importance of an embodied connection between person and world. When disconnections occur, it has psychological consequences, which were often conveyed through participant language.

Merleau-Ponty captures the central importance of space in constituting embodied experience. Embodied experience cannot occur without a relationship to space and “who we are” relies on our relation to the environment around us; “who we are” becomes possible because we understand “where we are” and “what” we can accomplish. Experiences of this relationship

being compromised, such as in vertigo or nausea, results in the “horror” of our existential fragility. This conceptualization is supported by the depersonalization studies referenced earlier; our experience of a *self* is contingent on our relationship with space. When that relationship is threatened, we have feelings that we are “not ourselves.” This arises out of the concrete bodily experience, for example experiencing illusory spinning and losing bodily control has effects on more abstract constructs, such as feeling not in control of oneself, disoriented or helpless against external forces.

Anxiety because of vestibular disorder makes intuitive sense in this context. The connection offers a way of understanding how violating assumptions between a body and space underpins a range of physiological, psychological, and cognitive consequences. Returning to the concepts of body ownership, an incongruent body-space relation can affect internal representation of the “self” (Lopez, Halje & Blanke, 2008). If, for example, if your body is not where you expect it to be in space, as is the case in illusory self-motion in vertigo, this can disrupt the fluidity of the body schema and the feeling of a body being one’s own. In this sample, these affected feelings of agency, as symptoms were often framed as experiences of losing a degree of body control.

As outlined in this research, vestibular disorders make the usual “givens” of normative perception conscious and reflective. What constituted a “symptom” conveyed this directly; it was often the sudden sense that something fundamental had changed between the world and the experiencer, as evidenced through the loss of body control. Following the “changing meaning of situations,” vertigo, both symptomatically and metaphorically, might be understood as the consequence of experiencing a rapidly changing world. Participant narratives appeared to

resonate with this conception, perhaps most eloquently stated by, “the ground was dropping out.” This turn of phrase touches back to the reality normative vestibular function is experienced as constant and consistent. For those with vestibular dysfunction, threat language additionally conveyed an inherent distrust of what had been previously “learned” about space, because what has been learned might any moment become “untrue.” The “ground” is not “supposed” to “drop out.” These shifting set of experiences and meanings, which at times may be labeled linguistically (attack) and affectively (anxiety).

Without perceptual faith, participants had to think *about* what had previously been “given” in their embodied experience. For vestibular patients, this appeared to be how to parse overwhelming sensory information, having to think *about* balance to not fall, or how to “reorient” themselves. This also came through in outlining triggers, as many participants endorsed certain body/head positions as being triggering. This implied needing to be to think *about* their body position in space either to ward off triggering motion or control false motion once symptoms begin. As Gallagher (2005) mentions, disruption in body schema makes basic perception the “figure” rather than the “ground.” As this study outlined, vestibular function is essential for a congruent body schema, as it is a basis for bodily agency, orientation, and stability. As such, vestibular function is a basis for grounding perceptual experience. Merleau-Ponty centered bodily perception *as* consciousness in active relation to the world. When the body schema is disrupted or disorganized, this *self-consciousness* also becomes disrupted and disorganized.

Experiences of the “world” can also affect self-experience, as seen through the construct of depersonalization-derealization. Participants expressed that the occasional inability to parse

the sensory field, to maintain orientation through balance or rely on their perceptual clues, changed their experience of “self.” I attributed this to the work of vestibular function as providing an organization of the body-space relationship, through the perceptual grouping of Figure-Ground. Perceptual organization is necessary to parse sensory information as well as to think “clearly.” Clinical studies suggest that feeling overwhelmed by sensation is a basis for dissociation in other disorders, such as PTSD (Harricharan, et al, 2017). Part of the design of our vestibular systems is to integrate multiple sensory modes to make the world appear coherent. “Dissociation” may reference a loss of coherence, like that kind communicated by a “mental lack of clarity,” during a vertigo attack.

