



Regional variation in courage and entrepreneurship: The contrasting role of courage for the emergence and survival of start-ups in the United States

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Abstract

Objective: There is growing evidence that certain regional personality differences function as important drivers of regional economic development (e.g., via effects on entrepreneurship and innovation activity). The present investigation examines the impact that regional variation in the trait courage has on entrepreneurship.

Method: Using data from a new large-scale internet-based study, we provide the first psychological map of courage across the United States ($N = 390,341$ respondents from 283 U.S. metropolitan regions). We apply regression analyses to relate regional courage scores to archival data on the emergence and survival of start-ups across American regions.

Results: Our mapping approach reveals comparatively high levels of regional courage in the Eastern and Southern regions of the United States. Regional courage scores were positively related to entrepreneurial activity, but negatively related to start-up survival—even when controlling for a wide variety of standard economic predictors. Several robustness checks corroborated these results. Finally, regional differences in economic risk-taking accounted for significant proportions of variance in the relationship between regional courage and entrepreneurship.

Conclusion: Our results suggest that regional courage may contribute to a pattern of enterprising and also risky economic behavior, which can lead to high levels of entrepreneurial activity but also shorter start-up survival.

KEYWORDS

courage, entrepreneurship, geographical psychology, personality, regions

1 | INTRODUCTION

Entrepreneurship—the process of starting and growing an independent business—is widely deemed an important societal phenomenon due to its links to job creation and economic, technological, and social change (Baumol, 1996; Hisrich, Langan-Fox, & Grant, 2007). Accordingly, understanding the psychological correlates of entrepreneurship has become an important focus in contemporary research in personality

psychology, economics, and business (Hisrich et al., 2007). So far, most research concerned with the psychological aspects of entrepreneurship has focused on the individual level of analysis and examined questions aimed at identifying the social and psychological factors that distinguish (successful) entrepreneurs from non-entrepreneurs (e.g., McClelland, 1965; Newman, Obschonka, Schwarz, Cohen, & Nielsen, in press; Stewart & Roth, 2001; Zhao, Seibert, & Lumpkin, 2010).

Developing a thorough and complete understanding of entrepreneurship requires that we look beyond individuals and consider the environments where entrepreneurial activity occurs. Indeed, economists often stress that one of the best ways to understand entrepreneurship is to study it as a “regional event” because of the well-documented, but not yet fully understood, regional differences in entrepreneurship rates (Audretsch & Lehmann, 2005; Feldman, 2001; Fritsch & Wyrwich, 2014). From this perspective, entrepreneurship is understood as a collective outcome and product of regional populations and economic ecosystems: the local interaction between formal and informal institutions and the people living in these regions (Sternberg, 2009). Among the informal institutions, the regional *culture* is deemed to be a particularly important feature of entrepreneurial regions (Feldman, 2001; Obschonka, 2017). Although there is no consistent definition of entrepreneurial culture in the economic literature (Hayton & Cacciotti, 2013), most entrepreneurship scholars would probably agree that it captures a collective pattern of psychological characteristics and social norms that is prevalent in, or shared by, regional populations.

Theory and research in geographical psychology provides a useful foundation for empirically investigating the psychological characteristics that are prevalent within regional populations. From this perspective, the psychological characteristics that are common in a given geographical region not only reflect the aggregation of individual-level scores, but also the *ethos* of a region: that is, the values, beliefs, and norms that are shared by residents (McCrae, 2001, 2004; Rentfrow, Gosling, & Potter, 2008). In this way, the personality traits that characterize regions represent what economists call “informal institutions” in a region (Fritsch & Storey, 2014).

