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A risky shift? An exploration of the measurement equivalence of entrepreneurial attitudes and entrepreneurial orientation across socioeconomic gradients

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ABSTRACT

While entrepreneurial orientation (EO) is often conceptualized on a firm level of analysis, scholarship has highlighted that firm-level strategy is influenced by the psychology of managers. Because an individual's psychological approach to risk-taking is influenced by socioeconomic factors, we explored whether responses to risk-taking items in scales of individual-level entrepreneurial attitudes and firm-level EO are influenced by socioeconomic status and the socioeconomic development of regions. Testing for measurement equivalence (ME), we found evidence consistent with the inference that items relating not only to risk-taking, but also to innovativeness and proactivity, are thought of differently according to socioeconomic influences on individual and regional levels of analysis. We discuss the implications of our results including the need for researchers to test for ME when exploring entrepreneurial attitudes and EO across socioeconomic gradients.

1. Introduction

Entrepreneurial orientation (EO) is a cornerstone of the field of entrepreneurship and an important predictor of firm performance (Rauch et al., 2009). While EO is predominately viewed as a firm-level construct (Covin and Wales, 2012), it is often measured through the psychological filter of individual managers (Frese, 2009); in addition, scholarship has highlighted how the attitudes and dispositions of individuals influence firm-level strategy (Frese and Gielnik, 2014; Hambrick and Mason, 1984). Based upon conservation of resources theory (Hobfoll, 1989), individual entrepreneurs' attitudes toward risk-taking appear particularly susceptible to influence from socioeconomic forces. Thus, entrepreneurs' attitudes about risk taking and measures of EO tied to those attitudes are likely to include both construct-relevant and construct-irrelevant signals – potentially leading to misinterpretation.

The present work explores whether individuals spread across socioeconomic gradients might differentially conceptualize items relating to risk-taking in comparison to their interpretations of items relating to innovativeness and proactivity. We pursue this line of investigation with two samples. First, we test for measurement equivalence (ME) in an individual-level assessment of entrepreneurial attitudes toward risk-taking, proactivity, and innovativeness in the United States among entrepreneurs of low and high socioeconomic status. Second, we test for ME in an assessment of firm-level EO, measured via manager self-report, among firms from Montenegro operating in regions of low and high socioeconomic development.

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This article makes at least three contributions. First, we provide evidence that the self-report of a firm's EO across socioeconomic gradients might be misleading – even within a single nation. Second, we take a preliminary step to answering the call by Covin and Miller (2014) to consider the extent to which intra-national socioeconomic factors might be conceptually related to EO. Third, we extend research on the psychology of entrepreneurship by demonstrating the theoretical relevance of tests of ME to an understanding of EO (Frese and Gielnik, 2014).

2. Entrepreneurial attitudes and their relationship to entrepreneurial orientation

As highlighted in a recent review by Wales (2016), a succinct and encompassing definition of EO was provided by Anderson et al. (2009) when they referred to the construct as "the extent to which firms are innovative, proactive, and risk-taking in their behavior and management philosophies" (p. 218). This definition reflects tension between the fact that EO is often conceived of as a firm-level construct (Covin and Wales, 2012) yet it is based on the attitudes and dispositions of individuals both from a measurement standpoint and a conceptual standpoint (Covin and Lumpkin, 2011). From a measurement standpoint, it is often the case that EO is shaped by individual psychology because it is assessed via the self-report of a single manager (Frese, 2009). From a conceptual standpoint, EO is shaped by the dispositions and attitudes of individuals because, according to upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984), the actions and decisions of top executives, and therefore the strategy of the firm, is shaped by those executives' personal experiences, values, and personalities. Empirical evidence for the relationship of individual-level psychological factors with EO was provided by Simsek et al. (2010) who found that a CEO's level of core self-evaluation (a broad personality trait) can influence firm-level EO. The importance of both individual-level attitudes and firm-level behaviors to EO was reflected by Anderson et al. (2015) when they proposed a model of EO formed jointly by a firms' objective entrepreneurial behaviors and managers' attitudes about risk-taking.