As noted above, these “changing meanings” can mean violations of certain assumptions about the body-space relationship, shown through experiences like vertiginous spinning and the sudden loss of body control. In their mitigation strategies, participants evoked forced movement to reestablish these connections, often linguistically joining the self and the subject as in “I gather myself,” as well as using stabilizing forces to regain control over a chaotic perceptual field. This language again suggests a need to re-organize, “gather” experience during vestibular symptoms.

All these more conceptual ideas are informed by concrete experience. Most physical symptoms of vestibular disorders are contingent on a relationship to space and ground, whether that be issues of imbalance, motion illusion or falling. Disorders are then primarily disorders of the body-space relationship. Having lost the “grounding” of the learned experience of space, disorientation occurs. Body agency is affected, and the body-space relationship becomes foregrounded, making other sensory stimuli difficult to parse. Psychologically, this physical

disorientation gives rise to emotional, cognitive and perceptual disorientation as seen through common symptoms of anxiety and dissociation. I will next discuss these implications for clinical work next.

Clinical Implications: The Language of Self, Anxiety, and Dissociation

One of the primary aims of the present study was to deepen an understanding of the relationship between vestibular dysfunction, anxiety, and dissociative symptoms. Clinical understanding of vestibular disorders may benefit from the framing of vestibular function as a grounding embodied experience. This could address the dissociations, or “loss of ground,” that arise in patients’ lived experiences of symptoms such as vertigo, dizziness, and imbalance. This framing may aid clinicians in understanding the profound experiential and existential changes that can occur during vestibular crises. Additionally, this can help develop rehabilitative frames aimed at “grounding” patient experience to increase self-efficacy.

Language and Diagnosis

How patients describe their symptoms verbally is a significant factor in initial differential diagnosis of vestibular disorders. Because language to describe vestibular symptoms can be diffuse, even clinicians can have difficulty with differential diagnoses of vestibular dysfunction (Polensek, Tusa & Stern, 2009). The difference in description between “imbalance” and “spinning” for example, and the metaphors that may accompany each, can lend weight to one etiology over another. Additionally, symptom description can vary based on the presence of psychiatric symptoms. Paying careful attention to where metaphor use is unexpected or divergent can lend insight into how other factors, such as psychiatric symptoms or experience of handicap, impacts participant experiences. Understanding the “symptom as metaphor” can clinicians in to the psychological, cognitive, and emotional aspects of the experience of “imbalance,” “spinning,” “brain fog.” Certain metaphors may be present across multiple etiologies or speak to experience that is beyond the expected “symptom” for that disorder, for example the emotional

resonances of “spinning” or “falling.” Clinicians may wish to assess how patients and offer strategies that match patient’s metaphorical expression. For example, do patients express needing to feel more in control of their body? More stable? Do they need to feel re-oriented? Are they asking for more mental clarity? Addressing the abstract forms that embodied experience takes may have a bidirectional effect on concrete symptoms.

Self-efficacy

Agency was interwoven through most of the metaphors outlined above. Agency in this study referred to feelings of agentic control of the body which related to feelings of agentic emotional and self-control. Feeling that body movements were not self-generated and uncontrollable, as in the *symptoms-as-forces* metaphor, affected anxiety and perceived handicap. This was based in the concrete experience of losing body control, giving rise to these more abstract constructs.

Agentic control of the body might relate to perceived handicap as, clinically, self-efficacy refers to a person’s confidence that they will be able to prevent or manage their symptoms (Bandura & Wessels, 1994). Experiencing a high degree of physical loss of body control may inform the conception of vulnerability and helplessness against symptoms, as seen in the Agentic metaphors *symptoms-as-forces*. Feeling more vulnerable to uncontrollable forces may create the sense that patients are less able to control their symptoms or engage in preferred activities, leading to high levels of perceived handicap. Certain cognitive frames, such as feeling symptoms are uncontrollable and catastrophic, can significantly impact anxiety and perceived handicap in patients with vestibular dysfunction (Kirby & Yardley, 2009). The language used to describe a patient’s relationship to their symptoms is important, as fearing the negative consequences of

vertigo and dizziness can more significantly impact quality of life than the symptoms themselves (Yardley, Beech & Weinman, 2001).

