THESIS

CONCEPTUALIZING CALLING: A TYPOLOGICAL APPROACH

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ABSTRACT

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The topic of calling, the work orientation associated most deeply with a sense of meaningful work (e.g., Bunderson & Thompson, 2009), has received increased interest and research within the last several decades. However, the field is plagued by confusion regarding what the calling concept entails and for whom. This present study addresses these two concerns within a sample (N = 588) of U.S. undergraduate students. First, a two-step cluster analysis method was employed to build upon the only previous typological study of calling (i.e., Hirschi, 2011) with the purpose of better understanding the patterns of vocational identity characteristics for those with a sense of calling. A two-cluster solution was determined which differed significantly on sense of calling; other key differences between the two clusters included the importance placed on work versus religion and the emphasis on self-enhancement and prosocial work values. These two clusters are similar to two of Hirschi's (2011) three calling clusters and the similarities and differences between the two studies findings are discussed. Second, the taxometric method was also used to discern if this lack of consensus and the diverse array of scholarly definitions of calling is reflective of two distinct types of calling within its latent structure. An indicator set was created to fully represent all understandings of the concept of calling using a combination of one dimension representing a "Modern" understanding of calling (i.e., the Calling Scale - Dobrow and Tosti-Kharas, 2011) and three dimensions representing Neo-Classical understandings of calling (i.e., the Calling and Vocation Questionnaire - Dik et al., 2012). This indicator set was then analyzed using three statistically non-redundant taxometric

procedures (i.e., MAXEIG, MAMBAC, and L-Mode). These taxometric results strongly support the latent structure of calling as dimensional (i.e., not categorical) and therefore did not support the hypothesis. These findings have important practical implications for causality, labeling, and measurement. While subsequent research is needed, the results of the present study point to the possibility that differences in how individuals define calling are reflective of personal characteristics influencing which aspects of calling are emphasized.

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INTRODUCTION

This study addresses two concerns regarding the concept of calling: what patterns emerge regarding vocational identity characteristics of those with a calling and clarification of the latent structure of calling. First, calling is framed within the context of meaningful work, the many diverse definitions of calling are discussed, and the conceptual confusion this creates is presented. Next follows an overview of the importance of calling and a brief summary of research on the concept. Hirschi's (2011) study using cluster analysis on German undergraduates is summarized as the only previous typological study on calling to date. Both the benefits reaped from this type of methodology and the remaining lack of clarity regarding the latent structure of calling are highlighted. This study uses the typological approach of cluster analysis with an U.S. sample to investigate the common and differential characteristics of groups of people who approach their work as a calling. To address the difficulties and dilemmas on how to define calling, the present study also employs the taxometric method, an additional typological statistical approach, to investigate the extent to which there are two distinct types of calling.

Meaningful Work

Work is a central aspect of human life; however, the meaning of work and motivations for work have varied considerably throughout the centuries (Hardy, 1990). Today, a growing body of management, vocational psychology, and occupational health psychology research emphasizes the importance of addressing people's work experience from a holistic perspective (e.g., Macik- Frey, Quick & Nelson, 2007). Positive psychology, defined as a "science of positive subjective experience, positive individual traits, and positive institutions" (Seligman & Csikszentmihalyi, 2014, p. 5), offers one approach to understanding the workplace holistically.

Specifically, positive psychology aims to balance an historically deficit-based understanding of human functioning in psychology by focusing on the helpful, optimal, and healthy characteristics of people. One application of positive psychology within the work domain examines meaningful work, described as the appraisal of work as positive and significant (Rosso, Dekas, & Wrzesniewski, 2010). Steger and Dik (2010) identified three main factors of meaningful work: comprehension, purpose, and serving the greater good. An increasing volume of studies support meaning and purpose at work as integrative aspects of workers' overall well-being (Harpaz & Fu, 2002), health (Dik, Byrne, & Steger, 2013), and general meaning in life (Steger & Dik, 2010). Meaningful work is also related to job satisfaction (Kamdron, 2005; Sparks & Schenk, 2001), job commitment (Bunderson & Thompson, 2009), increased tolerance to stress (Britt, Adler, & Bartone, 2001; Elangovan, Pinder, & McLean, 2010), and decreased mental health concerns (e.g., low self-esteem and anxiety; Deci et al., 2001). Due to this pattern of results, meaningful work has been incorporated by the National Institute for Occupational Safety and Health (NIOSH) as part of the definition of well-being and their Total Worker Health initiative. Leading career development theories also highlight the importance of meaning within the work domain. For example, developmental theories (e.g., Gottfredson, 1981; Super, 1980) encourage workers to reflect on what creates meaningful work and identify methods to implement their occupational self-concept. One promising pathway for promoting meaningful work and associated benefits is targeting the meaningful work orientation of "calling."

Calling as a Meaningful Work Orientation

Examination of the motivations behind why individuals engage in work has given rise to the categorization of different types of work orientations (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). Bellah and colleagues (1985) proposed in their book, *Habits of the Heart*, that

people generally hold one of three dominant orientations towards work: job (i.e., a focus on financial rewards), career (i.e., a focus on advancement and achievement), or calling (i.e., a focus on fulfilling, socially important work). These categories were described as having very little overlap, and one study of non-faculty university employees found that roughly an equal number endorsed each category as most relevant to themselves (Wrzesniewski et al., 1997). Calling since this time has been often studied on its own and not solely in comparison to the other two work orientations. Bunderson and Thompson (2009), in their study of callings in zookeepers, observed that the concept of calling has been consistently described by scholars as the "strongest" (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985), most "extreme" (Dobrow, 2004), and "deepest" (Hall & Chandler, 2005) means of increasing the sense that one's work is meaningful. It is important to note that not all callings are confined to the work domain. However, due to calling's historical foundation as work-related and being primarily examined within the context of work (for an example of an exception, see parents with a calling; Coulson, Oades, & Stoyles, 2012), calling will typically be referred to as it applies to the work role in this paper.

The calling work orientation has gained increased research attention within the past several decades. However, the idea that all legitimate areas of work can be approached as a calling, if pursued to glorify God and serve the common good, dates to at least the Protestant Reformation of the 16th and 17th centuries (Dik, Nepute, & McLaren, 2010). During this period in Europe, prominent figures such as Martin Luther and John Calvin argued that all honest work should be viewed as potentially having inherent sacred value. Luther viewed all occupations as proper Christian service, with the exceptions of the usurer, the prostitute, and the monk (if by trying to ensure their own salvation, monks were not working to help others; Hardy, 1990). These perspectives held that both common (i.e., "secular") and overtly religious occupations

could be equally glorifying to God. For example, providing other humans with shoes that kept their feet warm and dry was posited to have value comparable to tending to the church flock and leading Sunday services. While the calling concept has evolved, it has been traditionally described in a spiritual manner as originating from actively listening to God, discerning God's will, and then taking action according to this unique calling to fulfill the perceived greater purpose (Floyd, 1998). These religious roots can be observed though Floyd's (1998) view that the term "calling" necessarily implies a "caller," even though many contemporaries endorse the idea of calling as both secular and sacred (Cahalan & Schuurman, 2016).

Diverse Definitions of Calling

Despite the progress made in understanding associated benefits of calling, researchers are engaged in an ongoing debate about how to best define the concept. Across these definitions, there are often common themes, such as calling including a component of meaningful or purposeful work (e.g., Hirschi, 2011). While in some ways the various definitions of calling appear to overlap and correspond similarly to outcomes (Duffy, Autin, Allan, & Douglas, 2014), how to best define calling matters (e.g., Berkelaar & Buzzanell, 2014). Characteristics of the various calling definitions allow them to be described as existing along a bipolar continuum. On one end is the "Neo-Classical" view, which reflects historic understandings of calling and includes a prosocial motivation for work. On the other is the "Modern" view that focuses on passionate engagement and personal fulfillment (Bunderson & Thompson, 2009; Duffy & Dik, 2013). Because most researchers' definitions of calling fall somewhere within these two poles, it raises an important question: Do the differences emphasized by researchers in their definitions reflect the existence of distinct types of calling held by participants as well? Or does the diversity

found within research instead reflect differences in the degree of importance placed on certain dimensions of calling?

It is important to point out that a key distinction between calling definitions lies in the motivations and purpose underlying how individuals approach their work, not with the process through which they discern what work to do. The motivations for work can be grouped into two categories: prosocial motivations (e.g., the desire to help others and contribute to society) and self-focused motivations (e.g., cultivating their unique strengths and satisfying their interests). This may also reflect differences in long-term, broader motivational orientations by these groups, with prosocial motivations toward work primarily associated with obtaining eudemonic well-being (i.e., meaning) and self-focused motivations toward work connected to hedonic happiness (i.e., pleasure).

The prominent definitions of calling within the research literature and how they can be classified are highlighted next. Examining the six articles with the highest Google Scholar citation counts (as of May 12, 2017) that formally propose a definition of calling highlights major differences between definitions. These definitions have been placed along the continuum described above, between the Modern and Neo-Classical understandings of calling, distinctions made by Bunderson and Thompson (2009; see Table 1).

Purely Modern definitions view calling as including a meaning or purpose component with the motivation towards work much more self-focused. These descriptions of calling emphasize calling as a secularized concept with a focus on achieving self-actualization and fulfillment (e.g., to express creativity or mastery of personal strengths; Bunderson & Thompson, 2009). For example, Dobrow and Tosti-Kharas (2011) define calling as "a consuming,

meaningful passion people experience toward a domain" (p. 1005). Similarly, Hall and Chandler (2005) describe calling as "work that a person perceives as his [sic] purpose in life" (p. 10).

In contrast, Neo-classical definitions acknowledge historical and religious roots of the concept of calling and prosocial or other-oriented motivators (Bunderson & Thompson, 2009; Dik, Duffy, & Steger, 2012). Common themes found throughout Neo-Classical definitions of calling include the idea of using one's unique gifts, being summoned by God, or compelled by something sacred to perform a certain type of work (Dik, Nepute, & Mclaren, 2010). For example, Bunderson and Thompson (2009) defined calling as "that place in the occupational division of labor in society that one feels destined to fill by virtue of particular gifts, talents, and/or idiosyncratic life opportunities" (p. 38). Another example of a Neo-Classical definition of calling is Dik and Duffy's (2009), which requires an individual to view one's work as 1) purposeful/meaningful in nature 2) that aims to serve the greater good and 3) comes from a transcendent or external summons. These three dimensions were also found when college students were asked to qualitatively define what calling meant to them (Hunter, Dik, & Banning, 2010). For Dik and Duffy (2009), the last component, external summons, is what differentiates a calling from the closely related construct of a "vocation." While calling has traditionally been rooted in a religious context and tends to be more strongly endorsed by those who identify as religious, this definition also allows for a secular form of calling. Other contemporary scholars also endorse calling as no longer only a sacred concept (e.g., Elangovan et al., 2010; Hermansen, 2004). Within Dik and Duffy's (2009) definition, an external summons is viewed as coming from beyond the self, whatever the specific source may be (e.g., serving one's family, nation, a higher power, the local community). Of the three dimensions, the idea of an external summons seems to

be the component that is least likely to be endorsed, but does appear to have extreme importance for those individuals who do find it relevant (Dik, Nepute, & McLaren, 2010).

Some scholars take more of a "middle-of-the-road" view of calling and define it as purposeful/meaningful work with prosocial motivations, but without the need to also sense a calling as originating from an external source. Examples of this include Elangovan, Pinder, and McLean's (2010) definition which proposes three fundamental features: a move towards action, purpose or a personal mission, and a prosocial orientation. They combine these features into a definition of calling as "a course of action in pursuit of pro-social intentions embodying the convergence of an individual's sense of what he or she would like to do, should do, and actually does" (Elangovan et al., 2010, p. 430). Another example which falls between the poles of Modern and Neo-Classical definitions is Wrzesniewski et al.'s (1997) framing of a calling as one's "focus on enjoyment of fulfilling, socially useful work" (p. 21)

This brief overview of the most prominent definitions of calling highlights the differences in how scholars understand and define calling. The challenge of these diverse definitions is a hurdle which must be overcome by any research on the concept. Despite this confusion, there is a growing body of research examining calling and progress has been made in understanding the benefits and development of a calling.