If entrepreneurial attitudes help to determine firm-level EO, or at least help to filter an understanding of a firm's EO, then it is important to inquire whether different groups of entrepreneurs have the same understanding of key concepts. There have been multiple studies that have sought to establish whether entrepreneurs in different cultures equivalently understand EO (Hansen et al., 2011; Kreiser et al., 2010; Runyan et al., 2012). Whether individuals have equivalent understandings of a concept is often established through tests of ME. More specifically, establishing ME is an important prerequisite to comparing scores across groups because without ME those comparisons are potentially suspect or misleading (Chen, 2008). ME is evaluated based upon whether items in a given scale exhibit configural, metric, and scalar invariance (Vandenberg and Lance, 2000). Typically, both configural and metric invariance – which indicate similarity in general factor structure and strength of factor loadings respectively – are required for relativistic comparisons (e.g., comparison of correlation coefficients). When mean-level comparisons are made, scalar invariance – signifying comparability in item intercepts/thresholds – is required.

3. Relationship of risk-taking to socioeconomic factors on individual and regional levels

EO is commonly measured with a unidimensional scale of items that pertain to at least three distinguishable constructs – proactivity, innovativeness, and risk-taking (Rauch et al., 2009). However, just as there is tension between conceptualizing EO as a firm-level or individual-level construct (Bolton and Lane, 2012), there is also tension between thinking of EO as a unidimensional or multidimensional construct (Covin and Wales, 2012). In a recent reconceptualization of the EO model, Anderson et al. (2015) reserved special consideration for attitudes toward risk-taking (as opposed to attitudes toward proactivity or innovativeness). Special consideration of risk-taking attitudes appears justified in light of Stambaugh et al.'s (2017) observation that risk-taking items appear particularly attitudinal or dispositional in nature (e.g., "managers of my firm... have a strong proclivity for high-risk..."; Covin and Slevin, 1989, p. 86).

When entrepreneurs think about risk-taking, they often conceptually relate it to a variety of other phenomena – prominently including financial threat (Miller, 2007). A conceptual connection between risk-taking and financial threat is supported by Hobfoll's (1989) conservation of resources theory which proposes that a possible loss of resources leads to stress and to behaviors to avoid future loss. In light of this theory, it is plausible that entrepreneurs experiencing personally unfavorable socioeconomic conditions are differentially disposed to avoid, or perceive as more threatening, a given level of risk-taking. Moreover, when individuals' own financial security is linked to the financial success of firms they manage, the boundary between a firm's financial threat and personal financial threat will often be blurred. Support for these propositions can be found in research which has linked economic scarcity with trends in decision-making (Haushofer and Fehr, 2014), and in upper echelons theory which specifies that executives act on their personal interpretations of strategic situations (Hambrick, 2007).

Socioeconomic forces on national, intra-national, and individual levels can affect psychological phenomena (see Oishi, 2014). In this study, we first investigate the possible influence of forces on the individual level of analysis in the form of socioeconomic status (SES). In line with extant scholarship we define SES as the position held by an individual with reference to prevailing standards of financial, human, and social capital (e.g., Becker, 1964; Chapin, 1928; Coleman, 1988; White, 1982). Based upon conservation of resources theory (Hobfoll, 1989), we suggest that entrepreneurs with lower SES might respond differently to risk-taking items than entrepreneurs with higher SES due to their personal reactions to financial threat. In particular, we suspect that risk-taking items might be differentially related to attitudes toward other entrepreneurial behaviors – namely, proactivity and innovativeness – depending on entrepreneurs' SES; in addition, we suspect that a given level of risk-taking might be interpreted as more or less risky depending on entrepreneurs' SES. We expect that these two differential response tendencies would be reflected by a lack of metric ME and scalar ME (respectively).

Research question 1: In a scale of entrepreneurial attitudes toward risk-taking, proactivity, and innovativeness, will risk-taking items lack metric and scalar ME between groups of entrepreneurs with different SES?

After exploring the influence of SES on individual-level entrepreneurial attitudes, we then explore the influence of socioeconomic factors on a regional level of analysis in the form of regional socioeconomic development (SED). In line with scholarship on economic development (Sen, 1999), and in parallel to our definition of SES, we define SED as the prevailing standards of financial, human, and social capital in a given region or economy. In a parallel fashion to our first research question, we explore whether managers of firms in regions of lower SED might differentially perceive items relating to risk-taking in an EO scale due to their perceptions of financial threat to the firm, and by extension, due to financial threat to their own person.

Research question 2: In a EO scale will items relating to risk-taking lack metric and scalar ME between regions of different levels of SED?

