

A Cross-Cultural Examination of Self-Leadership: Testing for Measurement Invariance Across Four Cultures

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Abstract

The purpose of this study is to examine the cross-cultural validity of self-leadership by confirming a second-order factor structure and testing for measurement invariance in the operationalization of the self-leadership construct across four distinct national cultures: the United States, China, Germany, and Portugal. Results provide evidence in support of the cross-cultural validity of the hierarchical factor structure of self-leadership and in support of partial metric measurement invariance for the Revised Self-Leadership Questionnaire (RSLQ). Taken together, these findings suggest that future researchers examining substantive self-leadership hypotheses within and across non-U.S. cultures may proceed with confidence.

Keywords

self-leadership, cross-cultural, measurement invariance

Leadership is one of the most scrutinized phenomena in organizational and management research. The nature and essence of effective leadership have evolved over time along with changes in organizations and the environments in which they function. For example, the top-down, bureaucratic leadership approaches of the industrial era no longer make as much sense in today's knowledge-based world marked by complexity and instability (Uhl-Bien & Marion, 2009; Uhl-Bien, Marion, & McKelvey, 2007). In response to rapidly changing technologies and intense global competition, many organizations are moving away from a traditional top-heavy leadership paradigm toward a new model of leadership that involves empowering individuals at all organizational levels to take greater responsibility for their own work-related behaviors and actions (Pearce & Manz, 2005). This new approach focuses on how people can influence and lead themselves, suggesting that the traditional heroic leader perched atop an organization's vertical structure can no longer be expected to have all the knowledge and skills necessary to direct all aspects of knowledge-based work. Rather, individuals in today's highly educated and motivated workforce are more and more often being encouraged to lead themselves and to share critical leadership roles that were once filled by a traditional vertical leader who receives power through the organization's structure (Pearce & Manz, 2005).

The concept of employee self-leadership implies that although behaviors are often facilitated by external forces, such as a vertical leader, individual actions in the workplace

are ultimately controlled by internal forces (Manz, 1986; Stewart, Courtright, & Manz, 2011). Self-leadership, a concept first introduced in the organizational literature more than 30 years ago (Manz & Sims, 1980), has steadily gained influence over the past three decades (Neck & Houghton, 2006; Stewart et al., 2011), and has made significant contributions to the academic literature (e.g., Furtner, Baldegger, & Rauthmann, 2013; Konradt, Andreßen, & Ellwart, 2009; Manz, 1986; Manz & Sims, 1987; Prussia, Anderson, & Manz, 1998; Stewart, Carson, & Cardy, 1996) and practitioner-focused articles and books on the subject (e.g., Blanchard, 1995; Bryant & Kazan, 2013; Drucker, 2005; Manz & Sims, 2001; Neck & Manz, 2013; Sims & Manz, 1996; Waitley, 1995). In addition, the self-leadership concept is often included in basic management and leadership textbooks (e.g., McShane & Von Glinow, 2013; Nahavandi, 2012; Neck, Lattimer, & Houghton, 2014; Schermerhorn, Osborn, Uhl-Bien, & Hunt, 2012).

Although self-leadership research has led to a substantial body of literature, relatively little of this research has examined self-leadership relative to cross-cultural differences, despite an increased focus on leadership and culture in general over the past several decades (Dickson, Den Hartog, &

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Mitchelson, 2003). As Stewart and his colleagues (2011) point out in a recent review of the self-leadership literature in the *Journal of Management*, “Self-leadership has received almost no attention in relation to national culture” (p. 206). These authors go on to note that much of the existing self-leadership research has been conducted in the United States, a highly individualistic culture. They conclude that “additional work is needed to determine the extent to which findings generalize to more collectivist cultures” (p. 211).

Hence, the primary purpose of the present study is to extend self-leadership research by examining the cross-cultural validity of the self-leadership construct. More specifically, we test for metric equivalence in the operationalization of the self-leadership construct across four distinct national cultures: the United States, China, Germany, and Portugal. Metric invariance across cultures would indicate that self-leadership is valid cross-culturally as well as providing validity evidence for both the original Revised Self-Leadership Questionnaire (RSLQ; Houghton & Neck, 2002) as well as its translations (i.e., China: Ho & Nesbit, 2009; Portugal: Marques-Quinteiro, Curral, & Passos, 2012; and Germany: Andreßen & Konradt, 2007). In the past, cross-cultural researchers have identified the establishment of measurement equivalence across culturally diverse groups as an important first step in cross-cultural research (e.g., Steenkamp, Benedict, & Baumgartner, 1998; van de Vijver & Leung, 1997; Vandenberg & Lance, 2000). Establishing metric invariance indicates that people from different cultures respond the same way to items on a measurement scale. This indicates consistency between cultures as well as consistency between instruments used to operationalize a specific construct. Once the metric equivalence of self-leadership is reasonably established, researchers will then be able to examine substantive self-leadership hypotheses within and across cultures other than the United States. We begin with a brief review of self-leadership, including self-leadership measurement and existing cross-cultural self-leadership research, before providing a more detailed overview of the concept of measurement invariance. We then proceed to the analyses and results of the current study, concluding with a discussion of these results and their implications for future self-leadership research.

Self-Leadership: Definition and Overview

Self-leadership (Manz, 1986; Neck & Houghton, 2006) is a process through which individuals regulate their own behavior. More specifically, it may be viewed as a means of guiding and leading oneself through the use of specific sets of behavioral and cognitive strategies (Neck & Houghton, 2006). The self-leadership concept was first introduced in the 1980s in a practitioner-oriented book (i.e., Manz, 1983).

The seminal academic work on self-leadership appeared 3 years later in the *Academy of Management Review* (i.e., Manz, 1986). Self-leadership has conceptual foundations rooted in self-management (e.g., Manz & Sims, 1980), in behavioral self-control (e.g., Cautela, 1969; Thoresen & Mahoney, 1974), and in Kerr and Jermier’s (1978) notion of “substitutes for leadership.”

Self-leadership may be distinguished from related concepts such as self-control and self-management by its focus on higher-level standards of self-influence and by its inclusion of a wider array of self-influence strategies (Stewart et al., 2011). Manz (1991) drew the distinction between self-leadership and self-management by asking three basic questions: “What?” “Why?” and “How?” He described self-management as “a self-influence process and set of strategies that primarily address *how* work is to be performed to help meet standards and objectives that are typically externally set . . . [it] tends to rely on extrinsic motivation and to focus on behavior” (Manz, 1991, p. 17). In contrast, he described self-leadership as “a self-influence process and set of strategies that address *what* is to be done (e.g., standards and objectives) and *why* (e.g., strategic analysis) as well as *how* it is to be done . . . [it] incorporates intrinsic motivation and has an increased focus on cognitive processes” (Manz, 1991, p. 17).