A further area of research might be exploring how levels of perceived loss of body control may impact perceived levels of handicap and self-efficacy. This same metaphor concept may also inform the experience of emotional control, as higher perceived loss of body control seemed to relate to a higher level of emotional distress, as measured by anxiety. The connection between perceived control and emotional distress was also buttressed by the quantitative data, which suggested perceived handicap had significant statistical and clinical effects on anxiety; higher levels of perceived handicap translated to higher levels of anxiety. The “concrete” experience of losing body control, whether through being “impacted” by symptoms, spinning or falling, appeared to relate to the abstract concepts of self-efficacy and emotional control.

Findings in the quantitative survey data, which suggest that higher anxiety is related to increased perception of handicap, is consistent with previous literature. Psychological factors such as anxiety and depression have been found to impact patient outcomes, such as perceived disablement, more significantly than objective measures of vestibular function (Herdman, Norton, Pavlou, Murdin & Moss-Morris, 2020).

Anxiety

Anxiety was a common thread throughout participant narratives. Looking at the Beck Anxiety Inventory scores, this sample reported a level of anxiety that was consistent with other studies across multiple vestibular etiologies and greater than a control population (I.e., Bayat, Hoseinabadi, Saki & Sanayi, 2020; Creamer, Foran & Bell, 1995). Broadly, participant

narratives about anxiety typically related to either fearing the onset of symptoms, as was seen in the primary metaphors of “threat language,” or experiencing anxiety related to the violation of body-space relationship assumptions.

The International Classification for Vestibular Disorders delineates between “spontaneous” and “triggered” experiences of dizziness and vertigo (Bisdorff, Von Brevern, Lempert & Newman-Toker, 2009). In this sample, participants who experienced their symptoms as “coming out of nowhere” were more likely to use “threat” language, tracking again to the metaphor concept of Agentic Control. Linguistically, “threat language” appeared to be a combination of the *symptoms-as-force* metaphor structure, combined with a description of the *quality* of that force. There has been limited research on how cognitive framing of symptoms might impact the experience of vestibular dysfunction. One study suggests that when patients process dizziness as a “threat,” there is an increased chance of chronic symptoms (Whalley & Cane, 2017). However, using threat language was also dependent on perceived loss of agency and body control. Addressing “threat” framing without also addressing loss of agency might not be sufficient to minimize symptoms and moderate anxiety. This could also have implications for perception of self-efficacy in preparing for and remedying vestibular crises.

The threads between anxiety and perceived handicap in this sample and in the literature are many. One example is fear avoidance, where in patients avoid places and activities based on symptom-related fear. In vestibular patient populations, fear avoidance is associated with increased anxiety and a higher level of perceived handicap (Dunlap, et al., 2021; Herdman et al, 2020). In this sample, a lack of clear triggers, was often associated with participant responses that named multiple places and activities as potentially dangerous. Again, this could be

bidirectional: the lack of control over when an attack may occur may generate more anxiety or pre-existing anxiety may impact the perception of attacks as less controllable. Additionally, lack of education about the nature of vestibular illness contributes to higher levels of anxiety and perceived handicap (Kirby & Yardley, 2009). Based on the narratives here, it appeared lack of clear understanding of triggers itself contributed to anxiety *about* attacks. Further research regarding differences in anxiety between “triggered” and “spontaneous” vertigo may further develop this relationship.

On a clinical and interpersonal level, the unexpected and/or intermittent nature of many participant’s episodes in this sample appeared to exacerbate the social sense of “loss of control.” Research with vestibular populations has identified social consequences, or fears of being embarrassed, as contributing significantly to increased distress and feelings of helplessness (Nobbs, 1988). In this sample, many participants spoke to the fears of being “seen” in a certain way despite the illness being “invisible” or “misunderstood.” Drunkenness points to the inherent values interlaid with experiences of balance, uprightness, self-control, etc. As referenced by Straus (1952), the literal expressions of symptomology (“off-balanced,” “unstable,” “out of control”) track to a broader abstract concept of socially acceptable behavior and body control.

