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YOGA INSTRUCTOR BELIEF SCALE: INSTRUMENT DEVELOPMENT AND VALIDATION

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by

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PREFACE

Positionality

This dissertation was written in fulfillment of a doctorate in Educational Psychology by Tegan Jemma Reeves. Tegan is a graduate student at the University of Memphis as well as a yoga teacher. As such, Tegan's interest in yoga and the subject matter is rooted in her own beliefs and experiences of teaching and practicing yoga. Tegan acknowledges her experiences and potential biases seeking research quality and rigor to contribute to an empirical foundation for her assumptions as a yoga teacher and yoga practitioner. Tegan has no allegiance, financial or otherwise, to any particular body or yoga.

Dissertation Structure

The structure of this dissertation is in *manuscript* format, meaning that two chapters are full manuscripts to be submitted for publication. Manuscript 1 was prepared to be submitted to the *International Journal of Yoga Therapy*, an annual peer-reviewed journal publication by the International Association of Yoga Therapists. Manuscript 2 was prepared to be submitted to the *Journal of Psychoeducational Assessment*, a peer-reviewed journal publication by SAGE Journals.

ABSTRACT

In response to the growing interest in mind-body practices as preventative, therapeutic and educational interventions, the current work describes the instrument development and validation process to address a gap in yoga research. Yoga is a mind-body practice used in clinical and school settings that uses an integrative curriculum which simultaneously targets skill development/maintenance in physical, cognitive and emotional realms. Yoga is heterogeneous, as there is variability across styles and interventions. Yoga is also educational, as there are integrative skills being learned. The heterogeneous and educational nature of yoga necessitates reporting that accounts for variability in the instruction across instructors of an intervention. Observed instruction is one key element to understanding the heterogeneity of yoga. Influencing factors of instructional choices, such as beliefs should also be explored. While there is a validated instructional observation instrument for identifying components of a yoga intervention, a tool is needed to distinguish influencing factors of instructor choices. Modeled after research on school teacher beliefs and values linked to student achievement outcomes, the newly developed instrument provides a tool for measuring yoga instructor beliefs about yoga and yoga instruction. The sequential mixed methods steps in the development and validation of scores from the Yoga Instruction Beliefs Scale (YIBS) are described in separate manuscripts.

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CHAPTER 1

INTRODUCTION

The growing interest in mind-body practices is partially fueled from two directions. First, there is increasing attention being paid in schools to the educating the *whole child* (Hyde, 2012), including paying special attention to learning programs that target social and emotional learning. Second, there is growing interest in integrated interventions that may offer supplemental support for modern medicine (Cohen, 2017). The common area between these two fields (education and medicine) is the paradigm shift toward integration and away from causal binaries. At the confluence of this is mind-body practices such as yoga. With such an expansive reach, as the interest in mind-body practices grows, research should cover be directed toward understanding the intricate nature of integrated learning. However, mind-body practices are heterogeneous and multi-modal. To study such practices identifying differences across interventions is necessary. Potential differences studied in yoga interventions is limited to observed instruction. As instruction is a series of choices led by a yoga teacher, underlying influences of those choices should also be investigated. To address this, this body of work asks: Are there differences in yoga instructor beliefs that may influence the way yoga is instructed?

This dissertation will present a review of literature, a two part study, and a discussion that investigate yoga instructor beliefs. The following chapter will briefly review yoga research arguing that while the quality of rigor in yoga research has improved greatly in the last decade, yoga presents problems in its generalization of findings because of the heterogeneity of its intervention. The diverse curricular and theoretical styles of yoga mean that interventions differ from study to study. Furthermore, yoga therapists or teachers (i.e., instructors) may have individual differences that guide the implementation of how the therapy is implemented. The

chapter will continue by reviewing educational psychology constructs surrounding teacher beliefs to provide a platform for the current research. Finally, the chapter will end with the research goals of this dissertation.

Overview of the Problem

In fields from education to medicine, paradigms are shifting as the narrow way in which students and patients have been viewed is opening to a more dynamic vision of progress. In education, the call for *Social and Emotional Learning* (SEL) argues that successful, adaptive, healthy students are those who have skills in areas beyond the central curriculum. The *whole-child* movement suggests an integrated curriculum with programs such as yoga teaching life-skills and improving wellness (Hyde, 2012). Similarly, in the field of medicine, illness and treatment is taking a more integrated turn. The call for *Precision Medicine* argues that each patient enters with a profile of factors that influence the cause, symptoms, and treatment of illness (Cohen, 2017). Furthermore, the move away from a public perception of a deficit-model of thinking toward health toward a more positive focus supports an integrated whole-person approach.

Research in the fields of neurology and psychology can explain this necessity to shift from a directly-causal, binary, and reductionist way of understanding to an integrated whole-person model. Brain functioning and physiological responses to environmental pressure are integrated mechanisms with bidirectional influence (Siegal, 1999). Authors, like Van der Kolk (2014) and Porges (2009), have made strides in empirically defining the embodiment of trauma and the physiological mechanisms involved. The consistent message is a break of the cartesian binary, suggesting that events influence the mind and body simultaneously. In the wake of national recognition of the extended physiological and psychological impact of adverse

childhood experiences (ACEs), it seems pertinent to explore therapies and curricula that operate with this understanding.

Mind-body Therapies

Practices like mindfulness, yoga, tai chi, biofeedback and neurofeedback have growing evidence for sweeping benefits to treatment, prevention, and education. While vast in outcomes, quality work is being done in mind-body research. Yet, most research does little to acknowledge key variables that these practices involve, including learning and instruction. Of the integrative medicine modalities, yoga may be the most pertinent to define with these educational constructs as it includes physical, emotional, and mental health aspects within an instructor-student framework. Yoga involves a multimodal curriculum including mindfulness or meditation techniques, breathing practices, physical postures and sequences and relaxation (Butzer et al., 2015). As such, a yoga instructor or therapist is simultaneously teaching cognitive, physical, and emotional skills that influence wellness.

Yoga Therapy

Yoga is a lineage-based eastern practice (Broad, 2012) that treats mind, body and spirit as an integrated unit (Tyberg, 1940). The scope and quality of research on yoga is growing quickly (Jeter et al., 2015; Elway et al., 2014). As an intervention, yoga is heterogeneous in nature, meaning that yoga interventions vary in type, (Groessl et al., 2015), which poses problems in generalizability and meta-analysis of the effects. Riley and Park (2015) discuss these mechanisms of change as pertinent intervention characteristics. Groessl (2016) identifies fourteen components that are a part of any given yoga intervention at varying degrees.

The introduction of the instrument to measure these components makes a significant contribution to understanding the educational nature and implications of yoga. The Essential

Properties of Yoga Questionnaire (EPYQ; Groessl et al., 2015) is an observation-based measure that allows researchers to report more clearly on experimental interventions by describing the elements of yoga that occur during the intervention. With continued use, the EPYQ may also provide meta-analytic research on the mechanisms of change within and across different kinds of yoga interventions. Finding empirical links between specific yoga components and outcomes could increase treatment efficacy. Future findings such as this could inform yoga instructor choices in therapeutic settings. However, currently yoga is an integrated practice in which the choices, such as curricular components, are made by the instructor. The EPYQ is limited to observable instruction and does not provide information on what influenced instructional choices. Understanding instructor beliefs help provide context to the choices made and may lead to more predictive assumptions about how beliefs influence choices.

The heterogeneous nature of yoga therapy also makes it a uniquely useful practice as there is an extensive menu of components from which a yoga instructor may teach. The choice of components used is guided by the beliefs of the yoga instructor. These choices may stem from training, style, or personal experience. The relationships among training, style, personal experience and beliefs have not been explicitly explored within the context of yoga instruction. To fully understand how components of a yoga intervention are administered, and the context in which yoga is taught, a tool is needed to explore the beliefs of yoga instructors.

Statement of Purpose

The purpose of this study is twofold. First, to develop an instrument that identifies beliefs of yoga instructors. The intention is to provide a self-report measure that can be used in research and educational settings to identify individual differences in beliefs of yoga instructors. Secondly, to evaluate the psychometric properties and underlying factor structure of the instrument to provide

early evidence for reliability and validity of the instrument as well as present a polished instrument available for public use.

An instrument like this can be used across research fields to identify key components of the individual yoga instructor that may influence a yoga intervention. To accomplish this, a framework from educational psychology informs underlying theoretical support and systematic rigorous development of this self-report instrument. The long-term impact of quantitatively measurable perceived instructor beliefs and observed instruction used in intervention has potential to inform meta-analytic research on the mechanisms of change in yoga interventions. This work takes a step towards informing the critical judgement needed when addressing the use of integrative practices in medicine and education. In doing so, the goal of this dissertation is to report on the development of a theoretically sound instrument that has substantive and content validity and to provide quantitative evidence for the structural, generalizable, and external/criterion-related validity of a self-report instrument measuring the beliefs of yoga instructors.

Aims and Research Questions

Using an educational psychology theoretical basis and Rasch instrument development techniques, the current work seeks to develop a sound instrument and evaluate its psychometric properties. To do so, the project has two main parts. Part one, qualitative in nature, reports on the instrument development process (see Chapter 3: Manuscript 1. The second part, quantitative in nature, is to evaluate and provide evidence for the psychometric properties and structure of the instrument (see Chapter 4: Manuscript 2). The overarching goal of this work is to provide a self-report instrument that can be used in yoga interventions, education, and research settings, that identifies beliefs of yoga instructors that may influence instructional (or therapeutic) choices.

The research questions guiding the present research project are as follows.

Part one: Instrument Development (see Chapter 3: Manuscript 1)

1) What belief constructs can be derived from emergent themes of yoga instructor perceptions of beliefs?

2) What domains, or groups of constructs, map into previously existing belief-constructs in educational psychology?

3) What phrases can be used as items to elicit measurable responses from yoga instructors?

Part two: Instrument Validation (see Chapter 4: Manuscript 2)

4) What is an appropriate factor structure for reporting scoring?

5) Do the scores from the factors exhibit reasonable internal consistency (reliability)? How well do the constructs of yoga instructor beliefs correlate with other teacher belief instruments measuring similar constructs?

CHAPTER 2

LITERATURE REVIEW

As a mind-body therapy, there is a growing body of evidence for the potential yoga has to influence wellness through physical, mindful, and emotional skill development. The empirical evidence for this skill acquisition is outlined later in this chapter. As such, the acquisition of these skills is led by a qualified therapist or instructor, esoterically referred to as a guru. This tradition is discussed in the beginning of this chapter. After discussing the background of yoga, modern implications of yoga and current research are explored in the research section. While the mass and quality of research on yoga interventions continues to grow, there is very little research on yoga instruction and limited to no research on individual (yoga therapist or yoga teacher) instructor traits that may influence outcomes. As discussed in Chapter 1, yoga is both administered as a therapy and taught as a curriculum. Therefore, the individual yoga instructor may have a significant influence on outcomes of yoga therapy and yoga education. Using educational psychology as a cornerstone, the end of this chapter will explore the importance of instructor traits. The following chapter attempts to cover a broad spectrum of potential in view in yoga instruction as both a therapy and education.

Yoga

A commonly cited definition of yoga stems from the derivation of the Sanskrit verb root *yuj* meaning *to yoke;* translated as "to unite" yoga is thought of as a practice of uniting body and mind or a union with higher self (Tyberg, 1940). There is more to the word's etymology. In ancient eastern agriculture, yuj or yoking was a word used to talk about uniting an ox and cart. Another way to phrase this in English is "to harness". The ox-driven plow is a whole; stronger united than

either can be on its own. By definition, yoga is an inherent form of educating to stronger more united way of living.

The tradition of yoga passed through centuries through teachers (also called gurus). While modern yoga is different than its ancestral roots in many ways, this chapter illustrates that the importance of the teacher remains. The following section will review the historical and empirical literature surrounding yoga.

Roots of Yoga

The earliest claim of evidence of an age of yoga practice is a 5,000 year-old stone engraving, referred to as the *Pashupati Seal*, which depicts a mythical figure of the Indus Valley sitting in a yoga posture (Hornton, 2012). There is little in the way of artifacts to corroborate the age. It is likely that the first teachings of yoga around 1500 – 600 BCE (Pannikar, 1977). At the end of this period, these teachings were recorded with influence of Buddhism, vedic values, and philosophy. Evidence of yogic tradition and teachings in the east is found through the seventeenth century. Yoga traveled to the west in 1893 when the first teacher, *Swami Vivekananda* (Broad, 2012), came to the United States. The twentieth century housed development of a research center in India during the first part of the century and a surge of practice in the west during the 1960's.

Influential Texts. The first written yoga teachings were in the Vedas, a collection of texts that promoted health and well-being with an emphasis on rituals. The last of the texts, the Upanishads, is an esoteric text with philosophical guidance to self-realization. Around the same time, the Bhagavad Gita was published, a mystic story with fable-like morals and hero-like inspiration. In 200-100 BCE, was the first work presenting systematic yoga practice the Yoga Sutras which suggest eight steps (known as the eight-limb path) of the yoga discipline moving

from morality and self-regulation, to physical and meditative practice, with an ultimate goal of self-liberation. Later, in the fifteenth century, the Hatha Yoga Pradipika was published, emphasizing the physical and meditative practice. Yoga teachings into the twentieth century suggest that yoga was an integrated teaching that had four main components: raja yoga (harnessing the mind), jnana yoga (harnessing the spirit), karma yoga (harnessing the heart or selfless nature), and hatha (harnessing the body). In sum, early teachings and texts emphasize a holistic set of practices that work in harmony to emancipate an individual from internal or external restrictions.

The "guru". The oral transmission of early yoga was done through a guru or teacher. As texts and yogic teachings emerged, so did gurus. And, as the gurus diverged from each other, differences in teachings and styles were formed. Feuerstein (2008) suggests a diverse array of types were taught up until the eighteenth century. He contends that the types remaining can be traced to the origin of three texts: Yoga Sutras, Hatha Yoga Pradipika, and Bhagavad Gita. Yet, current styles of yoga can be more easily traced by lineage. The lineage-based evolution of yoga can be seen in the different styles of modern yoga (Broad, 2012). For example, from Krishnamacharya's teachings came diverging leaders: Iyengar, whose style of yoga is alignment-based, and Pattabi Jois, who inspired Ashtanga yoga traditions. Shivananda's disciples Satyananda, Vishnudevananda, and Satchitananda inspired holistic styles of yoga.

Modern Yoga

Yoga teachings evolved as they were passed down. Carol Hortnton (2012) argues that contemporary yoga is very different from its origins, claiming the eastern holistic and philosophical teachings have been replaced with western secular thought. Modern yoga teachings in the west have an emphasis on the physical practice and generally happen in a studio or clinic

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setting. While the practice and teaching of yoga may look very different now than it did in the time of Patanjali's Yoga Sutras, the common thread that the practice is an experiential education with a multidimensional goal to improve holistic wellness.

Components. Certain components are commonly agreed upon as essential foundations of yoga practice. Persistent components across styles involve purposeful movement, breathing techniques, contemplative/meditative exercise and relaxation (Butzer, et al., 2015; Gothe & McAuley, 2014). Elements of purposeful movement include physical postures and sequences. Breathing techniques can be conjunctive to movement or taught separately in a seated posture. Contemplative exercises, like guided imagery or open meditation, are elements or an environment of complete calm, often held at the end of class. The coordination of these elements is a yoga curriculum, but does not fully define the experiential learning.

Modern yoga is conceptualized as "a form of education, wherein experts seek to instruct their pupils not only in the postures of yoga but also in the underlying philosophies, and wider 'ways of living' embodied yoga" (Lea, Philo, & Cadan, 2016, p. 70). These elements and the teacher guide the process of learning in yoga. Likewise, the training and philosophical background of an individual teacher is influenced by the lineage of instruction.

Epistemological foundation. Modern yoga classes are offered in a diverse range of styles or a generic synthesized form. Yoga interventions are similarly diverse. While the core components of purposeful movement, remain elements of emphasis may be different. Often, such differences can be traced back to the philosophy of a guru. For example, B.K.S. Iyengar's lineage focuses on anatomical alignment but assumes that a transformative process happens in the mind and spirit through physical transformation and awareness (Iyengar & Perez-Christiaens, 2012). This differs from Yogi Bhajan's lineage, *Kundalini Yoga*, which focuses on spiritual and

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mental transformation using physical meditative movements (Williamson, Lola & Glieg, 2013). A more thorough discussion of yoga styles is included later in this chapter. But currently, it is important to note that lineage-based style differences may influence the instruction of yoga and that these differences may be attributed to underlying philosophy as well as labeled style.

The current project is interested in yoga as a modern therapy used in interventions. While this kind of yoga may be very different than that of the vedic period, the goal of a multidimensional embodied learning remains. The history of yoga sets a foundation of understanding the role of the instructor. Furthermore, the lineage of yoga informs epistemic differences in modern yoga instructors. To support continued efforts in yoga research the educational nature of yoga, dating to its inception, should be considered. The following section will review current research and identify areas in which the instruction and instructor may be overlooked.

Research

The amount of quality yoga research continues to improve with a surge in peer reviewed publications from one in 1967 to 250 in 2013 (Jeter et al., 2015). In addition, the number of randomized control trials have increased from zero to one per year in the 1970's and 1980's to zero to ten in 1990's and early 2000's and to ten to twenty-five from 2007 to2012 (Elway et al., 2014). Such proliferation reaches across fields as the potential outcomes of a yoga intervention have implications in a number of disciplines

A search on the academic database Scopus will present upwards of 4,400 journal publications about yoga. The majority of articles yielded are in the medical field, representing 73% of all yoga-relevant research literature. Approximately 13 % of yoga research focused on the psychological experience of the practice, and nearly 14 % are comprised of research in

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eclectic fields such as arts and humanities (Scopus, 2017). The extent of this work underlines the importance of cross-disciplinary calibration tools like an observation and self-report instrument to measure components of the instruction and instructor.

Of interest to this project is the scope of reported benefits and the kind of yoga implemented during the study. To review pertinent research, the following sections will give an overview of reports on efficacy, including general research as well as research in schools, and then explore intervention styles, instruction, and instructors.

Efficacy of yoga. There seems to be substantial empirical support for yoga as a treatment and prevention. As a treatment, yoga has been used for a myriad of physiological, mental, emotional and behavioral disorders. Yoga has also been studied as prevention for the effects of age and activity on injury and cognition.

Yoga in clinical settings. Yoga has been linked to psychological, cognitive, and physiological benefits. Psychological benefits include decreased stress (Brems, 2015; Butzer, et al., 2015), less reports of worry and depression (Eastman-Mueller, Wilson, Jung, Kimura & Tarant, 2013), increased resiliency (Meiklejohn et al., 2014; Jennings & Greenberg, 2009), reduced anxiety (Chettier, 2014), increased positive affect (Gaskins, Jennings, Thind, Becker, & Bock, 2014), and decreased self-objectification (Allard & Harwood, 2014). Cognitive research reveals an influence of yoga on improved cognition, enhanced attentional orientation, and increased cognitive flexibility (Froeliger, Garland & McClernon, 2012); improved attention processing speed, executive function and memory (Gothe & McCauley, 2015); and decreased emotional interference (Menezes, Dalpiaz, Rossi, & DeOliveria, 2015). Yoga is also linked to physiological benefits, such as lower systolic blood pressure (Nelson, Reed & Buck, 2014), healthier lifestyle reports (Berent, Zech, Lieschner & Berent, 2014), improved immune function

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(Lim & Cheong, 2015), and wellness (Poulin, Mackenzie, Soloway, & Karayolas, 2008). Across psychological, cognitive, and physiological fields, yoga seems to promote skill acquisition that enhances positive states and lessen the negative states, which leads to optimal wellness. In other words, a distant look at yoga research gives a picture of harnessing the mind and body to improve both.

Yoga in school settings. For now, one field has started to address this through consistency in interventions in multiple studies: education. For example, Yoga Ed (Chen & Pauwels, 2014; Khalsa et al., 2012) and Kripalu Yoga in Schools (Noggle, Steiner, Minami, & Khalsa 2012; Felver, Butzer, Olson, Smith & Khalsa 2015; Butzer, et al., 2015) are manualized programs. The increased attention on the yoga intervention may be because of the native structure of education itself.

Research on yoga in school settings is increasing (Butzer, Ebert, Telles, & Khalsa, 2015), in part propelled by *whole child* movement which is an effort to improve the quality of public education and student well-being (Hyde, 2012). Systematic reviews have found that, while research on school-based yoga is young and methodological quality is low-to-moderate (Khalsa & Butzer, 2016), there is preliminary evidence of improved emotional balance, attentional control, cognitive efficiency, anxiety, mood, resilience and coping (Serwacki & Cook-Cottone, 2012; Butzer, et al., 2015), improved well-being (mental, social, physical) and increased adaptive behaviors (Chen & Pauwels, 2014).