Self-leadership strategies may be divided into the three primary categories: behavior-focused strategies, natural reward strategies, and constructive thought pattern strategies (Neck & Houghton, 2006). *Behavior-focused strategies* attempt to increase one’s self-awareness to facilitate behavioral management, specifically the management of behaviors related to necessary but unpleasant tasks (Neck & Manz, 2013). Behavior-focused strategies include self-observation, self-goal setting, self-punishment, self-reward, and self-cueing (Neck & Houghton, 2006). Self-observation entails increasing one’s awareness of one’s motivation for specific behaviors. This type of awareness is an essential first step toward behavior modification and increased performance (Neck & Manz, 2013). When individuals possess accurate information regarding their current behavior and performance, they can more effectively set behavior-altering goals for themselves (Manz, 1986; Manz & Sims, 1980; Neck & Manz, 2013). Self-goal setting is based on goal setting theory, which suggests that setting challenging and specific goals can significantly increase individual performance levels (e.g., Locke & Latham, 1990; Neck, Nouri, & Godwin, 2003). The process of setting and monitoring these goals leads naturally to the strategies of self-rewards and self-cueing. Self-rewards can aid significantly in motivating the individual to accomplish the goals (Manz & Sims, 1980; Neck & Manz, 2013) and can range from something small or intangible such as mentally congratulating oneself for an important accomplishment or something large and concrete like a special gift for oneself after successfully

completing a demanding project (Neck & Houghton, 2006). Self-cueing involves introducing positive environmental cues such as to-do lists and sticky notes and removing negative environmental cues that can serve as potential distractions such as a television (Neck & Manz, 2013).

Natural reward strategies exist to create situations in which individuals find their task or activity inherently pleasurable and are therefore motivated simply because they enjoy what they are doing (Csikszentmihalyi, 1992; Neck & Manz, 2013). With conceptual foundations in intrinsic motivation theory (e.g., Deci & Ryan, 1985), there are two primary types of natural reward strategies. The first involves building more pleasurable aspects into a given task so that the activity itself becomes inherently rewarding (Manz & Sims, 2001; Neck & Manz, 2013). The second strategy involves a changing of perceptions by focusing attention away from the less enjoyable aspects of a task and refocusing it on the task's naturally rewarding aspects (Manz & Sims, 2001; Neck & Manz, 2013). Both natural reward strategies are designed to help generate feelings of self-efficacy and self-determination, which in turn lead to improved performance in work-related behaviors (Neck & Houghton, 2006).

Constructive thought strategies are designed to facilitate the formation of positive and productive thought patterns and to create habitual ways of thinking that can constructively affect performance (Neck & Manz, 1992, 2013). These strategies include using positive mental imagery, positive self-talk, and recognizing and replacing negative beliefs and assumptions. Dysfunctional beliefs and assumptions have the potential to lead to habitual dysfunctional thinking processes, depression, unhappiness, and personal ineffectiveness (Burns, 1980; Ellis, 1977). Some examples of dysfunctional thinking processes include *all-or-nothing thinking* (if performance is not perfect, it is viewed as a complete failure), *mental filter* (dwelling on a single negative detail while ignoring positive information), and *disqualifying the positive* (dismissing positive outcomes as irrelevant or atypical; Burns, 1980). Through identifying and changing these types of distorted and irrational beliefs and assumptions, individuals may be able to minimize dysfunctional thought processes and improve their cognitive effectiveness (Burns, 1980). Self-talk, the next constructive thought strategy, refers to covert internal dialogues (Neck & Manz, 1992). Negative self-talk may result in negative emotional states and ineffective cognitive processes (Ellis, 1977; Neck & Manz, 1992). By increasing one's awareness of the content of such internal dialogues, one may be able to reduce or eliminate irrational and pessimistic self-dialogues while facilitating more optimistic ones (Seligman, 1991). The last constructive thought strategy, mental imagery or visualizing successful performance in advance of actual performance (Manz & Neck, 1991; Neck & Manz, 1992), refers to the process of visualizing or mentally practicing

successful performance ahead of time. People who engage in such a process are more likely to engage in successful performance of the actual task than are those individuals who visualize or mentally rehearse failure or other negative outcomes (Finke, 1989). In short, empirical research across a variety of disciplines, ranging from sports and clinical psychology to education and communication, provides strong support for the role of rational beliefs and assumptions, positive self-talk, and constructive mental imagery as effective means for improving individual performance (Neck & Houghton, 2006).

Self-leadership processes focus on adding practical value to work organizations and on increasing individual effectiveness and well-being. A number of significant self-leadership outcomes have been examined in the literature. *Self-efficacy* is perhaps the most commonly mentioned self-leadership outcome variable (e.g., Manz, 1986; Neck & Manz, 1996, 2013), and studies have shown empirical support for self-efficacy as a primary mechanism through which self-leadership affects performance (e.g., Neck & Houghton, 2006; Prussia et al., 1998). *Psychological empowerment* is another commonly expected outcome of self-leadership. Indeed, self-leadership is often portrayed as a key process for facilitating empowerment (e.g., Houghton & Yoho, 2005). *Commitment and independence* are also often presented as outcomes in the self-leadership literature (e.g., Houghton & Yoho, 2005; Manz & Sims, 2001), with self-leadership providing a sense of ownership for individuals relative to their tasks and work processes. *Creativity and innovation* have also been identified as possible outcomes of self-leadership (e.g., Carmeli, Meitar, & Weisberg, 2006; DiLiello & Houghton, 2006; Houghton & Yoho, 2005; Manz & Sims, 2001). For example, DiLiello and Houghton (2006) suggest that many of the essential concepts from the creativity literature may be directly or indirectly related to self-leadership. *Team processes and effectiveness* also may be improved and enhanced by self-leadership, especially in self-managing teams where no formal internal leader has been designated (e.g., Hauschildt & Konradt, 2012; Houghton, Neck, & Manz, 2003; Konradt et al., 2009). *Entrepreneurship* is yet another process that may be aided by the application of self-leadership strategies (e.g., D'Intino, Goldsby, Houghton, & Neck, 2007; Neck, Neck, & Manz, 1997; Neck, Neck, Manz, & Godwin, 1999). Finally, self-leadership has recently been examined as an important outcome of transformational leadership (Andreßen, Konradt, & Neck, 2012; Furtner et al., 2013; Tekleab, Sims, Yun, Tesluk, & Cox, 2008) while being identified as a potential enhancer of the charismatic leadership approach (Chung, Chen, Lee, Chen, & Lin, 2011). In addition, self-leadership may affect or predict any number of other organizational variables, including positive affect, job satisfaction, productivity, quality, absenteeism, turnover, and career success (Neck & Houghton, 2006).

Although self-leadership has experienced increasing popularity in terms of the number of published journal articles per year over the past two decades, the construct has experienced several developmental problems and has been subject to some degree of criticism. For example, much of the early self-leadership literature was conceptual in nature, leading to concerns regarding construct validity (Neck & Houghton, 2006). More recently, however, empirical self-leadership studies have been published with increasing frequency. As we discuss in detail below, this early dearth of empirical self-leadership research can be attributed to the initial absence of valid self-leadership measurement scales, which have since been developed and validated. Another early criticism questioned the extent to which self-leadership is a unique and distinguishable construct relative to other theories of self-influence, motivation, and personality (e.g., Guzzo, 1998; Markham & Markham, 1995, 1998). However, as noted above, an increasing number of empirical studies over the past decade have helped to ease some of these early concerns regarding construct validity. For a more in-depth overview of the self-leadership literature and construct development, please refer to reviews by Stewart and his colleagues (2011) and by Neck and Houghton (2006).