4. Method

We explore our hypotheses by using stepwise tests of configural, metric, and scalar ME on assessments of entrepreneurial attitudes in the United States across levels of SES and on an assessment of EO in the country of Montenegro across regions with varying levels of SED. To operationalize SES in the U.S., we divide entrepreneurs into two groups according to whether or not they hold a college degree (degree = high SES). Education is a primary marker of SES (Bradley and Corwyn, 2002) and the probability of attainment of a college degree is both shaped by broader socioeconomic factors (Sewell and Shah, 1967) and a determinant of socioeconomic opportunity (Carnevale et al., 2011). Our sample in the U.S. is drawn from the first wave of the National Panel Study of Entrepreneurial Dynamics (PSED). The PSED is a study of nascent entrepreneurs beginning in 1998 (Cassar, 2006, 2010) that randomly dialed over 60,000 individuals across the US and conducted phone interviews with individuals who indicated that they were involved in the start-up process. Altogether, 809 nascent entrepreneurs were included in the first wave. We utilize a measure of entrepreneurial attitudes based upon eight items from the PSED that tap an individual's attitudes toward risk-taking, innovativeness, and proactivity. Support for the use of these eight items is provided by Eggers et al. (2012) who drew conceptual parallels between each of these eight items and corresponding items used to assess EO. These items included a mix of dichotomous and Likert-based scales. Our sample in Montenegro is drawn from a survey of 409 business owners/managers across 13 regions of the country (USAID, 2012). We split these 13 regions into high (n=7; M = €471; SD = 44.17) and low SED categories (n=6; M = €393; SD = 10.55) based upon earnings per capita. Measures of income/earning per capita are commonly used to estimate SED and tend to reflect broad financial and social dynamics in society (Khan, 1991). Data were collected through direct interviews with owners/managers by trained interviewers in Montenegrin. We used nine Likert-based items adapted and translated into Montenegrin from the scale by Covin and Slevin (1989). See Table 1.

5. Results

To avoid Type I error in a series of ME tests, we preceded tests of item ME with omnibus scale-level tests of metric and scalar ME. To account for the ordinal and dichotomous nature of items in the U.S., we utilize means and variance adjusted weighted least squares estimation (WLSMV) in the MPlus software (v.7.4; Beauducel and Herzberg, 2006; Muthén, and Muthén, 2012). In the U.S., we separately fit models in low and high socioeconomic groupings and a one-factor model exhibited good fit (including one correlated residual in either group) in both low- (RMSEA=.05, CFI=.95) and high- (RMSEA=.03, CFI=.96) socioeconomic groupings – indicating configural ME (SRMR values are not available for WLSMV). However, three items exhibited low loadings in one group but acceptable loadings in the other group. To investigate, we proceeded with an omnibus test of metric ME. This test was statistically significant ($\Delta\chi^2$ =17.12; Δdf = 7, p=.02) indicating a lack of full metric ME. Subsequent tests of individual items revealed a lack of metric equivalence for a risk-taking item (Risk-taking 2) and a proactivity item (Proactivity 3). Assuming partial metric equivalence (Byrne et al., 1989), we proceeded with an omnibus test of scalar ME which was significant ($\Delta\chi^2$ =32.22, Δdf = 18, p=.02). We found a lack of scalar ME for two thresholds in items Risk-taking 1 and Proactivity 1.

In Montenegro, we fit models in regions of low and high socioeconomic development. One item (Innovativeness 3) exhibited a low loading in one group – but an acceptable loading in the other group. We proceeded with a test of metric equivalence noting that both the low (RMSEA=.05, CFI=.97, SRMR=.06) and high (RMSEA=.08, CFI=.96, SRMR=.06) models exhibited good and marginal fit after accepting multiple correlated residuals for each model. The omnibus test for a lack of metric ME was significant ($\Delta\chi^2$ =29.20; Δdf = 8, $p < .01$). Subsequent tests indicated a lack of metric ME for not only Innovativeness 3, but also for Proactivity 1 and Proactivity 3. Assuming partial metric equivalence, an omnibus test of a lack of scalar ME was significant ($\Delta\chi^2$ =21.02; Δdf = 8, p=.01). Subsequent tests revealed a lack of scalar equivalence for two of the three risk-taking items (Risk-taking 1 and Risk-taking 3; see Table 1).