Research on Benefits of Calling

Few studies to date have examined the antecedents of calling. One such study is Dobrow's (2013) seven-year longitudinal study which examined calling development in elite music students. She found that social comfort (i.e., feeling socially accepted within the domain) and behavioral experiences (i.e., how actively involved participants were) predicted initially collected self-reports of calling, but also contributed to a decrease in calling over time. Ability

and demographics did not affect ratings of calling after controlling for major (i.e., music-oriented or not) and type of musical involvement (i.e., instrumental or non-instrumental). Dobrow (2013) asserted that her findings support a view of calling that is dynamic in nature and that calling is developed instead of "found" or discovered. Another initial study examining calling development within a large, U.S. nation-wide study suggests that, while many individuals pointed to common themes among calling development such as family, others have described varied sources of calling. Individuals who discerned a calling from external sources emphasized the importance of a higher power as the strongest influence. Those who discerned a calling from internal sources described personal qualities and goals as particularly influential (White, Olivas, & Dik, 2016).

While the field currently lacks a comprehensive understanding of how calling develops, research demonstrates that the concept of calling is highly salient and personally relevant in the United States among both college students (44% found calling relevant; Duffy & Sedlacek, 2010) and working adults (35.5% endorsed a calling orientation; Wrzesniewski et al., 1997; 50.6% believed they had a calling; Duffy et al., 2014). The benefits that are associated with endorsing a calling begin early on. Adolescents who hold purposeful work goals also report higher meaning in life and in schoolwork than their peers who did not have a purposeful orientation (Yeager & Bundick, 2009). Those who endorse calling as relevant to themselves have greater life, health, and job satisfaction, miss significantly fewer days of work, and experience better overall health than individuals who view their work as simply a job or a career (Wrzesniewski et al., 1997).

Duffy and Dik (2013) describe three primary ways in which individuals approach a calling: 1) searching for, 2) perceiving, or 3) living a calling. Studies demonstrate that benefits are most pronounced for those who feel they are currently living their calling (Duffy, Autin,

Allan, & Douglass, 2014). For these individuals, there are considerable benefits to general well-being (e.g., life satisfaction and meaning in life) as well as career development (e.g., career decision self-efficacy, career commitment, job satisfaction, work meaning; Dik, Duffy, & Eldridge, 2009). Individuals with a calling may also have the benefits of meta-competencies such as identity and adaptability, which aid workers throughout their entire career development (Hall & Chandler, 2005). In fact, Hall and Chandler (2005) suggest that living out a calling may provide a pathway to reach the highest level of work satisfaction. For callings with a prosocial emphasis, understanding how one's work helps one's community holds many benefits, such as protecting workers from burnout and dissatisfaction, increasing motivation and performance, and fostering career optimism and adaptability (Dik, Eldridge, Steger, & Duffy, 2012). Prosocial values may be especially beneficial for individuals working in menial and stigmatized jobs as understanding how one's work helps others can bring meaning to these otherwise dreary jobs (Dik & Duffy, 2009).

Callings in Diverse Populations

While the origins of the calling concept developed within the context of Christian societies, other major faith traditions, such as Islam and Buddhism, share common ideas surrounding calling, purpose, and meaningful work (e.g., Hermansen, 2004; Lama & Cutler, 2005, Cahalan & Schuurman, 2016). The Arabic words that translate into "call" or "calling" are most commonly used in the Qur'an to refer to people calling to God, however they are also used with God calling on humans to do God's bidding (Hermansen, 2004). Similar to how Luther and Calvin viewed work, Islam also supports the idea that all work done honorably and for God is sacred and of inherent worth. The concept of "right livelihood" in Buddhism, or making one's living through work that does not harm others, also has considerable overlap with the calling

work orientation. When the Dalai Lama of Tibetan Buddhism was directly asked about calling in *The Art of Happiness at Work*, His Holiness endorsed the concept as being the orientation toward work that he deemed to be most likely to foster inward satisfaction (Lama & Cutler, 2005). He further stated that it is generally optimal to have a prosocial motivation towards one's work or at least have a "proper" motivation (e.g., not jealousy or strong competition).

A growing body of research finds that calling is a relevant construct cross-culturally as the number of studies carried out in different countries increases (for more on the cross-cultural similarities and differences see Dik & Duffy, 2009; Dik, Nepute, & Mclaren, 2010; German undergraduates - Hirschi, 2011; Chinese college students - Zhang, Herrmann, Hirschi, Wei, & Zhang, 2015; Zhang, Dik, Wei, & Zhang, 2014; Autralian parents - Coulson, Oades, & Stoyles, 2012; Indian MTurk sample - Douglass, Duffy, & Autin, 2015). However, there is still reservation by some scholars who assert that, while calling appears to hold relevance across cultures, this is a matter for research to more fully address (Elangovan et al., 2010).

Methodological Concerns

Despite advancements within the field, there remains conceptual disagreement regarding the definition of calling. Readers may find themselves baffled by the lack of coherence and question what construct is being studied when each researcher seems to understand calling differently. This raises fundamental questions regarding what can be justifiably understood from the accumulating body of research conducted on this topic. What sorts of interpretations can be made from research conducted using measures aligning to very different definitions? Can these studies be generalized as examining the same construct, simply using different lenses? Or instead does this confusion arise from true differences in the latent structure of what a calling is, and for whom? These questions point towards the current difficulty drawing concrete implications from

research on calling, not only for researchers and scholars on the topic, but also for workers and organizations.

Related to this, methodological concerns exist regarding which measurement instrument to use because this choice is usually directly tied to the issue regarding definitions (Dik & Shimizu, under review). The distinctions between calling definitions and their measurement tools are nuanced. Additionally, any methodological approach used necessarily contains both strengths and unavoidable limitations. Therefore, if the field of calling is to progress, multiple methodological strategies should be applied. Research on calling has almost exclusively utilized one of two methodologies: quantitative studies that use a "top-down" approach or qualitative studies that employ a "bottom-up" approach (Dik & Shimizu, under review). Both approaches maintain strengths and weakness that are important to consider. For example, quantitative approaches generate results which are more generalizable, but may also potentially impose greater levels of researcher bias upon studies. Qualitative studies allow participants to provide "deep" or "rich" descriptions and are less likely to impose researcher bias. However, they are also more difficult to generalize from because of the extremely sample-driven nature of this approach. Yet, both of these approaches (i.e., quantitative and qualitative) have and will continue to contribute substantially to the field. However, neither approach is able to address the two concerns of the present study. As such, a third methodological approach, a typological approach, is used in the present study.

The Typological Approach

The typological approach refers to group of methods that tend to be quantitative and have been less commonly employed in calling research. Topological procedures may examine the number and characteristics of different groups, as is done with clustering methods. These

methods typically assume the existence of types and then group objects (e.g., people) together based on multivariate similarity (Gore, 2000). Clustering methods frequently aim to create a typology, or classification system, where one does yet not exist. Regarding calling research, cluster methods are especially important to examine the personal qualities of individuals who identify as having a calling. Similarities between clusters may point to essential or common elements of those who have a calling (Hirschi, 2011), which further highlight fertile career development processes from which callings are more likely to develop. Differences between clusters of individuals with callings, and better understanding these differences, will lay the groundwork from which to better understand sampling techniques and measurement selection.

Topological approaches may also examine if types exist within a construct by using empirical, quantitative methods (e.g., taxometrics, bimodal distribution) to directly investigate the construct in question. These typological methods offer potential in calling research by a providing a means for clarification within the midst of definitional confusion. Importantly, these methods examine the latent structure of the construct, going beyond surface level characteristics. While constructs cannot be observed directly, their existence should be supported by both empirical data and theoretical support (MacCorquodal & Meehl, 1948). Understanding the research objective of these typological methods requires recognizing the distinction between true classes, non-arbitrary types, and distinct groupings (i.e., "taxas," singular "taxon") versus continuous variables, solely dimensional groups, and differences in degree. As a commonsense example, there are differences on various dimensions (e.g., size, ear shape, fur length) amongst dogs. However, there is a distinct difference in type between dogs and cats; no matter how big the cat or how small the dog, they represent two distinctive taxa within the large grouping of common household pets. These differences in type or taxa can be detected because there will

naturally be different underlying statistical distributions for the different categories even if apparent surface level characteristics appear continuous. However, these analytic methods are typically limited to discernment of the existence of types, as opposed to the components which comprise each construct or type. Therefore, it is often necessary to employ additional statistical analyses, such as factor analysis, to examine dimensions and characteristics of the construct.

Cluster Analysis

Despite the potential that clustering methods hold for the future of calling research, previous research using these methods has been extremely limited (Dik & Shimizu, under review). In the only previous typological study on calling known to date, Hirschi (2011) conducted a cluster analysis using a large sample ($N = 407$) of German undergraduate college students. He employed cluster analysis with the stated intention of identifying the core and optional components of what calling entails. However, it is important to note that the method of cluster analysis cannot fulfill Hirschi's (2011) specified goal. Cluster analysis groups individuals based on their similarities on a variety of constructs, thus highlighting patterns of characteristics. As such, the use of cluster analysis on those who have a calling provides valuable insight into understanding their vocational identity features, but cannot be used to clarify the components of the actual construct. In other words, cluster analysis is an effective means for examining who has a calling and possibly even how sensing a calling may impact their identity, not what a calling is.

The Hirschi (2011) study used a two-step cluster analysis procedure and included measures that assessed the following constructs: presence of calling, career decidedness/commitment, self-exploration, career engagement, (career) confidence, work and religion centrality, core self-evaluations, and the work values of self-transcendence, conservation, openness to change, and self-enhancement. Hirschi (2011) first applied hierarchical

cluster analysis using Ward's method on squared Euclidian distances and determined the number of clusters based upon theoretical meaningfulness, parsimony, and explanatory power. The results of Hirschi's (2011) study demonstrated that a seven-cluster solution was most appropriate, with three groups above-average in presence of calling and four below-average in presence of calling. Next, Hirschi (2011) applied an iterative k-means clustering procedure using the initial cluster centers from the hierarchical cluster analysis as non-random starting points to make final assignments of participants to clusters. The three clusters with above-average presence of calling were then examined in more depth. The first group Hirschi (2011) labeled as "negative career self-centered" and was comprised of students who held work as extremely important, were focused on advancing their careers, but held negative views about themselves. The second group was labeled as "prosocial religious." These individuals did not place as much importance on work, but espoused strong prosocial motivations, and scored high on religious measures. The third group, "positive varied work orientation," placed a high emphasis on work, but did not have a consistent pattern with regard to their work values.

The conclusion that Hirschi (2011) drew from his study is that there are certain essential components of calling and the other aspects that differed between groups are optional. The defining characteristics of calling in his study are the achievement of vocational identity based on self-exploration, a sense of confidence towards one's career, and high career engagement. Despite this assertion, these "essential characteristics" may instead be consequences of a sense of calling rather than defining components. Hirschi (2011) also conjectured that calling also had non-essential, "optional" components (i.e., those dimensions not found across all calling clusters). He stated that his results point to calling as being action-orientated and that all sorts of work with a variety of work motivations can have a sense of calling, not only those with a pro-

social focus. Finally, he concluded that his study results endorse the best definition of calling as "work that a person perceives as her or his purpose in life" (originally found in Hall & Chandler, 2005, p. 160). Therefore, the Hirschi (2011) study emphasizes a Modern conceptualization of calling as not necessitating an external summons or pro-social intentions and being simply purposeful in nature. Once again, the use of cluster analysis does not support these conclusions regarding the actual construct of calling. However, Hirschi's (2011) study does provide an initial starting basis for understanding the characteristics of those who have a calling. Since cluster analysis is a sample-dependent and data-driven method, it is extremely important to replicate the study using other samples to support the generalizability of the results. The present study addresses this need by using cluster analysis to investigate a sample of U.S. college students who have a calling.