Self-Leadership Measurement

Self-leadership research was initially slowed by the lack of a valid and reliable self-leadership scale (Neck & Houghton, 2006). Early attempts at self-leadership measurement were drawn from self-leadership assessment prototypes and self-management questionnaires (i.e., Manz & Sims, 1991). This early work led to the first published self-leadership scale, Anderson and Prussia's (1997) Self-Leadership Questionnaire (SLQ). While the 50-item SLQ instrument offered an admirable first step in self-leadership scale development, it suffered from inherent reliability and validity problems and required additional modifications (Houghton & Neck, 2002). Consequently, Houghton and Neck (2002) developed and refined the RSLQ (see the appendix). Some of the items from the Anderson and Prussia SLQ were either eliminated or rewritten, while other items were added from Cox's (1993) previously unpublished self-leadership scale. Houghton and Neck (2002) removed items with large cross-loadings and used confirmatory factor analysis to provide support for the hierarchical nature of the self-leadership construct (i.e., three first-order factors—behavior focused strategies, natural rewards strategies, and constructive thought strategies—define a higher order general self-leadership factor).

Over the past decade, the RSLQ has established good reliability and validity across a number of empirical studies (e.g., Curral & Marques-Quinteiro, 2009; Houghton, Bonham, Neck, & Singh, 2004; Houghton & Jinkerson, 2007). Furthermore, the RSLQ has been translated into at

least six different foreign languages, including Chinese (Ho & Nesbit, 2009), Portuguese (Marques-Quinteiro et al., 2012), and German (Andreßen & Konradt, 2007), the cultures examined in the present study. The translated versions of the RSLQ have generally shown solid reliabilities and validities together with stable factor structures that further confirm the original findings of Houghton and Neck (2002) while providing an excellent opportunity to assess cross-cultural measurement invariance.

As Stewart et al. (2011) conclude, "The Houghton and Neck scales thus offer an empirically supported measurement instrument that captures different aspects of self-leadership ranging from behavioral aspects of self-management to more advanced strategies related to cognitive aspects of true internal control" (p. 191). Taken together, the findings to date have been encouraging and appear to confirm the RSLQ as an effective measure of self-leadership. One possible limitation of the RSLQ is its length. The full RSLQ includes 35 items, which can create difficulties for some types of research. Overall survey length can quickly become unwieldy, leading to rater fatigue, inaccuracy, and missing survey data. Consequently, Houghton, Dawley, and DiLiello (2012) have developed the Abbreviated Self-Leadership Questionnaire, which may prove useful as a general assessment of the global self-leadership construct.

Self-Leadership Across Cultures

Leadership across cultures is a very important topic in both the academic literature and in practice. One of the most extensive efforts to address leadership across cultures was conducted by the GLOBE research collaboration that focuses on culture and leadership in 61 nations (House, Javidian, Hanges, & Dorfman, 2002). Many of these studies have found that different attributes are necessary for successful leadership in different cultures and that leadership styles vary in their effectiveness across cultures (e.g., House et al., 2002). As mentioned above, few attempts have been made to examine self-leadership from a cross-cultural perspective, which could lead to the misapplication of self-leadership findings in different cultures. In a notable exception, Alves et al. (2006) used Hofstede's (2001) culture framework to develop a number of propositions regarding how self-leadership is likely to differ across cultures. Specifically, they suggested that high power distance is likely to raise the importance of the symbolic value of tasks and correspondent covert processes of self-leadership, that high uncertainty avoidance may serve to emphasize the importance of nonrational and intuition-based thought processes, that collectivism highlights the importance of social relationships, that femininity also may relate to social relationships and nonrational processes, and that long-term orientation may relate to the importance of making time an explicit element (Alves et al., 2006).

Table 1. Scores on Hofstede's Cultural Dimensions for China, Germany, Portugal, and the United States.

	Power distance	Individualism	Masculinity	Uncertainty avoidance	Long-term orientation
China	80	20	66	30	118
Germany	35	67	66	65	31
Portugal	63	27	31	104	30
United States	40	91	62	46	29

Source. www.geert-hofstede.com.

When investigating cross-cultural phenomena, it is important to consider the possibility that a phenomenon or its measure may vary across cultures. This potential difference is often tested using measurement invariance. This technique allows for the examination of the structure of a measure itself as well as mean differences in the phenomenon across cultures. In testing measurement invariance across cultures, researchers must examine and consider possible cultural differences on the given variable such as the ones outlined above for self-leadership. As Adler (1997) has noted, most current leadership theories cannot be considered universal because they tend to reflect the dominant culture in which they were developed, often U.S. culture. A case in point, the self-leadership concept has been developed and examined largely in the United States, a cultural context that is highly individualistic, has relatively low power distance, and has a short-term orientation. Indeed, Americans typically display higher individualism than residents of any other country in the world, which could affect citizens' ability and desire to lead themselves (Stewart et al., 2011). The cultures in which the current study examines self-leadership measurement invariance provide significant contrasts to the United States on several key cultural dimensions. For example, China is much higher on power distance, collectivism, and long-term orientation as compared to the United States, while Portugal is substantially higher on power distance, collectivism, femininity, and uncertainty avoidance relative to the United States. In addition, although the United States and Germany show a number of cultural similarities, they nevertheless differ significantly on a number of dimensions, including individualism (lower in Germany) and uncertainty avoidance (higher in Germany). Table 1 shows Hofstede's cultural dimensions for the four countries.

A few additional studies also have examined potential self-leadership cross-cultural differences, often in the context of developing and applying a translated version of the RSLQ. Müller (2006) initially developed and tested a German Self-Leadership Questionnaire not based on the RSLQ that nevertheless resulted in a successful replication of the basic three dimensional structure of self-leadership in a German sample. Subsequently, Andreßen and Konradt (2007) developed a German translation of the RSLQ, the

RSLQ-D, and were able to successfully replicate the factor structure of the original RSLQ across multiple German samples while reporting acceptable scale reliabilities along with both construct and criterion-related validity. The Andreßen and Konradt RSLQ-D has been used in a number of subsequent empirical studies (e.g., Andreßen et al., 2012; Furtner et al., 2013; Furtner & Rauthmann, 2010; Furtner, Rauthmann, & Sachse, 2010, 2011; Hauschildt & Konradt, 2012; Konradt et al., 2009) and continues to exhibit good psychometric properties. Similarly, Marques-Quinteiro et al. (2012) reported that a Portuguese translation of the RSLQ demonstrated the same hierarchical factor structure in a Portuguese sample as the original RSLQ in the original U.S. sample (i.e., Houghton & Neck, 2002). In addition, Marques-Quinteiro and his colleagues (2012) tested and found that the Portuguese translation of the scale demonstrated measurement invariance across multiple Portuguese samples and subsamples composed randomly and on the basis of work experience.