Furthermore, yoga-based interventions have been used in different ways to address progressing stages of child development. Yoga-based interventions in schools show developmentally appropriate benefits from early and middle childhood to late childhood and adolescence. Evidence suggests that, in early childhood yoga improves physical fitness (e.g.

respiratory and muscle strength; D'Souza & Avadhany, 2014) and may impact psychosocial outcomes such as self-regulation (Razza, Bergen-Cico, & Raymond, 2013). In middle childhood, yoga has been linked to improved self-satisfaction (Clance, Mitchell, and Engleman, 1980), self-perception (Richter, Tietjens, Ziereis, Querfurth, & Jansen, 2016; Case-Smith, Sines, and Klatt, 2010), coping strategies, (Ritcher, et al., 2016), stress levels (Butzer et al., 2016) and behavior change (Butzer, et al., 2016; Case-Smith, Sines, and Klatt, 2010; Klatt, Harpster, Browne, White, & Case-Smith, 2013). There is a slight shift in school-based yoga research as the ages of participants move from middle childhood to late childhood to include emotional benefits (Stuek, & Gloeckner, 2003; Berger, Silver, & Stein, 2009). Research on yoga in schools for adolescent students suggests emotional and well-being benefits (Noggle, Steiner, Minami, & Khalsa, 2012; Khalsa, Hickey-Schultz, Cohen, Steiner, & Cope, 2012; Felver, Butzer, Olson, Smith, & Khalsa, 2015) as well academic outcomes (Kauts & Sharma, 2009; Butzer, van Over, Taylor & Khalsa, 2015).

Yoga research in schools contributes to the educational understanding of yoga. The school based research contributes to this knowledge base by creating a richer view of social and emotional skill acquisition as well as supporting a view of yoga practice as an experiential activity that is guided through instruction. An underexplored discourse contextualizing yoga within educational parameters is skill-acquisition.

Skill-Acquisition. A crucial role in the mind-body movement is adaptive embodied learning. To properly understand learning in yoga, the skills acquired should be defined. Research links yoga to self-regulation skills. Another potential construct that defines these skills is interoceptive awareness.

School-based yoga has also been linked to increased emotion regulation (Hagins, Haden, & Daly, 2013; Bergen-Cico, Razza, & Timmins, 2015) and regulatory skill development (Gould, Dariotis, Mendelson & Greenberg, 2012). A e review of research on school-based yoga presents empirical and theoretical rationale for yoga as a tool for social and emotional development through physical, mental, and emotional regulation (Butzer, Bury, Telles, & Khalsa, 2016).

Prior research suggests that interoceptive awareness, a relatively new construct, is associated with yoga (Fiori, Aglioti, & David, 2017). Interoceptive awareness is the ability to be aware of the body's physiological state as well as regulate it (Farb & Mehling, 2018). Research and discourse around interoceptive awareness includes conceptual modeling (Garfinkel et al., 2015) and clinical implications (Lazar et al., 2016). While interoceptive awareness research is still growing, evidence of links to dispositional mindfulness (Hanley, Mehling, & Garland, 2017) and compassion (Fiori, Aglioti, & David, 2017) suggest adaptive embodied learning.

Yoga Research Interventions. The diverse variety of instructional curriculum (Gothe & McCauley, 2015) as well as the variable, wide, scope of instruction (Butzer et al. 2015) provides an incomplete view of yoga efficacy. Current researchers identify a lack of intervention evaluation, incomplete reporting focus, and inconsistent or incomplete curriculum.

Without a thorough evaluation of yoga-interventions (Michalsen et al., 2012; Saper et al., 2013), questions on fidelity of the program cannot be answered. During a study, the degree to which the yoga instructor fully implements the program and the degree to which the participant receives yoga instruction is important. A focus on dosage (i.e. time and intensity) reporting does help researchers in comparing intervention efficacy but dosage alone leaves a report incomplete. Indeed, some argue that yoga interventions often leave out essential components of yoga curricula, such as mindfulness (Feagans, Gould et al., 2014). A call for more rigorous adherence

protocol (Khalsa, 2015) and intervention reporting (Groessl, 2015) is the first step toward a more comprehensive understanding of yoga. This would allow for a more accurate understanding of yoga style as well as begin to illuminate the effects of yoga instruction.

However, this call leaves out another factor that influences yoga an educational practice and therapy. The unique composition of yoga provides experiential learning that is led by a qualified teacher (Musial, 2012). It must be taught and cultivated to be most effective (Butzer et al., 2016). The nature of the educational practice creates an innate importance of instructor choices and student-teacher relationships embedded within instruction and style. The following will consider styles, instruction, and instructors in current yoga research.

Yoga styles. A yoga style is a kind of yoga that has proclaimed distinctions in one or more of the following: lineage, philosophy, environment, curriculum, or instructor training. The National Center for Complementary and Alternative Medicine lists the following styles: Ananda, Anusara, Ashtanga, Bikram, Kripalu, Kundalini, and ViniYoga (NCCAM, 2013). Additional styles identified in systematic reviews of yoga interventions are: Vivekananda, Vinyasa, Sivananda, Restorative, and Silver (Elwy et al., 2013) and, Iyengar, Hot, Restorative, Svaroopa, Indea Devi, Prenatal, Gentle, and Children's (Groessl et al., 2015). These styles fall under the traditional category of Hatha Yoga. All of the listed yoga styles incorporate the four core components of yoga: voluntary breathing, purposeful movement, meditation, and relaxation. This is not a comprehensive list of all yoga styles, rather a list of styles used in interventions that incorporate all of the components of yoga without extraneous additions.

Some interventions use partial curriculum, implementing one component but do not integrate all four. Examples of these are: Yoga Nidra, Mindfulness and Kapalabati/Yogic Breathing. Other interventions add additional components to create specialized versions of yoga

such as Yogic flying/SKY yoga, Chair Yoga, Laughing yoga, Prenatal Yoga and Tantric yoga. Partial or inflated styles of yoga interventions are outside of the scope of this review but do underline the variability in yoga interventions.

Each style of yoga has distinctions and commonalities. Most styles have a distinct lineage and curricular preferences but converge in areas of philosophy and physical postures. Gothe and McCauley (2015) suggest that these characteristics, or areas of difference and overlap, include: shape of physical postures; rate at which postures are performed; sequence in which postures are delivered; environmental temperature; physical intensity; and use of external props. Other differences in styles may be environmental. Bailey (2014) illustrates that styles like Bikram Yoga have mirrors while others done and this has a unique impact on experience. Anecdotal differences such as emphasis on alignment versus movement through postures and consistent structure versus creative sequencing may be colloquial understandings within yoga circles.

Table 1

Clusters of Styles of Modern Yoga

Clusters	Example
Holistic	*Sivinanda, Kripalu, Integral, Ananda, Vivekananda*
Hot	*Hot 26, Bikram, Surya*
Power	*Baptiste, Core Power*
Gentle	*Silver, Yin, Vini,*
Generic	*Hatha, Variations, Vinyasa*
Alignment Based	*Iyengar, Ansura*
Ashtanga	*Mysore, Ashtanga*
Kundalini	

Note: Clusters were identified by author arbitrarily by basic common knowledge of styles and components. Further systematic cluster/classifications should be done to better understand how styles group together.

For the purpose of the current work, styles have been clustered together to create manageable comparisons. Table 1 presents categories of style based on colloquial understanding, lineage evolution, and expert input of how styles group together.

Current research is opening avenues to recognize differences in styles. In a systematic review of literature, Riley and Park (2015) suggest that mechanisms of change are both physiological and biological and that the interplay of such mechanisms differ across intervention. Stemming from the need for identifying mechanisms of change and measuring factors between interventions EPYQ (Groessl et al., 2015) is the primary step in empirically examining yoga intervention style differences. The EPYQ measures the presence of different factors within a yoga intervention. While this may be useful to identify style differences, this instrument informs beyond style-specific factors to the instruction of the intervention.

Instruction. The delineation of style by instruction lies in the educational nature of yoga. As Butzer et al. (2015) state *"yoga-based physical movement, breathing exercises, meditation practices and relaxation techniques provide [students] with an embodied and experiential sense of what it feels like to cultivate these skills"* (p. 20). The components of yoga offer the environment to become embodied and experience cultivating skills; however, the skills must be taught. The importance of the environment and instruction is pivotal in skill acquisition (Bandura, 1986). The way in which an individual is instructed through the curricula will change his/her experience, thereby changing his/her cultivation of skills and the overall efficacy of the yoga practice.

Variability in instructor choices likely exists across styles. To illustrate, we can look at an example in a traditional academic classroom. To increase writing-skill acquisition a student may take a high school creative-writing class. While creative-writing is a type of English course, the

class itself will have some common curricular and environmental factors that make it different from other courses like persuasive-writing or ancient literature. One creative-writing class may differ from that of a different school. The students' skill acquisition is not just led by the type of course but by the instructional emphasis and choices made. Similarly, a student may take any given style of yoga but the instruction also matters. Just as creative-writing is embedded under English courses, yoga styles are embedded in yoga. In both examples, instruction (and the instructor which will be discussed later) is an embedded component within and across styles.

Theoretically linking skill-acquisition to yoga, or styles of yoga, is not quite as clear-cut as it is in English classes. It is important then, to identify factors or mechanisms of change that may relate to skill acquisition as well as differentiate instruction and styles. Specifically, for empirical research, measurable mechanisms of change may clarify intervention efficacy and specificity of outcomes.

Strides have been made in this direction. The EPYQ identifies 14 factors, or points of emphasis during a yoga-intervention, that can be quantitatively measured: physicality, health benefits, acceptance/compassion, meditation/mindfulness, mental & emotional awareness/release, yoga philosophy, spirituality, breathwork, body awareness, body locks, restorative postures, individual attention, active postures, social aspects (Groessl et al., 2015). These factors increase understanding of yoga instruction. However the instrument requires a trained observer which decreases the usability in studies that have limited budgets. Furthermore, while the instrument is inclusive of observable instructional choices, there are vital instructional choices that cannot be captured in an observation.

Instructor Choice. Instruction doesn't just include curricular or philosophical emphasis, as measured in EPYQ, but also how instructors interact with the ever-changing skill-acquisition

needs of the student(s). In educational psychology, these choices are sometimes termed *problems of practice* (Skott, 2015). Problems of practice arise as an iterative and interactive education is administered. For example, as students become strong in an area, development and interest may plateau, an instructor must then offer a challenge to maintain engagement and further progress. Conversely, individual students with limitations in an area require scaffolding (Vygotsky, 1986) or modified instruction. Instructional choices like these take keen awareness and a foundation of understanding by the instructor.

Both progression and modification are instructional choices that solve problems of practices. As such, they are imperative for optimal and safe skill acquisition. In yoga, progression choices are made by sequencing, cueing and posture changes as a student becomes stronger, more agile or more aware. Similarly, modification choices are way to shift or change a posture or sequence for individual students.

Progression can be at the individual or group level and may be implicit or explicit. This is an important part of differentiated instruction. Differentiated instruction is the degree to which teachers give individualized lessons, verbal cues, and assessments (Coubergs, Struyven, Vanhourtnout, & Engles, 2017). A yoga instructor may identify a student who is ready to progress and give them individual instructions or modify sequence of movements presented to create a more difficult physical challenge for an entire group. If reported, current literature reports are limited to the use of progression at the group level. Table 2 illustrates empirical examples of reported intervention progression in yoga literature.

Table 2

Progression of Instruction Throughout Intervention

Citation	Style	Explanation
Alexander, Rollins, Walker, Wong, & Pennings, 2015	Kundalini	*In early yoga sessions, participants learned to become conscious of their breathing. Throughout the intervention, the instructor taught participants the basics of postural alignment, deep breathing, and monitoring the mind with simple meditations. As the series progressed, additional exercises, breathing practices, and meditations were added to expose participants to the wide range of movements that can work not only the skeletal muscles but also other body systems such as the internal organs, nervous system, circulation, and emotions.*
Chaya, Nagendra, Selvam, Kurpad, & Srinivasan, 2012	Holistic: Vivekananda	*In the first month, [participants] were mainly taught stretching yogic exercises, which were easy to learn, and, in the second month, the sun salutation was introduced, followed by various posture exercises, meditation, and breathing exercises (pranayama).*
Chan, Immink, & Hillier, 2012	Holistic: Satyananda	*The research team designed each of the six group classes to introduce new practices progressively, increasing the number of rounds and encouraging awareness of movement and body sensations.*
Cheung, Wyman, Resnick, & Savik, 2014	Generic: Hatha	*A progressive series of poses was used with static stretching, balance, and strength exercises.*
Bower, Garet, Sternlieb, Ganz, Irwin, Olmstead, & Greendale, 2012	Iyengar	*The postures were introduced using a standard progression from simpler to more challenging over the course of the intervention.*

Note. The above are examples of progression in different style-clusters. This is not an extensive or inclusive review of yoga intervention progressions.

Modifications can be done to individualize learning or for specific injury recovery/prevention purposes. Modifications can be done at the individual level such as Bower et al. (2012) demonstrate in a study with an Alignment style yoga intervention (Iyengar): "[the postures] were adapted to suit individual needs" (p. 240). Modifications can also be made at the group level to give a range of challenge. Cheung et al. (2012) report an illustration of this in a generic (Hatha) style yoga intervention: "modification of the basic asanas to suit participants' willingness to challenge themselves and their functional capacities. For example, the teacher demonstrated unilateral modification of movement, encouraged visualization for increased range of motion and permitted participants to use chairs and walls as supports during some of the asanas" (p. 1120). While not limited to students with disabilities, modifications are an important component of inclusive instruction: accessibility. In the classroom, self-efficacy about accessibility is the degree to which teachers feel comfortable accommodating students with special needs (Park, Dimitrov, Das, & Gichuru, 2016).

While stylistic differences may exist in ways teachers are trained to deal with problems of practice, emphasis and choice of the yoga instructor are more pertinent layers of understanding the potential of a given yoga intervention. As such, intervention reporting that simply lists the style of yoga gives insufficient information. Proper intervention reporting on instruction should include information about instructional choices. Optimal intervention reporting on instruction would have an addition of the EPYQ to show instruction emphasis and choice. Furthermore, other potential influences on instruction choices should be measured.

Instructor. An individual instructors' history, training, epistemology, and personal characteristics shape the ways in which a yoga intervention is delivered and directly impact students' experiential learning. In addition, a yoga instructor engages with students on multiple

dimensions (Park, Riley, Beseden, & Stuart, 2013) extending beyond style and instruction. Yet, while yoga research is developing in the areas of acknowledging instruction and style, to date there is still very little done to understand the influence of the individual instructor.

Most quantitative research does not report about the instructor(s) at all, and those that do limit reporting to the instructors' background in yoga. In a recent scoping review of yoga interventions since 1983, 60% of studies did not provide any information on instructors (Elwy et al., 2014). Of the 40% who did mention yoga instructors, authors found that descriptions like *trained* (8%) and *experienced* (6%) were used while some listed qualifications like RYT (i.e. Registered Yoga Teacher) and a few (1%) outside of the US described number of hours taught of trained (Elwy et al., 2014). While training and/or experience certainly influence instruction, the role of the yoga instructor seems to be deeper in nature.

Quantitative and discursive literature supports the importance of the individual yoga instructor. In a qualitative study, Park et al. (2013) found that students report wanting qualities *like being connected*; *present in the moment*; *giving love and compassion;* and *humor* were consistent and those characteristics are consistent with teacher behavior. It could be reasoned that the environment of the yoga intervention is guided not just by choices but also by characteristic behavior that is outside the purview of a yoga instructor's immediately conscious choice. Other interactive qualities such as language may also influence a student's experience.

A prolific researcher and author in the field also argues that the use of language matters. In a presentation to the symposium for yoga research, Cook-Cottone (2016) discusses the potential implications of both implicit and explicit use of language in teaching yoga. For example, language that is centered on the aesthetic appeal may still guide a student into the shape of a particular posture but does not provide the opportunity of interceptive skill

acquisition/maintenance that language centered around the sensory control and feeling of a posture allows. During instruction, this would be the difference in a yoga instructor saying *your knee should be at 90 degrees and your stomach should be flat* and subtly different language such as *feel your quad pull back to keep the knee over the ankle and tuck the tailbone to engage the lower abdomen*. The latter uses cues that encourage interoceptive and proprioceptive awareness skills while the former sets an external figure as a focus.

Not only is this a factor in skill-acquisition, but it is also an important area in which the yoga instructor influences the environment for the student. Indeed, McClure (2015) argues that it is imperative for yoga instructors to create an environment that allows the students to feel emotionally safe. He calls this building *a holding pattern* which is also colloquially discussed within yoga teachers as creating a *safe space*. McClure submits that intentional connection and use of inclusive gentle language are important for yoga instructors to adopt. The importance of this in learning revolves around the students' ability to be vulnerable. A safe space, or environment conducive to learning, is optimal if not imperative for some students to challenge themselves physically, emotionally, or mentally.

Between characteristics, behavior, and language, there may be an infinite number of overlooked factors at an individual instructor level that influence any given yoga intervention. Neither the amount of experience nor the styles of training seem likely predictors in discerning instructional choices. However, there is an empirically supported underlying construct that does predict the instructional choices and student outcomes: instructor beliefs. The last section in this literature review will cover this borrowed construct and posit that it may fill a gap in current the best-practice for yoga interventions.

Identifying the Instructor

Yoga is a practice in acquiring skills, or learning, that harnesses the strength of a united mind and body. Regardless of style, the foundation of skill-acquisition is the nature of a guided practice taught by a teacher and the experiential nature of psychological, cognitive, and physical skill acquisition/maintenance. Until recently, the empirical research that does explain a yoga intervention does not provide ample information to understand influencing factors in skill-acquisition. A budding number of studies recognize the importance of intervention reporting. The next step is to ensure that all of the components of the intervention are dually noted.

A yoga intervention consists of a dynamic interaction of style, instruction, and instructor. Style alone does not provide a complete or replicable intervention. The EPYQ the quantifies observable instruction emphasis, which provides more information on the mechanisms of change in a given intervention. However, this instrument requires a trained observer and is limited to observable instruction which does not account for problems of practice of the individual instructor. While the age, race, and amount of training are all important individual differences that should be examined, the educational nature of yoga suggests that instructor choices, such as progression and modification, may also influence instruction. Teacher beliefs guide choices (Fives & Buehl, 2015) and should be measured in the context of yoga teachers. An instrument that provides quantitative information on self-reported beliefs of yoga instructors is needed.

Teacher Beliefs

To date, there has been limited inquiry on the influence of the individual yoga instructor and there are no attempts at identifying measurable constructs within yoga instructors themselves. The next and final portion of this chapter reviews literature in educational psychology that has explored such constructs, namely teacher beliefs. Using educational

psychology to explore teacher beliefs, the remainder of the chapter seeks to explain teacher beliefs within a skill-acquisition framework, in order to better understand potential constructs that may influence instructor choices.

Pajares (1992) stated that teacher beliefs are "the single most important construct in educational research" (p. 329). Modern use of the term *beliefs* in educational psychology is "used to designate individual, subjectively true, value-laden mental constructs that are the relatively stable results of substantial social experiences and that have significant impact on one's interpretations of and contributions to classroom practice" (Skott, 2015, p. 19). Skott suggests that there are four consistent *key* aspects that make beliefs distinct: 1) beliefs are used to define individual mental constructs; 2) beliefs are temporally and contextually stable; 3) beliefs have cognitive and affective aspects; and 4) beliefs influence ways in which teachers interpret and engage with problems of practice. In other words, beliefs are individual to each teacher, are stable over time, have thought and feelings associated with them, and impact teaching behavior.

The importance of teacher beliefs and values is a long-standing discourse in educational psychology. In the *Handbook of Research on Teaching*, Getzels & Jackson (1963) discussed beliefs, arguing them as a pivotal component in researching teacher effectiveness. Ten years later, the second edition of the *Handbook of Research on Teaching* discussed beliefs in teachers, asserting that beliefs about theory of knowledge impact classroom choices (Price, 1973).