Taxometric Analysis

The two types of calling definitions described earlier (i.e., Neo-Classical and Modern) suggest that the divide among researchers reflects the existence of two distinct types of calling. It is unknown whether these differences in definitions point toward two types of calling or simply different dimensions of calling. Answering this question requires more than an examination of surface-level structure and instead necessitates a better understanding of the true underlying classification of calling. One approach to answering this question is to allow the data to demonstrate the answer by using the taxometric method.

The famed 20th century psychologist Paul Meehl was the primary mind behind the development of the taxometric method. Meehl noted that individuals within a taxon have some sort of objective break, division, or line in underlying structure between them and members of the other group which can be determined using statistical methods. Valid classification can be

difficult in three ways; between-groups similarity, within-group variation, and limitations of reliable and valid tools for measuring the important characteristics of the studied objects (Ruscio, Haslam, & Ruscio, 2004). While other methods besides taxometrics exist, they tend to either under-identify taxonic structures (e.g., examining bimodality of frequency distributions) or presume and over-estimate the number of groups (e.g., latent class analysis; Ruscio et al., 2004). Certain statistical methods, such as cluster analysis, begin from an understanding that there must be groupings and can be used to investigate how many categories may exist. However, the taxometric method is the most powerful process for the initial step in determining if constructs are dimensional in nature or if they encompass multiple distinct types (Ruscio et al., 2004).

Taxometrics was originally formulated by Meehl and his associates to try and test Meehl's hypothesis that schizotypal personality had a genetic liability among a certain group of people (Meehl, 1995). In creating the taxometric method, Meehl was attempting to find a method that would be able to distinguish the people with this genetic liability from the general population. In line with its origins, a large amount of the research using the taxometric method has been undertaken within psychopathology. However, this method has also been used to determine if there are distinct taxa within a multitude of various other concepts within psychology ranging from personality traits to responding styles to questions. It has even been endorsed by experts on taxometrics as applicable to other fields such as epidemiology, biology, and cognition (Ruscio et al., 2006). Taxometrics can be a robust and useful tool whenever researchers are attempting to "carve nature at its joints" (Plato) and create a classification system based upon the underlying structure of a construct. While proper use of taxometric methods has been found to be highly successful at distinguishing between categorical (discrete) and dimensional (continuous) models, one drawback to taxometrics is that there have been some

questions raised as to if this method can accurately distinguish when there are three or more groups (Walters, McGrath, & Knight, 2010). At the present, research using Monte Carlo datasets indicates that taxometrics is best used to distinguish whether a construct is dimensional or categorical. After this is determined with taxometrics, the use of other latent modeling procedures is recommended to determine the exact number of dimensions or categories (McGrath & Walters, 2012). Meehl's taxometric method provides a powerful statistical tool in providing conceptual clarity and is used in the present study to determine if the latent structure of calling is taxonic or dimensional.

The Present Study

Despite accumulating research on the topic of calling and associated outcomes, the field is plagued by an array of diverse definitions of what a calling entails which has led to a lack of coherence, methodological concerns, and hesitation regarding justifiable implications. While Hirschi (2011) attempted to provide clarity regarding what should be considered the core characteristics of calling, his study instead contributed a valuable first look at patterns of vocational identity characteristics for individuals who identified as having a calling within his German undergraduate sample. Understanding the patterns of characteristics of those who endorse a sense of calling is indeed a beneficial endeavor and this present study builds upon Hirschi's (2011) study by also conducting cluster analysis on an U.S. undergraduate sample. Taxometrics, a powerful yet underutilized statistical method, was also used in this present study to provide conceptual clarification. Specifically, it was used to test the hypothesis that there would be two distinct taxas within the latent structure of calling, reflected in the poles of Modern and Neo-Classical definitional categories.

Cluster Analysis. The first typological approach in the present study is cluster analysis. As noted above, cluster analysis assumes that participants differ significantly on at least some of the constructs of interest and uses this assumption to identify subgroups (Molenaar, 2004; Vondracek & Porfeli, 2002). This study attempts to investigate the research question: What are both the common and differing characteristics across groups of people who identify as having a calling? While differences in how the concept of calling is understood and manifests between cultures have been found, the similarities are striking. For example, a study on calling with Australian parents noted that the results were consistent with previous research despite examining the concept in a non-work domain and with an understudied cultural population (Coulson et al., 2012). The dimensions of Guiding Force, Meaning and Purpose, and Altruism identified in Chinese college populations (Zhang et al., 2015; Zhang et al., 2014) closely resembles those of purposeful work, prosocial orientation, and transcendent force found within Dik and Duffy's (2009) calling definition, as well as similar dimensions found in qualitative methods in U.S. samples (Hunter, Dik & Banning, 2010). These cross-cultural results are surprisingly similar to those of U.S. and other Western cultures. Cluster analysis was employed within a U.S. sample of undergraduates in the present study to examine the extent to which similar patterns may emerge between this study and Hirschi's (2011) study using a German undergraduate sample. While not included in the original Hirschi (2011) study, religious orientation was also included to determine if it would demonstrate unique patterns for individuals who feel they have a calling. Scholars from different major faiths in Cahalan and Shurrman's (2016) book, *Calling in Today's World*, discussed how the relative importance of religion and faith may impact modern experiences of calling. Members from the different faiths also posited that the motivations driving individuals to engage with their faith may directly

impact how they perceive and live their callings out (e.g., how those actively engaged in secular Judaism may differ in their perception of calling from their Jewish counterparts who believe in God). Hence, external motivations for engaging in religion may resound more profoundly for those who believe they have been called by a higher power, such as God. This experience of an external call aligns with the more traditional Neo-Classical understanding of calling. More intrinsic motivations for engaging in a calling might more strongly inspire those with a self-actualizing (i.e., Modern) emphasis of calling. However, because of the lack empirical research on calling which includes religious orientation, no a priori predictions were made.

Taxometric Analysis. The diverse definitions of calling have been loosely categorized by scholars (Bunderson & Thompson, 2009; Duffy & Dik, 2013) into two groups. These groups are the historically-rooted "Neo-Classical" callings, with its other-oriented motivation for work, and "Modern" callings which instead focusing on internal motivations for engaging in work. The conceptual distinction between these two ways of defining calling may reflect clear differences in how research participants define the construct, which would suggest the existence of two distinct types of calling. Therefore, the second purpose of the present study is to test this possibility using taxometric analysis. Stated formally, the first hypothesis is as follows:

> **Hypothesis 1**: It is expected that the latent structure of calling, when studied in undergraduate college students in the U.S., reflects discrete taxa.

While not testable within the current study, should discrete taxa and not continuous dimensions be found, the next step for subsequent studies would be to examine the items that differentiate the taxa. In light of the primary distinctions in calling definitions described above, it would be likely that the two hypothesized taxa underlying the latent structure of calling would be best described as "Neo-Classical" and "Modern." More specifically, it could be possible that the Neo-

Classical category would have an external (i.e., prosocial) focus and would highly correlated to the importance placed on religion. In contrast, a Modern category would be self-focused (e.g., motivated by self-actualizing outcomes or fulfillment of personal interests) and would not include a prosocial motivation for work.

METHODS

Participants and Procedure

A college student sample was chosen for this study as a population for which understanding career development processes are especially important as well as representing individuals for which past research has strongly supported calling as a relevant construct. Furthermore, the sample chosen also closely mirrored the undergraduate college sample used in Hirshi's (2011) study. The sample in the present study consisted of undergraduate students enrolled in PSY 100 and PSY 250 during the Fall 2015 semester at Colorado State University. These students were contacted via the undergraduate research pool and received course credit as compensation for taking the survey. Because the intention was to sample participants who identified as having a calling, all participants were required to answer affirmatively to a screening question ("People sometimes describe having a calling in life, often to a specific job or career. Do you have a calling?") to be eligible to take the survey. This same question was asked a second time as the first question of the demographic section of the survey (76% answered "Yes" the second time).

Data were initially collected from 828 participants. The data for 40 participants were deleted due to considerable missing data in their responses (e.g., did not respond to more than half of the survey questions). An additional 200 participants (24% of collected sample) were excluded from the analyses because they answered negatively to the screening question when asked a second time. This non-calling group also responded in consistent patterns on additional measures of calling (e.g., the Brief Calling Scale Presence subscale - Dik et al., 2012 and screening question $r = 0.563$, $p < .001$), indicating support for using the screening question as brief indicator of the

extent to which participants felt they had a calling. After data cleaning, a total of $n = 588$ remained for analyses. Of these 588 respondents, 67.5% identified as female, with a mean age of 19.11 years ($SD = 2.18$). The reported year in college was 62.6% 1st year, 24.1% 2nd year, 8.7% 3rd year, 3.7% 4th year, and 0.7% 5th year. The reported ethnicity was 83.5% White/European, 12.1% Latino/Hispanic, 5.1% Asian/Pacific Islander, 1.4% American Indian/Native American, 3.2% Black/African-American, and 2.2% Other. 18.0% of the sample identified as evangelical Christian.

Instruments

The presence of calling for taxometrics was measured using the Calling and Vocation Questionnaire (CVQ) and the Calling Scale (CS). The constructs examined in cluster analysis were presence of calling (measured with the CVQ), career decidedness, self-exploration, career engagement, career confidence, work and religion centrality, orientation towards religiousness, core self-evaluations, self-transcendence values, conservation values, openness to change values, and self-enhancement values. Correlations between the variables listed above are reported in Table 2. These specific measures are as follows:

Presence of Calling. The presence of a sense of calling in one's career was assessed with the Calling and Vocation Questionnaire (CVQ) – Presence of Calling: a twelve-item scale which measures three different dimensions (Dik et al., 2012). Calling was conceptualized in line with Dik and Duffy's (2009) three-part definition of calling noted previously (i.e., transcendent summons, prosocial orientation, and purposeful work). A four-level response scale ranging from 1 (not at all true of me) to 4 (absolutely true of me) was used to eliminate a neutral or midpoint response option. Scores on the CVQ have been demonstrated to be reliable, have strong test-retest reliability, highly predict actually having a calling, and correlate with work meaning,

career commitment, and job satisfaction (Duffy et al., 2014). In their instrument development study, Dik et al. (2012) found an internal consistency for their total scale score of .88 and a 1-month test–retest reliability of $r = .75$. Calling was also found to correlate in the expected directions with life meaning, work hope, and two other measures of calling. Because the CVQ presence scale is conceptualized as tridimensional, three indicators were created for taxometric analysis using the subscales of Presence-Transcendence Summons, Presence-Prosocial Orientation, and Presence-Purposeful/Meaningful Work. Cronbach's alpha in the present study was .78.

Presence of Calling. The presence of calling was also measured for use in the taxometric analysis using the Calling Scale (CS). The degree to which participants felt a calling, defined as a ''consuming, meaningful passion people experience toward a domain'' (p. 1001), was assessed by Dobrow and Tosti-Kharas's (2011) CS. The scale consists of 12 items that participants answered on a 7-point Likert-type scale ranging from strongly disagree to strongly agree (Cronbach's alpha = .92). The authors recommend that items be answered according to a specific domain, and in the instrument development study, the domains of music, art, business, and management were used. For this study, the CS was adapted to be applicable to those in all occupations as has been done in multiple other studies (e.g., Duffy et al., 2014). For example, two items were reworded from the original CS to read ''I am passionate about my work'' and ''I would sacrifice everything to do my job.'' In the instrument development study using multiple samples at different time points, Dobrow and Tosti-Kharas (2011) found the scale to have strong internal consistency reliability, strong test–retest reliability, and to be equally valid across different occupational groups. Several studies (Duffy et al., 2014; Dobrow, 2013; Dobrow & Tosti-Kharas, 2012) have found scores on this measure to correlate in the expected directions

with other calling measures, intrinsic motivation, self-efficacy, job involvement, behavioral involvement, and choosing careers related to one's calling. Because the CS is conceptualized as unidimensional in nature, all 12 items were used to create one indicator of the combined CVQ and CS indicator set for taxometric analyses. Cronbach's alpha in the present study was .92.