In contrast to the results outlined above for German and Portuguese cultures, Georgianna (2007) examined a number of key differences between a Chinese sample and a U.S. sample with regards to self-leadership using an English language version of the Müller (2006) Self-Leadership Questionnaire. Her findings suggest that there are important differences in self-leadership across the two cultures. Similarly, Neubert and Wu (2006) examined a Chinese translation of the RSLQ in a Chinese sample and found that the scale did not universally generalize to the Chinese culture. Specifically, their results suggested that a modified model of self-leadership including self-goal setting, visualizing successful performance, self-talk, self-reward, and self-punishment demonstrated the best fit among the alternative models they tested. Building on the work of Neubert and Wu (2006), Ho and Nesbit (2009) further refined and modified a Chinese version of the RSLQ to better reflect the social and relations-based features of a collectivist culture, resulting in a considerably more valid and reliable instrument. The purpose of these modifications was to reduce measurement-based noninvariance in the scale. Indeed, Ho, Nesbit, Jepsen, and Demirian (2012) subsequently found and reported empirical evidence supporting the measurement invariance of this modified scale across a Chinese and Australian sample. Consequently, any additional noninvariance discovered between Chinese samples and samples drawn from other cultures of interest will be more likely to reflect culturally based differences.

In the current article we build on the work of Ho et al. (2012) in positing that the basic self-leadership framework (Houghton & Neck, 2002; Neck & Houghton, 2006) is valid across cultural contexts. However, as the above review of the existing cross-cultural self-leadership research suggests, we do expect that cultural differences may be reflected in the operationalization and measurement of the construct.

By testing for metric invariance, we can address both of these issues with the same test. Indeed, as Blount and Jones (1997) have suggested, we should expect to find systematic differences in scores on certain self-leadership dimensions due to cultural differences. These researchers provide evidence that individuals living in developing countries do not fit the Western models of leadership because of their differing perspectives regarding loyalty, interpersonal relations, and authority (Blount & Jones, 1997). Similarly, in the measurement invariance analyses that follow, we empirically examine the extent to which the self-leadership construct may be perceived differently across four distinct cultures, using the frameworks presented by Hofstede (2001) and Alves et al. (2006) as a guide for interpreting the results of our study. We also use these data to validate the original RSLQ and its translations to determine the validity and reliability of these instruments.

Measurement Invariance

In the words of Horn (1991, p. 119), "Without evidence of measurement invariance, the conclusions of a study must be weak." Given the need for evidence of measurement invariance, our study examines the invariance between a U.S. sample and samples from three other cultures of interest using translations of the RSLQ (Houghton & Neck, 2002). According to Horn and McArdle (1992, p. 117), measurement invariance is defined as "whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute." When invariance cannot be shown, a researcher's conclusions are ambiguous at best and erroneous at worst.

When testing for measurement invariance, the first step is to test the equivalence of the factor loadings followed by the underlying factor structure (Byrne & Watkins, 2003). In their extensive analysis of the invariance literature, Steenkamp et al. (1998) discovered that confirmatory factor analysis is the most commonly used tool for testing invariance. This process employs multigroup confirmatory factor analyses to compare the theoretical model with the observed structure in at least two samples (Milfont & Fischer, 2010). When testing for invariance, there are multiple levels of potential invariance including configural, metric, scalar, factor covariance, and factor means, among others (Vandenberg & Lance, 2000). Examining configural invariance is the first step in establishing measurement invariance. This level of invariance is established if the basic structural model of interest can be shown to be invariant across groups, thus indicating that members of the different groups conceptualize the construct(s) in the same way (Milfont & Fischer, 2010). This model also serves as a baseline for subsequent tests of invariance.

Once configural invariance is established, it is possible to examine metric invariance. Metric invariance concerns

the extent to which the strengths of the relationships between specific measurement indicators and their respective underlying constructs are the same across groups (Milfont & Fischer, 2010). Metric invariance provides a stronger test of measurement invariance because it examines the concept of equal scale metrics and scale intervals across countries (Rock, Werts, & Flaughner, 1978). Although full metric invariance is obviously desired, expectations of such findings are generally considered to be scientifically unrealistic (Horn, McArdle, & Mason, 1983). The concept of partial invariance was first introduced by Lastovicka (1982), who suggested that a smaller subset of factors may be invariant across countries even if the factors structure are slightly different. Hence, investigators can explore the possibility of partial measurement invariance, which can be highly useful in identifying the parts of a model that might be culturally invariant relative to those that are not. When addressing the topic of invariance in a cross-cultural context, one must consider the reasons for a nonfinding with regard to invariance, such as the collectivist nature of one culture relative to another when comparing the relationships among factors and indicators.

Our analysis in the current study focuses on establishing the extent to which the RSLQ demonstrates configural and metric measurement invariance across four cultures of interest. Such a design allows for the potential identification of noninvariant aspects of self-leadership that may reflect important cross-cultural differences. However, as there is no *a priori* expectation of cultural differences based on existing empirical research or theory, the present study does not advance or test specified hypotheses regarding cross-cultural differences.

Method

Samples

The means, standard deviations, and intercorrelations needed for our analyses for each of the four samples examined in the current study were obtained from published studies examining or applying a version of the RSLQ (i.e., Furtner et al., 2013; Ho & Nesbit, 2009; Houghton & Neck, 2002; Marques-Quinteiro et al., 2012). In some cases the requisite descriptive statistics were reported in the published articles; in other cases the authors were contacted and asked if they would be willing to share descriptive statistics for their samples to be used in a study of self-leadership measurement invariance. Each of the four samples is discussed in more detail below.

U.S. Sample. The U.S. sample (Houghton & Neck, 2002) consists of 357 students (60% male, 40% female, mean age = 21.12) in an introductory management course at a large southeastern university in the United States. As part of a

class lecture on individual differences, students completed the revised self-leadership instrument. The questionnaires were completed anonymously, and participation was voluntary.

Chinese Sample. The Chinese sample (Ho & Nesbit, 2009) consists of 285 students (43% male, 57% female, mean age = 20) in a management course at a community college in Hong Kong, a special administrative region within the People's Republic of China. Although Hong Kong is a modern and Westernized city, the people of Hong Kong and Mainland China share a common cultural heritage and common cultural practices and perspectives (Ho & Nesbit, 2009).

German Sample. The German sample (Furtner et al., 2013) consists of 447 working professionals (58% male, 42% female, mean age = 40.04) located in Germany (72.5%), Austria (11.8%), Switzerland (11.2%), and Liechtenstein (4.5%). As an incentive for participation in the study, feedback was offered for all participants.

Portuguese Sample. The Portuguese sample (Marques-Quinteiro et al., 2012) consists of 720 individuals (31.4% male, 68.6% female, mean age = 28.3) who were randomly invited to participate in an online survey via email. Participants consisted of working professionals (54.86%) representing distinct industries such as research, teaching, and business consulting and university and postgraduate students (44.44%) enrolled in several different courses, including psychology, management, finance, and marketing.