Epistemic and Pedagogical Beliefs. Epistemic beliefs are a principal contextual coordinator. Epistemology is a set of frameworks or ideas that define the way we question (Denzin & Lincoln, 2005) and the way that we understand the world (Crotty, 2003). Aptly, Crotty (2003) defines epistemology stating it is the "philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and

legitimate" (pp. 8). Understanding one's own epistemic beliefs is also acknowledging their philosophical underpinnings. In this way lineage can be loosely traced mapping a framework in which most choices are influenced. The relationship between knowledge and beliefs are interwoven. Figure 1 depicts kinds of knowledge and a working framework of classroom impact (Helms & Stokes, 2013).
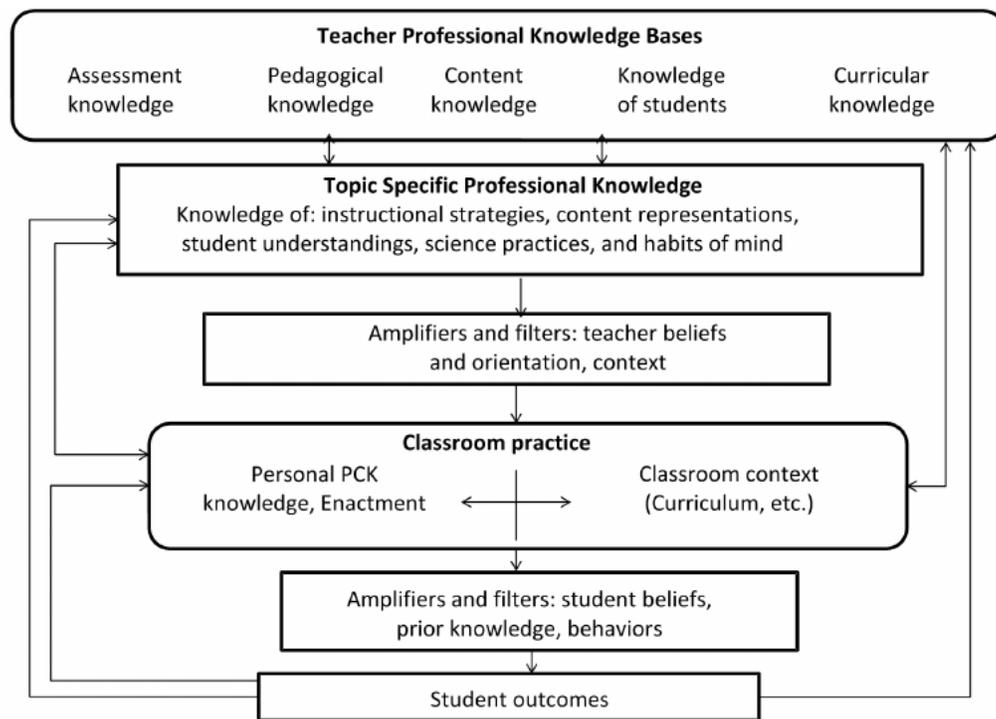
Figure 1. Teacher Knowledge and Practice (Helms & Stokes, 2013)

In defining epistemology, it is also important to acknowledge its multidirectional relationship with teacher training. School teachers may have certain epistemic beliefs because of their training but also may choose training because of their underlying epistemology. Likewise, a yoga instructor may have beliefs because of the style of yoga they teach concurrently choosing the style of yoga because it supports their way of understanding the world.

The(se) guiding philosophy(ies) of learning directs choices to foster skill-acquisition. Hancock and Gallard (2004) infer that epistemology leads to generalized approaching to teaching as a transmission of knowledge. Beliefs about the optimal environment to acquire skill, the ways in which challenge reinforces skill acquisition, the language used to impart knowledge or create experience, and the felt requirements of the process can all be seen differently from different epistemological perspectives. Therefore, it is context beliefs that allow for a framework of instruction.

Yoga instructor beliefs about how to teach may also be influenced by association to a certain group or collective, such as a school or yoga or particular style/lineage. Tschannen-Moran et al. (2015) discuss pedagogical comparisons and collective efficacy. Collective or group pedagogy among teachers in specific styles may propagate epistemology building a foundation of understanding that influences action. If viewed as a theoretical framework, it is easy to see how the confluence of nested factors including belonging to a group or style may link to instructional choices.

Affectual and Experiential Beliefs. The role of teacher beliefs should still be viewed as a dynamic system in which teacher's inner lives operate within a broader context of culture (Anderman & Klassen, 2016; Mockler, 2011). A yoga instructor's personal characteristics and beliefs about capabilities offer a layer of complexity beyond beliefs influenced by style. Beliefs about one's experience and competency may inform a teacher's epistemology and choices. Furthermore, emotions and affect are increasingly discussed in current research.

A teachers experience and broader culture have been linked to differences in student interaction (Anderman & Klassen, 2016) and instructional choices (Fives & Buehl, 2015). For example, teaching self-efficacy, which is a teacher's degree to which a teacher believes he or she

is able to perform teaching tasks at a specific level of quality in a specific situation (Dellinger, Bonnett, Oliver, & Ellett, 2008). Teacher self-efficacy has been found to predict positive teacher behaviors (Muijs & Reynolds, 2002).

Schutz and Pekrun (2007) argue that beliefs serve as a *referent point* for emotional experiences to emerge. Emotions and affect are increasingly viewed as a critical component in both student's and teachers' performance (Shutz & Pekrun, 2007; Boekaerts & Pekrun, 2016). Schutz and Zembylas (2009) suggest that teacher emotions and emotional beliefs have a myriad of influences on the classroom and learning. As such, emotion regulation should be included to provide an inclusive understanding of instructional choices. Emotional regulation is a current area of research on teacher beliefs (Gill & Hardin, 2015). Links to emotion and regulatory skill development have been found (Lombaerts et al., 2009). Together, epistemic/pedagogical and affectual/experiential beliefs allow a flexible framework in which to begin inquiry on yoga instructor beliefs.

Conclusion

The mind-body therapy, yoga, has a unique experiential component that underlines the significance of both instruction and instructor. In the practice of harnessing a united body and mind, the integrated nature of teacher-led curriculum and experiential learning must be holistic in inquiry to properly assess outcomes. As research using yoga interventions continues to grow, both instruction and instructor should be considered as variable in nature.

The incline in mass and quality of research suggests that the efficacy of yoga has implications across a number of fields including integrative health and education. However, the large scope of styles of yoga prohibits generalizability of research results. While recently an instrument has been published that recognizes the components of a yoga instruction, research on

what influences instructors to choose said components to emphasize has not been pursued. To properly assess a yoga intervention, a profile of both the yoga instruction (i.e. style and intervention) and the yoga instructor (i.e. beliefs) is necessary.

CHAPTER 3: MANUSCRIPT 1

YOGA INSTRUCTOR BELIEFS SCALE (YIBS) DEVLEOPMENT AND METHODS

Abstract

Yoga is a multi-dimensional and heterogeneous mind-body therapy. Tools that assess and evaluate distinct aspects of a yoga practice or intervention are necessary to facilitate comparative analyses. While the Essential Properties of Yoga Questionnaire (EPYQ) measures the observable presence of intervention components during instruction, no tool exists to address individual differences in the beliefs of yoga instructors. Hence, the Yoga Instructor Beliefs Scale (YIBS) was developed as a self-report tool that researchers and supervising-clinicians can use to identify beliefs and values of yoga instructors, which may have a significant influence on the yoga instruction. We summarize the products of the sequential exploratory phases of the instrument development process and report results from each. During Phase I, a comprehensive construct model of yoga instructor beliefs was developed by integrating current research domains in teacher beliefs and emergent themes from semi-structured interviews across a diverse sample of yoga teachers. In Phase II, panels of experts evaluated the construct novelty and importance of themes, resulting in a pool of potential items. Phase III consisted of cognitive interviews to assess the perceived meaning and clarity of using the preliminary YIBS items. The results of these three phases add to the construct validity of the YIBS instrument, and its intended use to illuminate differences in style, training, and setting and link yoga instructor beliefs to the presence of various components of yoga interventions. Long-term use of this tool could allow researchers to understand potential mediation or moderation of yoga instructor beliefs on the efficacy of yoga intervention components on specific outcomes.

Keywords: yoga, yoga instructor, teacher beliefs, Rasch instrument development

Introduction

Yoga is a practice, philosophy and/or therapy with empirically demonstrated efficacy in health and wellness outcomes that includes physical, emotional, and mental training. Interest in yoga is growing in the fields of psychological health, physical health, and schools, and this growing popularity of yoga in therapeutic and educational settings warrants attention. The scope and quality of research is rapidly evolving (Jeter et al., 2015; Elwy et al., 2014), but the heterogeneous nature of yoga as an intervention (Groessl et al., 2015) poses problems in generalizability and meta-analysis of effects. Differences in styles of yoga stemming from various methodologies, schools and lineages complicate assumptions of efficacy.

In a systematic review of literature Riley & Park (2015) identify mechanisms of change that may influence outcomes. In 2015, Groessl et al. reported on the development of the Essential Properties of Yoga Questionnaire (EPYQ) to provide an objective tool for describing the amount of various components of yoga interventions to adequately describe the components of the yoga interventions being used. The EPYQ demonstrates good reliability and validity and is available to yoga researcher as an objective measure of yoga-intervention characteristics (Park et al., 2016). The EPYQ identifies fourteen key components of a yoga intervention: acceptance/compassion, bandhas, body awareness, breathwork, instructor mention of health benefits, individual attention, meditation and mindfulness, mental and emotional awareness, physicality, active postures, restorative postures, social aspects, spirituality, and yoga philosophy.

The components of a yoga intervention are chosen and delivered by an instructor (i.e., yoga therapist or yoga teacher). In discussing the relationship between teacher and content Lea, Philo, & Cadan (2016) suggest that yoga instructors are experts who seek to teach underlying

philosophies. While research often positions yoga as an embodied and experiential skill-acquisition (i.e., skill cultivation, see Butzer et al., 2015), it should be taught to be most effective (Butzer et al., 2016). Musial (2011) suggests that a unique quality of yoga is that it is experiential in nature but needs to be led by a qualified teacher. Though a discussion of qualifications or certifications of a yoga instructor is beyond the scope of this paper, it should be noted that there seems to be a wide degree of variance in the use of the term qualified. The role of the yoga instructor is to facilitate skill-acquisition through the practice of yoga. As such, the choices of a yoga instructor impact experience and learning. Therefore, examination of what influences yoga instructor choices should be pursued.

While current yoga research has not explored inferential relationships to yoga instructor choices, there is long-standing evidence that beliefs of school teachers impact outcomes. In educational psychology, persistent findings suggest that schoolteachers' differing beliefs and epistemology (i.e. knowledge) impact student outcomes (Helms & Stokes, 2013). Modern use of the term *beliefs* includes individual, subjectively true, value-laden mental constructs that are the relatively stable (Skott, 2015), and leading educational psychologists argue that beliefs are "the single most important construct in educational research" (Pajares, 1992, p. 329). Beliefs guide choices which, in turn, guide student learning processes (Bandura, 1986), and as teacher beliefs filter information, frame circumstances, and guide behavior (Fives & Buehl's, 2012) these beliefs are a central factor to also be considered in yoga educational, efficacy, and outcome research.

The current project advances extant yoga research with the development of a tool to enhance analysis of yoga interventions as well as deepen the quality of exploration of yoga

instruction and education by identifying measurable beliefs of yoga instructors (i.e. teachers and therapists) that may influence instruction.

Methods

Research Aims

The Yoga Instructor Beliefs Scale (YIBS) was created with the following aims: 1) To derive a list of relevant belief constructs across yoga instructors; and 2) To develop a self-report survey that can be completed by yoga instructors to accurately measure belief constructs. This research is part of a larger research project that includes validation and psychometric analysis of the developed instrument.

Overview of Study Design

A sequential exploratory design was employed, following the Rasch instrument development framework described in Wolfe & Smith, 2007. In line with commonly used measurement development techniques, including the Essential Properties of Yoga Questionnaire (EPYQ; Groessl et al., 2015), Rasch uses extensive quantitative and qualitative methodology to develop informed viable constructs. Rasch measurement principles and techniques have been employed in the development and validation of medical assessments, including those measuring patient reported outcomes (de Bock, Williams, Tugaut, & Guillemin, 2016), and educational assessments, such as the Self-Efficacy to Teach Statistics (SETS; Harrell-Williams et al., 2017)

The instrument development activities were part of a three-phase process. Phase I allowed for rich exploration of yoga instructor perceptions and teacher beliefs. In Phase II, constructs and themes of teacher beliefs and yoga instructor perceptions were discussed by experts in yoga research and education. Finally, Phase III developed and field-tested a prototypic survey. The research in developing this survey was approved by the Institutional

Review Board at the study site, and all participation was self-selected through voluntary recruitment.

Phase I: Exploration and Organization

To provide a rich contextual view of beliefs, the focus of Phase 1 was qualitative exploration of potential constructs around yoga instructor perceptions and teacher beliefs. Of pertinence to the current publication, the first phase of this project seeks rich qualitative inquiry. An intentional emphasis of this project was to provide in depth qualitative inquiry to develop a theoretically explored foundation for instrument development. Note that tables are provided with findings as early as the preliminary stage of investigation to provide evidence for the iterative process of instrument development. However, as the project progresses constructs and assumptions evolve.

Construct Development. In line with Rasch methodology, a strong theoretical rationale is important to frame construct validity testing, this was sought through a literature review of research in teacher beliefs. Research in the field of educational psychology contributed to the organization of teacher beliefs and how they influence student outcomes. A scoping review of literature found key areas in which teacher beliefs are used in empirical research and discourse. A flexible framework was sought to create a setting of inquiry. Key areas of teacher beliefs were identified: epistemic/pedagogical beliefs, and affectual/experiential beliefs.

Epistemic beliefs are defined as a set of frameworks of ideas that define the way we understand the world (Denzin & Lincoln, 2005). Aptly, Crotty (2003) defines epistemology, as the "philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate" (p. 8). Hancock and Gallard (2004) infer that epistemology leads to generalized approaching to teaching as a transmission of knowledge.

Within and overlapping with epistemology is pedagogy, pedagogical beliefs are teachers' beliefs on the best and most effective ways to teach. Experiential and affectual (i.e. emotion) beliefs are discussed in the most recent edition of the *Handbook of Educational Psychology* (Skott, 2015), emphasizing the importance of teachers' lives. This involves conceptualizing the role of a teacher as a dynamic system whose inner life and beliefs (within a broader context of school and culture) includes efficacy, emotions, and engagement (Anderman & Klassen, 2016). This flexible systems framework of epistemic/pedagogical beliefs and affectual/experiential beliefs informed an interview-guide and potential probes for the researchers to begin interviews.

Interviews. To identify perceptions of yoga instructors across styles of yoga, semi-structured interviews were conducted. Interviews were performed as conversational partners (Rubin & Rubin, 2012), meaning that the lead investigator, also a yoga teacher, prompted open dialogue about yoga. To ensure the inclusion of many styles of yoga, we employed purposeful sampling (Patton, 1990). Yoga instructors were recruited in 2017 via email. An internet search was done to develop a list of yoga organizations, studios, and individuals to recruit. Effort was made to reach a diverse population of styles, lineages, and clientele. Inclusion criteria included an upper level certification in a specific yoga style, a minimum of five years' teaching experience, 18 years of age or older, and signed, informed consent. Of approximately 100 instructors contacted to participate in the study, 21instructors expressed interest in participating. Thirteen of these met inclusion criteria, and 12 completed phone interviews (4 men and 8 women). Participants were mostly Caucasian (Caucasian = 10, Hispanic = 1, Indian American = 1) and female (female = 8, male = 3). Although most of the participants lived closer to a coast (east coast = 4, west coast = 4), individuals from the Midwest (n = 2) and South (n=2) were also included.

To ensure a diverse sample of yoga instructors, styles of yoga needed to be identified so that the sample could be selected from all styles. Based on an initial review of literature, styles were reviewed for setting, theoretical background, curricular goals, and sequencing. Styles were clustered together based on similarities. Table 3 presents clusters of modern yoga styles identified. The yoga instructor participants represented six clusters of yoga styles (Ashtanga 18%, Holistic, 18%, Hot 9%, Iyengar 18%, Power 9%, and Generic 28%: see Table 3 for details on style). While effort was made to include all of the eight styles identified in the literature review, participants representing Kundalini and Gentle yoga were scheduled but did not complete interviews.

Table 3

Clusters of Styles of Modern Yoga

Clusters	Example
Holistic	*Sivinanda, Kripalu, Integral, Ananda, Vivekananda*
Hot	*Hot 26, Bikram, Surya*
Power	*Baptiste, Core Power*
Gentle	*Silver, Yin, Vini*
Generic	*Hatha, Variations, Vinyasa*
Alignment Based	*Iyengar, Ansura*
Ashtanga Kundalini	*Mysore, Ashtanga*

Note: Clusters were identified by author arbitrarily by basic common knowledge of styles and components. Further systematic cluster/classifications should be done to better understand how styles group together.

Interviews were conducted by phone, lasted between 50-90 minutes, and were recorded and transcribed verbatim. The lead investigator prompted discussion around four key beliefs areas identified in the literature review: 1) Context, 2) Epistemology, 3) Pedagogy, and 4) Experience. This exploratory process was an effort to gather rich and dense data.

The qualitative analysis of the interviews included three specific steps: 1) Exploratory theme identification; 2) Qualitative comparative analysis; and 3) Organization and statement extraction. Initial transcriptions were coded using exploratory line-by-line and thematic grounded theory principals (Charmaz, 2003), and the primary investigator created a codebook. Transcripts were then de-identified, and an informed post-hoc coding was performed with a team of graduate research assistants.

Using a priori, content-specific coding (Bernard & Ryan, 2010) researchers coded all transcripts and came to a consensus on emergent themes. The themes found were: Differentiation, Physicality, Yoga Philosophy, Role, Curriculum, Languaging, Safety, and Experiential. Table 4 presents examples of emergent themes through yoga instructor interviews. Findings support the importance of beliefs to yoga instructors. However, if beliefs influence differences in instructor choices then there needs to be some evidence of differences between yoga instructors.

To seek preliminary evidence that these beliefs may differ across yoga instructors and yoga styles the presence, qualitative comparative analysis was used (Ragin, 2008). Using a comparative fuzzy-set matrix (Scheider & Wegamann, 2010) Table 5 presents the initial fuzzy-set matrix describing presence of themes in each style. Blinded by style, secondary coders rated each interview for the presence or absence of a theme using dichotomous coding (0 meaning not present, 1 meaning present)

Table 4

Emerging Themes of Yoga Instructor Belief Perceptions

Theme	Examples
Differentiation	It's for every body and I want them to know that they have every right and ability to get these benefits.
Physicality	I try to make it available to everybody and so you can have a wide range in classes, so offer different options.
Yoga Philosophy	I think that's why we start with asana because it's the most easy… easily accessible. It's here, we can touch it, we can see it, it's available to us and gives us immediate feedback. But that, in turn, starts to inform us of all the other limbs. All the more subtle aspects. Even the philosophy starts to arise out of the experiences in the physical.
Role	I think it's more important that people understand the true purpose of yoga and the foundational teachings of yoga.
Curriculum	As we progress in the practice then we may feel called to a deeper study of some of these more ancient texts, and then that learning gets codified.
Languaging	And I think the whole point is to guide our students into the darkness and find where the light is. If you're afraid of pain, afraid of being challenged, afraid of suffering in yoga, where's the growth?
Physical Safety	I start it [child's pose] off every time because for a while I got away from it and I thought every time I hear it as a student I appreciate it. So even in the beginning of class, I say we're starting in child's pose.
Emotional Safety	We don't talk in metaphors or similes and we always use "your body," "your leg," not "the body" or some "distant body part." I feel like that does give more ownership and it does make people feel safe in a way that they don't realize. That our language is so meticulously mined and thought over.
Experiential	I would say number one is how to keep your students safe. Know how to protect students against injury in class is really important.

Note. Words are verbatim from interview, with the exception of bracket use to denote meaning inferred earlier in text. Themes are listed by most common to least common. Examples are arbitrarily chosen by author. As presented at the 2017 Symposium for Yoga Research (Rybak, Reeves, & Jorgenson, 2017)

Finally, themes were mapped into teacher belief constructs to create an initial list of belief constructs. Using previous educational psychology literature themes of Safety, Differentiation, and Curriculum were clustered into Student Centered Learning, Differentiated Instruction, and Accessibility. The remaining themes were clustered into beliefs about Integration and Emphasis. Once the initial construct map was developed, statements were extracted from interviews to provide example items for Phase II of the project.

Table 5

Presence of Themes Between Styles

Theme	Holistic	Hot	Power	Generic	Alignment-Based	Ashtanga
Differentiation	*	*1	*	*	*1	1
Prana	1	1	1	*	*	1
Physicallity	*1	*1	*1	*1	*	*1
Yoga Philosophy	1	0	*1	*	1	1
Responsibility	1	*0	1	*	*1	1
Instructional Choice	1	1	*1	*	*	1
Languaging	1	1	1	1	*	*
Physical Safety	1	0	1	*	*	*
Emotional Safety	1	0	*1	*	*	*
Experiential	1	1	1	*	1	1

Note. Presence of construct are coded using fuzzy-set dichotomous codes. Threshold and identification was designed by theme (i.e. at least once; 25%; etc.) and informed by interview data. 0 = construct not present or identified, 1 = construct present or identified , * = undetermined, *1 or *0 = determined post code. As presented at the 2017 Symposium for Yoga Research (Reeves, et al., 2017).