Recent work indicates that regional personality differences within countries generally exist and that these differences meaningfully relate to regional indicators in various political, economic, social, and health domains (Rentfrow et al., 2008; Rentfrow, Jokela, & Lamb, 2015). Regarding the correlates of regional personality scores, the majority of studies have focused on the economic domain, with a particular interest in the potential of regional psychological characteristics to inform our understanding of regional entrepreneurial cultures and regional development (Obschonka, 2017). Almost all of this research has looked at regional variation in the Big Five personality traits. The results of these studies indicate that regional personality characteristics, such as high Openness and Conscientiousness and low Neuroticism, have significant effects on entrepreneurship and innovation (e.g., Lee, 2017; Obschonka, Schmitt-Rodermund, Silbereisen, Gosling, & Potter, 2013; Obschonka, Lee, Rodríguez-Pose, Eichstaedt, & Ebert, in press; Stuetzer et al., 2018). Nevertheless, despite casting new light on the macro-psychological drivers of economic vitality, there is a bandwidth-fidelity tradeoff

(Cronbach & Gleser, 1957; John, Hampson, & Goldberg, 1991) between the Big Five personality traits and entrepreneurship. Specifically, the Big Five represent broadly defined traits that account for a large amount of behavioral information (John & Srivastava, 1999), whereas entrepreneurship represents a set of more specific behaviors. This imbalance between bandwidth and fidelity risks overlooking more narrowly defined personality traits that might be particularly relevant for understanding the specifics of entrepreneurship.

2 | COURAGE AS A PERSONALITY TRAIT

One narrowly defined trait that should be relevant for entrepreneurship is courage. Courage has long been recognized as a cardinal virtue and distinctive feature of laudable human behavior (Dahlsgaard, Peterson, & Seligman, 2005). Nevertheless, for a long time the psychological literature on courage has tended to be sparse and fragmented (Lopez, 2007), with the bulk of existing work being more theoretical than empirical in nature (Magnano, Paolillo, Platania, & Santisi, 2017; Rate, 2010). This shortcoming has often been attributed to the lack of a clear, commonly agreed-upon definition of courage (Norton & Weiss, 2009; Woodard & Pury, 2007). In the present research, we follow the widespread understanding of courage as persistence despite fear (Cox, Hallam, O'Connor, & Rachman, 1983; Rachman, 2004). According to this conceptualization, courage serves to override the avoidance response that is normally elicited by fear and promotes approach behavior instead (Chockalingam & Norton, 2018; Rachman, 2004). This mechanism thus acts to prioritize growth needs over safety needs (Goud, 2005) and is especially pronounced if the pursued goal is of high personal importance (Chockalingam & Norton, 2018), such as founding a business. Furthermore, in this view, courage can gradually evolve into fearlessness (Rachman, 2004; Woodard & Pury, 2007) as repeated exposure to the fear-inducing stimulus may lead to habituation and desensitization to the associated risks (Goud, 2005; Hannah, Sweeney, & Lester, 2007).

Irrespective of the debate about the definition of courage, the rise of positive psychology has reignited the academic interest in courage and recent years have witnessed a strong upsurge in research activity in the field (Rate, 2010). Some of the studies on courage have investigated it as a driver of negative behaviors, such as suicide (Pury, Starkey, Kulik, Skjerning, & Sullivan, 2015), eating disorders (Pury et al., 2014), and terrorism (Pury et al., 2015; Silke, 2004). The overwhelming majority of studies, however, paints a bright picture of courage, linking it to self-esteem (Hannah, Sweeney, & Lester, 2010), positivity (Dunlop & Walker, 2013), and confidence (Hannah et al., 2007; Rachman, 2004; Walker & Hennig, 2004). Despite this increasing interest and body of findings

at the individual level, we know virtually nothing about regional variation in courage and its macro-level correlates. In the following, we develop two sets of hypotheses about region-level effects of courage on entrepreneurship, as a particularly important economic outcome at the regional level (Audretsch & Lehmann, 2005; Sternberg, 2009). To the best of our knowledge, no empirically driven, quantitative study has directly examined the relationship between courage and entrepreneurship on the individual, let alone regional level.