Characteristics of Dissociation with Vestibular Patients

As noted above, violations of assumptions about the body-space relationship appeared to be fundamental to the experience of vestibular dysfunction. Dissociative symptoms, as a psychological construct, appear to have an association with vestibular dysfunction, marked by experiences such as derealization and depersonalization. Participants endorsed several derealization and depersonalization symptoms, at a rate higher than in one previous study with

vestibular patients and at a higher rate than controls (Kolev, Georgieva-Zhostova & Berthoz, 2014). As noted in the discussion of results, those with higher anxiety reported significantly more symptoms of dissociation.

Dissociation in the context of vestibular symptoms is phenomenologically consistent, as these symptoms represent the point at which lived sensory experience is discordant with what is known to be “reality” and the “normal” interaction of forces. In this study, this came through in Stability metaphors, where the unconscious assumption of a stable environment is violated, creating a sense that the “normal” has become distorted. This tracked as well to Figure-Ground metaphors where the “rules” of normative sensory perception, grouped by foreground and background, was violated. This sensory violation resulted in the more abstract experience of “brain fog” and other cognitive effects.

Motion perception relies on spatial orientation to detect direction and speed of self-motion as well as moving objects (Dichgans & Brandt, 1978). The difference between expected motion and perceived motion creates a “disconnect” in experience, as the assumption of a stable environment is violated. This may provide some insight as to why people with vestibular disruption, including those in this sample, report higher levels of dissociation than individuals without vestibular difficulties (Sang, et. Al., 2006). Derealization can refer to experiences that the world is distorted or “false” in some way. In this case, unstable motion-perception violates assumption about how the world is normally oriented. This includes the stability we ordinarily expect from the environment. In fact, many items on the depersonalization-derealization inventory might be considered “vestibular” items such as “feeling as if walking on shifting ground,” “dizziness,” and “feeling not in control of yourself.” When a normally “consistent”

environment becomes “unstable,” such as a room spinning, the experiencer may attribute that to themselves (“self-motion,” “feeling not in control of yourself”) or the environment (“environmental-motion,” “feeling as if walking on shifting ground”).

Considering this, the experience of dissociation in this vestibular patient population was distinct. Dissociation in this sample was characterized by the experience of cognitive changes (i.e., “difficulty understanding”) and different experience of the environment that was relevant to vestibular symptoms (i.e., “ground shifting”), which related directly to the two “violations” named above. The experience of “sensory overload” might contribute to this as difficulty parsing multiple sensory inputs affects balance, even in non-vestibular populations (i.e., Harrichan, et al, 2017). Analysis of frequently endorsed items on the Depersonalization-Derealization Inventory in this sample were consistent with results from previous studies which suggest dissociative symptoms in patients with vestibular disorders are related to distorted body-space relationships (i.e., “feels as if walking on shifting ground”) and cognitive changes (i.e., “difficulty concentrating”) (Sang, et.al, 2006). Items related to more “strangeness” in the environment or emotional disconnection were not as prevalent as symptoms that related to loss of Agency (i.e., “not in control of body”) and Figure-Ground cognitive changes (i.e., “difficulty concentrating”).

Notably anxiety changed the quality of dissociative symptoms in this sample, amplifying them and adding a greater sense of detachment from surroundings as well as increased confusion. The influence of anxiety might be considered where dissociative symptoms seem particularly high. Alterations in proprioception and bodily awareness may be reiterated by increased panic and anxiety. This is consistent with prior findings suggesting that anxiety affects the experience of dissociative symptoms in vestibular patients (Kolev, Georgieva-Zhostova &

Berthoz, 2014). Feeling “overstimulated” by the environment is consistent with recent research that suggests that visually induced dizziness is associated with sensitivity across sensory domains (Powell, et. Al., 2020). This increased sensitivity may translate to difficulty parsing specific sensory domains, disrupting the usual Figure-Ground organization of perception.