Phase II: Expert Input

To facilitate collaborative and informed development of theoretically viable constructs (Wolfe & Smith, 2007), the input of experts was sought to transform the construct map and item examples into a prototype survey.

Expert Panel Focus Groups. Focus groups were conducted with expert panels to facilitate discourse in constructs and elicit input toward construct and item development. To identify experts in yoga, potential participants were recruited through online searches, publication and presentation reports, and word of mouth. In addition to the inclusion criteria of the instructors (5 years of yoga instruction and 18 years of age) selection of experts included national notoriety and offerings of workshops, publications, presentations, or training. Expert panel focus groups were conducted through an online portal (GoToMeeting) and were designed to be conversational, structured around the presented beliefs constructs with room to allow for pertinent ideas to emerge. Three focus groups were conducted with 2-3 participants in each (N=7 total). Using a progressive, iterative process, construct maps and items were reconstructed after each expert panel focus group.

Important to the current work, expert panels identified a missing component to the construct map: the relevance of the *Yamas and Niyamas* (historical ethical principles for yoga practitioners) and yoga instructor responsibility and discipline. Discussion and further research clarified the need and scope of the additional construct. Further, interviews were re-coded for the presence of themes related to responsibility and discipline. The addition was deemed necessary, yet overlap between pre-identified constructs was apparent. A reconstruction of the belief construct map, as well as final interview coding and statement extraction was completed,

and inter-rater reliability was used to ensure consistency. We utilized the resulting map and statements to develop the prototype questionnaire.

Prototype Questionnaire. A progressively developed item pool of 71 statements was, derived from the interviews and expert panel focus groups, was created. Representing six constructs, the items were then organized into four sections: beliefs about yoga, beliefs about self as a yoga teacher, beliefs about yoga instruction, and beliefs about yoga as a yoga participant. Table 6 gives examples of items within constructs. Six constructs, or subscales, were created: Integration, Emphasis (with 5 domains), Student-centered Instruction, Differentiated Instruction, Accessibility, and Responsibility/Discipline.

Integration beliefs clustered around ideas of integrated learning across mind, body, emotion, intellect and existence (also described as the five sheaths). Emphasis beliefs demonstrated a preference or emphasis on a particular part of yoga such as physical or emotional learning. Student-centered instruction beliefs centered around whether teacher choices are driven by theory or by student need. Differentiated instruction beliefs identify the degree to which instruction changes across a diverse student base. Accessibility beliefs demonstrate teacher self-efficacy in including students with limitations. Responsibility/Discipline beliefs show a connection to moral or ethical components of yoga (also discussed as Yamas and Niyamas). Of the constructs, Integration, an epistemic belief construct, represented 21% of the total items. The constructs related to pedagogical beliefs representing 30% of the total items as follows: Student Centered Instruction (6%), Differentiated Instruction (14%) and Accessibility (10%), represented 30% of the total items. The experiential beliefs of Emphasis (36%) and Responsibility/Discipline (13%) represented 49% of the items. Answers are based on a 1 – 7 numerical scale of frequency with one set of the following cues: 1 indicating "strongly disagree",

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3 indicating "disagree somewhat", 5 indicating "agree somewhat" and 7 indicating "strongly agree" or 1 indicating "never", 3 indicating "not often", 5 indicating "often" and 7 indicating "always". The middle (sometimes) and neutrals (agree or disagree) are not included to eliminate the potential for center tendency bias. The wording and formatting of each item was assessed using principals of item construction to facilitate clear, concise, accessible statements (Wolfe & Smith, 2007). The scale was developed using Rasch model theory following Wolfe and Smith (2007) to assess initial content validity and technical quality.

Table 6

Example Items

	Integration	Emphasis	Student Centered Learning	Differentiated Instruction	Accessibility	Responsibility and Discipline
Beliefs about Yoga	*Yoga offers a unitive experience of mind, body, and spirit.*					
Beliefs about self as Yoga Teacher	*When I teach meditation, I include anatomical/physical cues.*		*I prefer teaching one-on-one.*	*I change my sequencing and cues during a class based on how my students are reacting to a posture.*		
Beliefs about Yoga Teaching					*It is a yoga teacher's responsibility to change instruction and/or make adjustments to ensure that students feel accepted, supported, and included in class.*	
Beliefs about self as a Yoga Participant		*Yoga has helped me recognize negative self-talk.*				*I challenge myself to observe and be aware of the things around me, even if they are unpleasant.*

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Phase III: Field Testing

The aim of the third phase was to ensure that items were unambiguous and easy to answer on a scale of agreeability or frequency. To ensure this cognitive interviews were performed to ensure an intensive exploration of wording clarity, appropriateness, and field importance.

Yoga teachers and therapists were recruited via email and word of mouth (N=10). The initial interviewees were contacted and given an opportunity to review the items in a phone interview (n=2). As the contextual richness of the field testing methodology weight in-person interviewing, recruitment of local instructors was used. Local studio owners were contacted and teachers from 5 different studios replied with interest. Therefore, in addition, in person interviews were performed with teachers local to the research cite city (n=8). Using a *think aloud* technique (Wolfe & Smith, 2007) participants read through the YIBS prototype and discussed their understanding of the items' meanings, whether they had problems responding, and how easily they understood the items. Each interview lasted between 45 and 90 minutes. An iterative item and scale development process was used to make small improvements as interviews were completed. Each adjustment was notated. The interviews were transcribed verbatim. After all interviews were complete, transcriptions and adjustment notations were reviewed for consistency.

The resulted in a 69-item survey with six subscales. Table 7 shows a complete blueprint of the sections and constructs covered. The survey was developed so that it can be taken online at any time.

Table 7

Test Blueprint

	Integration	Emphasis	Student Centered Learning	Differentiated Instruction	Accessibility	Responsibility and Discipline	TOTAL
Beliefs about Yoga	7	11					**25%**
Beliefs about self as Yoga Teacher	7	10	3	6	4	1	**44%**
Beliefs about Yoga Teaching		1	1	4	3	4	**18%**
Beliefs about self as a Yoga Participant	1	4				4	**13%**
TOTAL	**21%**	**36%**	**6%**	**14%**	**10%**	**13%**	71

Discussion

The diversity in yoga-based practices and yoga philosophy leads to substantial variability in yoga participants' experiences, which leads to differences in reported and experienced outcomes. Yoga instructors' beliefs and values may be a potential factor influencing the experience of yoga participants. As Groessl et al. (2015) state, there is a need to have *processes of measure* in place to provide tools to systematically study the differences and relative effects of yoga interventions on outcomes. The EPYQ (Groessl et al., 2015) is a measurement tool that characterizes components of a yoga intervention. However, the differences in core beliefs of the yoga teacher or therapist administering the yoga remain unexplored.

The YIBS is a measurement tool that identifies beliefs and values of yoga instructors (teachers and therapists). This tool may be used by researchers to identify differences in yoga teachers across a single intervention. However, interventions will vary in many ways, including curriculum, goals, instruction emphasis, and style. Therefore, measuring differences across

interventions may be limited in scope and may lead to inaccurate assumptions. Cross-intervention analysis should include an additional measure, such as protocol/adherence reports, in conjunction with the YIBS.

The YIBS may also provide insight regarding correlational research. Fives and Buehl (2014) suggest that teachers hold subsets or subsystems of beliefs that group together. Identifying beliefs that may cluster in relation to variables such as style, level of training, emphasis of instruction, or intervention setting may provide insight into core differences across yoga teachers and therapists. For example, a large-scale study identifying pedagogical and epistemic differences between yoga therapists, yoga teachers, and yoga instructors who provide a combination of yoga services may provide insight into the kinds of differences that influence health care outcomes. However, the YIBS must be validated before it can properly be used as a scale.

While the development of the survey was done in a rigorous and intentional manner, it is important to note that quantitative instrument validation and confirmation of the psychometric properties is essential before making assumptions about the belief factors. Future directions of the current project include using Rasch modeling to validate the factor structure and analyze individual items for validity.

CHAPTER 4: MANUSCRIPT 2

ASSESSING THE FACTOR STRUCTURE AND CONCURRENT VALIDITY OF THE

YOGA INSTRUCTOR BELIEFS SCALE

Abstract

The paradigm shift from core curricula to educating the *whole-child* and teaching *Social and Emotional Learning* (SEL) necessitates tools to facilitate comparative analysis on evidence-based practices in these areas. One such *whole-child* practice involves yoga instruction. While a validated instrument is available to identify observable behaviors of yoga teachers, no such measure of instructors' self-reported beliefs exists. The purpose of this study was to refine and validate scores from a recently developed instrument that measures beliefs of yoga instructors and determine subscales of the instrument. Validity and reliability evidence for the scores from the Yoga Instructor Beliefs Scale (YIBS) was evaluated using a sample of 203 yoga instructors who completed the YIBS via Qualtrics. Exploratory factor analysis was used to assess the factor structure. Correlations with existing measures were used to assess concurrent validity. Results from analyses suggested two overarching domains with a total of ten factors for the YIBS. The factors of the Defining Yoga domain are: Experiential, Transformational, Energetic, Affectual, Mindful, & Physical. The factors of the Teaching Yoga Domain are: Curriculum Integration, Student Awareness, Accessibility and Differentiated Instruction). Future studies should investigate the domains and factors in relation to style of yoga, years of instruction, observed behavior during instruction, and student outcomes.

Keywords: Scale development, yoga, instructor beliefs, teacher beliefs, yoga in schools

Introduction

The call for *Social and Emotional Learning* (SEL) argues that successful, adaptive, healthy students have skills in areas beyond traditional curriculum content areas. As a part of the *whole-child* movement, organizations like the Collaborative for Academic, Social, and Emotional Learning (CASEL) call for a more dynamic view of curricula. This integrated view of learning includes learning activities beyond the core curriculum, such as yoga (Hyde, 2012). Yoga involves a multimodal curriculum including mindfulness, breathing practices, physical movement, and relaxation (Butzer, Ebert, Telles, & Khalsa, 2015) taught by a qualified teacher (Musial, 2011).

Yoga is a heterogeneous practice (Groessl et al., 2015) that is led by a teacher or therapist. A qualified teacher may have a number of yoga trainings and an array of experience informing his or her teaching choices. As a classroom teachers' beliefs guide their choices in the classroom (Fives & Buehls, 2014), the route of a yoga teacher's choices should also be explored. While evidence is growing for school-based yoga programs (Butzer et al., 2016), little to no research has investigated beliefs of yoga instructors.

Yoga in Schools

Research on yoga in school settings is on the rise (Butzer et al., 2015). A published literature review of research on school-based yoga presents empirical and theoretical rationale for yoga as a tool for social and emotional development (Butzer, Bury, Telles, & Khalsa, 2016). Similarly, systematic reviews have found that while research on school-based yoga is young and methodological quality is low-to-moderate (Khalsa & Butzer, 2016), there is preliminary evidence of improving emotional balance, attentional control, cognitive efficiency, anxiety, mood, resilience and coping (Serwacki & Cook-Cottone, 2012; Butzer et al., 2015) as well as

perceived benefits such as improved well-being (mental, social, physical) and increased adaptive behaviors (Chen & Pauwels, 2014).

Yoga research in schools contributes to the educational understanding of yoga. The efficacy of yoga therapy in clinical settings informs us in the potential for psychological, cognitive and physiological skill acquisition. While research on yoga in schools provides a platform for understanding educational benefits of yoga, there are gaps to be addressed. To increase rigor and consistency, some suggest an increased focus on comparative controls (Telles et al., 2013; Hagins, Haden, & Daly, 2013) and pedagogical differences (Ehud, An, & Avashalom, 2010; Bergen-Cico, Razza, & Timmins, 2015). Furthermore, though the design of both yoga and classroom education recognized importance of teacher characteristics on student outcomes, there is little to no depth in reporting on the yoga instructors themselves.

Yoga Teachers and Teacher Beliefs

A certification for a yoga teacher usually involves a *Teacher Training* that may be done at a remote location under a certifying organization or at a local studio. One commonly recognized teaching accreditation is a 200 or 500 hour certification reviewed by the Registered Yoga Teacher Alliance (RYT). A yoga therapist training involves graduation from school accredited by the International Association of Yoga Therapists (IAYT). Accreditation to train and certify a yoga teacher or therapist involves hours in training, curricular inclusion, and hours in supervised practice. The experience, epistemology, lineage, and emphasis of instruction may be different across certifying agencies.

Yoga must be taught and cultivated to be most effective (Butzer et al., 2016). As Butzer et al. (2015) state, "*Yoga-based physical movement, breathing exercises, meditation practices and relaxation techniques provide [students] with an embodied and experiential sense of what it*

feels like to cultivate these skills" (p. 20). The practice of yoga creates an environment of embodied experience cultivating skills; however, the skills must be taught. The importance of the environment and instruction is pivotal in any skill acquisition (Bandura, 1986). While the influence of yoga instructor beliefs have not been explored, long-standing research in the classroom suggests that teacher beliefs are important.

The beliefs of a teacher have been linked to environmental and instructional differences. Teacher beliefs predict teaching practice and pedagogy (Pajaras, 1992; Zee & Helma, 2016), teaching preparation and effectiveness (Nespor, 1987), and student outcomes (Kunter et al., 2013). Beliefs influence teacher practice through impacting the way in which teachers filter information, frame problems, and guide action which, in turn, influences student learning (Fives & Buehl, 2014). In addition to impacting behavior, beliefs can create a structure of learning (Hertzog, 2011).

For yoga instructors, the way in which yoga was learned and experienced will have inevitable impact on the way in which it is instructed. As evidenced by classroom research, the way in which individuals are instructed through curricula will change their learning experience, thereby impacting his/her cultivation of skills. Therefore, exploring the individual differences in beliefs across yoga teachers is pivotal in understanding the learning process.

Current Study

Most research in yoga and school-based yoga has overlooked the instructional and educational beliefs of yoga instructors. In the first phase of the larger study on yoga instructor beliefs, specific factors of epistemological, pedagogical, and self-efficacy beliefs were identified and an initial item bank was created. The current work focuses on the instrument refinement and validation process. The primary goals were to evaluate the proposed item-to-subscale mapping

via factor analysis and identify items for revision or removal. We hypothesized that subscales would emerge based on epistemic beliefs and training. Additionally, to provide evidence for concurrent validity, correlation analysis was conducted with emerging subscales and existing measures of interoceptive awareness, differentiated instruction and self-efficacy about accessibility. We predicted positive correlations between yoga instructor belief and teacher belief scales.

Method

Participants

Yoga instructors were recruited via virtual communication methods, including email, Facebook, and Instagram. There was no monetary incentive given for completing this survey. Initially, 338 respondents entered the online Qualtrics survey and consented to participation in the research project, via a consent question. Of those participants, 204 participants fully completed the entire YIBS survey.

Though potentially demonstrative of the specific target population, the gender and ethnicity of the sample were not diverse. The majority of the participants were female (90%) and white (85%), with 2% black or African American, 4% Hispanic or Latino/Latina, 2% Asian, and 7% who identified as Other. The sample did show diversity in age and geographic region. The youngest yoga instructor was 19 years old and the oldest was 75 (M = 43.8, SD = 11.9). Participants within the United States (81%) covered all regions: Northeast (23%), Pacific Northwest (1%), Southeast (22%), Midwest (14%), Midsouth (15%), and West Coast (6%). In addition, there were yoga instructors from Canada (7%) and *non-US: other* (13%). Figure 2 summarizes the style of yoga instructors reported in both their instruction and practice.

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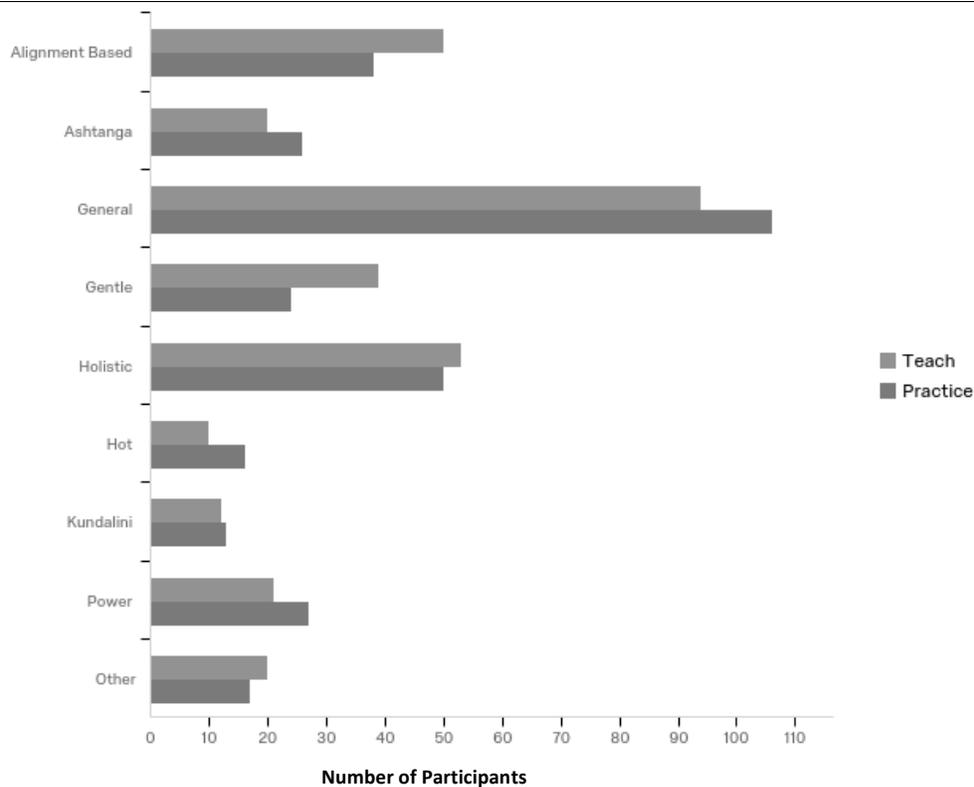
Figure 2. Summary of Style of Yoga Taught and Practiced.
Note: Reported styles are based on clusters of styles conceptualized in part 1 of this
project. See Reeves et al. (2018) in progress.

Measures

Yoga Instructor Beliefs Scale. The YIBS was designed to assess beliefs of yoga

instructors (Reeves, et al., in progress) using a sequential exploratory design. The scale was

developed using the Rasch measurement framework, following instrument development

activities as described in Wolfe and Smith (2007). The YIBS began as a 69-item questionnaire

with six potential subscales: Integration, Emphasis (with 5 domains), Student-centered

Instruction, Differentiated Instruction, Accessibility, and Responsibility/Discipline. Response

options are based on a scale of 1 – 7 with one set of the following cues: 1 indicating "strongly

disagree", 3 indicating "disagree somewhat", 5 indicating "agree somewhat", and 7 indicating "strongly agree" OR 1 indicating "never", 3 indicating "not often", 5 indicating "often", and 7 indicating "always". The middle (sometimes) and neutrals (agree or disagree) is not included to eliminate the potential for center tendency bias. Table 8 outlines a test-blueprint of the original YIBS.

Table 8

Original YIBS Initial Test Blueprint

	Integration	Emphasis	Student Centered Learning	Differentiated Instruction	Accessibility	Responsibility and Discipline	TOTAL
Beliefs about Yoga	7	11					**26%**
Beliefs about self as Yoga Teacher	7	10	3	6	4	1	**45%**
Beliefs about Yoga Teaching			1	4	3	3	**16%**
Beliefs about self as a Yoga Participant	1	4				4	**13%**
TOTAL	**22%**	**36%**	**6%**	**14%**	**10%**	**12%**	69

Note: Originally published in (Reeves, et al., in progress).

Differentiated Instruction. Differentiated instruction is the degree to which teachers give individualized lessons, verbal cues, and assessments (Coubergs, Struyven, Vanhourtnout, & Engles, 2017). Modified versions of two factors in the Differentiated Instruction Questionnaire (DI-Quest: Coubergs, Struyven, Vanhourtnout, & Engles, 2017) were employed (See Table 2). The DI-Quest is a 31 item scale with five factors: mindset, ethical compass, flexible grouping, assessment, and use of differentiated instruction. Of these factors and items, only ethical

compass and use of differentiated instruction were applicable to the present study. From these factors, six items (3 in ethical compass and 3 in use of differentiated instruction) were removed as they contain related to teaching in a classroom and included language about government policy, assessment, and learning profile. The remaining 4-items were be used. Answers are based on a 1-7 scale of frequency, with 1 indicating "totally disagree" and 7 indicating "totally agree".