3 | HYPOTHESES ON THE RELEVANCE OF REGIONAL COURAGE FOR ENTREPRENEURSHIP

In combination with empirical findings that have related courage to sensation-seeking (Muris, 2009) and willingness to take risks (Howard & Alipour, 2014; Walker & Hennig, 2004), courageous people intuitively appear to possess a wide range of characteristics that are conducive to entrepreneurial behavior. Indeed, social scientists have repeatedly speculated on the role of courage as a precondition for entrepreneurship (Bird, 1988; Lufthans & Youssef-Morgan, 2017), with some going as far as calling it the “*sine qua non* virtue for entrepreneurs” (Naughton & Cornwall, 2006, p. 73). In keeping with this understanding, both laypeople (Dodd, Jack, & Anderson, 2013) and entrepreneurs themselves (Down & Warren, 2008) ascribe courage to entrepreneurial activity. Likewise, according to the Oxford Dictionary, the link between courage and entrepreneurship is already evident in the very definition of “enterprise,” the corresponding noun that describes the activity that an entrepreneur engages in. *Enterprise* is defined as “A project or undertaking, especially a bold or complex one,” while the word *bold*, in turn, is defined as “showing a willingness to take risks; confident and courageous.”

Research at the individual level provides a number of clues about the psychological attributes of courage and their links to entrepreneurship. But how might *regional* levels of courage become linked to entrepreneurship? First and foremost, this research question implicitly assumes that both courage and entrepreneurship vary across regions (i.e., that courage, as well as entrepreneurship, shows variance at the regional level within one country). Whereas such regional variation in entrepreneurship is well documented in a large number of studies (e.g., Fritsch & Wyrwich, 2014; Obschonka et al., 2013; Saxenian, 1996; Sternberg, 2009), so far no study testing regional variation in courage exists. However, drawing from other studies proving meaningful regional differences in personality (e.g., Götz, Ebert, & Rentfrow, 2018; Rentfrow et al., 2013; Rentfrow et al., 2015) and theories describing the underlying mechanisms behind the emergence and persistence of regional personality differences (Oishi, 2014;

Rentfrow et al., 2008), our basic assumption in this study is that courage indeed shows regional variation (but our data do not allow to study the mechanisms driving these regional differences in courage).

What are our concrete assumptions *how* regional courage might shape regional entrepreneurship rates? Drawing on the conceptual model proposed by Rentfrow et al. (2008), the present study assumes that regional levels of courage affect entrepreneurship via a threefold process (see Figure 1). The first process (Link A) describes an *additive effect*, in which a regional outcome is the direct consequence of people in the region expressing their individual personality (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). The second process describes an *emergent norm effect*, in which the behavioral tendencies associated with traits that are common in the area become the social norm (Link B; Huggins & Thompson, 2017). Finally, the third process describes a *social influence effect*, in which the norms associated with these regional characteristics (Link B) shape the behaviors of all individuals in the region, irrespective of their natural disposition (Link C; Latané, 1981).

3.1 | Effect of regional courage on entrepreneurial activity

Using the conceptual model depicted in Figure 1, we hypothesized that there will be a positive relationship between regional courage and entrepreneurial activity (i.e., the regional start-up rate). This hypothesis follows a definition of entrepreneurship as a human behavior defined by an enterprising and agentic character that perceives and exploits opportunities, and challenges established firms (Baumol, 1996; Hisrich et al., 2007; Schumpeter, 1934). Specifically, if a region has a large share of residents who are high in courage, then there should be more people in the area with an enterprising character (Link A). Consequently, such regions should display

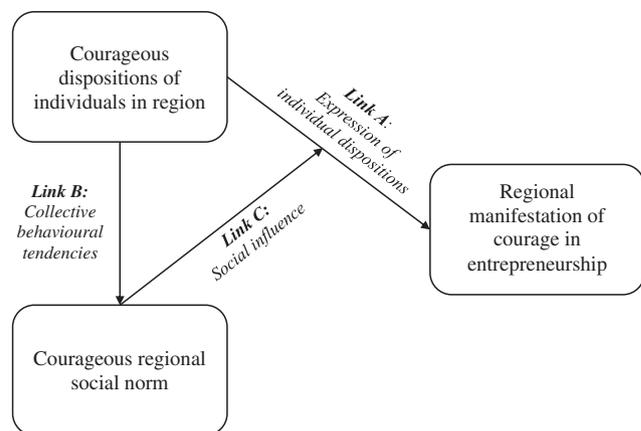


FIGURE 1 Conceptual links between regional courage and entrepreneurship

more entrepreneurship compared to regions with lower levels of courage. Additionally, in a region with many courageous individuals, there might emerge a social norm (Link B), which might further lower the inhibition level of courageous people to found new firms and, in turn, stimulate enterprising behaviors among people lower in courage (Link C). The hypothesis that follows this line of argument is:

H1: Regional levels of courage are positively related to entrepreneurial activity.