In summary, we found evidence for a lack of metric and scalar ME among risk-taking items in the U.S. In contrast, we only found a lack of scalar ME among risk-taking items in Montenegro. However, we also observed a lack of ME attributed to proactivity and innovativeness items. Among all between-group differentials, the largest discrepancies were for the loading and threshold of risk-taking items in the U.S. (Risk-taking 2 & 1 respectively) and the loading of an innovativeness item in Montenegro (Innovativeness 3). We note that according to interpretations of configural ME which require both good fit and loadings at .30 or above, we could call into question basic factor comparability between groups in the U.S. and Montenegro.

Table 1
Measurement equivalence analyses for entrepreneurial attitude and EO scales.

		Low Group		High Group		Metric	Scalar 1	Scalar 2	Scalar 3	Scalar 4
Country/item reference	Item text	β	SE	β	SE	Δχ2	Δχ2	Δχ2	Δχ2	Δχ2
United States										
Proactivity 1	I have engaged in a deliberate, systematic search for an idea for a new business	.41	(.06)	.31	(.08)	0.11	0.02	3.89*	0.01	1.87
Proactivity 2	If no action is taken to implement this business idea, the opportunity may not be available	.25	(.07)	.36	(.09)	1.07	0.35	1.22	0.00	0.05
Proactivity 3	My personal philosophy is to "do whatever it takes" to establish my own business	.63	(.06)	.36	(.10)	4.95*	0.16	6.70	0.27	3.44
Proactivity 4	I spend a considerable amount of time making organizations I belong to function better	.39	(.06)	.14	(.08)	0.04	3.17	3.65	2.09	1.78
Innovativeness 1	Will spending money on research and development be a major priority for this new business?	.23	(.09)	.46	(.12)	2.00	1.78			
Innovativeness 2	To be innovative and in the forefront of new technology	.47	(.06)	.47	(.09)	0.75	1.60	2.82	1.96	0.01
Risk-taking 1	I enjoy the challenge of situations that many consider "risky"	.64	(.06)	.51	(.09)	0.92	0.61	3.47	11.61**	2.85
Risk-taking 2	A business that would provide a good living, but with little risk of failure vs. A business likely to make you a millionaire but with a high chance of going bankrupt	.44	(.10)	.62	(.11)	8.26**	2.82			
Montenegro										
Proactivity 1	My business typically initiates actions which competitors then respond to	.60	(.07)	.69	(.06)	4.89*	1.15			
Proactivity 2	My business is very often the first business to introduce new products/services, administrative techniques, operating technologies	.71	(.08)	.85	(.03)	1.33	0.80			
Proactivity 3	In general, my business has a strong tendency to be ahead of other competitors in introducing novel ideas or products	.85	(.05)	.83	(.04)	7.61**	1.16			
Innovativeness 1	In general, my business favors a strong emphasis on R & D, technological leadership, and innovation	.47	(.09)	.75	(.05)	0.93	2.35			
Innovativeness 2	In the past 5 years, my business has marketed very many new lines of products or services	.65	(.07)	.89	(.03)	0.87	3.41			
Innovativeness 3	In the past 5 years, changes in products or services at my business have usually been quite dramatic	.18	(.13)	.87	(.04)	21.65**	1.96			
Risk-taking 1	In general, my business has a strong proclivity for high-risk projects with very high return	.61	(.08)	.91	(.02)	2.61	5.82*			
Risk-taking 2	When confronted with decision-making situations involving uncertainty, my business typically adopts a bold, aggressive posture	.74	(.05)	.90	(.03)	1.30	1.87			
Risk-taking 3	In general, my business believes that owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives	.43	(.08)	.46	(.07)	1.59	4.89*			

Metric/scalar Δχ2 = tests of nested models, Δ*df* = 1. United States statistics: Low: *n*=328, χ2(19)=35.26*, RMSEA=.05, CFI=.95; High: *n*=225, χ2(19)=23.27*, RMSEA=.03, CFI=.96. United States item scales and notes: Proactivity 1–2=agreement scale; Innovativeness 2=importance scale; Proactivity 3–4 & Risk-taking 1=truth scale; Innovativeness 1=yes/no; Risk-taking 2=semantic alternative. Models each include one correlated residual. Montenegro statistics: Low: *n*=164, χ2(24)=34.07, RMSEA=.05, CFI=.97, SRMR=.06; High: *n*=172, χ2(13)=48.92**, RMSEA=.08, CFI=.96, SRMR=.06. Montenegro item scales and notes: All items were on a 5-point scale of agreement from "strongly disagree" to "strongly agree." Models included multiple correlated residual (CR) error terms (low=3CR; high=5CR).