Accessibility. Self-efficacy about accessibility is the degree to which teachers feel comfortable accommodating students with special needs (Park, Dimitrov, Das, & Gichuru, 2016). A modified version of a factor in the Teaching Efficacy for Inclusive Practices Scale (TEIP: Park, Dimitrov, Das, & Gichuru, 2016; Sharma, Loreman, & Forlin, 2012) was used to assess beliefs about accessibility (See Table 2). The TEIP is an 18-item scale with three factors: efficacy to use inclusive instruction, efficacy in collaboration, and efficacy in managing behavior. Of these factors, only *efficacy to use inclusive instruction* was applicable to the present study proposal. From this factor, one item was removed as it contains language directly related to teaching in a classroom. The remaining 4 items were used. Answers are based on a 1-6 scale of frequency, with: 1 indicating "strongly disagree", 2 indicating "disagree", 3 indicating "disagree somewhat", 4 indicating "agree somewhat", 5 indicating "agree", and 6 indicating "strongly disagree".

Embodied Mindfulness. Interoceptive awareness, or the awareness of and ability to regulate bodily states, is a core component of yoga and suggested to be a mechanism of change (Gard et al., 2014; Cook-Cottone, 2017). Hence, the Multidimensional Assessment of Interoceptive Awareness (MAIA; Mehling et al., 2012) was used to assess the correlation between individual instructors' mindfulness and their beliefs about yoga and teaching yoga. The

MAIA is a 32-item questionnaire that includes eight subscales: noticing, not-distracting, not-worrying, attention regulation, emotional awareness, self-regulation, body listening, and trusting. While all the subscales are of merit, prototype testing of the online survey for this study indicated that fatigue would be an issue with all 32-items of the scale so two subscales were selected: attention regulation (7-items) and self-regulation (4-items). Answers are based on a 0 – 5 scale of frequency, with 0 indicating "never" and 5 indicating "always".

Table 9

Instrument Subscales and Items Used to Test Concurrent Validity

Instrument	Factor	Item
DI-Quest	Ethical compass	During my lessons, my students can decide with me on which assignment they need to work
		Knowing my students, I select the learning content, materials and teaching methods
	Differentiated Instruction	I choose the learning content and teaching methods based on my student
		During my lessons, different students work on different tasks with a different level of difficulty
TEIP	Efficacy to Use Inclusive Instruction	I am able to provide an alternate explanation or example when students are confused
		I am confident in designing learning tasks so that the individual needs of students with disabilities are accommodated
		I can accurately gauge student comprehension of what I have taught
		I can provide appropriate challenges for very capable students
MAIA	Attention Regulation	I can pay attention to my breath without being distracted by things happening around me.
		I can maintain awareness of my inner bodily sensations even when there is a lot going on around me.
		When I am in conversation with someone, I can pay attention to my posture.
		I can return awareness to my body if I am distracted.
		I can refocus my attention from thinking to sensing my body.
		I can maintain awareness of my whole body even when a part of me is in pain or discomfort.
		I am able to consciously focus on my body as a whole.
	Self-Regulation	When I feel overwhelmed I can find a calm place inside.
		When I bring awareness to my body I feel a sense of calm.
		I can use my breath to reduce tension.
		When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.

Note. Instruments listed were modified by removing unrelated factors and items.

Data Analysis

The aim of this research was to examine the appropriateness of items and the previously hypothesized internal structure of the YIBS. Exploratory factor analysis (EFA) was chosen because the study is exploratory in nature and this is the first time these items have been quantitatively analyzed. Additionally, EFA can increase the reliability of a scale by identifying inappropriate items as well as examine the dimensionality of constructs and relationships between items (Netemeyer, Bearden, & Sharma, 2003). EFA was conducted on the initial 69 items using SPSS 22 software. To determine the appropriate number of factors, parallel analysis (Velicer et al., 2000; Horn, 1965) was employed, using the raw data SPSS syntax (rawpar.sps; O'Conner, 2000). Item loadings were assessed to determine which factor the items should be assigned to and whether items with poor loading should be omitted. An *a priori* criteria for factor accuracy was selected (loadings $\geq .37$), based on the number of yoga instructors in the analysis (Norman & Streiner, 2014). To evaluate the internal consistency of the scores for the factors, a reliability analysis was carried out. Concurrent validity was assessed by conducting correlation analysis of the YIBS composite scores with modified scales of the DI-Quest (Coubergs, Struyven, Vanhourtnout, & Engles, 2017), the Teaching Efficacy in Inclusive Practices (Sharma, Loreman, & Forlin, 2012), and the Multidimensional Assessment of Interoceptive Awareness (Mehling et al., 2012). Effect sizes and cutoff values of the Pearson product-moment correlation coefficient were interpreted using Cohen (1988).

Results

Preliminary Analyses

Missing data analyses were conducted using SPSS. It became apparent that the majority of missing data was due to participants ending participation before the completion of the survey.

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In most cases, participants ended at the conclusion of a Qualtrics page, meaning they missed on average twenty items per page that they skipped. Only participants who completed all of pages of the online survey containing YIBS items were retained in the current study. Within the resulting data set, the individual item response distribution was visually inspected using frequency summaries to verify variability of responses for the YIBS items.

Initial Factor Analysis

Preliminary exploratory factor analysis revealed that the originally designated categories of Integration and Emphasis did not group together as hypothesized. Additionally, as the items from these two categories represented the majority of the original YIBS items, items from other categories, such as Differentiated Instruction and Accessibility, did not have loadings greater than .37 on any factors as the factors were dominated by the original Integration and Emphasis items. Hence, the rotated factor results were explored in order to develop a new analysis strategy. The original Integration and Emphasis items seemed to cluster around statement characteristics, specifically distinguishing *defining* yoga and *teaching* yoga. Items were then divided into two item characteristic domains, defining variables and teaching variables, in preparation for an EFA on each domain. There were initially seven items that described class size preference (i.e., preference for one-on-one, small class, or large class) and how lesson plans were implemented (i.e., a regimented unchangeable plan versus a flexible plan). Only three of these were kept in order to reduce the number of items. Additionally, there were two items that did not group with any other items (*There is one right way to do a posture* and *Yoga teachers have a responsibility to make ethical decisions*). A total of six items were removed, leaving 63 items for the remaining analyses.

Factor Analysis for Defining Yoga Domain

The parallel analysis of the eigenvalues for the original 28 items related to Defining Yoga suggested retaining six factors. Visual inspection of the scree plot in Figure 4 shows the change in the eigenvalues also starts to taper off around the 6th eigenvalue. Table 10 and Table 11 present the eigenvalue summary and factor loadings used to determine proper factors. The 6-factor structure accounts for 67.1% of the total variance in Defining Yoga items. The results for the EFA with Promax rotation showed that seven items did not have loading greater than .37 on any of the factors. These items were removed, resulting in a total of 21 items.
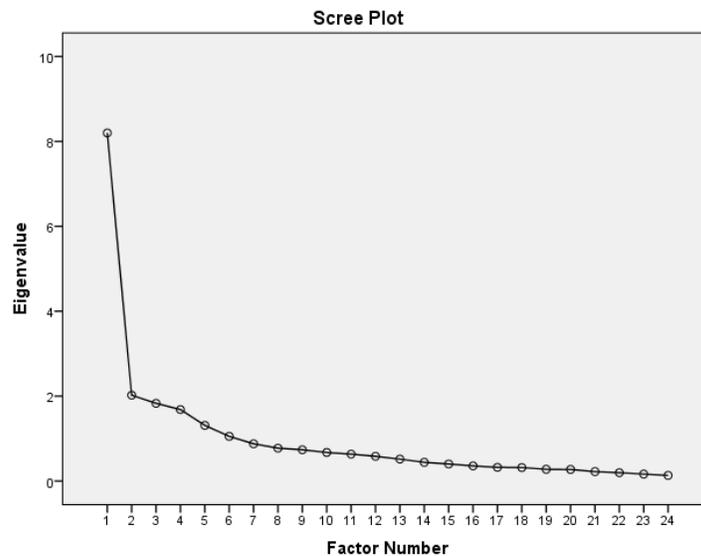

Figure 3

Scree Plot for the Eigenvalues of the Original 28 YIBS Defining Yoga Items

Table 10

Eigenvalues and Variance Explained for the Initial 6-Factor Structure of Defining Items

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.198	34.159	34.159	7.806	32.524	32.524
2	2.022	8.427	42.586	1.659	6.911	39.435
3	1.830	7.626	50.212	1.526	6.358	45.793
4	1.682	7.010	57.222	1.304	5.434	51.227
5	1.312	5.466	62.688	.938	3.908	55.135
6	1.053	4.387	67.074	.691	2.880	58.015

Note. Extraction Method: Principal Axis Factoring.

Table 11

Defining Yoga Domain Matrix with Six-Factor Structure

	Factor					
	1	2	3	4	5	6
Through yoga, we recognize physical sensations of emotions like enjoyment.	**.743**	.066	-.292	.238	-.201	.117
Through yoga, we recognize physical sensations of emotions like doubt.	**.672**	-.039	-.330	.151	**-.422**	.076
Through yoga, we recognize physical sensations of emotions like fear.	**.672**	-.042	-.328	.204	**-.408**	.044
A primary benefit of yoga is emotional healing.	**.648**	.113	-.094	.192	.045	-.177
Changing ones breathing can change physical health.	**.634**	**-.467**	.195	-.225	.061	.112
In my yoga practice, I recognize how I respond to emotions.	**.631**	.261	-.240	-.269	.202	.209
I have found that awareness of my breath during postures has led to changes in experience of every-day life.	**.626**	.071	-.075	-.192	.102	.008
Changing thoughts can change one's physical health.	**.620**	**-.438**	.168	-.204	-.049	.002
Yoga leads to a feeling of oneness or connectedness to all things.	**.616**	.347	.239	-.005	-.051	-.090
When I practice yoga I experience more of a sense of unitive consciousness.	**.611**	.330	.114	-.285	.055	-.069
Changing our emotional awareness can change one's breath.	**.594**	**-.421**	.023	-.131	-.116	-.026
Yoga works because practicing yoga creates awareness of our own layers of energetic fields.	**.591**	.304	**.581**	.107	-.201	-.073
A primary benefit of yoga is increased mindfulness.	**.562**	-.205	-.096	.353	**.381**	**-.462**
Yoga creates awareness of the subtleties of breathing.	**.549**	-.070	.107	.087	.076	.059
Through yoga, we learn to recognize mind-wandering.	**.532**	-.062	-.198	.238	.113	-.146
I often experience a sense of flow during yoga practice.	**.530**	.156	-.036	-.159	.155	.299
I challenge myself to observe and be aware of the things around me, even if they are unpleasant.	**.525**	.201	-.203	-.314	.079	-.085
Through my yoga practice, I recognize negative self-talk.	**.492**	.136	-.288	-.099	.095	-.093
I think it is important to be compassionate with myself.	**.477**	.140	-.151	-.047	.068	-.059
I set time aside each day for yoga.	.337	.203	.041	-.133	.202	.142
Changing the breath can change one's emotional health.	**.566**	**-.577**	.222	-.301	-.065	-.074
Yoga works because practicing yoga influences the energy channels of the body.	**.532**	.305	**.588**	.120	-.134	-.099
Yoga works because it improves the physical body.	.355	-.095	.268	**.515**	.134	.374
A primary benefit of yoga is physical health.	.361	-.167	.024	.349	**.382**	.203

Note. Extraction Method: Principal Axis Factoring. Factor loading above 0.37 bolded.

Using language that emerged during the item development process, the six factors for Defining Yoga are labeled as Experiential, Transformational, Energetic, Affectual, Mindful, and Physical (shown in Table 12). The first factor, Experiential, representing 34.2% of the Defining Domain, consists of seven items that describe the experiential nature of yoga, including emotional, physical, and existential components. Representing 8.4% of the Defining Domain, the second factor consists of four items that describe various states of change that happen in the context of yoga. The third factor, Energetic, contains three items representing 7.6% of the domain, incorporates esoteric ideas such as energy and connectedness. Also three items and 7.6% of the domain, the fourth factor, Affectual, distinguishes affect recognition through yoga. Finally, the last two factors, Mindful and Physical, had only two items and they define yoga in terms of mindfulness and physicality.

Table 12

The Definition Domain and Resulting Six-Factor Structure After Factor Reduction Procedures

	Factor					
	1	2	3	4	5	6
Factor 1: Experiential (7 items)						
In my yoga practice, I recognize how I respond to emotions.	0.999					
I often experience a sense of flow during yoga practice.	0.666					
I challenge myself to observe and be aware of the things around me, even if they are unpleasant.	0.647					
Through my yoga practice, I recognize negative self-talk.	0.524					
I set time aside each day for yoga.	0.515					
I have found that awareness of my breath during postures has led to changes in experience of every-day life.	0.513					
When I practice yoga I experience more of a sense of unitive consciousness.	0.483					
Factor 2: Transformational (4 items)						
Changing the breath can change one's emotional health.		0.979				
Changing ones breathing can change physical health.		0.790				
Changing thoughts can change one's physical health.		0.763				
Changing our emotional awareness can change one's breath.		0.681				
Factor 3: Energetic (3 items)						
Yoga works because practicing yoga creates awareness of our own layers of energetic fields.			0.982			
Yoga works because practicing yoga influences the energy channels of the body.			0.890			
Yoga leads to a feeling of oneness or connectedness to all things.			0.434			
Factor 4: Affectual (3 items)						
Through yoga, we recognize physical sensations of emotions like fear.				0.984		
Through yoga, we recognize physical sensations of emotions like doubt.				0.945		
Through yoga, we recognize physical sensations of emotions like enjoyment.				0.747		
Factor 5: Mindful (2 items)						
A primary benefit of yoga is increased mindfulness.					0.899	
Through yoga, we learn to recognize mind-wandering.					0.465	
Factor 6: Physical (2 items)						
Yoga works because it improves the physical body.						0.733
A primary benefit of yoga is physical health.						0.554

Factor Analysis for Teaching Yoga Domain

The parallel analysis of the eigenvalues for the original 35 items that were related to Teaching Yoga suggested retaining seven factors. The results for the EFA with promax rotation showed that 11 items did not have loading greater than .4 and so they were removed, resulting in 24 items. There were several factors without any items with loadings greater than .4 (i.e, 'empty' factors) so a model with fewer factors was examined. A visual inspection of the scree plot (Figure 4) shows the change in eigenvalues starts to level off around the 4th eigenvalue and there seemed to be four strong factors (i.e., multiple items with high item loadings) in the seven factor model, so a four factor model was estimated. Table 13 and Table 14 present the eigenvalue summary and factor loadings. Both factor loadings and theoretical nature of the items were used to determine proper factors.
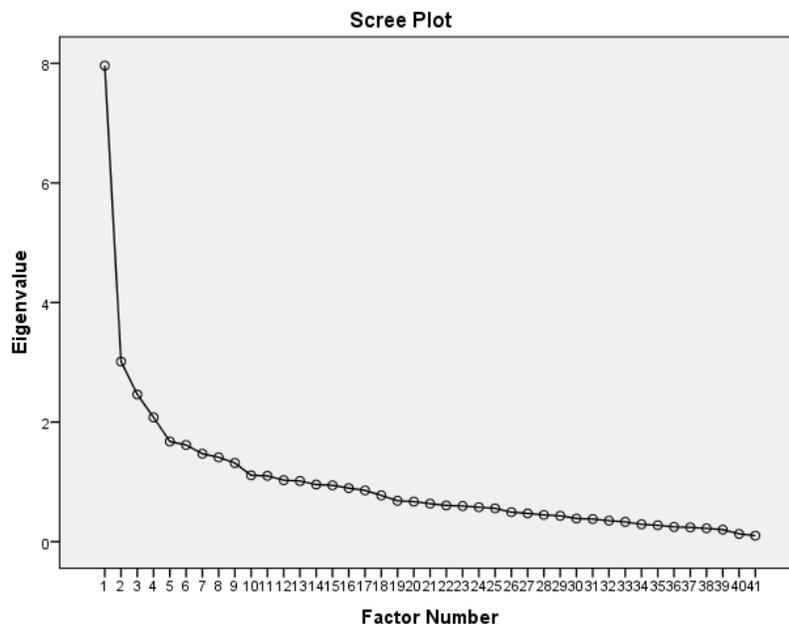

Figure 4. *Scree Plot for the Eigenvalues of the Original 35 YIBS Teaching Yoga Items*

Table 13

Eigenvalues and Variance Explained for 7-factor Structure of Teaching Items

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.765	21.139	21.139	6.765	21.139	21.139
2	5.385	16.830	37.969	5.385	16.830	37.969
3	2.695	8.423	46.392	2.695	8.423	46.392
4	2.236	6.986	53.379	2.236	6.986	53.379
5	1.781	5.566	58.945	1.781	5.566	58.945
6	1.462	4.569	63.514	1.462	4.569	63.514
7	1.286	4.019	67.533	1.286	4.019	67.533

Extraction Method: Principal Axis Factoring.

Using language that emerged during the item development process, the four factors for Teaching Yoga were labeled as Curricular Integration, Student Awareness, Accessibility, and Differentiated Instruction (shown in Table 14 and 15). The 4-factor structure accounts for 53.4% of the total variance in teaching yoga items. Representing 21.1% of the Teaching Domain items, the first factor, Curricular Integration, consists of 9 items that describe integrative qualities of instructional beliefs. The second factor, Student Awareness, representing 16.8% of the Teaching Domain items, includes six items that describe teacher beliefs surrounding creating an environment to foster student awareness. The third and fourth factors, Accessibility and Differentiated Instruction, each representing 7.6% of the Teaching Domain items contain four items that respectively describe self-efficacy beliefs around making yoga accessible to all students and beliefs about changing instruction to fit the needs of students.

Table 14

Teaching Domain Original Matrix with Seven-Factor Structure

	Suggested Factor Loadings						
	1	2	3	4	5	6	7
When I teach meditation, I include anatomical/physical cues.	**.479**	.161	-.115	-.134	.066	**.433**	-.252
When I teach breathing exercises, I include imagery.	**.577**	.165	-.016	-.055	.218	.147	-.324
I offer students opportunities to practice compassion for others.	**.641**	.236	-.136	.032	-.207	-.317	.050
I encourage my students to recognize the way they think during physical discomfort in yoga practice.	**.551**	.339	-.253	.132	.250	-.315	.060
I offer students opportunities to notice sensations of the physical body.	**.607**	.250	-.184	.145	-.136	.067	-.311
I offer students opportunities to practice self-compassion.	**.648**	.262	-.183	.146	-.173	-**.361**	-.175
I encourage my students to recognize emotions they feel during physical discomfort in yoga practice.	**.632**	.355	-.171	.136	.124	-**.399**	.045
I offer students opportunities for contemplation.	**.683**	.246	-.163	.208	.110	-.114	-.290
I integrate themes.	**.398**	.072	-.083	-.281	.090	.040	**.410**
I offer opportunities to set an intention.	**.389**	.297	-.091	-.183	-.008	.019	.218
I use quotes.	**.454**	.127	-.016	-.294	-.005	-.162	**.582**
I teach breathing throughout my classes/sessions.	**.591**	.222	-.041	-.111	-.179	.178	-.060
I integrate yogic philosophy.	**.629**	.182	.021	-.186	-.043	-.052	.013
I teach breathing exercises in classes/sessions.	**.572**	.188	.073	-.214	-.041	**.438**	.043
I teach mindfulness/meditation throughout classes/sessions.	**.653**	.232	-.033	-.164	-.191	.183	.093
I teach mindfulness/meditation exercises in classes/sessions.	**.626**	.220	.113	-.072	-.196	.363	.123
I feel comfortable safely including students with significant physical limitations.	.335	.060	**.601**	**.389**	.115	.212	-.062
I have access to the resources I need to safely accommodate students/clients with significant physical limitations.	.234	.202	**.734**	.274	.066	.126	-.012
I feel comfortable safely including students/clients with a significant intellectual or psychological limitation.	.290	.023	**.713**	.285	.148	-.143	.105
I have access to the resources I need to safely accommodate students/clients with significant intellectual or psychological limitation.	.325	.041	**.734**	.268	.094	-.195	.163
It is a yoga teacher's responsibility to ensure that students feel accepted, supported, and included in class.	**-.410**	**.887**	.033	.030	-.006	.023	-.018
It is a yoga teacher's responsibility to ensure the physical safety of their students.	**-.408**	**.885**	.030	.027	-.018	.022	-.024
Competition in yoga class is healthy because students can see other people accomplish things they may want to accomplish.	**-.439**	**.868**	.017	.019	.013	.033	-.004
Yoga teachers/therapists should describe how a posture feels.	-.333	**.679**	.057	.006	.006	.009	-.007
Yoga teachers/therapists should change sequencing and cues during a class based on how my students are reacting to the postures.	-.319	**.688**	-.019	-.032	-.036	-.019	.057
If the location that a teacher/therapist teaches were to change (such as - state, culture, population, etc.), the way they teach should also change.	**-.418**	**.875**	.027	.015	-.015	.016	-.046
I prefer teaching very small groups.	.076	.023	-.176	.009	**.822**	.054	.132
I have a plan but it changes.	.052	.042	-.194	-.073	**.815**	.066	-.136
I do not have a plan for the classes/sessions that I teach	.008	-.030	-**.384**	**.795**	-.113	.125	.081
There is one right way to do a posture or sequence.	**-.372**	**.662**	-.021	-.068	.027	.004	.106
I prefer teaching very large groups.	.063	.027	-.322	**.412**	.106	**.415**	**.426**
I have a plan and I don't stray from it.	-.031	-.039	-**.409**	**.758**	-.120	.097	.175

Extraction Method: Principal Component Analysis. Factor loading above 0.37 bolded.