Cognitive Metaphor Theory: Methodological Implications

As noted, limited work has been done on cognitive metaphor theory and metaphor use in disabled populations. Cognitive metaphor theory has received critiques assuming a universal “normalized” body that allows for the development of shared, embodied language (i.e., Vivaldi, 2010). Previous research in CMT with disabled populations has endeavored to see experimentally whether other diverse bodily experiences impact use of embodied metaphor (i.e., Rinaldi et al., 2018).

The metaphors used in this sample were not unique to patients with vestibular disorders. This is in part because the concrete experience of vestibular disruptions is not unique to a patient population; anyone can become dizzy or disoriented and experience illusory motion. However, it was illustrative to begin with the participant descriptions of regular, concrete experience of these disruptions and see how these common metaphors related to other clinically relevant abstract concepts such as anxiety and dissociation.

Interestingly, self-location metaphors, such as the *self-as-container* metaphor that was identified as a “background” metaphor, were less frequently used than expected. Instead, metaphor of stability, orientation and agency were more pronounced. Comparing these uses was helpful, as it pointed to some of the more salient structures of experience for this sample was less

about *where* the self is located and more about *what* the self can do (Agency) in relationship to the environment (Stability & Orientation). This example points to the utility of analyzing metaphors for specific populations, rather than relying on a broader discourse of language to reveal experiential structures.

The purpose of the vignette in this study was to assess if certain metaphors would be more anxiety-provoking, based on a paradigm developed by Thibodeau & Boroditsky (2011). The experimental manipulation did not yield statistically significant results on the outcome measure of anxiety, meaning the language manipulation did not appear to cause difference in self-reported anxiety differences between participants. Negative results could have been due to a few reasons. First, the vignettes may have been too complex, diluting the effect of the different metaphor frames. Second, the study was conducted online and the outcome measure, a seven-point Likert scale, may not have been sensitive or finely-grained enough to assess for subtle affective changes. Likewise, participants may have experienced other emotional reactions to the vignettes, beyond anxiety. Finally, the low participant number in each group may have not provided enough power for a between-groups analysis.

Additionally, metaphors used to frame the vignettes were “common” metaphors found in the clinical literature and may not have been appropriate or impactful in the current sample. One aspect of this method of analysis is to examine where subgroup metaphor compares to “common” metaphors used in the larger population. Metaphor use in this sample did include variations from the metaphor concepts pooled from the broader selection of clinical, vestibular metaphors.

Short-form responses from participants allowed for a “reverse engineering” of embodied cognition, as embodied experience, specifically “symptoms,” such as illusory motion, were described directly by metaphor. This made it necessary to assess the “symptom as metaphor” working from descriptions of experienced motion to understand how these are lived more abstractly. This was evident in the “motions” of spinning and falling which tracked affectively to anxiety for example, emotionally and cognitively. This may be a way to address metaphors relevant to diverse embodiments as, per Sobchack’s (2006) injunction, it brings “increased attention to where discursive construction meets embodied reality.” Quantitative data allowed as a “check” to see if descriptions of concrete experience tracked onto more abstract constructs, such as anxiety, perceived handicap, and dissociation. These did appear to be consistent with one another, with concrete experience often influencing these constructs, as demonstrated through sample and individual scores. This adds different data to support the utility of metaphor analysis to connect concrete and abstract experience. Working from symptom description allows us to examine how the direct perceptual experience of sensation is organized by metaphor.

Schmitt’s (2005) method of metaphor analysis is phenomenologically based. Being able to deconstruct metaphor provided an organized method of revealing broader primary structures. For example, the symptoms-as-force metaphors could be deconstructed to concrete experience of being impacted by forces/objects. Understanding this allowed for the conception of agency to come into play: if the forces are imbued with agency, what might that say about the agency of body/self that is impacted? The linguistic bases of metaphor analysis very useful when considering experiences of the “self.” The subject-object structures of metaphors were useful in teasing apart where the “self” and the “body” interacted through the organization of “physical” and “conceptual” experience, as in the Agency example above.