3.2 | Effect of regional courage on regional entrepreneurial survival

Entrepreneurship research often does not only study entrepreneurial activity, but also entrepreneurial survival of new start-ups (how long they are active in the market and “survive” the competitive landscape). In fact, many start-ups exit the market in the first years after foundation. For example, only 50% of all manufacturing start-ups survive the first 5 years, while only 20% are still in business after 10 years (Knaup, 2005; Mata & Portugal, 1994). In general, a company leaving the market can reflect very different business outcomes ranging from simple failure to being very successful and getting incorporated into an incumbent firm via a merger or acquisition (Weterings & Marsili, 2015). However, in the vast majority of cases, a start-up’s decision to exit the market indeed signifies a lack of short-term success (Coad, 2014). Consequently, economists stress that for a region’s economic vitality, the continuous emergence of many new firms is essential and so is ensuring the success and survival of these newly founded firms (Shane, 2018). While the existing economic and psychological theory allowed for a clear-cut hypothesis on the link between regional courage and entrepreneurial activity, the relationship between regional courage and entrepreneurial survival presents itself as more complex. Acknowledging this complexity (and to avoid post-hoc theorizing), we again build on the conceptual links as established in Figure 1, but now take an open approach by developing and testing two competing hypotheses.

The first of these two hypotheses rests on the notion that regional courage may not only promote the emergence of start-ups, but also their subsequent survival. The underlying premise here is that what positively drives entrepreneurial activity should also positively drive entrepreneurial success. In fact, entrepreneurship research shows that the personal factors positively predicting the probability to start a business often relate to subsequent business success in a similar way (Hisrich et al., 2007). In other words, an entrepreneurial mindset can be conducive to both entrepreneurial activity and success. On the firm level, in courageous regions start-ups have a higher probability of being founded

by courageous individuals (Link A), which could help these start-ups to thrive and survive longer in the market due to the entrepreneurial character of their founder (Brandstätter, 1997). Additionally, if a region has a stronger courageous climate (Link B), courageous founders might be affirmed to live out their enterprising character more strongly and even less courageous founders might be stimulated to act in a more enterprising manner (Link C). The hypothesis that follows this line of argument is:

H2a: Regional levels of courage are positively related to entrepreneurial survival.

At the same time, it is also conceivable that regional courage plays a contrasting role for activity and survival, namely a *positive* effect on activity but a *negative* effect on survival. Interestingly, research in economic geography indicates that regional factors fostering the emergence of new firms often *negatively* relate to their survival after foundation. For example, more densely populated urban areas typically foster the emergence of new firms. However, once the companies are founded, due to the adverse effects of congestion (such as high levels of rent, traffic, and competition), being located in a densely populated area often has a negative influence on survival prospects (Brixy & Grotz, 2007; Folta, Cooper, & Baik, 2006). As noted above, courage—as defined in the present study—can be described as a trait fostering enterprising behavior associated with discounting of risks (Hannah et al., 2007; Maddi, 2008). Such discounting of risks can be considered a cognitive bias in entrepreneurship impeding success (Keh, Der Foo, & Lim, 2002; Simon, Houghton, & Aquino, 2000). Accordingly, courageous, risk-prone founders might (a) enter the market overconfidently with less elaborated business models and less accurate risk assessments and (b) make more risky decisions when running their businesses (Link A). At the same time, in a regional climate that generally values courageous (and hence risky) behaviors (Link B), these effects might be even more potent. That is, courageous individuals might act riskier than they would do anyway and even less courageous individuals might experience affirmation to establish and run their businesses in an overconfident manner (Link C). If start-ups founded in courageous climates (and/or by courageous entrepreneurs) indeed tend to enter the market prematurely and act overconfidently, they will (on average) very likely face diminished survival chances. Specifically, there is evidence that well-endowed start-ups (Pe’er & Keil, 2013) resting on elaborate businesses plans (Brinckmann, Grichnik, & Kapsa, 2010)—two exemplary features that premature start-ups might lack—face greater survival prospects. Furthermore, research shows that engaging in risky projects with uncertain outcomes is a strategy that generally very rarely pays off for newly founded firms (Cefis & Marsili, 2011; Ebert, Brenner, & Brixy, 2018) and “should only be undertaken by companies who are financially secure” (Buddelmeyer, Jensen, & Webster,

2010, p. 281). The hypothesis that follows this line of argument is:

H2b: Regional levels of courage are negatively related to entrepreneurial survival.