Table 15

The Teaching Domain and Resulting Four Factor Structure After Factor Reduction Procedures

	Factor			
	1	2	3	4
Factor 1: Curricular Integration (9 items)				
I teach breathing exercises in classes/sessions.	0.824			
I teach mindfulness/meditation exercises in classes/sessions.	0.814			
I teach mindfulness/meditation throughout classes/sessions.	0.724			
I teach breathing throughout my classes/sessions.	0.501			
I use quotes.	0.484			
I integrate yogic philosophy.	0.478			
I offer opportunities to set an intention.	0.437			
When I teach meditation, I include anatomical/physical cues.	0.419			
I integrate themes.	0.407			
Factor 2: Student Awareness (6 items)				
I encourage my students to recognize emotions they feel during physical discomfort in yoga practice.		0.902		
I encourage my students to recognize the way they think during physical discomfort in yoga practice.		0.818		
I offer students opportunities to practice self-compassion.		0.674		
I offer students opportunities for contemplation.		0.607		
I try to feel what particular student/client('s) body might feel like in postures.		0.549		
I offer students opportunities to practice compassion for others.		0.517		
Factor 3: Accessibility (4 items)				
I have access to the resources I need to safely accommodate students/clients with significant intellectual or psychological limitation.			0.843	
I feel comfortable safely including students/clients with a significant intellectual or psychological limitation.			0.791	
I have access to the resources I need to safely accommodate students/clients with significant physical limitations.			0.788	
I feel comfortable safely including students with significant physical limitations.			0.684	
Factor 4: Differentiated Instruction (4 items)				
It is a yoga teacher's responsibility to ensure that students feel accepted, supported, and included in class.				0.617
It is a yoga teacher's responsibility to ensure the physical safety of their students.				0.585
If the location that a teacher/therapist teaches were to change (such as - state, culture, population, etc.), the way they teach should also change.				0.458
Yoga teachers/therapists should change sequencing and cues during a class based on how my students are reacting to the postures.				0.452

Notes. Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

Reliability and Item Analysis

To evaluate the internal consistency of each factor, reliability analyses were carried out.

Both the Defining Yoga Domain (α = .90) and the Teaching Yoga Domain (alpha = .85) had

high internal consistency, when all items in the larger domain were scaled. As can be seen, the scaled factors also showed acceptable to good internal consistency overall.

In the Defining Yoga Domain, four of the six factors showed acceptable internal consistency, with alphas ranging from .81 to .89 (see Table 16). Two factors in the Defining Yoga Domain showed internal consistency below what is generally acceptable: the Mindful factor (α = .68) and the Physical factor (α = .66). However, each of these factors has only two items, which may be impacting the reliability estimates. In fact, Eisinga, Grotenhuis, & Pelzer (2013) suggest that a coefficient alpha is inappropriate for 2-item measures. Suggestions to address this made in the discussion section.

Table 16

Descriptive statistics for the Defining Yoga Domain with 6-Factors

	No. items	Alpha	*M* (*SD*)	Min.	Max.	Skewness	Kurtosis
Experiential	7	.81	5.73 (0.83)	3.00	7.00	-.586	-.101
Transformational	4	.88	6.22 (0.94)	1.00	7.00	-1.724	4.731
Energetic	3	.86	5.58 (1.19)	1.67	7.00	-.645	.210
Affectual	3	.89	5.59 (1.20)	1.00	7.00	-.401	-.329
Mindful	2	.68	6.30 (0.85)	3.50	7.00	-1.14	.559
Physical	2	.66	5.69 (1.12)	1.00	7.00	-.615	.443

Note. N = 203, 21-items, α = 0.90

In the Teaching Yoga Domain, three of the four factors showed good reliability, with alphas ranging from .81 to .86 (see Table 17). However, in the Student Awareness factor, the alpha-if-deleted value indicated the reliability would increase from .85 to.86 with one item removed (*I try to feel what a particular student/client('s) body might feel like in postures*). Therefore, this may be an item to be considered for removal. The Differentiated Instruction factor had lower than acceptable reliability (α = .60). An inspection of the item correlations within the factor suggests that there may be two distinct smaller factors. Inter-item correlation

indicated that the Differentiated Instruction Items 1 and 2 and Items 3 and 4 were moderately

correlated while Items 1 and 3 and Items 2 and 4 were not (see Table 18). This low inter-item

correlation contributed to the lower reliability estimate.

Table 17

Descriptive Statistics for the Teaching Yoga Domain with 4-Factors

	No. items	Alpha	*M* (*SD*)	Min.	Max.	Skewness	Kurtosis
Curricular Integration	9	.81	5.31 (0.85)	1.11	7.00	-.688	2.266
Student Awareness	6	.85	5.51 (0.99)	1.00	7.00	-.677	1.584
Accessibility	4	.86	4.32 (1.37)	1.00	7.00	-.072	-.216
Differentiated Instruction	4	.60	5.57 (0.84)	3.50	7.00	-.072	-.796

Note. N = 203, 23-items, α = 0.85

Table 18

Correlations for Differentiated Instruction Items

Item	1	2	3	4
1. It is a yoga teacher's responsibility to ensure that students feel accepted, supported, and included in class.	1.00	0.503**	0.244**	0.159**
2. It is a yoga teacher's responsibility to ensure the physical safety of their students.		1.00	0.197**	0.172**
3. Yoga teachers/therapists should change sequencing and cues during a class based on how my students are reacting to the postures.			1.00	0.411**
4. If the location that a teacher/therapist teaches were to change (such as - state, culture, population, etc.), the way they teach should also change.				1.00

Note. Pearson correlation **. Correlation is significant at the 0.01 level (2-tailed).

Concurrent Validity

Table 19 presents the descriptive statistics for the measures used to assess the concurrent

validity for YIBS. A correlation analysis was run to compare the Differentiated Instruction factor

in the Teaching Domain with a modified scale of the DI-Quest. A total scale of the DI-Quest,

separate factors of the DI-Quest were not used due to a Cohen's alpha below 0.6. The

Differentiated Instruction composite scale of the YIBS showed a significant but moderate

correlation with the DI-Quest composite scale. A correlation analysis was run to compare the

Accessibility factor in the Teaching Domain with a modified scaled version of the Teaching

Efficacy in Inclusive Practices (TEIP). The Accessibility composite scale of the YIBS showed a

strong significant positive correlation with the TEIP. All of the YIBS factors were significantly

correlated with the modified (two-factor) composite scale of the MAIA, the Attention Regulation

scale of the MAIA, and the Self-regulation scale of the MAIA. Correlations are presented in

Table 20.

Table 19

Descriptive Statistics for D-Quest, TEIP, and MAIA

	No. items	Alpha	*M* (*SD*)
DI-Quest	4	.81	5.08 (1.06)
TEIP	4	.76	5.46 (0.90)
MAIA	11	.91	4.75 (0.62)
MAIA: Attention Regulation	7	.90	4.67 (0.68)
MAIA: Self-Regulation	4	.80	4.90 (0.68)

Note. N = 194, missing data in the MAIA decreased the overall number of participants

Table 20

Correlations for D-Quest, TEIP, and MAIA Scores for Defining Yoga and Teaching Yoga Domains

Scale	Domain	D-Quest	TEIP	MAIA	MAIA - AR	MAIA - SR
Experiential	Defining Yoga	-	-	0.52**	0.51**	0.41**
Transformational		-	-	0.27**	0.24**	0.24**
Energetic		-	-	0.26**	0.25**	0.22**
Affectual		-	-	0.20**	0.20**	0.16*
Mindful		-	-	0.20**	0.18*	0.19**
Physical		-	-	0.13	0.14	0.10
Curricular Integration	Teaching Yoga	-	-	0.28**	0.25**	0.26**
Student Awareness		-	-	0.22**	0.23**	0.13
Accessibility		-	0.51**	0.15**	0.16*	0.11
Differentiated Instruction		0.36**	-	0.13	0.10	0.13

Note: N= 194. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). AR = Attention Regulation. SR = Self-Regulation.

Discussion

Summary of Findings

The purpose of the study was to evaluate the factor structure of the initial set of items on the Yoga Instructor Beliefs Instrument and assess the psychometric properties of the scores from the resulting factors and items. The original structure contained categories that included items that defined beliefs about yoga and items that defined beliefs about teaching yoga. The results from the EFA did not support the use of the proposed factor structure. However, when items were divided into two overarching domains, Defining Yoga and Teaching Yoga, several strong factors emerged. Several items were deleted from the original instrument as they did not strongly load on any factors. These items addressed class size preference, lesson implementation (having and deviating from a plan). The resulting EFA suggested instrument that has 44-items across 10 total scales.

The results indicate that scores from these factors demonstrate reasonable internal consistency. Furthermore, correlations with existing instruments measuring similar constructs support the concurrent validity of three related areas in educational psychology: differentiated instruction, self-efficacy about accessibility, and mindfulness.

Future Work

Based on the current results, both the item content and factor structure could use additional work. There are several factors that could be improved in future iterations of the instrument. In the Defining Yoga Domain, two factors are two item scales which contributes to their lower internal reliability estimate. Adding more items to these particular scales (Mindful and Physical) may strengthen these factors.

Additional data collection is warranted in order to perform confirmatory factor analysis using the factor structure emerging from the EFA. In the Teaching Yoga Domain, the four item Differentiated Instruction factor showed poor reliability (< .60) with apparent item-pair clustering within the factor. During the CFA, the current model should be compared to one that splits these into two distinct scales, which could improve the performance and reliability of the scales. However, in doing so, the aforementioned obstacle of a two-item scale should be considered.

In addition to the content and structural validity aspects, evidence regarding the external validity of scores from the YIBS needs to be further investigated. The YIBS is designed to identify differences in beliefs of yoga instructors. As such, a limitation of the instrument is its internal and self-reported nature. Observable behavior of teachers, such as curricular implementation, should also be considered when investigating differences in outcomes. The Essential Properties of Yoga Questionnaire (Groessl et al., 2015) identifies observable points of emphasis in yoga instruction. By exploring both reported beliefs and observed instruction, a more complete model of the potential mechanisms of change in yoga can be developed. Future studies should investigate the links between the YIBS scales and EPYQ scales.

The heterogeneous nature of yoga suggests that beliefs of yoga teachers may be influenced by, and may influence, the style of yoga trained in, practiced, and taught. The style of yoga may dictate outward behavior such as curriculum implementation. Furthermore there may be more subtle connections such as specific belief constructs. Future studies should investigate differences in YIBS scores across styles of yoga. In addition to style of yoga, differences such as years of experience and occupation (i.e. yoga therapist or yoga teacher) should be explored.

CHAPTER 5

DISCUSSION

This dissertation sought to address the growing need to better understand the mind-body therapy, yoga, by exploring and measuring beliefs of yoga instructors. Using the Rasch measurement framework, part one of this project involved qualitative, exploratory techniques to ensure that the instruments' constructs have a sound theoretical foundation. This included semi-structured interviews based on educational psychology constructs, expert panel reviews, and cognitive interviews to capture yoga instructors' beliefs about yoga and teaching yoga. The second part involved exploratory factor analysis and classical test theory reliability and item analysis of pilot study data collected using an online survey approach. This sequential mixed methodological approach is necessary when developing instruments with complex and specific constructs (David, Hitchcock, Ragan, Brooks, & Starkey, 2016). The following discussion mirrors the two-manuscript structure of this dissertation by separately addressing the findings within each part of the project, followed by overall implications for practice and future directions.

Part 1: Exploration of Yoga Instructors' Beliefs and Instrument Development

Exploratory findings supported the aim of this study, to develop a theoretically sound self-report instrument that can be used by yoga instructors. The nature of part one progressively built on findings of each step and phase of development. The initial phase included an educational psychology literature review, interviews, and prototype construct map. The second phase included iterative construct mapping and item pool development with expert panels. Finally, a prototype questionnaire was given to yoga instructors to decipher clarity and content, and these findings were subsequently examined .

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Phase Ia: Interviews

  A review of educational psychology literature set a framework of epistemic/pedagogic beliefs and affectual/experiential beliefs that informed the interview guide. Findings from the interviews provided a foundation for further discussion in later steps. Themes that emerged included Differentiation, Physicality, Yoga Philosophy, Role, Instructional Choices, Languaging, Safety, and Experiential. Differentiation revolved around the inclusive nature of the practice (Note that theme titles were developed by the research team to explain overarching concept. *Languaging* was created to depict the choices of language-use including sentence structure, intonation, use of Sanskrit terms, valance, etc.). Physicality included the physical nature of learning. Yoga philosophy included discussion around lineage, culture, and yogic teachings. Role was a theme that included beliefs on what the main function of a yoga teacher should be. Instructional Choice regarded curricular choices such as sequencing, a component of such choices but decidedly distinct was Languaging which included beliefs on how to say and frame things to provide optimal learning. The safety theme regarded emotional and physical safety of students and the teachers role in ensuring it. Finally, the Experiential theme covered ideas of embodied learning through the practice of yoga itself.

  The two themes of Yoga Philosophy and Role were discussed by the research team as the most commonly present. To fully engage with the data original verbatim transcriptions were revisited. Upon reviewing the verbatim transcription excerpts from the themes of Yoga Philosophy and Role, underlying epistemological underpinnings became apparent. Researchers noted consistencies throughout interview as evidence of a belief structure as opposed to singular belief statements. That is to say that differences in interviewee statements in the themes of Yoga Philosophy and Role were rooted in an underlying belief structure.

Some inquiry surrounding epistemology encourages rich data that is usually post-positivist or constructionist in nature requiring in depth data analysis. As the goal of the first part of the project was to identify measurable constructs, researchers agreed that the overarching theme was *overall integration of yoga philosophy* but further qualitative research should be done. A limitation of this analysis is that deeper meaning behind teacher beliefs around the role of a yoga instructor was not explored. A less positivist methodology may provide a more vibrant understanding a sense of responsibility or role as a yoga teacher.

Themes about Instructional Choice and Languaging underline the need to understand instructor beliefs. As noted in the literature review, instructional choices, like progression and modification, are a part of the heterogeneity of yoga because different yoga styles demonstrate different pedagogical beliefs that guide these choices. The interviews provided information on the perceptions of what kinds of beliefs surround choices like sequencing. However, with further investigation, the transcripts provided researchers discussion around the underlying beliefs that influence such choices. For example, some choices seemed universal, like "*starting in child's pose every class*", while others seemed to be framed around the students, like "*I watch the students reaction to postures and will change my plan for class if it doesn't land*". Upon reflection within the beliefs framework, this seems to be an epistemological/pedagogical belief. Similar belief constructs exist in education. Schaefer and Edgerton's (1985) work suggested a dichotomous belief about the way students learn based on whether the teacher is child-centered or teacher-centered. The examples above may be thought of as teacher-centered (i.e. I choose the first posture in every class and don't stray from that plan) or student-centered (i.e. I change my plan according to what I think my students need). Similarly, differentiated instruction uses a student-centered model to decipher the degree to which teachers change instruction for the

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differing needs of their students. The themes of Differentiation and Safety can also be linked to research on teachers' beliefs. A teacher's beliefs about their own ability to provide an environment that is inclusive of all individuals is part of their own self-efficacy and may influence behavior (Muijs & Reynolds, 2002). During this stage the constructs of *Differentiated Instruction* and *Self-Efficacy for Inclusive Practices* were identified as similar measurable constructs used in educational psychology research that may be used in Part 2.

Finally, the themes of Physicality and Experiential provided evidence for skill-acquisition and learning. Experiential beliefs were around the learning that happens in yoga and included mindfulness, interoception, and compassion. Current discourse supports the influence of these beliefs on teacher behaviors. Davis and Neitzel (2011) suggests that the yoga components that emphasize awareness and acceptance of thoughts without judgment allows a teacher to be more clearly decisive (Davis & Neitzel, 2011) is the foundation of self-compassion and compassion for others (Knowles, Lucas, Modlen, Gardner, & Dean, 2010). Some theorize that this fosters a more effective classroom through heightened compassionate behavior (Jennings & Greenberg, 2009). As such, beliefs about mindfulness, such as awareness without judgement, may influence instructional choices. Since mindfulness is a component of the yoga curricula, emotion beliefs for yoga instructor may interact with contextual and self-beliefs in ways that have not been explored with traditional school teachers. For instance, it may be that beliefs such as acceptance without judgment are a part of an instructor's epistemic beliefs, which may suggest implications in other beliefs.

There was an intentional absence of assumptive framing in the interviews as they were designed to include a broad scope of current research without limiting, biasing, or leading the interviewees. In doing so, the interviews and working model was intentionally open-ended and

exploratory in nature. As such, one limitation of the literature review and interview guides was the loose structure in which yoga teachers were invited to discuss their beliefs surrounding yoga instruction. A more direct line of questioning may have provided a more precise view of certain beliefs.

A construct map and initial item pool were created from the interview transcriptions. Themes of Physicality, Yoga Philosophy, Curriculum, Languaging and Experiential were grouped as Integrative Curriculum and Emphasis. The remaining themes informed constructs of Differentiated Instruction, Student Centered Learning, and Accessibility.

Phase Ib: Comparative Qualitative Analysis

In this phase, it was important to confirm that there were differences in beliefs across different styles of yoga. The presence and absence of themes across different reported style of yoga gave evidence for heterogeneity of beliefs across styles. Furthermore, as assignment to style-clusters is representative of a participant identifying as a part of a particular group, differentiation between groups gives evidence to collective epistemic beliefs. The styles of yoga varied in the presence and amount of themes represented. For instance, in the Holistic style-cluster, every theme was thought to be represented by at least one researcher. Similarly, the Ashtanga and Power style-clusters presented evidence of presence of most or all of the themes, while the Hot style-cluster presented the most absence of themes.

The Holistic style-cluster includes styles of yoga that incorporate lifestyle skill-acquisition into their curricular goals. For example, one of the Holistic styles used in empirical research, Kripalu, has a school of yoga as well as a school of aryuveda. It may be that the epistemological frameworks of these styles are inclusive in nature so the instructors interviewed covered many themes. Another possible influence is the amount of tradition or lineage involved

in the style-cluster. A commonality of the styles within the Holistic, Alignment-Based, and

Ashtanga style-clusters is that each follows traditions of an elder leader or lineage (i.e. Iyengar:

B.K.S. Iyengar, Ashtanga: Patabi Jois, Integral: Swami Sivinanda, etc.). Conversely, styles

within the Hot cluster-style are relatively newer. These are exploratory assumptions and should

not be taken as evidenced findings.

It is important to note that this preliminary comparison and analysis was done to provide

preliminary evidence for differences and should not be generalized. The sample size and

structure was too small and unevenly distributed to be able to make conclusive assumptions. For

example, the presence of all themes in the Holistic style-cluster may be due to the number of

interviews in the sample or the experience of the interviewee.

Phase II: Expert Panel

Expert panel reviews were used to deepen the understanding of the constructs and

develop an initial prototype of the instrument from an item pool. During these conversations,

yoga experts conceptualized yoga instructor beliefs as encompassing traditional yogic

philosophy beliefs. Therefore, a construct that included items covering the scope of ethical and

discipline beliefs was deemed necessary, so the construct *Responsibility and Discipline* was

added to incorporate the traditional ideas of *Yamas and Niyamas*. The expert panel focus groups

also suggested a reconceptualization of the emphasis of yoga as containing five elements

commonly taught in traditional yogic texts. The five elements (also known as the *Koshas* or the

Five Sheaths (Pannikar, 1977) are: 1) physical body; 2) life force energy, or breath; 3) emotion;

4) intellect; and 5) spirit. While it was agreed that these elements were already present in the

item pool and constructs, the panels suggested subtle changes to the number of items to create a

more evenly distributed item pool within the Emphasis construct. A limitation of the expert

panels was the size and scope of experts. While participation was diverse in region, inclusion of teacher trainers may have been useful.

Phase III: Cognitive Interviews

To begin the process of evaluating the clarity and appropriateness of the YIBS items, cognitive interviews were done using a *think-aloud* technique. An iterative process was used to adjust the instrument through the interview process and progressively develop a clear and appropriate tool. The final product was a 69-item measure across six domains.