Career Decidedness/Commitment. Career decidedness/commitment was measured with the Vocational Identity Scale (Holland, Gottfredson, & Power, 1980). The Vocational Identity Scale measures a cluster of positive characteristics that include vocational attitudes, vocational commitment, desirable career beliefs, desirable problem solving attitudes, and rational career decision-making styles (Holland, Johnston, & Asama, 1993). The scale is composed of 18 true-false items-all scored "No." High scores reflect a clear sense of identity. Students were asked to consider their present situation in making their selection about if the statements (e.g., "I'm not sure yet which occupations I could perform successfully") resembled their personal situation. Kuder–Richardson Formula 20 (KR-20) coefficient in the present study was .88.

Self-Exploration. The degree of self-reflection was assessed with four items from the Career Exploration Scale developed and validated by Hirschi (2009). The measure asks students to indicate on a five-point scale the degree to which they engaged in self-reflective behaviors (reflection about personal interests, skills, preferences, what makes one enjoy work), with answers ranging from "rarely" to "a great deal." Previous studies have shown positive correlations between this scale and other measures of career exploration, career decidedness, career planning, and career choice congruence (Hirschi, 2010a, 2010b; Hirschi, Niles, & Akos, 2011). Cronbach's alpha in the present study was .79.

Career Engagement. The degree to which students were actively engaged in advancing their career was assessed with eight items. Three questions were general in nature (e.g., "I am

actively engaged in shaping my future career"), and five detailed specific career behaviors (developing career plans, collecting information about possible employers, establishing professional contacts, voluntarily participating in professional training or education, taking assignments or positions that could promote one's career). Students indicated on a five-point Likert scale, ranging from "almost never" to "very often," the degree to which they were engaged in those behaviors during the previous six months. Support for construct validity of scale scores comes from their significant correlations within Hirschi's (2011) sample with career decidedness, career decision self-efficacy, and self-exploration (Cronbach's alpha = .88; Hirschi, 2011). Cronbach's alpha in the present study was .86.

Career Confidence. The extent to which a student feels confident that she or he would be able to master different tasks in his or her career development was with the short version of the Vocational Self-Efficacy Scale developed and validated by Rigotti, Schyns, and Mohr (2008) and based on the longer measure by Schyns and von Collani (2002). The scale consists of six items (e.g., "Whatever comes my way in my job, I can usually handle it"), and answers were indicated on a five-point Likert scale ranging from "not at all true" to "completely true." Cronbach's alpha in the present study was .846.

Work and Religion Centrality. The relative importance of work and religion was assessed with the work importance measure introduced by Whitley and England (1977) for exploring the value systems of managers. The students were asked to distribute 100 points into 5 categories (i.e., leisure, community, work, religion, and family) representing the relative importance of each in their lives at the present time. The points given to the work domain were used to determine the relative level of work centrality. Similarly, the points given to the religion domain were used to determine the relative level of religion centrality. The work centrality

measure has been applied by many studies that have supported its construct validity in terms of its significant relationships with career success and job satisfaction (e.g., Hirshi, 2011).

Orientation Towards Religiousness. Intrinsic and Extrinsic orientation towards religiousness was measured using the Age-Universal I-E Scale-12 which is a measure revised and amended by Maltby (1999) and is based on the Religious Orientation Scale (Allport & Ross, 1967) and the Age-Universal I-E scale (Gorsuch & Venable, 1983). Intrinsic orientation was assessed with six items (e.g., "It doesn't much matter what I believe so long as I am good"), Extrinsic-Personal orientation was assessed with three items (e.g., "What religion offers me most is comfort in times of trouble and sorrow"), and Extrinsic-Social with three items (e.g., "I go to church because it helps me make friends"). Respondents answered one of three options of "(1) Yes, (2) Not certain, and (3) No", with item endorsement seen as evidence of either intrinsic or extrinsic religiousness. In Maltby's (1999) psychometric test, conducted using a large multinational sample, the intrinsic scale ($M = 4.83$, $SD = 3.36$) shared a correlation of $r = .02$ with the Extrinsic-Personal scale ($M = 2.14$, $SD = 1.75$) and a correlation of $r = .04$ with the Extrinsic-Social scale ($M = 1.98$, $SD = 1.69$). The Extrinsic-Personal and Extrinsic-Social scale shared correlation statistic of $r = .13$. Cronbach's alphas in the present study were: Intrinsic scale $\alpha = .85$, Extrinsic-Personal scale $\alpha = .81$ Extrinsic-Social scale $\alpha = .82$.

Core Self-Evaluations (CSEs). Judge, Erez, Bono, and Thoresen (2003) have described CSEs as the "basic, fundamental appraisal of one's worthiness, effectiveness, and capability as a person" (p. 304). The construct represents the trait-like common core of neuroticism, self-esteem, self-efficacy, and locus of control beliefs (Judge et al., 2003). CSEs were assessed using Judge et al.'s scale (2003), which consists of 12 items (e.g., "I am confident that I will get the success I deserve in life"), which will be answered on a 5-point scale from "strongly disagree" to

"strongly agree." Numerous studies support the reliability (e.g., Hirschi, 2011) and validity of the scale scores by finding, for example, that scores correlate in predicted directions with job satisfaction, career success, job stress, or commitment (Brunborg, 2008; Judge & Hurst, 2007; Kacmar, Collins, Harris, & Judge, 2009). Cronbach's alpha in the present study was .82.

Work Values. Work values were assessed with the measure developed by Cable and Edwards (2004), which is based on Schwartz's circumplex model of values (Schwartz & Bilsky, 1987). Each work value (e.g., altruism) is assessed with three items (e.g., "Making the world a better place") on a five-point scale asking students, "How important is this to you?" with responses ranging from "not important at all" to "extremely important." To account for the effect that value ratings promote positive correlations among theoretically opposing values, the three items within each value were averaged and the scores were ipsatized by subtracting the individual average level of value endorsement from the average score of the value (Hirschi, 2011; Hitlin & Piliavin, 2004). The exception to this process was for the value of autonomy which was assessed with only one item due to the administration error of not including the two other items intended to measure autonomy on the survey given to participants. Because of this, to achieve a value for autonomy, the individual average level of value endorsement was subtracted from the single item score. In this way, each value represents its relative importance compared to the other values, which enables a clear distinction between different value orientations among different people. As with Hirschi's (2011) original study, the degree of self-transcendence work values was then derived by taking the sum of altruism (α = .88, M = 12.5, SD = 2.32) and the relationship to the other values (α = .91, M = 11.7, SD = 2.41). Conservation work values are the sum of security (α = .89, M = 12.7, SD = 2.30) and authority (α = .79, M = 10.2, SD = 2.56). Openness to change work values are the sum of variety (α = .82, M = 10.9, SD = 2.51) and

autonomy ($M = 3.70$, $SD = 0.961$, no alpha because only assessed using one item due to an administration error). Finally, self-enhancement values are the sum of pay ($\alpha = .91$, $M = 10.7$, $SD = 2.55$) and prestige ($\alpha = .78$, $M = 11.4$, $SD = 2.55$).

Analyses

Cluster analysis was applied to the data to examine how the patterns of personal characteristics in Hirschi's (2011) study with German undergraduates with a calling would compare to a sample of U.S. undergraduates. Cluster analysis describes a family of statistical procedures designed to discover classifications and is typically applied to clustering humans within the social and behavioral sciences (Gore, 2000). In accordance with Gore's (2000) recommendations and to closely mirror Hirschi's (2011) study design, a two-step procedure (i.e., hierarchical cluster analysis and k-means) was applied to examine if there are some key components present among all individuals who endorse the presence of calling while other characteristics are true for some, but not others.

Next, taxometrics was employed to examine whether there were discrete types of calling or varied degrees of emphasis placed upon multiple dimensions of calling. Meehl originally instructed that taxometrics be used only with samples containing a minimum of 300 participants with a taxon base rate (i.e., the number of taxon members in relation to the overall sample size, signified by "*P*") greater than .10, a minimum proportion level that has largely been supported by Monte Carlo data (Ruscio et al., 2006). In general, this cutoff meets the basic requirement that both the taxon base rate and the complement base rate are large enough for the analyses to be able to detect the two groups. However, experts in taxometric analyses assert that having a large enough absolute number of taxon members is more important than the actual taxon base rate to successful taxonic detection. Therefore, having enough taxon members (i.e., $n \geq 50$) can be

sufficient even when the sample size is large enough that the actual taxon base rate falls below the recommended .10 (Ruscio et al., 2006).

Indicators must meet certain parameters pertaining to the observed effect sizes of each and inter-indicator correlations to be able to reliably detect the true latent structure of any construct. In the present study, indicators were chosen purposefully from both Neo-Classical and Modern viewpoints of calling and combined to form a four-dimensional indicator set. The CVQ item 8 (i.e., "I do not believe that a force beyond myself has helped guide me to my career.") was removed prior to analyses and the Transcendent Summons subscale recalculated without it due to its higher than desired (i.e., $r > 0.89$) correlations with two CS items. Prior to analyses, data was deleted listwise for a final sample $n = 547$.To ensure appropriateness of the taxometric approach, the combined indicator set was assessed within the data set prior to analysis to confirm that it is able to separate the taxon from the complement class with a minimum of $d = 1.25$ and that all indicators are not correlated more than $r = .30$ within groups. Furthermore, the adequacy of the collected data and procedural implementation was informed by generating comparison data of both taxonic and dimensional comparison data before actual analyses are conducted.

It was determined by examining the comparison sampling distributions that the data were appropriate for taxometric analysis (i.e., dimensional and taxonic comparison data provide graphs which are significantly distinctive to warrant accurate classification) and data were analyzed using the bootstrap taxometric method to determine the underlying latent structure of calling. Bootstrapping is the procedure of drawing multiple subsamples randomly from the observed distributions for each indicator to gain a better understanding of the consistency of each calculated statistic. Taxometrics is also termed coherent cut kinetics because the inference to the latent structure relies on multiple consistency tests (Meehl, 1995). In compliance with this

fundamental underpinning of taxometrics, this study used three statistically non-redundant tests (MAXEIG, MAMBAC, and L-Mode) as well as a curve fit index for the indicator set to assess the latent structure (these procedures are described further in the Results section) and was run on the indicator set using Ruscio's (2016) recommended settings.

RESULTS

Before hypothesis testing, the presence and impact of missing data was analyzed by a Missing Completely At Random (MCAR) test to assess patterns in missing responses. This analysis included all scales compared by demographics (age, sex, ethnicity, year in college). Even when all scales were included against all demographics, the analysis was non-significant (p = .06, α = .01 to correct for type II error). This indicates that participants did not systematically choose to not answer questions in any sort of pattern, supporting the ability of the data set to support meaningful analyses.

Cluster Analysis

Cluster analyses was carried out using two steps. In the first step, hierarchical cluster analysis was run on the data using the "NbClust" R package (Charrad, Ghazzali, Boiteau, & Niknafs., 2014a). The agglomeration method for hierarchical clustering was set to "Ward.D2" and the clusters are embedded in a bidimensional Euclidean space with a range of 2-8 cluster solutions. The number of clusters from the hierarchical cluster analysis were determined by examining 30 model fit indices. These indices based their support for most appropriate number of cluster solution by focusing on clustering validity, which is based on relative criteria and consists of the evaluation of a clustering structure by comparing it with other clustering schemes, resulting by the same algorithm but with different parameter values (e.g., the number of clusters; Charrad, Ghazzali, Boiteau, & Niknafs., 2014b). The R package of "NbClust," was an attempt to gather all indices available in R into one package (Charrad, et al., 2014b). It is very typical that all indices are not unanimous in their findings of the most accurate number of clusters. One option to the dilemma of choosing the number of clusters is to rely more heavily on the indices

that perform optimally in stimulated data sets. However, using a majority rules approach seems to be the most reliable solution for selecting the best number of clusters in real data sets (Charrad, et al., 2014b).

Using Ward's method and Euclidean distances, the hierarchical cluster analysis revealed the following, among all indices: 10 proposed two as the best number of clusters, 2 proposed three as the best number of clusters, 12 proposed four as the best number of clusters, 1 proposed five as the best number of clusters, 2 proposed seven as the best number of clusters, and 1 proposed eight as the best number of clusters. Additionally, the Dindex graphic proposed four-clusters while the Hubert graphic proposed three clusters. Following the majority rule, the best number of clusters is four. However, the two-cluster solution was also very highly recommended (i.e., 10 indices for the two-cluster solution versus 13 for the four-cluster solution). Therefore, both four-cluster and two-cluster solutions were selected to run in the second step, which used the k-means clustering method to assign individuals to final clusters.