Measurement

Self-leadership was measured in each of the samples using a version of the RSLQ (Houghton and Neck, 2002). The RSLQ consists of 35 items in nine distinct subscales within the three primary self-leadership dimensions. As outlined above, each of the translated versions of the RSLQ (e.g., China: Ho & Nesbit, 2009; Portugal: Marques-Quinteiro et al., 2012; and Germany: Andreßen & Konradt, 2007) has demonstrated good factor loadings, reliability, and validity relative to the original English-language version. Among translated scales, the Ho and Nesbit (2009) version of the RSLQ experienced the most modifications in its adaptation to a Chinese context. As noted above, in an effort to correct the problems exhibited by the Neubert and Wu (2006) translation, Ho and Nesbit made substantial refinements to the scale dimensions that were problematic in the earlier Chinese version of the scale. Although this modified Chinese version of the RSLQ could possibly serve to mask some potential areas of noninvariance of the original English version of the RSLQ in the Chinese context, the overarching purpose of our analysis is to examine the extent to which the basic self-leadership dimensions are invariant between U.S. and

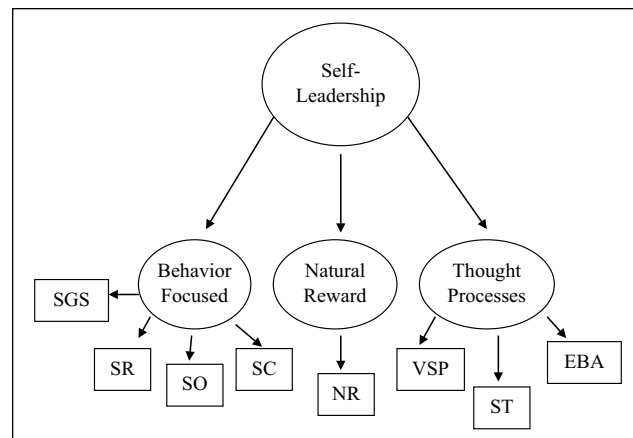


Figure 1. A hierarchical structure model of self-leadership.

EBA = Evaluating Beliefs and Assumptions; NR = Natural Reward; SC = Self-Cueing; SGS = Self-Goal Setting; SO = Self-Observation; SR = Self-Reward; ST = Self-Talk; VSP = Visualizing Successful Performance.

Chinese samples. Because the modified Ho and Nesbit scale retains the basic structural integrity of the original RSLQ, we believe that an examination of its invariance in a Chinese sample relative to the original scale in a U.S. sample will provide us with useful and meaningful results.

Analysis

In conducting our measurement invariance analysis, we follow established procedures recommended in the measurement invariance literature (e.g., Cheung & Rensvold, 1999; Milfont & Fischer, 2010; Vandenberg & Lance, 2000). Specifically, we employ structural equation modeling (SEM) techniques, in particular the maximum likelihood estimation technique in LISREL 8.53 to examine the structural models in our analyses. Following the recommendations of Hoyle and Panter (1995), we report the following fit indexes to assess the fit of the structural models: chi-square (χ^2 ; e.g., Bollen, 1989b), the goodness-of-fit index (GFI; Jöreskog & Sörbom, 1981), the nonnormed fit index (NNFI; Bentler & Bonnett, 1980), the incremental fit index (IFI; Bollen, 1989a), and the comparative fit index (CFI; Bentler, 1990). Multiple fit indexes are advisable to demonstrate convergent evidence of model fit. The values of GFI, NNFI, IFI, and CFI range from 0 to 1.0, with values greater than .90 commonly indicating acceptable model fit (Bentler & Bonnett, 1980; Hoyle & Panter, 1995). The chi-square difference test is used to examine fit between competing nested structural models.

The second-order factor model for self-leadership, as established by Houghton and Neck (2002), is shown in Figure 1. Item-parceling procedures were used to create composite indicators representing eight distinct self-leadership subfacets. Research suggests that when scale items are unidimensional, the estimates of structural equations modeling will not vary significantly regardless of whether the

model uses parcels or items (Little, Cunningham, Shahar, & Widaman, 2002; Sass & Smith, 2006). We made two minor modifications to the second-order factor model tested by Houghton and Neck (2002). First, we eliminated the self-punishment composite indicator. Self-punishment was excluded because this dimension has more recently been reconceptualized in the self-leadership literature as “self-correcting feedback” (e.g., Neck & Houghton, 2006) and because excessive self-punishment involving self-criticism and guilt can become self-destructive (Manz & Sims, 2001). Second, whereas Houghton and Neck (2002) used three individual items to measure the natural rewards latent construct, we collapsed these into a single composite indicator to facilitate comparisons across the samples that reported single a correlation for natural rewards. Although single-item indicators can be problematic in SEM analyses, we followed Kline’s (2011, p. 278) recommendations and fixed the measurement error variance of our single-item indicator based on a prior estimate obtained from an earlier analysis.

In conducting our analyses, we first examine the basic factor structure of self-leadership within each of the samples separately before moving on to testing various aspects of cross-cultural invariance. Specifically, we replicate the confirmatory factor analysis (CFA) conducted by Houghton and Neck (2002) in the original development of the RSLQ in each of the four current samples, testing the hypothesized second-order factor model against nested competing one-factor and three-factor uncorrelated models. Having once established structural stability and acceptable fit for the hierarchical model in each of the four samples, we then move on to our main analysis, testing the cross-cultural measurement equivalence of self-leadership. This is accomplished by examining the invariance of the second-order factor structure model in a multigroup comparison between the U.S. sample and each of the three focal cultures. Following established procedures in the measurement invariance literature (e.g., Cheung & Rensvold, 1999; Milfont & Fischer, 2010; Vandenberg & Lance, 2000), we first test for configural invariance between the United States and the comparison culture. The configural model serves as a baseline for more stringent invariance analyses.

We then test for full metric invariance across the groups. If full metric invariance is not achieved, we proceed to an examination of partial metric invariance by constraining the factor loadings on each of the three first-order latent factors one at a time in sequential models. Through this process, we identify which of the three self-leadership dimensions is noninvariant across the groups under comparison. Once the noninvariant factors have been identified, we examine the set of composite indicators using the factor-ratio test and triangle heuristic described by Cheung and Rensvold (1999) to identify an invariant set of indicators and the noninvariant indicators. Once the invariant set of indicators is identified, a model testing partial metric invariance can be examined. If partial metric

invariance is achieved, other tests of invariance, such as scalar, error, and factor variance, may be undertaken.

Results

Means, standard deviations, and correlations for each of the four samples are shown in Table 2. Results of the CFA comparing the second-order factor structure (Figure 1) established by Houghton and Neck (2002) to nested competing alternative models for each of the four samples are shown in Table 3. As reflected in the table, the second-order factor model was the best-fitting model in each of the four samples. It is interesting to note that the results of the reanalysis of the Houghton and Neck data (i.e., U.S. English sample; Table 3) using the slightly modified model described above resulted in substantially better model fit than that originally reported by Houghton and Neck (2002, p. 685), thereby providing evidence in support of using the modified model in the current analysis. Standardized parameter estimates for the second-order factor model for each of the four samples are shown in Table 4. These results, confirming the second-order factor structure in each of the four samples, allow us to move on to multigroup tests of measurement invariance.

Tables 5 to 7 show the results of the invariance analyses comparing the U.S. sample to each of the three remaining cultures of China, Germany, and Portugal, respectively. In each case, configural invariance (Model 1) was established with reasonably good fit in the multigroup comparison with the U.S. sample, China: $\chi^2(39\ df) = 166.36$, GFI = .93, NNFI = .88, IFI = .92, CFI = .92; Germany: $\chi^2(39\ df) = 171.60$, GFI = .95, NNFI = .93, IFI = .95, CFI = .95; Portugal: $\chi^2(39\ df) = 312.74$, GFI = .95, NNFI = .85, IFI = .90, CFI = .90. Thus, having established configural invariance in each of the three cultures, we move on to an examination of full metric invariance. It was not unexpected that the full metric invariance model (Model 2) was rejected for each of the three cultures under comparison with the United States. Although model fit did not deteriorate substantially, the chi-square difference test was significant in each instance, indicating an absence of full metric invariance and leading to a reject decision. Given these results, we proceed to test a series of models (Models 2.1 to 2.3) that aim to identify which of the three first-order latent self-leadership factors are noninvariant. Accordingly, the factor loadings for each of the three factors were constrained to equality while allowing the remaining two factors to estimate freely for each of the three cultures.