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

6. Discussion

The present work was based on three contentions: (1) managers' attitudes regarding risk-taking are likely to help determine, or at least influence the measurement of, a firm's entrepreneurial strategy when that estimation relies on individual self-report (Anderson et al., 2015; Frese, 2009; Hambrick and Mason, 1984); (2) socioeconomic forces on multiple levels of analysis can shape the conceptualization of risk-taking in relation to other entrepreneurial constructs (Hobfoll, 1989); and (3) without appreciating sources of a lack of ME, signals regarding entrepreneurial attitudes or a firm's EO might be misinterpreted.

The first, and clearest, implication of our discovery of a lack of full metric and scalar, and arguably configural, ME in the U.S. and Montenegro is that researchers need to test for ME when conducting research among entrepreneurs and firms that operate across varying socioeconomic contexts. It is possible that problems of a lack of ME could have serious consequences (e.g., by indicating spurious correlations or mean-level differences); indeed, as evidenced in the Monte-Carlo simulation by Steinmetz (2013), while the comparability of scales might survive a lack of metric ME in a majority of items, even one non-invariant intercept in a 4–6 item scale might lead to an elevated chance of Type-I error. Testing for ME in EO scales is rare even when working across different countries (Runyan et al., 2012), and to our knowledge, this is the first study that has tested for ME in EO across socioeconomic contexts. Our results also highlight the potential peril of relying upon the self-report of a single manager to evaluate a firm's EO. Without evaluating objective firm behaviors and/or the self-report of *multiple* managers, it is impossible to separate construct-irrelevant from construct-relevant variance. We note in particular that studies exploring the difference between needs-based entrepreneurs in financially insecure contexts and opportunity-based entrepreneurs in financially secure contexts (see Block et al., 2015) will need to pay particular attention to issues of ME before comparisons of entrepreneurial attitudes or EO are made.

The second contribution of this study is that we took an important preliminary step in answering the call from Covin and Miller (2014) to consider the extent to which socioeconomic factors inside of a given country context might relate to EO. We introduced conservation of resources theory (Hobfoll, 1989) as a way to approach this topic. Our study's results highlight the possibility that differential conceptualizations of EO across socioeconomic gradients could be one reason why it is believed that EO is differentially adaptive across economic contexts (Wiklund and Shepherd, 2005). Future research could build on our results by crafting theoretical rationales regarding why innovativeness and proactivity items might be differentially interpreted. Perhaps, as reasoned by Covin and Miller (2014), it might be that innovation in a resource-rich context is more centrally related to entrepreneurship than in poor contexts.

The third contribution of this study is that it extends research on the psychology of entrepreneurial behavior by emphasizing the theoretical relevance of tests of ME. Indeed, our study demonstrates an important method by which to explore to what extent EO scales indicate firm-level or individual-level signals. According to Frese and Gielnik's (2009) action-characteristics model of entrepreneurship and Anderson et al. (2015) reconceptualization of EO, individual-level factors might not only be considered antecedents to, but integral components of, EO. Thus teasing apart attitudes from behaviors appears likely to help advance an understanding of entrepreneurial concepts and processes. An important future research direction is to explore the divergence, if any, between attitudinal and objective estimations of a firm's EO and to account for the role that a lack of ME might play in such a divergence. For example, while Stambaugh et al. (2017) observed a high level of comparability between attitudinal and objective measures of EO, future research could introduce steeper socioeconomic gradients among entrepreneurs/firms to see if this comparability holds.

Future research will also need to address some limitations of the present work. For example, our work did not use an unaltered version of the Covin and Slevin (1989) scale – nor did we consider alternative sub-dimensions of EO (Lumpkin and Dess, 1996). Furthermore, we were unable to control and test for alternative explanations of the lack of ME we observed. It is possible that responses were affected by institutions – that is, commonly-held beliefs about proper organizational structures and practices (Meyer and Rowan, 1977). Institutions are imbued with norms that might affect how people conceptualize concepts like risk-taking (see Tolbert et al., 2011). While institutions arise from socioeconomic factors (e.g., expectations regarding the availability of social safety nets in regions of higher SED), their social nature could provide more proximal influences on decision making beyond those explored here. We encourage future research to use a multivariate item response theory approach which can simultaneously consider multiple influences on item-level responses (Reckase, 2009).

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