K-means is an iterative method which minimizes the within-class sum of squares for a given number of clusters (MacQueen 1967; Hartigan and Wong 1979). Currently, k-means is one of the most popularly adopted partitioning algorithms and is often conducted following that of a different clustering technique (Charrad, et al., 2014a). K-means cluster analysis was run in SPSS to assign individual cases to clusters. After closely examining both the four-cluster and two-cluster solutions, the two-cluster solution was chosen because it provided the most explanatory power, theoretical meaningfulness of each cluster, and was more concise than the four-cluster solution. The two-cluster solution also more meaningfully highlighted differences between clusters with regard to in career self-exploration and career engagement. Therefore, the two-cluster solution was deemed the best solution and used to make the final assignment of students

to cluster groups. Convergence for the two-cluster solution was achieved due to no or small change in cluster centers after 9 iterations. The maximum absolute coordinate change for any center was .000. The minimum distance between initial centers was 126.43.

The final two-cluster solution differed significantly (i.e., $p < .05$) in presence of calling between groups (Cluster 1; $M = 33.19$, $SD = 6.7$, $n = 344$ and Cluster 2; $M = 37.79$, $SD = 6.4$, $n = 136$). Across the two-clusters, no significant differences were found in core self-evaluations, career self-efficiency, career decidedness/commitment, nor the work values of conservation and openness to change. The cluster with highest presence of calling rated work centrality lower and religion centrality higher. Interestingly, the highest presence of calling cluster consistently also had a lower rating across all three religiousness orientations (i.e., intrinsic, extrinsic personal, and extrinsic social) as well as on the work value of self-enhancement. The highest calling cluster rated higher on measures of career self-exploration, career engagement, and the work value of self-transcendence than their counterparts. The means and descriptive statistics of each construct within each cluster are presented in Table 3.

Taxometric Analyses

In the taxometric analysis, MAXEIG (MAXimum EIGenvalue; Waller & Meehl, 1998) was first performed by graphing chunks of the data that overlay each other, termed "overlapping windows." This was done to yield more data points and smooth out the curve of the graph, which in turn should help raters more easily determine if graphed data most closely appears to match taxonic or dimensional comparison graphs. Taxonic structure results in peaked curves while dimensional structure typically provides non-peaked curves. MAXEIG is a closely-related procedure to MAXCOV (*MAX*imum *COV*ariance; Meehl, 1973; Meehl & Yonce, 1996) and both use the General Covariance Mixture Theorem (GCMT). When simplified, GCMT states that

indicator covariance is the result of both the taxon and complement base rates and the validity of both indicators. These two procedures repeatedly take subsamples and, since validity is assumed to remain the same and can therefore be replaced with a constant, are able to then estimate taxon and complement base rates. Peaked graphs result when the complement and taxon base rate are roughly equal, which does not occur for dimensional data, therefore resulting in non-peaked graph curves.

The fundamental difference between these two procedures is that MAXCOV is based on the idea that indicator covariance should vary as a function of both the taxon and complement base rates while MAXEIG examines output indicators through the first eigenvalue of a modified covariance matrix (Ruscio et al., 2006). In fact, Ruscio and colleagues (2006) conceptualize these two approaches as alternatives of a single approach and recommend ways in which to combine the two procedures to take advantage of both procedures' strengths. Ruscio's (2016) most updated taxometric R scripts treat the two procedures as similar enough that they can be run using the same script with the only variation being the requested usage of either covariances or eigenvalues. MAXEIG has demonstrated slightly greater accuracy (Walters & Ruscio, 2010) and was thus used in the present study.

The MAXEIG procedure was run on the indicator set using Ruscio's (2016) recommended settings. These recommendations include; 10 replications, subsamples of 25 windows with 0.9 overlap, a $n = 165$ per window, a total number of 3 curves, Y-values not smoothed for graphing and estimation, 100 samples of comparison data drawn from each population, and using an adapted general covariance mixture theorem to estimate the base rate. The base rate estimate across curves ($M = 0.78$, $SD = 0.07$) was well above the recommended base rate of 0.10 (e.g., Meehl, 1995). This estimated base rate from the MAXEIG procedure was

used to create a taxon group of $n = 424$ and a complement group of $n = 123$ which was used with all other procedures. The between-group validity, recommended to be greater than $d = 1.25$ (e.g., Ruscio et al., 2006), of this indicator set supports the appropriateness of utilizing the taxometric method (mean $d = 1.69$, $SD = 0.19$). Additionally, within group correlations remained tolerably low (i.e., preferred below $r = 0.3$; taxon group mean $r = 0.31$ complement class mean r = 0..06) as well as being substantially smaller than full-sample correlations ($r = 0.50$; e.g., Ruscio, et al., 2006).

MAMBAC and L-Mode procedures were also run on the CVQ indicator set using Ruscio's (2016) recommended settings. MAMBAC (*M*ean *A*bove *M*inus *B*elow *A C*ut; Meehl & Yonce, 1994) was also conducted to provide non-redundant evidence for the latent structure of calling determined using MAXEIG. MAMBAC also uses combinations of two indicators at a time and is based on the idea that there should be an optimal cutting score (i.e., a value that best distinguishes members into either taxon or complement groups). MAMBAC searches for this score, if an optimal cutting score can be found, this provides support for taxonic structure. If there are no taxa present in the dataset, there will be no optimal cutting score. When using the MAMBAC procedure, peaked graphs indicate the optimal cutting score at the peak and thus support taxonic structure. Flat graphs indicate no optimal cutting score and therefore support dimensional latent structure. L-Mode is different than either MAMBAC or MAXEIG, because it does not involve a sliding kinetic cut. Instead, L-Mode is based on Thurstone's (1935, 1947) assertion that latent factors are not always representative of continuous variables and can also provide information about categorical ones. Waller and Meehl (1998) used this contention in order to develop L-Mode; which is a factor-analytic taxometric procedure (Ruscio & Ruscio, 2000). L-Mode graphs the distribution of cases' estimated scores on a single latent factor

calculated using Bartlett's (1937) method of factor score estimation. Because the result is a composite of variables that are each valid measures, the factor scores are a stronger method for identifying taxonic versus dimensional data than individual indicators would be. Taxonic structure should produce a bimodal distribution of factor scores, dimensional data should produce a unimodal distribution of factor scores (Ruscio & Ruscio, 2000).

The final step employed in the taxometric analyses is to calculate a comparison curve fit index (CCFI) using the previously generated comparison data as a consistency test for MAXCEIG, MAMBAC, and L-Mode procedures. To create CCFIs, both dimensional and taxonic graphs for each procedure are generated that reproduce the distributional and correlational characteristics of the research data. These curves are then fitted to the research data graphs and examined both visually and with a quantified method to determine if the graphs better represented dimensional or taxonic structure. In this study, the CCFI was used to analyze the MAXEIG, MAMBAC and L-MODE procedures ($CCFI_{MAXEIG} = 0.247$, $CCFI_{MAMBAC} = 0.436$, and $CCFI_{L\text{-}Mode} = 0.183$; mean CCFI value = 0.280), and resulting graphs were also analyzed visually (see Figures 1, 2, and 3) by three independent raters who unanimously confirmed that the actual data better fit the shape of the simulated dimensional comparison data than that of the simulated taxonic comparison data for all three procedures. Given the recommended interpretive guidelines (e.g., CCFI values can range from 0 [dimensional] to 1 [categorical], and the more a CCFI value deviates from .50, the stronger the result; CCFI values between .40 and .60 should be interpreted with caution), these results suggest that calling is a dimensional rather than categorical construct.

DISCUSSION

The present study used two typological approaches to clarify how a sample of U.S. university students conceptualized their careers as a calling. The first was the cluster analysis method, employed to understand the characteristics of groups of individuals who identified as having a calling. A final two-cluster solution emerged, with similarities and differences between the groups discussed below. The second was the taxometric method, used to clarify whether there are two distinct types within the latent structure of calling. A dimensional latent structure was supported in the present study and implications for labeling, causality, and measurement are discussed below. This study did not examine which components of calling participants endorse as relevant to themselves. However, the results of the present study suggest that the differences in definitions of calling reflect the influence of personal characteristics on the emphasis placed on various aspects of calling.

Cluster Analysis Implications

Overall, common themes and patterns emerged between the present study and Hirschi's (2011) study. The two clusters identified in this study are comparable to the first two clusters in Hirschi's (2011) study, labeled "negative career self-centered" and "pro-social religious." Cluster 1 of the present study was akin to the negative career self-centered group in Hirschi's (2011) study; both have a high centrality placed on work relative to religion, endorsed the work value of self-enhancement as of primary importance, and reported lower levels of career self-exploration compared to their peers. However, Cluster 1 in the present study differed from the negative career self-centered cluster in Hirschi's (2011) study in that participants rated their core self-evaluations in a manner similar to the higher calling cluster (i.e., Cluster 2). Cluster 2 in the

present study resembled the pro-social religious cluster of Hirschi's (2011) study in that it demonstrated higher religion than work importance and a higher rate of self-transcendence values.

Parallel to Hirschi's (2011) findings, one key difference between calling groups in the present study was the importance placed on the life domains of work and religion. Those who rated work as more important also emphasized advancing themselves through their careers. This highlights the motivation (i.e., self-enhancement) for the importance of work as a calling for these individuals. Those who endorsed religion as more central to their lives demonstrated a higher level of calling. This potentially indicates that a religious background is conducive to identifying more deeply with the concept of calling (Cahalan & Schuurman, 2016), which may be particularly critical for individuals in a relatively early stage of career development (i.e., college students). For example, one study with youth demonstrated that those with higher religion identities also scored higher on personal meaning and concern for others (Furrow, King, & White, 2004) and another found that religiosity in adolescents corresponds to compliant, anonymous and altruistic prosocial behaviors, but not but not public, dire and emotional prosocial behaviors (Smith, 2003). Furthermore, aspects of spirituality and religion relate positively to career decision self-efficacy, career values, and job satisfaction (Duffy, 2006). Thus, it may be that those who place importance on religion and prosocial motivations towards work are not only more inspired, but also have the tools to enable them to engage with their callings earlier in their career development. Those who do not place an emphasis on religion may find alternative life experiences to be more fertile ground for calling development later in life.

While the present study is not able to support causal inferences, it does align with the notion espoused in Hirschi's (2011) study that those who engage in more self-exploration report

higher rates of presence of calling, pointing towards calling as an action-orientated construct (originally found in Elangovan et al., 2010). This may be because deeper reflection and understanding of oneself aids in calling development. The present study also demonstrates that having higher rates of calling corresponds to higher rates of engagement. While once again causality cannot be inferred, these findings are congruent with past research which support that living a calling is more likely to lead to increased experiences of career engagement (Hirschi, 2012) and that career engagement and calling are highly correlated, but distinct concepts (Dobrow & Tosti-Kharas, 2011). Thus, it may be that self-exploration is necessary to understand, develop, and perceive a calling and active engagement with one's work is necessary to live a calling.

As with Hirschi's (2011) study, there are some expected characteristics that are common across both calling groups. The present study did not contain a comparison group low in calling, therefore it cannot be determined if individuals with above average calling score differently than those below average in calling. However, as in Hirschi's (2011) study, calling clusters did not differ in career decidedness and career self-efficiency. These present findings support Hirschi's (2011) conclusion that vocational identity achievement is an important common characteristic for those who have a calling.

There were also differences between the present study and Hirschi's (2011) study. In contrast with Hirschi's (2011) study in which one of his groups ("negative career self-centered") fell below-average on core-self evaluations, the two clusters in the present study did not differ on core self-evaluations. An additional difference between this study and Hirschi's (2011) is that the work values of conservation and openness to change did not differ significantly between the two calling groups. The current foundation of empirical research does not point to specific reasons as

to why to expect such differences to emerge between German and U.S. cultures. It is possible that cultural differences may contribute to these observed differences between the present study and Hirschi's (2011) study. Other reasons for these differences include variance in methodologies, differences between the type of university sampled, changes in sampling method (i.e., the present study screened participants to feel they had a calling, Hirschi's study did not), and/or sampling error. Future studies may benefit from allowing participants to elucidate their response processes through such methods as think-aloud protocols, debriefing interviews, and comments sections on surveys to attempt to better understand the cause of these differences in results.