As shown in Table 5, results of this analysis for China indicate that the Behavior Focused factor is equivalent across the two samples (nonsignificant chi-square difference test), while the Natural Reward and Thought Process factors are not (significant chi-square difference tests). Likewise, results of this analysis for Germany indicate that the Thought Processes factor is equivalent across the two samples

Table 2. Means, Standard Deviations, and Correlations.

Indicator variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
U.S. English sample (<i>N</i> = 357)										
1. SGS	3.94	0.675	—							
2. SR	3.99	0.960	.252	—						
3. SO	4.04	0.637	.577	.219	—					
4. SC	3.98	1.06	.319	.137	.124	—				
5. NR	3.85	0.929	.440	.285	.283	.117	—			
6. VSP	3.62	0.816	.492	.299	.279	.143	.368	—		
7. ST	4.04	0.927	.296	.129	.189	.191	.210	.385	—	
8. EBA	3.77	0.698	.437	.289	.354	.177	.334	.451	.320	—
Chinese sample (<i>N</i> = 285)										
1. SGS	3.42	0.62	—							
2. SR	3.86	0.84	.266	—						
3. SO	3.47	0.55	.463	.193	—					
4. SC	3.38	0.98	.419	.216	.122	—				
5. NR	3.62	0.60	.217	.174	.308	.098	—			
6. VSP	3.49	0.78	.318	.162	.301	.114	.198	—		
7. ST	3.43	0.77	.408	.354	.256	.286	.234	.295	—	
8. EBA	3.44	0.61	.323	.142	.372	.129	.322	.169	.322	—
German sample (<i>N</i> = 447)										
1. SGS	3.75	0.84	—							
2. SR	3.99	0.98	.252	—						
3. SO	3.74	0.71	.577	.219	—					
4. SC	3.39	1.07	.319	.137	.124	—				
5. NR	3.99	0.58	.440	.285	.283	.117	—			
6. VSP	3.18	0.89	.492	.299	.279	.143	.368	—		
7. ST	3.46	0.87	.296	.129	.189	.191	.210	.385	—	
8. EBA	3.69	0.75	.437	.289	.354	.177	.334	.451	.320	—
Portuguese sample (<i>N</i> = 730)										
1. SGS	4.00	0.70	—							
2. SR	3.08	1.12	.06	—						
3. SO	4.03	0.57	.66	-.02	—					
4. SC	3.93	1.03	.28	.12	.25	—				
5. NR	4.18	0.65	.38	.19	.39	.12	—			
6. VSP	3.40	0.88	.39	.24	.38	.21	.33	—		
7. ST	3.88	0.93	.30	.18	.30	.20	.26	.28	—	
8. EBA	3.24	0.81	.19	.36	.23	.19	.24	.28	.31	—

EBA = Evaluating Beliefs and Assumptions; NR = Natural Reward; SC = Self-Cueing; SGS = Self-Goal Setting; SO = Self-Observation; SR = Self-Reward; ST = Self-Talk; VSP = Visualizing Successful Performance.

(nonsignificant chi-square difference test), while the Behavior Focused and Natural Reward factors are noninvariant (significant chi-square difference tests). Finally, results for Portugal indicate that the Thought Processes factor is equivalent across the two samples (nonsignificant chi-square difference test), while the Behavior Focused and Natural Reward factors are not (significant chi-square difference tests).

Having identified the noninvariant factors for each culture, we proceeded to an examination of the invariance of the indicators for each of the noninvariant factors. As mentioned above, we used the factor-ratio test and the triangle heuristic to identify invariant sets of indicators to identify those

indicators that are invariant (Cheung & Rensvold, 1999). The factor-ratio test entails constraining the factor loading of a single item one at a time and examining the difference in chi-square between the constrained and unconstrained model (Cheung & Rensvold, 1999). Detailed results of the factor-ratio tests are not presented here but are available on request. These analyses identified the following noninvariant indicators in each of the three cultures: for China, the Natural Reward and Evaluating Beliefs and Assumptions indicators; for Germany, the Self-Goal Setting and Natural Reward indicators; and for Portugal, the Self-Reward and Natural Reward indicators. Subsequently, the final step in establishing partial

Table 3. Fit Indices for Alternative Models.

Model	χ^2	df	GFI	NNFI	IFI	CFI	χ^2 difference	df
U.S. English (<i>N</i> = 357)								
Second-order factor model	47.94	18	.97	.95	.97	.97		
One-factor model	78.86	20	.95	.91	.94	.94		
Model 1-2 difference							30.92	2
Three uncorrelated factors model	278.90	21	.83	.64	.73	.73		
Model 1-3 difference							230.96	3
Chinese (<i>N</i> = 285)								
Second-order factor model	58.41	18	.95	.89	.93	.93		
One-factor model	64.03	20	.95	.89	.92	.92		
Model 1-2 difference							5.62	2
Three uncorrelated factors model	195.63	21	.85	.59	.70	.69		
Model 1-3 difference							137.22	3
German (<i>N</i> = 447)								
Second-order factor model	84.89	18	.95	.94	.96	.96		
One-factor model	96.16	20	.95	.94	.96	.96		
Model 1-2 difference							11.27	2
Three uncorrelated factors model	451.95	21	.82	.68	.76	.76		
Model 1-3 difference							367.06	3
Portuguese (<i>N</i> = 730)								
Second-order factor model	192.38	18	.94	.84	.90	.90		
One-factor model	241.84	20	.91	.81	.87	.87		
Model 1-2 difference							49.46	2
Three uncorrelated factors model	563.91	21	.84	.57	.68	.68		
Model 1-3 difference							371.53	3

CFI = comparative fit index; GFI = goodness-of-fit index; IFI = incremental fit index; NNFI = nonnormed fit index.

Table 4. Standardized Parameter Estimates for the Second-Order Factor Model.

Parameter	U.S. English	Chinese	Portuguese	German
Self-Goal Setting → Behavior-Focused	1	1	1	1
Self-Reward → Behavior-Focused	0.52	0.69	0.21	0.98
Self-Observation → Behavior-Focused	0.66	0.66	0.80	0.91
Self-Cueing → Behavior-Focused	0.58	0.91	0.62	1.05
Natural Reward → Natural Reward	1	1	1	1
Visualizing Successful Performance → Constructive Thought Processes	1	1	1	1
Self-Talk → Constructive Thought Processes	0.77	1.33	0.87	0.91
Evaluating Beliefs and Assumptions → Constructive Thought Processes	0.77	0.91	0.67	0.74
Behavior-Focused → Self-Leadership	0.52	0.39	0.47	0.65
Natural Reward → Self-Leadership	0.53	0.25	0.38	0.26
Constructive Thought Processes → Self-Leadership	0.52	0.39	0.49	0.51

measurement invariance was to test a model (Model 3) in which the noninvariant items in each sample were allowed to vary freely. As shown in Tables 5 to 7, the partial metric invariance model (Model 3) resulted in a nonsignificant chi-square difference test in each of the three cultures, thereby demonstrating partial metric invariance. The establishment of partial metric invariance allows for the testing of scalar and other more restrictive forms of invariance. Although we do not report the results in our tables, we tested but failed to

demonstrate scalar invariance in any of the three cultures. Having failed to establish scalar invariance in any of our samples, we concluded our analyses.