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Part 2: Study of YIBS Instrument

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The quantitative analysis of the YIBS pilot study data led to several changes in the instrument. The first involved a restructuring of belief constructs into two main Domains: Defining Yoga and Teaching Yoga. The second change involved removing items that did not load strongly on any factors within the domains.

The Defining Yoga Domain included all statements that contribute to a definition of yoga or yoga efficacy. The Defining Yoga Domain had six factors: Experiential, Transformational, Energetic, Affectual, Physical, and Mindful. These beliefs are epistemic beliefs of how yoga is experienced. For example, *Yoga works because…* or *In my yoga practice I experience….* If considered epistemic beliefs these may be foundational to the understanding of skill-acquisition and are supported in empirical discourse. As Crotty (2003) explains, the philosophical and epistemic foundation of understanding is the core of how we think learning happens. Crotty expounds that epistemic beliefs are the core of what we think is possible (2003). As learning and the potential for skill-acquisition are central to instructional choices, the epistemic beliefs of a teacher will guide instruction. However, as evidenced by the data, beliefs about definition may not necessarily equate to or cluster with beliefs about teaching. As such, Defining Yoga Domain

should have distinct characteristics that show foundational differences in teachers' beliefs about what yoga is and what yoga does.

The Teaching Yoga Domain included all statements about teaching, teachers, or direct integration of curriculum. The Teaching Yoga Domain had four factors: Curricular Integration, Student Awareness, Accessibility, and Differentiated Instruction. These beliefs are pedagogical beliefs of how yoga should be taught or self-beliefs about instructional choices. Teacher beliefs about pedagogy typically focus on the most effective ways to teach (Hancock & Gallard, 2004). While the initial literature review in part one of this project conceptualized pedagogical beliefs as beliefs within epistemology, current findings emphasis distinctions between the two. Further exploration through testable theoretical models may help clarify the relationship between the two.

One main difference in the findings from the qualitative and quantitative portions of the dissertation was in the area of emphasis. As underlined in the Expert Panels, the points of emphasis are traditionally taught as distinct layers of Physical Body, Breath, Emotion, Intellect, and Spirit. The assumption was that these items would cluster together to support the distinction between each emphasis. However, it seems as though yoga teachers do not conceptualize the layers differently, based on the factor analysis. Items originally organized as Emotion and Spirit seemed to cluster together. Similarly items that had to do with Breath and Intellect clustered together. However, the physical items stayed distinct from the others. Though the layers mentioned, are traditionally taught in yogic texts (Pannikar, 1977) it seems that the conceptualization of these structures may be different as it relates to beliefs.

Another contrast in findings is the existence of beliefs surrounding Responsibility and Discipline. The construct of Responsibility and Discipline was strongly encouraged by expert

panel focus groups. Furthermore, there was both qualitative evidence in interviews as well as theoretical reasoning. However, items did not cluster together. This may be due to the depth of definition within the construct. Based on the Yamas and Niyamas, this construct was multidimensional and may have held too many subdomains. Because of the richness of this data further qualitative exploration is recommended on yoga instructor beliefs surrounding Responsibility and Discipline.

The reliability of the scores from the instrument and subscales suggests that the updated version of the YIBS can provide information about yoga instructor beliefs. Furthermore, correlations show evidence that the factors of Differentiated Learning, Accessibility are measuring the teaching construct they are meant to be measuring. In addition, the factors aligned with yoga skill-acquisition (i.e. interoceptive awareness) are supported.

Implications for Practice

The YIBS is a self-report measure that can be used in research, educational, and therapeutic settings to identify beliefs of yoga instructors. This tool can help identify differences across yoga instructors that may influence instructional choices. It is important to note that this is not an instructor evaluation tool, rather an instrument that can identify trends.

The primary intended use for the YIBS is to identify differences between yoga instructors who are teaching the same intervention as their beliefs may mediate or moderate outcomes. With continued use, the YIBS may inform meta-analytic research between and across intervention styles. Research could be done in conjunction with the EPYQ to link instructor beliefs and instructional emphasis. In educational and therapeutic settings, the YIBS may identify epistemic and pedagogical beliefs that can inform training and development. For

example, a Teacher Training program may be able to use the information from the YIBS to monitor change over time.

Future Research

Instructor beliefs influence instructional choices. To describe a system of beliefs and investigate the differences of these beliefs across areas, such as training, style, and setting, contributes to the goal of better understanding yoga instruction in school or therapy settings. The current work on the YIBS is an initial step; however, future work is necessary.

Further development and validation of the YIBS should involve confirmatory factor analysis and comparative research. Confirmatory factor analysis on the current model should be done using a larger sample. Differences across yoga instructors, such as career classification (i.e. yoga teachers versus yoga therapists), training, style, and experience, should be quantitatively evaluated to confirm heterogeneity of the constructs and assumptions of influence on instructional choice.

Additionally, yoga instructor beliefs should be measured via the YIBS and correlated with actual yoga instruction practices documented by the EPYQ. This last recommendation is arguably most important in terms of the overarching goal of yoga instructor research. While we know that in a school classroom setting, teacher beliefs influence teacher choices, the tools have not been available to assess this relationship within the yoga instruction framework. With the development of the YIBS and the EPYQ, the field now has the two instruments required that might help us answer the question: Do yoga instructor beliefs influence yoga instructor choices? The answer to this question can set a groundwork for eventual understanding of how both the yoga instructor and the yoga instruction might influence student or patient outcomes.

Conclusion

This dissertation described the process undertaken in the development and validation of a self-report measure to identify yoga instructor beliefs. Both qualitative and quantitative results indicate the presence of different types of beliefs across heterogenous samples of yoga instructors. The resulting instrument can be used in conjunction with current research as well as to design further research to better understand the influence of yoga instructors and instruction on student/patient outcomes.

REFERENCES

Akaike, H. (1987). Factor analysis and AIC. *Psychometrika*, *52*(3), 317 -332.

Alexander, G. K., Rollins, K., Walker, D., Wong, L., & Pennings, J. (2015). Yoga for self-care
and burnout prevention among nurses. *Workplace Health & Safety*, 63(10), 462-470.
doi:10.1177/2165079915596102

Allard, T. T., & Harwood, E. A. (2014). Minimizing the consequences of self-objectification in
college women through yoga. *Insight: Rivier Academic Journal*, *10*(1), 1.

Anderman, L. H., & Klassen, R. M. (2016) Being a Teacher: Efficacy, emotions, and
interpersonal relationships in the classroom. In L. Corno & E. M. Anderman (Eds.)
Handbook of Educational Psychology (3rd ed).(pp. 402-415). New York: Routledge.

Bailly, H. (2014). Embodied transcendence? An exploratory study of yoga in Dunedin. *Sites: A
Journal of Social Anthropology & Cultural Studies*, *11*(2), 57. doi:10.11157/sites-
vol11iss2id282

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.*
Englewoord Cliffs, NJ: Prentics-Hall.

Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimension and job
performance: A meta-analysis. Personnel Psychology, 44, 1-26.

Barry, B., & Stewart, G. L. (1997). Composition, process, and performance in self-managed
groups: The role of personality. Journal of Applied Psychology, 82, 62-78.

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), Advances in experimental
social psychology (Vol. 6, pp. 1-62). New York: Academic Press

Berent, G. R., Zeck, J., Leischner, J. A., & Berent, E. A. (2014). Yoga as an Alternative
Intervention for Promoting a Healthy Lifestyle Among College Students. *Journal of*

Addictions Nursing (Lippincott Williams & Wilkins), *25*(4), 167-171 5p.

    doi:10.1097/JAN.0000000000000046

Berger, D. L., Silver, E., J., & Stein, R. E. K. (2009). Effects of yoga on inner-city children's

    well-being: A pilot study. *Alternative Therapies, 15*(5), 36 – 42.

Bergen-Cico, D., Razza, R., & Timmons, A. (2015). Fostering self-regulation through

    curriculum infusion of mindful yoga: A pilot study of efficacy and feasibility. *Journal of*

    Child and Family Studies. doi: 10.1007/s10826-015-0146-2

Bernard, H. R., & Ryan, G. W. (2010).

    Analyzing qualitative data: systematic approaches. Thousand Oaks, CA. Sage.

Boekaerts, M. & Pekrun, P. (2016) Emotions and emotion regulation in academic settings.

    Handbook of Educational Psychology. New York: Routledge.

Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric

    properties of the Five Facet Mindfulness Questionnaire in depressed adults and

    development of a short form. *Assessment, 18,* 308–320.

    http://dx.doi.org/10.1177/1073191111408231

Bower, J. E., Garet, D., Sternlieb, B., Ganz, P. A., Irwin, M. R., Olmstead, R., & Greendale, G.

    (2012). Yoga for persistent fatigue in breast cancer survivors: a randomized controlled

    trial. *Cancer*, 118(15), 3766-3775. doi:10.1002/cncr.26702

Brems, C., (2015) A yoga stress reduction intervention for university faculty, staff, and graduate

    students. *International Journal of Yoga Therapy (25*) 61 – 78.

Briggs, D. C., & Wilson, M. (2003). An introduction to multidimensional measurement using

    Rasch models. *Journal of Applied Measurement, 4*(1), 87-100.

Broad, W. (2012). *The science of yoga: The risks and the rewards* (1st ed.). New York: Simon & Sculster.

Butzer, B., Day, D., Potts, A., Ryan, C., Coulombe, S., Davies, B., Weidknecht, K., Eberty, M., Flynn, L., & Khalsam S. B. S. (2015). Effects of a classroom-based yoga intervention on cortisol and behavior in second and third grade students. *Journal of Evidence-Based Complementary & Alternative Medicine, 20*(1), 41-49. doi:10.1177/2156587214557695

Butzer, B., Ebert, M., Telles, S., & Khalsa, S. B. S. (2015) School-based yoga programs in the United States: A survey. *Advances, 29*(4).

Butzer, B., van Over, M., Taylor, J. J. N., & Khalsa, S. B. S. (2015). Yoga may mitigate decreases in high school grades. *Journal of Evidence-Based Complementary & Alternative Medicine.* doi:10.1155/2015/259814

Butzer, B., Bury, D., Telles, S., & Khalsa, S. S. (2016). Implementing yoga within the school curriculum: a scientific rationale for improving social-emotional learning and positive student outcomes. *Journal of Children's Services*, *11*(1), 3-24 22p. doi:10.1108/JCS-10-2014-0044

Case-Smith, J., Sines, J. S., & Klatt, M. (2010). Perceptions of children who participated in a school-based yoga program. *Journal of Occupational Therapy, Schools, & Early Interventions, 3*, 226-238. doi:10.1080/19411243.2010.520246

Chan, W., Immink, M. A., & Hillier, S. (2012). Yoga and exercise for symptoms of depression and anxiety in people with poststroke disability: a randomized, controlled pilot trial. *Alternative Therapies in Health & Medicine*, 18(3), 34-43.

Charmaz, K. (2003). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), Strategies of Qualitative Research (pp. 249-291). Thousand Oaks,

CA: Sage Publications. Crotty, M. (1998). Introduction: The research process. *In The foundations of social research: Meaning and perspective in the research process* (pp. 1-17). London: Sage Publication

Chaya, M. S., Nagendra, H., Selvam, S., Kurpad, A., & Srinivasan, K. (2012). Effect of yoga on cognitive abilities in schoolchildren from a socioeconomically disadvantaged background: A randomized controlled study. *Journal of Alternative & Complementary Medicine*, 18(12), 1161-1167. doi:10.1089/acm.2011.0579

Chen, D. D. & P. L. (2014). Perceived benefits incorporating yoga into classroom teaching: Assessment of the effects of "Yoga Tools for Teachers". *Advances in Physical Education, 4*, 138-148. doi: 10.4236/ape.2014.43018

Chen, N., Xia, X., Qin, L., Luo, L., Han, S., Wang, G., & ... Wan, Z. (2016). Effects of 8-Week hatha yoga training on metabolic and inflammatory markers in healthy, female Chinese subjects: A randomized clinical trial. *Biomed Research International*, 20165387258. doi:10.1155/2016/5387258

Chettiar, C. (2014). Yoga as an intervention method in the reduction of anxiety in college girls. *Research Horizons*, *4,*184.

Cheung, C., Wyman, J. F., Resnick, B., & Savik, K. (2014). Yoga for managing knee osteoarthritis in older women: a pilot randomized controlled trial. *BMC Complementary and Alternative Medicine*, (1), 160. doi:10.1186/1472-6882-14-160

Clance, P. R., Mitchell, M., & Engelman, S. R. (1980). Body cathexis in children as a function of awareness training and yoga. *Journal of Clinical Child Psychology*, *9*(1), 82-90.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Cohen, L. (2017, October). *Yoga in cancer care. A comprehensive approach to transform your*

   life and health. Symposium conducted by the International Alliance for Yoga Therapists

   at the annual Yoga Research Symposium in Stockbridge, MA.

Conboy, L. A., Noggle, J. J., Frey, J. L., Kudesia, R. S., and Khalsa, S. B. S. (2013). Qualitative

   evaluation of a high school yoga program: Feasibility and perceived benefits. *Explore,*

   9(3), 171-180. doi:10.1016/explore.2013.02.001

Cook-Cottone, C. (September 2017) *Mechanisms change: Yoga for trauma and eating disorders.*

   Presented at the Annual Yoga Research Symposium, Stockbridge, MA, USA.

Cook-Cottone, C. P. (2016, September). *Words matter: The use, documentation, and*

   effectiveness of an intentional narrative in yoga interventions (a theoretical rationale).

   In Symposium: Yoga Research 101. Oral presentation presented at the Symposium on

   Yoga Research, Kripalu, Stockbridge, Massachusetts, U.S.A.

Crotty, M. (2003). Introduction: The research process. *The Foundations of Social Research:*

   Meaning and perspective in the research process (pp. 1-17). London: Sage Publications.

Coubergs, C., Struyven, K., Vanthournout, G., & Engels, N. (2017). Measuring teachers'

   perceptions about differentiated instruction: The DI-Quest instrument and model. *Studies*

   In Educational Evaluation, 41. doi:10.1016/j.stueduc.2017.02.004

D'Souzza, C. D. & Avadhany, S. T. (2014). Effect of yoga training and detraining on respiratory

   muscle strength in pre-pubertal children: A randomized trial. *International Journal of*

   Yoga, 7, 41-47. doi:10.4103/097-6131.123478

David, Hitchcock, Ragan, Brooks, & Starkey, 2016

Davis, D. S., & Neitzel, C. (2011). A self-regulated learning perspective on middle grades

  classroom assessment. *Journal of Educational Research, 104*, 202-215. doi:

  10.1080/00220671003690148

de Bock, E., Williams, P., Tugaut, B., & Guillemin, I. (2016) Four decades of Rasch analysis on

  patient-reported outcomes instruments validation: A systematic literature review. *Value*

  In Health, *19*(7), A362.

Dellinger, A. B., Bonnett, J. J. Olivier, D. F., & Ellett, C. D. (208). Measuring teachers' self-

  efficacy beliefs: Development and use of the TEBS-self. *Teaching and Teacher*

  Education, 24(3), 751-766. doi:10.1016.j.tate.2007.02.010

Denzin, N. & Lincoln. Y. (2005) Introduction: The discipline and practice of qualitative

  research. In N. Denzin & Y. Lincoln (Eds.), *The Sage Handbook of Qualitative Research,*

  (*3rd ed)*(pp. 1-32). Thousand Oaks: Sage Publications.

Eastman-Mueller, H., Wilson, T., Jung, A., Kimura, A., & Tarrant, J. (2013). iRest Yoga-Nidra

  on the College Campus: Changes in Stress, Depression, Worry, and Mindfulness.

  International Journal of Yoga Therapy, *23*(2), 15.

Eisinga, R., Grotenhuis, M., & Pelzer, B. (2013) The reliability of a two-item scale: Pearson,

  Cronbach, of Spearman-Brown? International Journal of Public Health, 58(4): 637-642.

  Doi: 10.1007/s00038-012-0416-3.

Ehud, M., An, B. D., Avshalom, S. (2010). Here and now: Yoga in Israeli schools. *International*

  Journal of Yoga, 3, 42-47. doi:10.4103/0973-6131.72629

Elwy, R., Groessl, E. J., Elsen, S. V., Riley, K. E., Maiya, M., Lee, J. P., Srkin, A., & Park, C.

  (2014) A systematic scoping review of yoga intervention components and study quality.

  American Journal of Preventative Medicine, 47(2), 220 – 232.

Farb, N., & Mehling, W. E. (2018). Editorial: Interoception, Contemplative Practice, and

    Health. *Frontiers In Psychology*, *7*

Feagans Gould, L., Mendelson, T., Dariotis, J.K., Ancona, M., Smith, A.S.R., Gonzalez, A.A.,

    Smith, A.A. and Greenberg, M.T. (2014), "Assessing fidelity of core components in a

    mindfulness and yoga intervention for urban youth: applying the CORE process", *New*

    Directions in Youth Development, Vol. 142, Summer, pp. 59-81, available at:

    www.ncbi.nlm.nih.gov/pubmed/25100495

Feuerstein, G. (2008). *The Yoga Tradition: Its History, Literature, Philosophy, and Practice*.

    Prescott, AZ: Hohm Press.

Felver, J. C., Butzer, B., Olson, K. J., Smith, I. M., & Khalsa, S. B. S. (2015). Yoga in public

    school improves adolescent mood and affect. *Contemporary School Psycholpogy, 19,*

    184-192. doi: 10.1007/s40688-014-0031-9

Fiori, F., Aglioti, S. M., & David, N. (2015) Interactions Between Body and Social Awareness in

    Yoga. *Journal Of Alternative And Complementary Medicine*, *23*(3), 227-233.

Fives, H., & Buehl, M. M. (2014). Exploring differences in practicing teachers' valuing of

    pedagogical knowledge based on teaching ability beliefs. *Journal of Teacher Education,*

    65(5), 435-448. doi:10.1177/0022487114541813

Fives, H., & Buehl, M. M. (2012) Spring cleaning for the "messy" construct of teachers' beliefs:

    What are they? Which have been examined? What can they tell us? In K. R. Harris, S.

    Graham, & T. Urdan (Eds.), *APA educational psychology handbook: Vol 2. Individual*

    differences and cultural and contextual factors (pp. 471 -499). Washington, DC:

    American Psychological Association.

Frenzel, A., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., & Klassen,
R. M. (2016) Measuring teachers' enjoyment, anger, and anxiety: The teacher emotions
scales (TES). *Contemporary Educational Psychology, 46*, 148-163

Froeliger, B. E., Garland, E. L., Modlin, L. A., & McClernon, F. J. (2012). Neurocognitive
correlates of the effects of yoga meditation practice on emotion and cognition: A pilot
study. *Frontiers in Integrative Neuroscience*, *.6* doi:10.3389/fnint.2012.00048

Gangadhar, B. N., (2015, September) *Yoga therapy in schizophrenia: Clinical and biological
effects.* Symposium conducted by the International Alliance for Yoga Therapists at the
annual Yoga Research Symposium in Stockbridge, MA.

Gard, T., Noggle, J. J., Park, C. L., Vago, D. R., & Wilson, A. (2014). Potential self-regulatory
mechanisms of yoga for psychological health. Frontiers in Human Neuroscience, 8, 770.
doi:10.3389/fnhum.2014.00770

Garfinkel, S. N., Seth, A. K., Barrett, A. B., Suzuki, K., & Critchley, H. D. (2015). Knowing
your own heart: Distinguishing interoceptive accuracy from interoceptive
awareness. *Biological Psychology*, *104*65-74. doi:10.1016/j.biopsycho.2014.11.004

Getzels, J. W., & Jackson, P. W. (1963) The teacher's personality and characteristics. In N.L.
Gage (Ed.), *Handbook of research on teaching* (pp. 507-582). Chicago, IL: Rand
McNally.

Gill, M. G., & Hardin, C. (2015). A "hot" mess: Unpacking the relation between teachers' beliefs
and emotions. In L. Corno & E. M. Anderman (Eds.) *Handbook of Educational
Psychology (3rd ed).*(pp. 402-415). New York: Routledge.

Gothe, N. P, & McCauley, E. (2015) Yoga and cognition: A meta-analysis of chronic and acute
effects. *Psychosomatic Medicine, 77*, 785 − 797. Doi:10.1097/PSY.0000000000000218

Gould, L. F., Dariotis, J. K., Mendelson, T., & Greenberg, M. T. (2012). A school-based

    mindfulness intervention for urban youth: Exploring moderators of intervention effects.

    Journal of Community Psychology, 40(8), 968-982. doi:10.1002/jcop.21505

Gothe, N. P, & McCauley, E. (2015) Yoga and cognition: A meta-analysis of chronic and acute

    effects. *Psychosomatic Medicine, 77*, 785 – 797. Doi:10.1097/PSY.0000000000000218

Grossel, (2015, September) *Measurement and enhancement of yoga treatment compliance in*

    research. Symposium conducted by the International Alliance for Yoga Therapists at the

    annual Yoga Research Symposium in Stockbridge, MA.