Assessing religious orientation in the present study led to a surprising pattern of results. The finding that Cluster 2, which was higher on centrality of religion, rated lower across all religious orientations than Cluster 1, was counterintuitive. Future research will be needed to help clarify why these patterns were observed in the present study. One possibility is that individuals who do not identify religion as important in their lives do not have a clear understanding of why they would engage in religion. Despite claiming to be applicable for those who are less religious (Maltby, 1999), another explanation is that the phrasing of the Age-Universal I-E Scale-12 is present-focused, attempting to tap into current behaviors and motivations, which may simply not be present for those who indicate a low centrality of religion in their life. Therefore, they may answer religious orientation questions with less insight and/or motivation towards providing meaningful answers. These possibilities point to potentially unreliable reporting, which may in turn have led to the inconsistency in observed versus expected results. It may also be possible that those individuals who placed more of an importance on religion did not find any of their motivations for engaging in religion on the Age-Universal I-E Scale-12 (i.e., intrinsic, extrinsic-

personal, extrinsic-social). Future studies may identify alternate and more relevant motivations for engaging in religion for these individuals. For example, one possibly fruitful religious motivation to include in addition to the popular intrinsic and extrinsic motivations is a "quest" motivation (Batson, 1976; Batson & Ventis, 1982). Quest has been defined as "an open-ended, active approach to existential questions that resists clear-cut, pat answer" (Batson & Schoenrade, 1991, p. 416) and appears to relate to more situational helping (Batson, 1976). As such, it contains several similar themes to calling that it is action-oriented (Elangovan et al., 2010; Hirschi, 2011), related to existential topics such as meaning, and possibly also contains a prosocial aspect.

Taxometric Implications

To determine if the latent structure of calling is dimensional or categorical, this study also employed three non-redundant taxometric methods (i.e., MAXEIG, MAMBAC, and L-Mode) to examine one indicator set made up of four dimensions. These four indicators were intentionally chosen to represent measures which align with both Modern (i.e., the CS) and Neo-Classical (i.e., the CVQ) definitions of calling. The data demonstrated appropriateness for running the taxometric method on the indicator set by meeting all prerequisites for base rate estimates, between-group validity, and within-group correlations. In the graphs, the simulated dimensional data fit the actual curve shape better than the categorical solution. Consequently, all CCFI values were lower than .50 (CVQ $CCFI_{MAXEIG} = 0.247$, CVQ $CCFI_{MAMBAC} = 0.436$, and CVQ $CCFI_{L\text{-}Mode} = 0.183$, CVQ mean CCFI value = 0.289). Thus, the results from analyses with the indicator set strongly support a dimensional latent structure of calling.

These taxometric results suggests that, while diverse definitions of calling exist within the field and have been conceptualized to fall between the poles of Modern and Neo-Classical

(Bunderson & Thompson, 2009), this does not appear to reflect an actual difference of type in the latent structure of calling. As such, the hypothesis stating that taxonic structure would be found in this study was not supported. While it may be useful for researchers to conceptualize calling definitions as coming from more of a Modern or Neo-Classical emphasis, it would be erroneous and misleading to label the concept of calling itself as dichotomous in nature, represented by these two categories in an "either-or" manner. Also, understanding the diverse collection of calling definitions as falling along the continuum between the poles of Modern and Neo-Classical is not inherently wrong. However, it is important that researchers refrain from discussing definitions in these terms. To do so may increase the possibility of reader confusion regarding if these labels reflect typological differences within the construct of calling.

Correctly understanding if calling is dimensional or categorical is a large step towards more fully understanding causality (Ruscio, Ruscio & Carney, 2012). The dimensional findings in this study have implications for theories that may be created with the help of longitudinal studies concerning the antecedents and development process of calling. When dimensional findings are supported, it is often due to a multitude of contributing factors (Waller & Meehl, 1998).When taxonic structure is found, it is often due to a specific etiology with just a few influential factors. Hence, when there are distinct types (e.g., a statistically relevant discontinuity), often there is even more of a reason to understand antecedents (Ruscio, Haslam, & Ruscio, 2006). Because the latent structure of calling appears to be dimensional, there are likely many antecedents for calling development and a less unified developmental process. Understanding how calling develops among different people and common sources of calling (e.g., family; White, Olivas, & Dik, 2016) is useful. However, future studies may expect to

discover a diverse array of antecedents to calling and varied paths taken by individuals in developing a calling.

Another ramification of the taxometric results is an improved understanding of how to measure this concept, currently a confusing and slightly ambiguous venture (Dik, Eldridge, Steger, & Duffy, 2012). Since a dimensional structure for calling was supported, measurement instruments should be selected based upon their psychometric properties and validated use with specific populations. If subsequent research finds that certain dimensions of calling are more important for some populations, researchers should mindfully choose measures which include those aspects of calling. Researchers should further test their measurement model to ensure that the measure they use fits the data well for the sample being studied.

General Discussion

I would like to echo the recommendation made by Dik and Shimizu (under review) that researchers would be well-served to avoid attempting to create additional definitions of calling without the presence of compelling evidence that an alternative definition beyond those already in the literature is needed. Doing so may exacerbate the existing conceptual confusion, given the already diverse array within the field. It is also unlikely to prove fruitful to postulate a "best" or unified definition of calling, or one that captures the main themes of existing definitions. Such unification is elusive, and such a definition more likely may become simply another option alongside the others it was purported to unify. Instead, studies should rely on past research which has already used factor analyses (e.g., Dik & Duffy, 2009) and qualitative methods (e.g., Hunter, Dik, & Banning, 2010; Zhang, Dik, Wei, & Zhang, 2014) to understand the commonly endorsed dimensions of calling. From there, it will likely prove very important to examine the characteristics of those who more readily endorse certain dimensions to understand which

aspects of calling are relevant, and for whom. Doing so will aid in methodological choices regarding which scale to use for certain populations. It will also likely assist in understanding calling development as well as causal relationships between antecedents and consequences of calling. Further, this would help answer Hirschi's (2011) goal by providing clarification regarding what are core or fundamental dimensions of calling versus optional aspects endorsed by only some populations.

The results of this present study point to the possibility that the differences in definitions of calling may reflect how characteristics of those who have a calling differentially impact how they emphasize different aspects of the same concept. For instance, it is striking to note that in the present study Cluster 2 individuals (higher presence of calling) were higher in both centrality of religion and prosocial values than their peers in Cluster 1. It is plausible that these individuals may more strongly endorse definitions of calling closer to the Neo-Classical pole. As such, Cluster 2 individuals may find the religiously rooted concept of an external call more relevant to themselves and how they understand calling. Their higher emphasis on a general prosocial workplace value likely means that they would also experience their specific calling from a prosocial orientation. Cluster 1 individuals who scored higher on Work Centrality and the work value of Self-Enhancement may more heavily emphasize aspects of calling that are more closely aligned with Modern definitions of calling. It is imperative to note that despite how these personal characteristics influence which aspects of calling resonate most deeply with whom, that calling itself is still a single construct. If the possibility described above is supported in subsequent research, it is conceivable that the differences found between researchers' definitions of calling may reflect their own personal characteristics influencing how they perceive and describe calling.

Future Directions and Limitations

Taxometrics is limited in that it only specifies taxonic versus dimensional structure and does not aid in identifying key dimensions of a construct (i.e., what a construct is and is not). Therefore, this current study is limited in that it is unable to answer what constitutes a calling. Because a dimensional structure of calling was supported, future research can rely on the body of preexisting studies which have already examined the common dimensions of calling. One method for doing so without imposing researcher bias regarding the best definition of calling would be to use preexisting measures which do not specify within the scale what a calling entails (e.g., the Brief Calling Scale - Dik et al., 2012). However, it may be useful for future methods to continue to use innovative approaches to investigate how calling is best understood, which dimensions appear most, and for whom. An approach which may be robust to concerns such as researcher bias as well as generalizability of data would be to use a combination of qualitative and quantitative methods. One such method for calling may mirror the "career development strivings strategy" approach used by Dik, Sargent, and Steger (2008) where they assessed the goals and motives for participants engaged in career decision-making and planning processes via survey. This novel approach allows participants to generate individualized responses and rate each response along several dimensions, thus providing nomothetic generalizability from idiographic data. One strength of this approach is that it avoids imposing researcher bias from definition selection. It further allows participants to articulate more deeply how they experience calling, allowing the examination of possible themes regarding emphasized dimensions and their relationships to other variables of interest (e.g., such as if a prosocial orientation towards calling does indeed increase a sense of derived meaning). While the Dik, Sargent, and Steger (2008) study did include the calling concept as a career decision striving, subsequent research may want

to mirror the methodology to conceptualize how various processes related to calling (e.g., motivations for engaging in work as a calling) influence which aspects of calling are emphasized.

Another future step for calling research is to continue to conduct research across diverse populations. One limitation of the research on calling to date is that it often fails to look beyond convenience samples of undergraduate college students and is still limited in terms of cultural and ethnic diversity. Recent promising advancements have been made in understanding calling in more diverse samples as international scholars become increasingly interested in calling (e.g., Chinese college students - Zhang, Herrmann, Hirschi, Wei, & Zhang, 2015; Zhang, Dik, Wei, & Zhang, 2014; Autralian parents - Coulson, Oades, & Stoyles, 2012; Indian MTurk sample - Douglass, Duffy, & Autin, 2015) and the topic of meaningful work is more and more incorporated into research within organization samples via fields such as OHP (e.g., transformation leadership and meaningful work – Arnold., Turner, Barling, Kelloway, & McKee, 2007; meaningful work, personality, and benefits from stressful events within deployed U.S. soldiers – Britt, Adler, & Bartone, 2001). It is imperative to continue to grow the current body of knowledge with regard to the unique patterns and conceptualizations of calling across diverse cultural and national lines. Specifically, the characteristics of calling groups may differ between populations (e.g., based upon different career development stages or cultural backgrounds). Continued use of cluster analysis in other populations is thus encouraged to further understand characteristics of those who endorse a calling, point towards key career development processes which may foster callings, and inform measurement selection specific to various populations.

While undergraduate college students represent a population in which career development is especially relevant, future studies may also benefit from additional studies such

as Duffy, Torrey, England, and Tebb's (2016) on retired adults which examined the most common calling activities (i.e., "Helping Others") and barriers to living a calling (i.e., lack of resources) within this understudied population. Another recent study examines how retirees in Sweden process "de-calling" (i.e., retirement from a job they perceive as a calling) through "conserving the calling, learning to become a self-oriented subject, and redefining the calling" (Bengtsson & Flisbäck, 2017, p. 37). Such research is encouraged to continue within populations such as older working adults, retired individuals, or those engaging in encore careers to more fully understand how more mature career development stages and chronological aging impact calling experiences.

While intentionally selected as improvements in both measurement and statistical methods, it is important to note that there were significant methodological differences between Hirschi's (2011) study and the present study employing cluster analysis. Therefore, because the present study did not attempt to directly replicate Hirschi's (2011), it cannot be determined if the difference in patterns between the two studies are possibly due to a variety of factors related to divergent methodology rather than the cultural differences. The present study intentionally sampled only participants who identified as having a calling which introduced the possibility that differences found between studies could be due to sampling differences. Furthermore, the sampling methods of this study resulted in no below average calling clusters for comparison. Another limitation of the present study was an administration error which led to the work value of autonomy being only measured with a single item instead of the three-item composite used for the other work values. This error limits the accuracy with which autonomy can be confidently assumed to have been assessed by the subscale. Finally, it is likely that the current study did not include the religious orientation(s) that the cluster with the highest calling may have found

relevant to themselves. Future studies should attempt to provide a more comprehensive array of orientations from which participants may choose from or allow them self-generate responses regarding their individualized motivations for engaging in religion.