4 | THE PRESENT INVESTIGATION

The present investigation examined the associations between regional variation in courage and entrepreneurship. In doing so, we introduced a new large-scale psychological data set and tested the relationships between courage and entrepreneurship across the U.S. Metropolitan Statistical Areas (MSAs). Specifically, we assumed a positive link between regional courage and start-up rates (H1), and then tested two competing hypotheses—one that assumes a positive relationship between regional courage and start-up survival (H2a) and one that assumes a negative link (H2b). Whereas *entrepreneurial activity* measured the entry rate of new businesses, *start-up survival* referred to the share of start-ups surviving a certain period after their foundation. Given that both outcomes are central and frequently researched outcomes in entrepreneurship research (e.g., Armington & Acs, 2002; Van Praag, 2003), we sought to better understand the role of regional courage for both outcomes. This allowed us to make novel contributions to three research domains: (a) personality research concerned with regional economic outcomes, (b) entrepreneurship research concerned with features of entrepreneurial culture/informal institutions, and (c) research in geographical psychology concerned with regional variations in psychological traits.

5 | DATA

5.1 | Participants and procedure

The collection of the personality data was carried out in collaboration with TIME Magazine, which approached the lab of the fifth author to create a survey to commemorate the 20th anniversary of the publication of the Harry Potter book series. The collaboration was intended to create an interactive survey that would “match” participants to one of the four fictional Hogwarts Houses from the Harry Potter saga¹ using well-established psychometrically sound personality measures.² The survey was advertised and publicized through websites and social media channels (e.g., Facebook, Twitter) by TIME Magazine and its media partners (e.g., People, Entertainment Weekly). Participants provided consent by opting in to complete the survey. Once the survey was completed, participants received customized feedback, informing them which of

the Hogwarts House best matched their personality, as well as the degree to which their personality profile overlapped with the remaining three houses. Between June 2017 and January 2018, 849,799 individuals worldwide completed the survey.

As the central aim of this study was to examine regional differences in courage across the United States, we excluded all participants who reported living outside the United States. We also excluded all participants who had missing values at the construct level or who were outside the age range of the active working population (i.e., 18–65 years). Next, we excluded all respondents who did not report a valid U.S. ZIP code or who resided outside one of the 380 MSAs. In keeping with prior research (Gebauer et al., 2017), we only included MSAs with at least 100 respondents to ensure sufficiently reliable personality estimates. Our final sample comprised 390,341 participants across 283 MSAs. Of those participants, 72.67% were female. Regarding race, 76.42% were Caucasian, 7.64% were Asian, 6.39% were Hispanic, and 3.14% were Black or African American. The mean age of the respondents was 31.39 years ($SD = 10.04$).

MSA sample sizes ranged from 100 in the MSAs of Battle Creek, Mississippi and St. George, Utah to 33,932 in the New York-Newark-Jersey City MSA (mean MSA sample size = 1,369, median MSA sample size = 411). Accordingly, setting a minimum threshold of 100 participants per region led to an exclusion of 97 MSAs out of the total number of 380 MSAs. The correlation between the number of participants in an MSA and the actual population of that MSA (5-year estimate, US Census Bureau, 2017) was $r = 0.95$, indicating that the regions were numerically well represented in our data. While the sample is a fair representation of the size of the regional population, the data set mirrors other large-scale online convenience samples in the sense that its demographic composition is skewed, especially in terms of age and gender (Gosling, Vazire, Srivastava, & John, 2004). To address the skewed composition of our sample, we followed previous research (Obschonka et al., 2016, 2015) and applied sampling weights when aggregating individual personality scores. Specifically, we created six categories consisting of three age groups (18–24, 25–34 and older than 34) per two gender categories (male or female). We then obtained sampling weights for each MSA by dividing the share per age-gender category in our data by the share of residents per age-gender category in the actual population (US Census Bureau, 2017). As is customary in geographical psychology (Götz et al., 2018; Hofstede & McCrae, 2004; Rentfrow et al., 2013, 2008, 2015), regional personality was derived by calculating the weighted average across the scores of all participants residing within the respective MSAs. Online Supplement 2 provides the weighted courage score for each region.