Groessl, E. J., Maiya, M., Elwy, A. R., Riley, K. E., Sarkin, A. J., Eisen, S. V., & ... Park, C. L.

    (2015). The essential properties of yoga questionnaire: Development and methods.

    International Journal of Yoga Therapy, *25*(1), 51.

Gross, J. J. (2014). Emotion regulation: Conception and empirical foundations. In J. J. (Ed.)

    Handbook of Emotion Regulation (2nd ed). (pp 3 – 20). New York: Guilford Press.

Gu, J., Strauss, C., Crane, C., Barnhofer, T., Karl, A., Cavanagh, K., & Kuyken, W. (2016).

    Examining the factor structure of the 39-item and 15-item versions of the Five Facet

    Mindfulness Questionnaire before and after mindfulness-based cognitive therapy for

    people with recurrent depression. *Psychological Assessment, 28,* 791–802.

Hagins, M., Haden, S. C., & Daly, L. A. (2013). A randomized controlled trial on the effects of

    yoga on stress reactivity in 6th grade students. *Evidence-Based Complementary and*

    Alternative Medicine. doi: 10/1155/2013/607134

Hancock, E. S. & Gallard, A. J. (2004) Preservice science teachers' beliefs about teaching and

    learning: The influence of K – 12 field experiences. *Journal of Science Teacher*

    Education, 15, 281-291. doi:10.1023/B:JSTE.0000048331.17407.f5

Hanley, A. W., Mehling, W. E., & Garland, E. L. (2017). Holding the body in mind:

      Interoceptive awareness, dispositional mindfulness and psychological well-

      being. *Journal Of Psychosomatic Research*, *99*13-20.

      doi:10.1016/j.jpsychores.2017.05.014

Harrell-Williams, L.M., Lovett, J.N., Lee., H.S., Pierce, R.L., Lesser, L.M., & Sorto, M.A.

      (2017). Validation of scores from the high school version of the Self-Efficacy to Teach

      Statistics (SETS-HS) instrument using pre-service mathematics teachers. *Journal of*

      Psychoeducational Assessment. Published online, October 2017.

Hertzog, L. (2011). Can a successful ESL teacher hold deficit beliefs of her students' home

      language and cultures? *Multicultural Perspectives, 13*(4), 197-204.

      doi:10.1080/15210960.2011.f9

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis.

      Psychometrika, 30, 179-185. doi:10.1007/BF02289447

Hyde, A. (2012). The Yoga in Schools Movement: Using Standards for Educating the Whole

      Child and Making Space for Teacher Self-Care. *Counterpoints*, 109.

Iyengar, B. S., & Perez-Christiaens, N. (2012). *Sparks of Divinity: The Teachings of B.K.S.*

      Iyengar From 1959 to 1975. Berkeley, CA: Rodmell Press.

Jennings, P., & Greenberg, M. (2009). The prosocial classroom: Teacher social and emotional

      competence in relation to student and classroom outcomes. *Review of Educational*

      Research, 79, 491–525.

Kauts, A., & Sharma, N. (2009). Effect of yoga on academic performance in relation to stress.

      International Journal of Yoga, *2*(1), 39-43

Khalsa, S. B., (2015, September). *Chronology of yoga therapy research.* In the Symposium for

    Yoga Research. Oral presentation presented at the Symposium on Yoga Research,

    Kripalu, Stockbridge, Massachusetts, U.S.A.

Khalsa, S. B. S., & Butzer, B. (2016) Yoga in school settings: A research review. *Analysis of the*

    New York Academy of Sciences, (Meditation), 1-12. doi:10.11/nyas.13025

Khalsa, S. B. S, Hickey-Schultz, L., Cohen, D., Steiner, N., & Cope, S. (2012) Evaluation of the

    mental health benefits of yoga in a secondary school: A preliminary randomized

    controlled trial. *The Journal of Behavioral Health Services & Research, 39*(1). 80-90.

    doi:10.1007/s11414-011-9249-8

Klatt, M., Harpster, K., Browne, E., White, S., & Case-Smith, J. (2013). Feasibility and

    preliminary outcomes for Move-Into-Learning: An arts-based mindfulness classroom

    intervention. *The Journal of Positive Psychology, 8*(3), 233-241.

    doi:10/1080/17439760.2013.779011

Knowles, M. L., Lucas, G. M., Molden, D. C., Gardner, W. L., & Dean, K. K. (2010). There's no

    substitute for belonging: Self- affirmation following social and nonsocial threats.

    Personality and Social Psychology Bulletin, *36*, 173-186.

Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013).

    Professional competence of teachers: Effects on instructional quality and student

    development. *Journal of Educational Psychology, 105*, 805-820. doi:10/1037/a0032583

Lazar, S., de Jong, M., Ashih, H., Mischoulon, D., & ... Sack, A. T. (n.d). Effects of

    Mindfulness-Based Cognitive Therapy on Body Awareness in Patients with Chronic Pain

    and Comorbid Depression. *Frontiers In Psychology*, *7*

Lea, J., Philo, C., & Cadman, L. (2016). 'It's a fine line between . . . self-discipline, devotion and

    dedication': negotiating authority in the teaching and learning of Ashtanga yoga. *Cultural*

    Geographies, *23*(1), 69. doi:10.1177/1474474015569993

Lim, S.A & Cheong, K.J., (2015) Regular Yoga Practice Improves Antioxidant Status, Immune

    Function, and Stress Hormone Releases in Young Healthy People: A Randomized,

    Double-Blind, Controlled Pilot Study. *Journal of Alternative & Complementary*

    Medicine, *21*(9), 530-538 9p. doi:10.1089/acm.2014.0044

Lombaerts, K., DeBacker, F., Engels, N., van Braak, J., & Athanasou, J. (2009) Development of

    the self-regulated learning teacher belief scale. *European Journal of Psychology of*

    Education, 1, 79-96.

McClure, B. (2015). Yoga therapy: Building a holding environment for somatic and psyche

    change. *International Journal of Yoga Therapy. 25*, 21-26

Mehling, W. E. (2017, October) *Assessing yoga skills.* In the Symposium for Yoga Research.

    Oral presentation presented at the Symposium on Yoga Research, Kripalu, Stockbridge,

    Massachusetts, U.S.A.

Mehling WE, Price C, Daubenmier JJ, Acree M, Bartmess E, Stewart A (2012) The

    Multidimensional Assessment of Interoceptive Awareness (MAIA). PLoS ONE7(11):

    e48230. https://doi.org/10.1371/journal.pone.0048230

Meiklejohn, J., Phillips, C., Freedman, M., Griffin, M., Biegel, G., Roach, A., et al. (2014).

    Integrating mindfulness training into K-12 education: Fostering the resilience of teachers

    and students. *Mindfulness*, *1,* 1–17. http://dx.doi.org/10.1007/s12671-012-0094-5.

Menezes, C. B., Dalpiaz, N. R., Rossi, N. T., & De Oliveira, A. A. (2015). Yoga and the

interplay between attentional load and emotion interference. *Psychological Reports*,

117(1), 271-289. doi:10.2466/28.02.PR0.117c16z1

Michalsen, A., Jeitler, M., Brunnhuber, S., Lüdtke, R., Büssing, A., Musial, F., . . . Kessler, C.

(2012). Iyengar yoga for distressed women: A 3-armed randomized controlled trial.

Evidence-Based Complementary and Alternative Medicine, 2012, 408727.

http://dx.doi.org/10.1155/2012/408727

Mockler, N. (2011). Beyond "what works": Understanding teacher identity as a practical and

political tool. *Teachers & Teaching: Theory and Practice, 17*(5), 517-528.

doi:1080/13540602.2011.602059

Muijs, D., & Reynolds, D. (2002). Teacher beliefs and behaviors: What really matters? *Journal

of Classroom Interaction, 50*(1), 45-40.

Musial, J. (2011). Engaged Pedagogy in the Feminist Classroom and Yoga Studio. *Feminist

Teacher: A Journal of The Practices, Theories, And Scholarship of Feminist Teaching*,

21(3), 212-228.

NCCAM: National Center for Complementary and Alternative Medicine. (2013). Yoga for

health. Retrieved from http://nccam.nih.gov /health/yoga/introduction.htm

Nelson, D., Reed, J., & Buck, S. M. (2014). Effect of a 16-Week Yoga Program on Blood

Pressure in Healthy College Students. *Physical Educator*, *71*(3), 533-544.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies,

19*(4), 317-328.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: issues and

applications*. Sage Publications, London.

Noggle, J. J., Steiner, N. J., Minami, T., & Khalsa, S. B. S. (2012). Benefits of yoga for

       psychosocial well-being in a US high school curriculum: A preliminary randomized

       controlled trial. *Journal of Developmental and Behavioral Pediatrics, 33*(3), 193-201.

Norman, G. R., & Streiner, D. L. (2014). Biostatistics: The bare essentials (4th ed.). Shelton,

       CT: People's Medical Publishing

Oades-Sese, G. V., Matthews, T., & Lewis, M. (2014). Shame and pride and their effects on

       student achievement. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *Handbook of*

       Emotions in Education. New York: Taylor & Francis.

O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components

       using parallel analysis and Velicer's MAP test. Behavior Research Methods,

       Instrumentation, and Computers, *32*, 396-402.

Pajares, M. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct.

       Review of Educational Research, 62(3), 307-332.

Pannikar, R. (1977) *The Vedic experience.* New Delhi, India: Motilal Banarsidass.

Park, C. L., Elwy, A. R., Maiya, M., Sarkin, A. J., Riley, K. E., Eisen, S. V., & ... Groessl, E. J.

       (2018). The Essential Properties of Yoga Questionnaire (EPYQ): Psychometric

       Properties. *International Journal Of Yoga Therapy*, doi:10.17761/2018-00016R2

Park, C. L., Riley, K. E., Besedin, E. Y., & Stewert, M. (2013). Discrepancies between

       perceptions of real and ideal yoga teachers and their relationship to emotional well-

       being. *International Journal of Yoga Therapy, 23*(2), 53 – 57

Patton, M. (1990). *Qualitative evaluation and research methods*. Beverly Hills, CA: Sage

Pekrun, K, & Schutz, p, A (2007). Where do we go from here? Implications and future directions

       for inquiry on emotions in education, In p, A Schutz & R, Pekrun (Eds,), *Emotion in*

education. San Diego: Academic Press.

Piaget, J. (1981). Intelligence and affectivity: Their relationship during child development. In T. A. Brown & C. E. Kaegi (Eds.), *Annual Reviews Monographs.* Palo Alto, CA: Annual Reviews.

Price, K. (1973) Of the impact of theory of knowledge on thought about education. In R. Travers (Ed.), *Second handbook of research on teaching* (pp. 498-512). Chicago, IL: Rand McNally.

Porges, S. W. (2001; 2009). The polyvagal theory: Phylogenetic substrates of a social nervous system. *International Journal of Psychophysiology, 42,* 123–146.

Poulin, P. A., Mackenzie, C. S., Soloway, G., & Karayolas, E. (2008). Mindfulness training as an evidenced-based approach to reducing stress and promoting well-being among human services professionals. *International Journal of Health Promotion and Education, 46,* 35–43.

Ragin, C. C. (2008). *Redesigning Social Inquiry : Fuzzy Sets and Beyond*. Chicago: University of Chicago Press.

Razza, R. A., Bergen-Cico, D., & Raymond, K. (2013). Enhancing preschoolers' self-regulation via mindful yoga. *Journal of Child and Family Studies*. doi:10.1007/s10826-013-9847-6

Reeves, T. J., Jorgensen, R., Rybak, T. M., Kaufman, J. K. & Dunn, J. (2017, October) *A Qualitative Analysis of Yoga Instructor Beliefs Across Styles within and Educational Psychology Framework.* Poster Session at the annual Symposium for Yoga Research in Stockbridge, MA, USA.

Richter, S., Tietjens, M., Ziereis, S., Querfurth, S., & Jansen, P. (2016). Yoga training in junior
primary school-aged children has an impact on physical self-perceptions and problem-
related behavior. *Frontiers in Psychology*. doi: 10.3389/fpsyg.2016.00203

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.),
Handbook of research on teaching education (2nd ed., pp. 102-119). New York, NY:
Routledge.

Riley and Park (2015). How does yoga reduce stress? A systematic review of mechanisms of
change and guide to future inquiry. *Health Psychology Review, 9*(3), 379-396. doi:
10.1080/17437199.2014.981778

Ross, A., Bevans, M., Friedmann, E., Williams, L., & Thomas, S. (2014). "I Am a Nice Person
When I Do Yoga!!!": A Qualitative Analysis of How Yoga Affects Relationships.
Journal Of Holistic Nursing, *32*(2), 67-77 11p. doi:10.1177/0898010113508466

Ross, A. (2015, September) *The relationship of yoga to health: results for a national survey of
yoga practitioners.* Symposium conducted by the International Alliance for Yoga
Therapists at the annual Yoga Research Symposium in Stockbridge, MA.

Rubin, H. J. & Rubin, I. S. (2005; 2012) *Qualitative Interviewing: The heart of hearing data.*
Thousand Oaks, CA: Sage.

Rybak T. M, Reeves, T. J., & Jorgensen, R. (2017, October) *A Qualitative Comparison of Yoga
Instructor Beliefs Between Styles.* Poster Session at the annual Symposium for Yoga
Research in Stockbridge, MA, USA.

Saper, R.B., Boah, A.R., Keosaian, J., Cerrada, C., Weinberg, J. and Sherman, K.J. (2013),
Comparing once- versus twice-weekly yoga classes for chronic low back pain in

predominantly low income minorities: a randomized dosing trial. Evidence-Based

   Complementary and Alternative Medicine: eCAM, Vol. 2013 No. 2013, p. 658030. doi:

   10.1155/2013/658030

Schaefer, E. S., & Edgerton, M. (1985). Parent and child correlates of parental modernity. In I. E.

   Siegel (Ed.), Parental belief systems: The psychological consequences for children (pp.

   287–318). Hilsdale, NJ: Erlbaum.

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, *6*, 461-464.

   doi:10.1214/ aos/1176344136

Schneider, C. Q., & Wagemann, C. (2012). *Set-Theoretic Methods for the Social Sciences : A

   Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press.

Scopus. (2017). Jones, Mary. Retrieved November 20, 2017, from http://www.scopus.com/

Shutz, P. A. & Zembylas, M. (Eds.). (2009) *Advances in teacher emotion research. The impact

   on teachers lives.* New York: Springer.

Schutz, P.A., & Pekrun, R. (2007). *Emotions in Education.* San Diego, CA: Elsevier.

Serwacki, M. L., & Cook-Cottone, C. (2012). Yoga in the schools: A systematic review of the

   literature. *International Journal of Yoga Therapy*, 22, 101–109.

Sharma, U., Loreman, T. & Forlin, C. (2012). Measuring teaching efficacy to implement

   inclusive practices. *Journal of Research in Special Education Needs*, 12, pp. 12–21.

Siegal, D. (1999) *The developing mind: Toward a neurobiological understanding of

   interpersonal experience.* New York: Penguin.

Skott, J. (2015). The promises, problems, and prospects of research on teachers' beliefs. In L.

   Corno & E. M. Anderman (Eds.) *Handbook of Educational Psychology (3rd ed).*(pp. 402-

   415). New York: Routledge.

Spruce, R., & Bol, L. (2015). Teacher beliefs, knowledge, and practice of self-regulated learning. *Metacognition Learning, 10*, 245-277. doi:10.1007/s11409-014-9124-0

Stipek, D., Feiler, R., Daniels, D., & Milburn, S. (1995) Effects of different instructional approaches on young children's achievement. *Child Development, 66*, 209-223.

Stueck, M., & Gloeckner, N. (2005). Yoga for children in the mirror of science: working spectrum and practice of the Training of Relaxation with Elements of Yoga for Children. *Early Child Development and Care, 175*(4), 371-377. doi:10.1080/0300443042000230537

Telles, S., Singh, N., Bhardwaj, A. K., Kumas, A., & Balkrishna, A. (2013). Effect of yoga or physical exercise on physical, cognitive and emotional measures in children: A randomized controlled trial. *Child and Adolescent Psychiatry and Mental Health, 7*(37)

Tran, U. S., Glück, T. M., & Nader, I. W. (2013). Investigating the Five Facet Mindfulness Questionnaire (FFMQ): Construction of a short form and evidence of a two-factor higher order structure of mindfulness. *Journal of Clinical Psychology, 69,* 951–965. http://dx.doi.org/10.1002/ jclp.21996

Tsschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education*, *17*783-805. doi:10.1016/S0742-051X(01)00036-1

Tschannen-Moran, M., Salloum, S. J., Goddard, R. D. (2015). The influence of collective beliefs and shared norms. In L. Corno & E. M. Anderman (Eds.) *Handbook of Educational Psychology (3rd ed).*(pp. 402-415). New York: Routledge.

Usher, E. L., & Pajares, F. (2008). Sources of Self-Efficacy in School: Critical Review of the Literature and Future Directions. *Review of Educational Research*, (4). 751.

Van der Kolk, B. A. (2014). *The Body Keeps Score: Integration of Mind, Brain, and Body in the Treatment of Trauma*. Phoenix, AZ.

Van der Linden, D., te Nijenhuis, J., & Bakker, A. B. (2010). The General Factor of Personality: A meta-analysis of Big Five intercorrelations and a criterion-related validity study. *Journal of Research In Personality*, *44*315-327. doi:10.1016/j.jrp.2010.03.003

Velicer, W.F. (1976). Determining the number of components from the matrix of partial correlations. Psychometrika, 41, 321-327.

Velicer, W.F., Eaton, C.A., & Fava, J.L. (2000). Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In R. D. Goffin , & E. Helmes (Eds.), Problems and solutions in human assessment: Honoring Douglas Jackson at seventy (pp. 41-71). Boston, MA: Kluwer.

Vygotsky, L. S. (1986). *Thought and language.* Cambridge, MA: MIT Press.

Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology*, *82*(1), 81-91. doi:10.1037/0022-0663.82.1.81

Wolfe, E. W., Viger, S. G., Jarvinen, D. W., & Linksman, J. (2007) Validation of scores from a measure of teachers' efficacy toward standards-aligned classroom assessment. *Educational and Psychological Measurement. (67)*3, 460-474.

Wolf, E. W., & Smith, E. V. (2007) Instrument development tools and activities for measure validation using Rasch models: Part I – Instrument development tools. *Journal of Applied Measurement, 8*(1), p 2 – 27

Williamson, D. Lola, K. and Gleig, A. (2013). *Homegrown Gurus: From Hinduism in America to American Hinduism*. Albany, NY

Williamson, L. (2013) Yoga in public schools. *Education Digest.* 1. 35 – 37

Wu, M. L., Adams, R. J., Wilson, M. R., & Heldane, S. A. (2007). ACER ConQuest: Generalized item response modeling software (Version 2.0) [Computer software]. Melbourne: Australian Council for Educational Research.

Zee, M., & Koomen, H. M. Y. (2016) Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being. *Review of Educational Research. 86*(4), p 981-1015. doi: 10.3102/0034654315626801

APPENDIX

Initial Interview Semi-Structured Guide

1) Tell me a little about why you started teaching yoga…

2) How many styles of yoga do you teach?

    a. If you teach one style, tell me about why you chose it.

    b. If you teach numerous styles, tell me about what you like in each

3) What do you think are important things for yoga teachers to know and understand about yoga?

4) When you study yoga, what parts of the study inform your instruction?

5) What parts of your personal practice inform your instruction?

6) What kind of learning or growth do you believe happens during yoga?

7) Is there anything else you want to share about your experience, yoga instruction, or yoga itself?

Focus Group Semi-Structured Guide

1) These are the identified themes that emerged from the interview <<insert themes>>.

    a. Of these themes please discuss where there is potential overlap so that we can combine where necessary.

    b. Of these themes please prioritize them to identify what we think are the 3-7 most important.

2) These are the 3 – 7 identified themes <<review shortened list>>

    a. In each theme are there multiple responses, dichotomous answers, or scalable responses (go through each)

3) Here is each theme and how we think it can be measured <<review list one at a time>>.

    a. What are questions that may be asked of yoga instructors to measure responses?

Cognitive Interview Structured Guide

1) I am going to ask a series of questions. After each question please respond with the following

    a. What you think the question means or is asking.

    b. What your response would be

    c. If you think there is any language that could be confused or difficult to interpret.

Appendix B

IRB Approval

The data collected for part I was covered under University of Memphis IRB# PRO-FY2017-234.

The survey data in part II was covered under University of Memphis IRB# PRO-FY2018-477.