Analyzing metaphor in a patient population also illustrated how non-normative experience of embodiment often produces metaphor that is stigmatizing. For example, being “unbalanced” or “unstable” has negative connotation, because it violates our assumptions about how normative perceptual experience should occur, as in the Stability and Drunkenness metaphors. Because experiencing the world in a way that is discordant with how we understand basic normative forces to work is disturbing (or exhilarating). Metaphor work with differently embodied participants may wish to take this into consideration, as metaphor use may be transgressive or unexpected in these populations. The “drunkenness” simile is an ideal example of this and reveals the social environment is also prone to disorganization. Drunkenness was often linked to embarrassment or fears of seeming irrational. While dizziness is not stigmatized or embarrassing per se, the fear of being *perceived* as losing control suggests that stigma is related to a conception of disability as a norm violation. Though the experiencer understands they are not drunk, the social nature of being observed is an inextricable element of the experience of disability. Implicit in the use of “drunkenness” is that “self-control” is normative, good and requires agentic control between body and self. Secondly, this suggests that *unintentional* norm violation contributes to feelings of embarrassment. This represents a parallel process of the experiencer-environment relationship, where suddenly the environment or the self is in violation of an established norm of expected behavior.

Lastly, the simile of “drunkenness” speaks not only to a fear of appearing “out-of-control” but of being essentially misunderstood and having disability mistaken for recklessness, frivolity or worse. The nature of vestibular function as integrative, multimodal, and complex means the array of symptoms and makes vestibular dysfunction especially prone to misunderstand, even misdiagnosis by clinicians.

In this study, Systematic Metaphor Analysis was used to examine the experiences of a vestibular patient population. As noted, research in cognitive metaphor theory has often relied on the experiences of non-disabled populations. This project showed that metaphor analysis is a helpful way of revealing phenomenological structures of illness, especially when considering how related “conventional” metaphors are used. Use of quantitative data provided another means of assessing “abstract” concepts as they related to the primary, embodied examples referred to in metaphor.

Limits of the Study

This project represents a first attempt at meaningfully integrating quantitative and qualitative data. The kind and amount of data presented different challenges and opportunities for analysis. Metaphor analysis is typically done with longer-form interview data. My method of approaching mixed methods was with post-hoc exploratory, descriptive statistics. This made statistical inferences difficult, though I endeavored to include data which seemed to support or elucidate the qualitative material.

Limits of this study also include a lack of cultural or demographic considerations. Because of this, my data lacked access to understanding experience in diverse patient contexts. Additionally, this study included a very broad range of etiologies, making it difficult to broaden thematic elements that may mark experiences unique to each diagnosis.

As prior noted in the discussion of methodology, the nature of this qualitative data set presented the need for modifications to Schmitt’s method. Written narrative did not provide opportunity to develop answers and follow the participant’s lead as in an in-depth qualitative

interview. The resulting qualitative data was broad but relatively shallow. This meant having to rethink how to approach analysis in a way that might be feasible and clinically relevant.

However, this approach may not have captured the depth and complexity of patient experience.

Conclusion

Borrowing from cognitive linguistic (Lakoff & Johnson, 1999) and qualitative (Schmitt, 2005) methodologies, this study worked to explore how concrete embodied experience gives rise to more abstract concepts by examining metaphor use in a clinical population. This study, aimed to deepen the understanding of why anxiety, vestibular dysfunction and dissociative symptoms interact. I analyzed the short answers and quantitative data from 113 participants with vestibular disorders. Participants were asked to read a vignette framed by different metaphors to assess whether specific metaphor use would impact perception of anxiety. There were no significant results in the experimental manipulation and the qualitative findings offer some suggestion as to why this was the case. This sample seemed to utilize different metaphors to describe their experiences than were used to frame the vignettes. The results of the metaphor analyses additionally generated several primary metaphors, upon which richer contextual descriptions of experience were built.