TABLES

Table 1
Calling Definitions and their Primary Dimensions

Possible Components	**Neo-Classical**	←				**Modern**
	Dik & Duffy (2009)	Bunderson & Thompson (2009)	Elangovan et al. (2010)	Wrzesniewski et al. (1997)	Hall & Chandler (2005)	Dobrow & Tosti-Kharas (2011)
Purposeful/ Meaningful	X	X	X	X	X	X
Prosocial Motivations	X		X	X		
Transcendent Source/Destiny	X	X				

Note. X indicates incorporation of this component of calling in the authors' formally articulated definition of calling. Table originally presented in Dik and Shimizu (under review).

Table 2
Intercorrelations of Cluster Analysis Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. CVQ Presence	-													
2. Work Importance	-.09*	-												
3. Religion Importance	.26**	.39**	-											
4. Core Self-Evaluation	.11*	0.02	-0.02	-										
5. Career Engagement	.41**	0.01	0.08	.22**										
6. Religion - Intrinsic	-.32**	.36**	-.74**	0.00	-.17**	-								
7. Religion - Extrinsic Personal	-.24**	.33**	-.50**	0.00	-.15**	.74**	-							
8. Religion - Extrinsic Social	-0.08	.11**	-.17**	.12**	-0.06	.32**	.31**	-						
9. Occupational Self-Efficiency	.30**	0.06	0.01	.43**	.39**	-0.05	-0.02	0.03	-					
10. Vocational Identity	.22**	0.01	.09*	.41**	.23**	-.094*	-0.05	0.03	.31**	-				
11. Self-Transcendence	.47**	-.13**	.17**	.10*	.21**	-.19**	-.18**	-0.02	.19**	.13**	-			
12. Conservation	.13**	.11*	-.12**	.11*	.19**	.09*	0.02	0.04	.12**	0.00	.10*	-		
13. Openness-to-Change	.13**	-0.01	-0.01	.17**	.15**	-0.01	-0.04	0.04	.15**	-0.01	.14**	.19**	-	
14. Self-Enhancement	-.16**	.17**	-.25**	0.04	0.08	.17**	0.04	0.03	0.04	-.14**	-.18**	.45**	.08*	
15. Career Self-Exploration	.33**	-0.04	.14**	0.04	.37**	-.18**	-.16**	-0.01	.17**	0.07	.27**	.11*	.18**	-.01

Note: * Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

Table 3
Final Cluster Mean Centers

	Cohen's *d*	**Cluster 1**				**Cluster 2**			
		M	*SD*	Kurtosis	Skewness	*M*	*SD*	Kurtosis	Skewness
Calling Presence*	-0.70	33.2	6.7	-0.13	-0.31	37.8	6.4	-0.59	-0.44
Work Centrality*	0.91	23.1	12.	1.84	0.85	13.8	8.3	6.89	1.65
Religion Centrality*	-2.78	4.67	5.3	0.09	0.94	31.5	12.6	6.39	1.94
Intrinsic Religiosity*	2.33	21.3	4.1	-0.92	-0.56	13.2	2.7	2.39	1.43
Extrinsic Personal Religiosity*	1.20	6.7	2.2	-1.26	-0.38	4.4	1.6	1.13	1.21
Extrinsic Social Religiosity*	0.37	8.3	1.5	2.48	-1.96	7.7	1.7	0.35	-1.15
Career Decidedness	-0.33	28.2	4.7	-0.63	-0.47	29.8	5.0	-0.89	-0.51
Career Self-Efficiency	-0.20	27.5	4.9	1.66	-1.04	28.4	4.3	0.40	-0.71
Core Self-Evaluation	-0.08	42.3	6.4	0.27	-0.15	42.8	5.9	-0.27	0.12
Career Engagement*	-0.32	30.1	7.0	-0.17	-0.08	32.2	6.1	-0.28	-0.08
Career Self-Exploration*	-0.42	14.9	3.1	0.27	-0.54	16.1	2.6	-0.68	-0.15
Self-Transcendence*	-0.41	16.3	3.2	0.66	-0.60	17.6	3.1	-0.06	-0.45
Conservation	0.18	15.4	3.2	0.12	-0.69	14.8	3.5	1.15	-0.90
Openness to Change	0.04	10.9	2.8	0.24	-0.29	10.8	2.8	-0.20	-0.26
Self-Enhancement*	0.50	14.9	3.5	-0.13	-0.29	13.0	4.1	-0.08	-0.19

Note: * Used to denote significant differences between clusters (i.e., $p < .05$), determined using ANOVAs

FIGURES

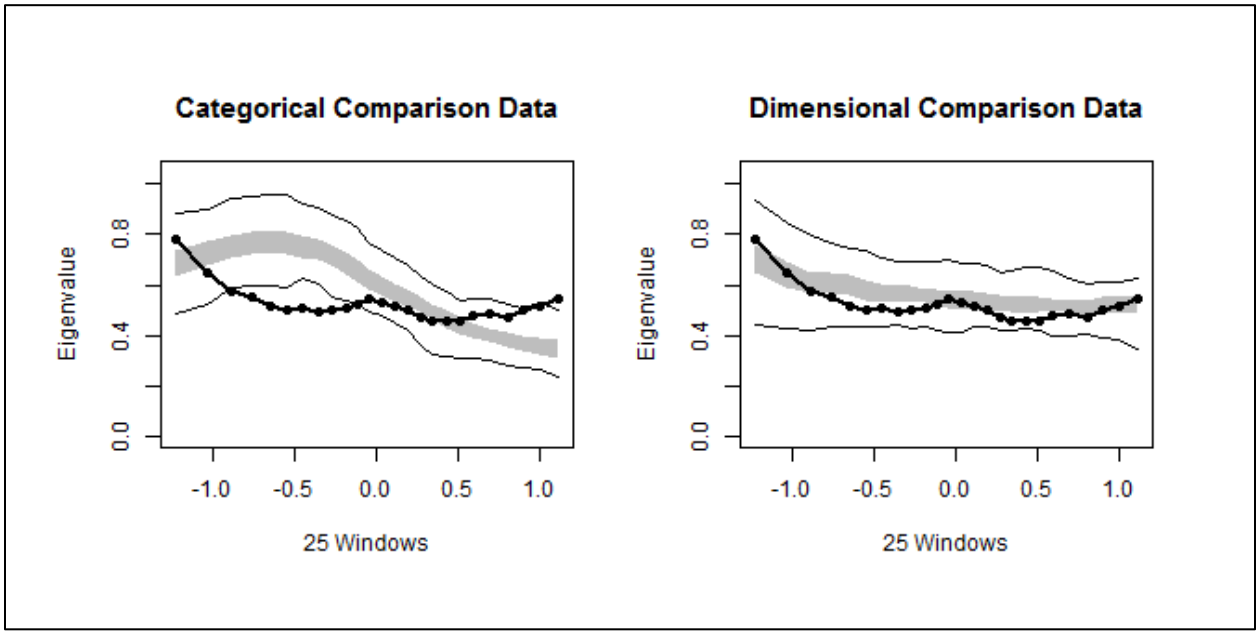

Figure 1. Resulting categorical and dimensional graphs for MAXEIG procedure, $CCFI_{MAXEIG} = 0.247$

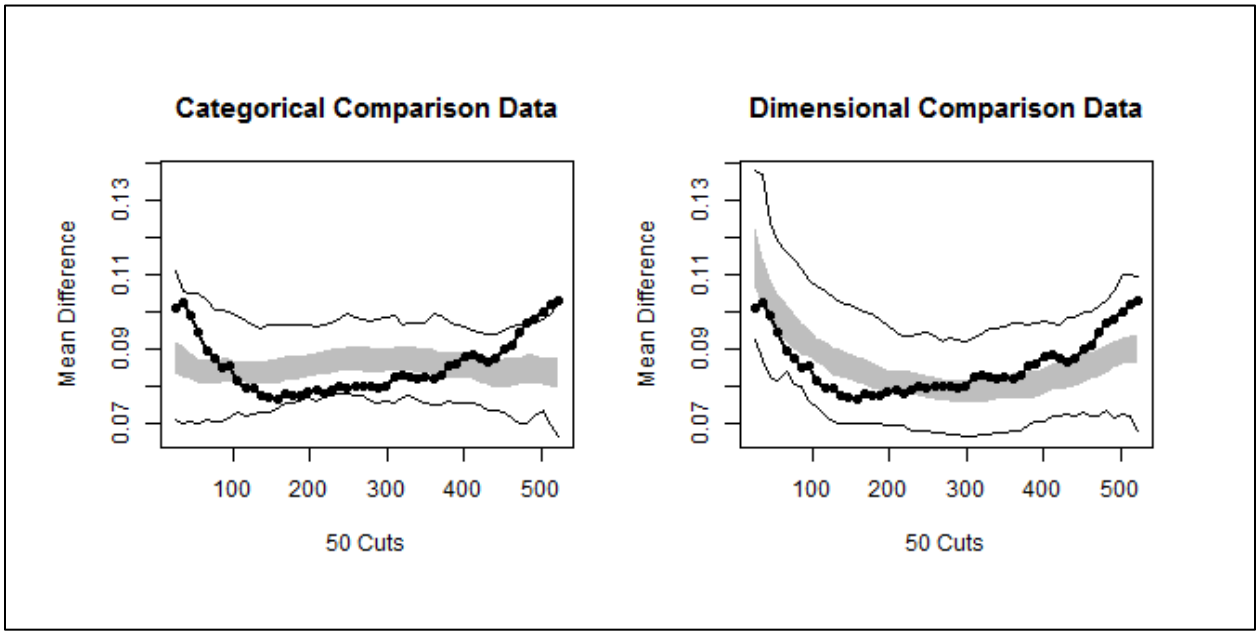

Figure 2. Resulting categorical and dimensional graphs for MAMBAC procedure, $CCFI_{MAMBAC} = 0.436$

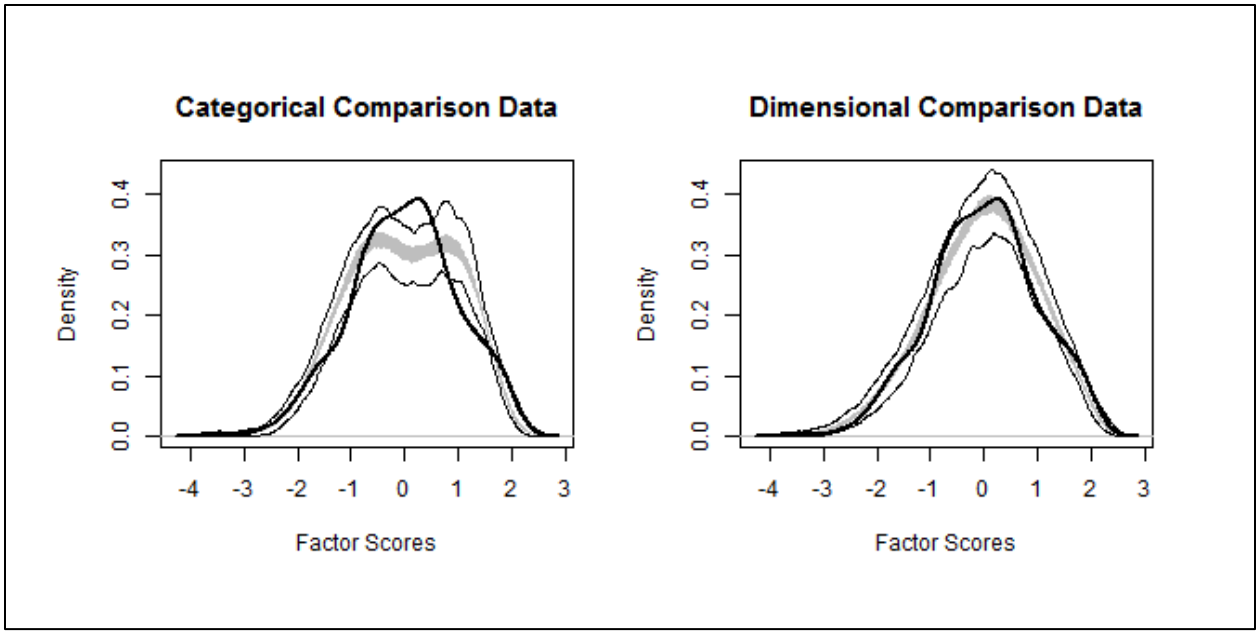

Figure 3. Resulting categorical and dimensional graphs for L-Mode procedure, $CCFI_{L\text{-}Mode} = 0.183$

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APPENDIX A: Survey Questions

Screening Question

People sometimes describe having a calling in life, often to a specific job or career. Do you have a calling?