Discussion

The results of our study provide evidence that the second-order factor model of self-leadership fits reasonably well across samples from the United States, China, Germany,

Table 5. Fit Indices for Invariance and Results of Chi-Square Difference Tests for China.

Model	χ^2	df	GFI	NNFI	IFI	CFI	Model	χ^2 difference tests		
								$\Delta\chi^2$	Δdf	Results
Model 1: Configural invariance (baseline model)	166.36	39	.93	.88	.92	.92				
Model 2: Full metric invariance	202.29	47	.91	.88	.90	.90	Test of full metric invariance: Model 1 vs. Model 2	35.93	8	Reject
Model 2.1: Loadings on NR constrained	194.13	40	.92	.86	.90	.90	Test of factorial invariance: Model 1 vs. Model 2.1	27.77	1	Reject
Model 2.2: Loadings on BF constrained	171.82	43	.92	.89	.92	.91	Test of factorial invariance: Model 1 vs. Model 2.2	5.46	4	Accept
Model 2.3: Loadings on TP constrained	177.94	42	.92	.88	.91	.91	Test of factorial invariance: Model 1 vs. Model 2.3	11.58	3	Reject
Model 3: Partial metric invariance (NR and EBA indicators allowed to vary freely)	172.03	44	.92	.89	.92	.92	Test of partial metric invariance: Model 1 vs. Model 3	5.67	5	Accept

BF = Behavior-Focused; CFI = comparative fit index; EBA = Evaluating Beliefs and Assumptions; GFI = goodness-of-fit index; IFI = incremental fit index; NNFI = nonnormed fit index; NR = Natural Reward; TP = Thought Processes.

Table 6. Fit Indices for Invariance and Results of Chi-Square Difference Tests for Germany.

Model	χ^2	df	GFI	NNFI	IFI	CFI	Model	χ^2 difference tests		
								$\Delta\chi^2$	Δdf	Results
Model 1: Configural invariance (baseline model)	171.60	39	.95	.93	.95	.95				
Model 2: Full metric invariance	234.41	47	.94	.92	.93	.93	Test of full metric invariance: Model 1 vs. Model 2	62.81	8	Reject
Model 2.1: Loadings on NR constrained	200.29	40	.95	.92	.94	.94	Test of factorial invariance: Model 1 vs. Model 2.1	28.69	1	Reject
Model 2.2: Loadings on BF constrained	195.40	43	.95	.93	.94	.94	Test of factorial invariance: Model 1 vs. Model 2.2	23.8	4	Reject
Model 2.3: Loadings on TP constrained	172.83	42	.95	.94	.95	.95	Test of factorial invariance: Model 1 vs. Model 2.3	1.23	3	Accept
Model 3: Partial metric invariance (SGS and NR indicators allowed to vary freely)	174.01	44	.95	.94	.95	.95	Test of partial metric invariance: Model 1 vs. Model 3	2.41	5	Accept

BF = Behavior-Focused; CFI = comparative fit index; GFI = goodness-of-fit index; IFI = incremental fit index; NNFI = nonnormed fit index; NR = Natural Reward; SGS = Self-Goal Setting; TP = Thought Processes.

and Portugal. In addition, our results provide evidence of self-leadership measurement invariance across these cultures, although the data support only a partial metric invariance model for each culture. This provides support for the validity of both the self-leadership construct and its corresponding measures included in this study. Nevertheless, these results also indicate some degree of self-leadership noninvariance in these cultures. More specifically, the German and Portuguese samples both demonstrated noninvariance for the Behavior Focused and Natural Reward latent constructs relative to the U.S. sample, while the Chinese sample showed noninvariance for the Natural

Reward and Thought Processes constructs relative to the U.S. data. At the indicator level, the Chinese sample demonstrated noninvariance for the Natural Reward and Evaluating Beliefs and Assumptions composites, while the German sample showed noninvariance for the Self-Goal Setting and Natural Reward indicators and the Portuguese sample reflected noninvariance for the Self-Reward and Natural Reward indicators.

These results imply that there may be some systematic differences in the way the members of these separate cultures respond to and interpret items on the RSLQ, and it seems likely that these differences may reflect cultural

Table 7. Fit Indices for Invariance and Results of Chi-Square Difference Tests for Portugal.

Model	χ^2	df	GFI	NNFI	IFI	CFI	Model	χ^2 difference tests		
								$\Delta\chi^2$	Δdf	Results
Model 1: Configural invariance (baseline model)	312.74	39	.95	.85	.90	.90				
Model 2: Full metric invariance	363.03	47	.94	.86	.88	.88	Test of full metric invariance: Model 1 vs. Model 2	50.29	8	Reject
Model 2.1: Loadings on NR constrained	349.73	40	.94	.83	.88	.88	Test of factorial invariance: Model 1 vs. Model 2.1	36.99	1	Reject
Model 2.2: Loadings on BF constrained	326.27	43	.94	.86	.89	.84	Test of factorial invariance: Model 1 vs. Model 2.2	13.53	4	Reject
Model 2.3: Loadings on TP constrained	313.56	42	.95	.86	.90	.90	Test of factorial invariance: Model 1 vs. Model 2.3	0.82	3	Accept
Model 3: Partial metric invariance (SR and NR indicators allowed to vary freely)	314.55	44	.95	.87	.90	.90	Test of partial metric invariance: Model 1 vs. Model 3	1.81	5	Accept

BF = Behavior-Focused; CFI = comparative fit index; GFI = goodness-of-fit index; IFI = incremental fit index; NNFI = nonnormed fit index; NR = Natural Reward; SR = Self-Reward; TP = Thought Processes.

differences relative to the U.S. sample. Drawing on the frameworks presented by Hofstede (2001) and Alves et al. (2006) to help interpret our findings, we can speculate as to some of the reasons for the invariant aspects of self-leadership. For example, as outlined earlier, China differs substantially from the United States on the dimensions of power distance, collectivism, and long-term orientation. Perhaps the future focus of typical Chinese people makes it more difficult for them to focus on finding and employing short-term natural rewards or on evaluating dysfunctional beliefs. Similarly, higher power distance may make it more difficult for those in this culture to find natural rewards or to evaluate their own beliefs when they are accustomed to being directed by authority figures. The highly collectivist nature of Chinese culture is another obvious difference that may manifest itself in an inability to critically examine one's individual beliefs and assumptions.