Findings suggest that vestibular function provides a “ground” for perceptual experience and underpins the body’s relationship to space which affects feelings of agency, orientation, stability, and cognition. The abstract constructs of anxiety and depersonalization-derealization, as measured through quantitative data, were considered. Findings confirm previous research that vestibular dysfunction, anxiety and depersonalization-derealization are correlated. Metaphor analysis suggested that these correlations might be explained by vestibular function’s role in moderating the body-space relationship, which allows for physical and psychological feelings of orientation, stability, and agency.

These findings were considered in the context of clinical and philosophical arguments about embodiment. This work provided empirical evidence to support the work of Merleau-Ponty as well as expand the phenomenological literature on vestibular function. Namely, this study suggests that vestibular function is important of “grounding” the self and experiencing agency, in addition to previous theorizing that vestibular function plays an important role in self-location.

Findings from this study also had implication for clinical work with patients with vestibular disorders. One is that perceived body control might be an important factor for intervention as that related to experiences of agency, anxiety, and subjective handicap. Feeling a sense of control over symptoms, including having strategies to “reorient” the self, appeared to mitigate the experience of anxiety and lower perceived handicap. Dissociation in this population may have features which are shaped by psychiatric symptoms. Cognitive impairment in this sample appeared to relate to difficulty parsing the sensory environment. This informed the experience of dissociation, as the most endorsed dissociative symptoms were relevant to cognitive functioning. Dissociation in this sample also appeared to impact perceptions of space and motion as opposed to perceptions of time or disconnections from the environment. Anxiety appeared to shape dissociative symptoms, adding more experiences of “strangeness” and disconnection when present.

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Appendix A

Study Procedures (order of questionnaires randomized)

- 1: Informed consent
- 2: Eligibility screening
- 3: Structured questionnaire
- 4: VAPS
- 5: Embodied metaphor battery (either self, balance or literal conditions)
- 6: Post-test anxiety rating
- 7: DHI
- 8: BAI
- 9: Derealization & Depersonalization Inventory

End

Appendix B

Thank you for your interest in our study.

I am a graduate student in Clinical Psychology at Duquesne University in Pittsburgh. I am working on a study exploring the way language impacts certain physical and emotional experiences of people with vestibular difficulties. During the study, you will be asked to complete a survey made up of a few questionnaires. These surveys will ask you about your functioning, symptoms and experiences. Some questions on the survey are open-ended questions and some are rating scales. This survey will take about 20-30 minutes.

The study will be conducted online. Though there is no compensation for the study, you can elect to be entered into a drawing to win a \$100 Visa gift card. There is no cost to you to participate.

If you are interested, please follow the survey link for more information and to determine your eligibility to participate <link>. All of your information will be kept confidential. If you have any questions, please feel free to contact me by email at abramsk1@duq.edu or phone at 516-274-8981. Thank you for your interest!

Appendix C



DUQUESNE UNIVERSITY

600 FORBES AVENUE ♦ PITTSBURGH, PA 15282

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE: The role of language in the relationship between vestibular dysfunction, anxiety and the Self

INVESTIGATOR:

Kate Abrams, MA,

Doctoral Candidate

McAnulty College and Graduate School of Liberal Arts

Psychology

abramsk1@duq.edu

(516) 274-8981

ADVISOR:

Dr. Alex Kranjec, PhD

Associate Professor

McAnulty College and Graduate School of Liberal Arts

Psychology

kranjeca@duq.edu

217 Rockwell Hall

(412) 396-1613

SOURCE OF SUPPORT:

This study is being performed as partial fulfillment of the requirements for the Doctoral degree in the McAnulty College and Graduate School of Liberal Arts at Duquesne University.