Demographics

Age
Sex
Ethnicity (options: African-American or African, American Indian or Alaskan Native, Asian or Pacific Islander, Caucasian or European, Hispanic or Central/South American, Other)
Year in college (enter a number, e.g., 2)
GPA
What religion are you most affiliated with at the present time, if any? Please be as specific as possible
Are you an evangelical Christian?
How often do you attend religious services?
Approximately how many hours per month do you spend doing volunteer work?
Have you declared a major?
If yes, what is your major?
If applicable, what job title, occupation, and type of industry do you hope to pursue?
Please describe the primary activities you hope to be involved in on this job:

Brief Calling Scale (BCS)

Some people, when describing their careers, talk about having a "calling." Broadly speaking, a "calling" in the context of work refers to a person's belief that she or he is called upon (by the needs of society, by a person's own inner potential, by God, by Higher Power, etc.) to do a particular kind of work. Although at one time most people thought of a calling as relevant only for overtly religious careers, the concept is frequently understood today to apply to virtually any area of work.

The following questions assess the degree to which you see this concept as relevant to your own life and career. Please respond honestly, not according to what is socially desirable or what you feel you "ought" to think. Please indicate the extent to which each of the following statements currently describe you, using the following scale.

1 = Not at all true of me
2 = Mildly true of me
3 = Moderately true of me
4 = Mostly true of me
5 = Totally true of me

I have a calling to a particular kind of work.
I have a good understanding of my calling as it applies to my career.
I am trying to figure out my calling in my career.
I am searching for my calling as it applies to my career.

Calling and Vocation Questionnaire (CVQ)

Instructions: Please indicate the degree to which you believe the following statements describe you, using the following scale. Please respond with your career as a whole in mind. For example, if you are currently working part time in a job that you don't consider part of your career, focus on your career as a whole and not your current job. Try not to respond merely as you think you ''should'' respond; rather, try to be as accurate and as objective as possible in evaluating yourself. If any of the questions simply do not seem relevant to you, ''1'' may be the most appropriate answer.

1 = Not at all true of me
2 = Somewhat true of me
3 = Mostly true of me
4 = Absolutely true of me

I believe that I have been called to my current line of work.
I'm searching for my calling in my career.
My work helps me live out my life's purpose.
I am looking for work that will help me live out my life's purpose.
I am trying to find a career that ultimately makes the world a better place.
I intend to construct a career that will give my life meaning.
I want to find a job that meets some of society's needs.
I do not believe that a force beyond myself has helped guide me to my career.
The most important aspect of my career is its role in helping to meet the needs of others.
I am trying to build a career that benefits society
I was drawn by something beyond myself to pursue my current line of work.
Making a difference for others is the primary motivation in my career.
I yearn for a sense of calling in my career.
Eventually, I hope my career will align with my purpose in life.
I see my career as a path to purpose in life.
I am looking for a job where my career clearly benefits others.
My work contributes to the common good.
I am trying to figure out what my calling is in the context of my career.
I'm trying to identify the area of work I was meant to pursue.
My career is an important part of my life's meaning.
I want to pursue a career that is a good fit with the reason for my existence.
I am always trying to evaluate how beneficial my work is to others.
I am pursuing my current line of work because I believe I have been called to do so.
I try to live out my life purpose when I am at work.

Living One's Calling Scale

Please answer the following items if you currently feel a calling to a particular job or line of work. Please answer using the following scale:

1 = Strongly Disagree
2 = Moderately Disagree
3 = Slightly Disagree
4 = Neutral
5 = Slightly Agree
6 = Moderately Agree
7 = Strongly Agree
8 = Not applicable – I don't have a calling

I have regular opportunities to live out my calling.
I am currently working in a job that closely aligns with my calling.
I am consistently living out my calling.
I am currently engaging in activities that align with my calling.
I am living out my calling right now in my job.
I am working in the job to which I feel called.

Multidimensional Calling Measure (MCM)

Please indicate on a scale from 1 to 6, where one is strongly disagree and 6 is strongly agree, how much you agree with the following statements.

Doing my job I can realize my full potential.
I am passionate about doing my job.
I identify with my work.
By doing my job I serve the common good.
My job helps to make the world a better place.
I have high moral standards for doing my job.
An inner voice is guiding me in doing my job.
I follow an inner call that guides me on my career path.
I am destined to do exactly the job I do.

Calling Scale (CS) - Dobrow and Tosti-Kharas

Please indicate on a scale from 1 to 7, where one is strongly disagree and 7 is strongly agree, how much you agree with the following statements.

I am passionate about my work.
I enjoy my work more than anything else.
My work gives me immense personal satisfaction.

I would sacrifice everything to do my job.
The first thing I often think about when I describe myself to others is my work.
I would continue to do my work even in the face of severe obstacles.
I know that my work will always be part of my life.
I feel a sense of destiny about doing my work.
My work is always in my mind in some way.
Even when not engaging in my work, I often think about it.
My existence would be much less meaningful without my involvement in my work.
Engaging in my work is a deeply moving and gratifying experience for me.

The Calling Paragraph

Instructions: First read all three paragraphs and then indicate how much you are like A, B, and C. on a scale ranging from "very much," "somewhat," "a little," or "not at all like me"

A works primary to earn enough money to support life outside of her/his job. If she/he was financially secure, she/he would no longer continue with his current line of work, but would really rather do something else instead. A's job is basically a necessity of life, a lot like breathing or sleeping. She/he often wishes the time would pass more quickly at work. She/he greatly anticipates weekends and vacations. If A lived her/his life over again, she/he probably would not go into the same line of work. She/he would not encourage her/his friends and children to enter her/his line of work. A is very eager to retire.

B basically enjoys her/his work, but does not expect to be in her/his current job five years from now. Instead, she/he plans to move on to a better, higher level job. She/he has several goals for her/his future pertaining to the positions she/he would eventually like to hold. Sometimes her/his work seems a waste of time, but she/he knows that he must do sufficiently well in her/his current position in order to move on. B can't wait to get a promotion. For her/him, a promotion means recognition of her/his good work, and is a sign of her/his success in competition with her/his coworkers.

C's work is one of the most important parts of her/his life. She/he is very pleased that she/he is in this line of work. Because what she/he does for a living is a vital part of who she/he is, it is one of the first things she/he tells people about herself/himself. She/he tends to take her/his work home with her/him and on vacations, too. The majority of her/his friends are from her/his place of employment, and she/he belongs to several organizations and clubs relating to her/his work. C feels good about her/his work because she/he loves it, and because she/he thinks it makes the world a better place. She/he would encourage her/his friends and children to enter her/his line of work. C would be pretty upset if she/he were forced to stop working, and she/he is not particularly looking forward to retirement

Work and Religious Centrality

Instructions: Please distribute 100 points into the 5 categories below in order to represent the relative importance of each in your life at the present time.

-Leisure
-Community
-Work
-Religion
-Family

The Short Occupational Self-Efficacy Scale

Please indicate on a scale from 1 to 6, where one is "not at all true" and 6 is "completely true", how much you agree with the following statements.

I can remain calm when facing difficulties in my job because I can rely on my abilities.
When I am confronted with a problem in my job, I can usually find several solutions.
Whatever comes my way in my job, I can usually handle it.
My past experiences in my job have prepared me well for my occupational future.
I meet the goals that I set for myself in my job.
I feel prepared for most of the demands in my job.

Career Engagement Scale

Please answer using the following scale:

1 = almost never
2 = occasionally
3 = a moderate amount
4 = quite often
5 = very often

To what extent in the past six months….

…actively sought to design your professional future?
…undertook things to achieve your career goals?
...cared for the development of your career?
…developed plans and goals for your future career?
…sincerely thought about personal values, abilities, and weaknesses?
…collected information about employers, professional development opportunities or the job market...
…established or maintained contacts with people who can help you professionally?
…voluntarily participated in further education, training or other events to support your career?
…assumed duties or positions that will help you progress professionally?

Work Values

Instructions: Please think about how important each of these work values are to you personally for your career and rate each from 1-5, in which 1 is "not important at all" and 5 is "extremely important"

Making the world a better place
Being of service to society
Contributing to humanity
Forming relationships with coworkers
Getting to know your fellow workers quite well
Developing close ties with coworkers
Self-enhancement
Salary level
Total compensation
The amount of pay
Gaining respect
Obtaining status
Being looked up to by others
Being certain of keeping my job
Being sure I will always have a job
Being certain my job will last
Distinct reporting relationships
A clear chain of command
Definite lines of authority
Doing a variety of things
Doing something different every day
Doing many different things on the job
Doing my work in my own way

The Core Self-Evaluations Scale

Instructions: Below are several statements about you with which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item.

1 = Strongly disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly agree

I am confident I get the success I deserve in life.
Sometimes I feel depressed.
When I try, I generally succeed.
Sometimes when I fail I feel worthless.
I complete tasks successfully.
Sometimes, I do not feel in control of my work.
Overall, I am satisfied with myself.
I am filled with doubts about my competence.
I determine what will happen in my life.
I do not feel in control of my success in my career.

I am capable of coping with most of my problems.
There are times when things look pretty bleak and hopeless to me.

The 'Age-Universal' I-E Scale-12

Instructions: Please determine whether the attitude or behavior contained within the question is a description of you.

1 = Yes
2 = Not certain
3 = No

I try hard to live all my life according to my religious beliefs.
It doesn't much matter what I believe so long as I am good.
I have often had a strong sense of God's presence.
My whole approach to life is based on my religion.
Prayers I say when I'm alone are as important as those I say in church.
I attend church once a week or more.
My religion is important because it answers many questions about the meaning of life.
I enjoy reading about my religion.
It is important to me to spend time in private thought and prayer.
What religion offers me most is comfort in times of trouble and sorrow.
Prayer is for peace and happiness.
I pray mainly to gain relief and protection.
I go to church because it helps me make friends.
I go to church mainly because I enjoy seeing people I know there.
I go to church mostly to spend time with my friends.

Career-Exploration Scale

Please indicate how often in the last three months have you….

1 = rarely
2 = a little
3 = moderately
4 = rather often
5 = a great deal

…reflected on what your vocational interests are?
…thought about your strengths and abilities?
…contemplated about what is important to you in a job?
…contemplated about what type of work you enjoy?
…informed yourself about vocational possibilities?
…collected information about particular employers?
…conducted conversations with experienced professionals in your desired area?
…informed yourself about the labor market in your desired area?

…looked for information about certain professional or study fields?
… informed yourself about developmental opportunities in your desired area?

My Vocational Situation - Identity Clarity

Instructions: Try to answer each of the following statements as mostly TRUE or mostly FALSE. Choose the answer that best represents your present opinion. In thinking about your present job or in planning for an occupation or career…

I need reassurance that I have made the right choice of occupation.
I am concerned that my present interests may change over the years
I am uncertain about the occupations I could perform well.
I don't know what my major strengths and weaknesses are.
The jobs I can do may not pay enough to live the kind of life I want.
If I had to make an occupational choice right now, I'm afraid I would make a bad choice.
I need to find out what kind of career I should follow.
Making up my mind about a career has been a long and difficult problem for me.
I am confused about the whole problem of deciding on a career.
I am not sure that my present occupational choice or job is right for me.
I don't know enough about what workers do in various occupations
No single occupation appeals strongly to me.
I am uncertain about which occupation I would enjoy.
I would like to increase the number of occupations I could consider.
My estimates of my abilities and talents vary a lot from year to year.
I am not sure of myself in many areas of life.
I have known what occupation I want to follow for less than one year.
I can't understand how some people can be so set about what they want to do.