Similarly, the Portuguese culture is much higher in power distance, uncertainty avoidance, and collectivism than U.S. culture. It seems possible that a typical person in Portugal may therefore think (and interpret scale items) differently based on these differences. More specifically, more reliance on the collective, less risk taking, and more acceptance of authority may result in a different interpretation and application of both self-set and natural rewards. Finally, although German culture shares more similarities with U.S. than Portuguese and Chinese culture, the German sample examined in our analyses still demonstrated areas of noninvariance. For instance, despite being relatively high in individualism, German culture is nonetheless substantially less individualistic than U.S. culture, and in addition German culture is higher in uncertainty avoidance than U.S. culture. Perhaps these differences can help explain why Germans

tend to think differently about self-goal setting and natural rewards than do people in the United States.

These results have important implications for future self-leadership research. In general, these results are highly encouraging for the future of self-leadership research using translated versions of the RSLQ. Our findings demonstrate full configural measurement invariance and partial metric measurement invariance the U.S. data across the Chinese, German, and Portuguese samples, indicating that self-leadership researchers in these cultural contexts can have confidence that the translated versions of the RSLQ are measuring self-leadership in a manner that is largely consistent with results found in the culture in which the scale and the self-leadership construct were developed. Nevertheless, our analyses suggest that the measurement results for certain dimensions of self-leadership should be interpreted with some degree of caution in certain cultures.

Despite the overall strengths inherent in our research design (e.g., Cheung & Rensvold, 1999; Milfont & Fischer, 2010; Vandenberg & Lance, 2000), our study is not without some important limitations. First, we used composite indicators or item parcels in our analyses. As Meade and Kroustalis (2006) point out, the use of item parcels as indicator variables tends to result in the erroneous identification of measurement invariance more often than does the use of item-level indicators. However, as Little et al. (2002) have suggested, the use of parcels may be warranted if the research focus is on understanding the relationship among latent constructs rather than the relationship among items. From this perspective, "item indicators are merely tools that allow one to build a measurement model for a desired latent construct. Once built, the item indicators become less consequential" (Little et al., 2002, p. 169). In harmony with the

self-leadership measurement model originally advanced by Houghton and Neck (2002), most self-leadership researchers using the RSLQ (e.g., Chung et al., 2011) have employed composites or parcels at the subscale level (see Houghton & Neck, 2002, p. 677). Consequently, we contend that the use of item composites is particularly appropriate for our analyses because this is the way in which the scale is most often used in applied research. Furthermore, because the correlation tables used in the current analyses (i.e., Furtner et al., 2013; Ho & Nesbit, 2009; Houghton & Neck, 2002; Marques-Quinteiro et al., 2012) were all reported at the subscale level and not at the item level, an analysis of the measurement invariance of the RSLQ at the item level was infeasible using these data sets.

Second, it is possible that other systematic factors within these samples other than national culture are responsible for the noninvariant findings discovered here. For example, two of the samples (U.S. and China) comprised students, while one of the samples was composed of working professionals (Germany) and the remaining sample (Portugal) contained a mixture of professionals and students. Similarly, the composition of the various samples included in our analyses differed significantly in terms of gender composition and average age, providing another possible explanation for our findings. Although Houghton and Neck (2002) argue that because self-leadership involves behavioral and cognitive processes that are common to people across a variety of contexts and there is little evidence to suggest systematic differences in self-leadership based on age or gender (e.g., D'Intino et al., 2007), these results should still be interpreted carefully.

Third, the Natural Reward latent construct and Natural Reward composite indicator both proved to be noninvariant across all three cultures. Although it is possible that Natural Rewards are simply an aspect of self-leadership that does not transfer well across cultures, it is also possible that the noninvariance relates to the inherent measurement weaknesses associated with a single-item indicator. In addition, as Houghton et al. (2012) discuss, the Natural Rewards dimension has had a particularly troublesome history throughout the process of self-leadership scale development. Perhaps the fact that the items underlying this dimension have demonstrated factor instability and low reliabilities across U.S. samples helps to explain why this dimension was noninvariant across all of the samples examined in our study.

In conclusion, the findings of our study provide evidence in support of the cross-cultural validity of self-leadership in general and of the measurement invariance of the RSLQ specifically. As mentioned earlier, the establishment of measurement equivalence across culturally diverse groups is an important first step in cross-cultural research (e.g., Steenkamp et al., 1998; van de Vijver & Leung, 1997; Vandenberg & Lance, 2000). Our study therefore makes an important contribution in advancing

cross-cultural self-leadership research by providing evidence in support of the cross-cultural validity of the hierarchical factor structure of self-leadership and in support of partial metric measurement invariance for the RSLQ. Future researchers examining substantive self-leadership hypotheses within and across non-U.S. cultures may now proceed with a greater degree of confidence.

Appendix

The Revised Self-Leadership Questionnaire (Houghton & Neck, 2002)

INSTRUCTIONS: Read each one of the following items carefully and try to decide how true the statement is in describing you.

<i>Not at all accurate</i>	<i>Somewhat accurate</i>	<i>A little accurate</i>	<i>Mostly accurate</i>	<i>Completely accurate</i>
1	2	3	4	5

1. I use my imagination to picture myself performing well on important tasks.
2. I establish specific goals for my own performance.
3. Sometimes I find I'm talking to myself (out loud or in my head) to help me deal with difficult problems I face.
4. When I do an assignment especially well, I like to treat myself to some thing or activity I especially enjoy.
5. 'I think about my own beliefs and assumptions whenever I encounter a difficult situation.
6. I tend to get down on myself in my mind when I have performed poorly.
7. I make a point to keep track of how well I'm doing at work (school).
8. I focus my thinking on the pleasant rather than the unpleasant aspects of my job (school) activities.
9. I use written notes to remind myself of what I need to accomplish.
10. I visualize myself successfully performing a task before I do it.
11. I consciously have goals in mind for my work efforts.
12. Sometimes I talk to myself (out loud or in my head) to work through difficult situations.
13. When I do something well, I reward myself with a special event such as a good dinner, movie, shopping trip, etc.
14. I try to mentally evaluate the accuracy of my own beliefs about situations I am having problems with.
15. I tend to be tough on myself in my thinking when I have not done well on a task.

16. I usually am aware of how well I'm doing as I perform an activity.
17. I try to surround myself with objects and people that bring out my desirable behaviors.
18. I use concrete reminders (e.g., notes and lists) to help me focus on things I need to accomplish.
19. Sometimes I picture in my mind a successful performance before I actually do a task.
20. I work toward specific goals I have set for myself.
21. When I'm in difficult situations I will sometimes talk to myself (out loud or in my head) to help me get through it.
22. When I have successfully completed a task, I often reward myself with something I like.
23. I openly articulate and evaluate my own assumptions when I have a disagreement with someone else.
24. I feel guilt when I perform a task poorly.
25. I pay attention to how well I'm doing in my work.
26. When I have a choice, I try to do my work in ways that I enjoy rather than just trying to get it over with.
27. I purposefully visualize myself overcoming the challenges I face.
28. I think about the goals that I intend to achieve in the future.
29. I think about and evaluate the beliefs and assumptions that I hold.
30. I sometimes openly express displeasure with myself when I have not done well.
31. I keep track of my progress on projects I'm working on.
32. I seek out activities in my work that I enjoy doing.
33. I often mentally rehearse the way I plan to deal with a challenge before I actually face the challenge.
34. I write specific goals for my own performance.
35. I find my own favorite ways to get things done.

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