STUDY OVERVIEW:

This study is looking at the way language contributes to physical and emotional experiences in people with vestibular disorders. In this study, you will be asked to answer a series of questions about your functioning, symptoms and experiences. You will also be asked to answer both open-ended questions and rating scales to describe your experiences. You will be asked to read a vignette and rate how anxious a scenario might make you. There are minimal risks associated with participating in this study, but no greater than those encountered in everyday life. Some of these questionnaires ask you about your experiences with anxiety or to imagine how anxious a

scenario might make you. This may make you feel some increased anxiety. You may not benefit from participating in this study. This study is not intended to provide clinical treatment or advice. Participation in this study will not affect your medical care.

PURPOSE:

You are being asked to participate in a research project that is investigating the way language contributes to physical and emotional experiences

In order to qualify for participation, you must:

- Be over the age of 18
- Be a native English speaker
- Have been diagnosed with a vestibular disorder by a physician
- Not have experienced a traumatic brain injury
- Not have other cognitive diagnoses (such as Alzheimer's disease or an intellectual disability)
- Not have been diagnosed with a serious mental illness (such as schizophrenia, or bipolar disorder).

PARTICIPANT PROCEDURES:

This study is being done in one online survey. This survey will ask you some questions about how your vestibular symptoms impact your daily functioning. Some of these questions will be open-ended questions and you will be asked to provide a description of your experiences. Other questions will ask you to rate some symptoms you may have experienced on a scale. You will also be asked to read a vignette about a potentially anxiety-provoking scenario and rate how anxious that scenario might make you. Completing this survey will take you approximately 20-30 minutes.

RISKS AND BENEFITS:

There are minimal risks associated with participating in this study, but no greater than those encountered in everyday life. However, some of these questionnaires will ask you about your experiences with anxiety or to imagine how anxious a scenario might make you. This may make you feel some increased anxiety. You may not benefit from participating in this study, but we hope that your participation can increase our knowledge about vestibular disorders and anxiety that may help others in the future.

COMPENSATION:

There will be no compensation for participating in this study. However, by participating you can elect to be entered into a drawing for a chance to win a \$100 Visa gift card.

There is no cost for you to participate in this research project.

CONFIDENTIALITY:

Your participation in this study, and any identifiable personal information you provide, will be kept confidential to every extent possible, and will be destroyed 3 years after the data collection is completed. Your name will never appear on any survey or research instruments. All written and electronic forms and study materials will be kept secure. Any responses you provide to the survey questionnaire will be de-identified and kept in a password protected file on a password protected computer. In addition, any publications or presentations about this research will only use data that is combined together with all subjects; therefore, no one will be able to determine how you responded.

RIGHT TO WITHDRAW:

You are under no obligation to start or continue this study. You can withdraw at any time without penalty or consequence by choosing to not complete the questionnaires and closing the survey window. Incomplete surveys will not be used in data analysis. If you choose to withdraw your consent to participation after the study ends, you may contact Kate Abrams at abramsk1@duq.edu or by phone at 516-274-8981.

SUMMARY OF RESULTS:

A summary of the results of this study will be provided at no cost. You may request this summary by contacting the researchers and requesting it. The information provided to you will not be your individual responses, but rather a summary of what was discovered during the research project as a whole.

FUTURE USE OF DATA:

Any information collected that can identify you will have the identifiers removed and be kept for use in future related studies. Your data may be used in the future for other statistical studies or to compare with data collected in future related studies.

VOLUNTARY CONSENT:

By continuing with this study I signal my informed consent, my voluntary willingness to participate, and my understanding that my participation is voluntary and that I am free to withdraw at any time, for any reason without any consequences. Based on this, I certify I am willing to participate in this research project.

I understand that if I have any questions about my participation in this study, I may contact Kate Abrams, MA at abramsk1@duq.edu or by phone at 516-274-8981 or Dr. Alex Kranjec at

kranjeca@duq.edu or by phone at 412-396-1613. If I have any questions regarding my rights and protections as a subject in this study, I can contact Dr. David Delmonico, Chair of the Duquesne University Institutional Review Board for the Protection of Human Subjects at 412.396.1886 or at irb@duq.edu.