5.2 | Measures

5.2.1 | Courage

The abbreviated six-item courage measure (“Courage”; $M = 5.16$, $SD = 0.1$, $Min = 4.91$, $Max = 5.45$; Howard & Alipour, 2014³) was administered to assess courage. A 7-point Likert scale ranging from 1 = *Disagree strongly* to 7 = *Agree strongly* was employed. Sample items include “If there is an important reason to face something that scares me, I will face it” and “Even if something scares me, I will not back down.”

We evaluated the suitability of the courage measure for a geographical analysis by conducting analyses to evaluate the measure’s reliability and measurement invariance. Inter-item analyses yielded a Cronbach’s alpha of 0.82, indicating good reliability. Group-mean reliabilities (also called intraclass correlation 2, ICC2) yielded an ICC2 coefficient of 0.75, indicating acceptable reliability of the aggregated courage scores. We checked for metric invariance and scalar invariance (Vandenberg & Lance, 2000) across all 283 MSAs by applying multi-group factor analyses comparing the factor structure of courage in a given region to the factor structure in the remaining regions. Following Cheung and Rensvold (2002), we treated deviations in comparative fit indices exceeding 0.01 as a violation of invariance. With 283 regions and 2 invariance conditions, this led to 566 tests of invariance. Importantly, no test exceeded the 0.01 threshold, suggesting no deviations from the overall factor structure in any region (see results in Online Supplement 2).

5.2.2 | Entrepreneurial activity

Following the widely used Kaufmann-Index (Fairlie, Reedy, Morelix, & Russell-Fritch, 2016; Obschonka et al., 2013), we operationalized regional entrepreneurial activity (“E-Activity”; $M = 65.54$, $SD = 15.15$, $Min = 35.13$, $Max = 120.68$) through the start-up density in an MSA based on data from the Business Dynamic Statistics (US Census Bureau, 2018). Specifically, we calculated the number of newly founded establishments in the year 2014 (i.e., the latest available cohort in the Business Dynamics Statistics) per 1,000 establishments in that MSA.

5.2.3 | Entrepreneurial survival

To capture the most critical post-foundation period of a new firm (Van Praag, 2003) and in line with operationalizations in previous entrepreneurship research (Brixy & Grotz, 2007; Cader & Leatherman, 2011), we measured entrepreneurial survival (“E-Survival”; $M = 50.32$, $SD = 4.27$, $Min = 24.59$, $Max = 63.73$) as the share of a start-up cohort that is still in

operation 5 years after their foundation. Again, we used the latest available start-up cohort from the Business Dynamics Statistics for which such information was available (US Census Bureau, 2018). Specifically, we calculated the share of establishments from the 2009 cohort that were still active in 2014.

5.2.4 | Control variables

To better understand the link between regional personality and entrepreneurship, we wanted to carve out the unique effect of regional courage on entrepreneurship and thus adopted a very conservative approach testing courage against a wide variety of economic control variables. First, to account for the effects of regional differences in human capital and knowledge assets on entrepreneurship (Acs, Armington, & Zhang, 2007; Pe’er & Keil, 2013), we obtained indexed estimates of STEM degree graduates (“STEM”; $M = 100.44$, $SD = 26.03$, $Min = 48.50$, $Max = 195.10$) and university research and development spending (“University”; $M = 108.29$, $SD = 43.88$, $Min = 0.00$, $Max = 200.00$) from the latest version of the Innovation Index 2.0 (Slaper, Van der Does, Egan, Ortuzar, & Strange, 2016). Second, to account for the effects of the regional economic structure (Brixy & Grotz, 2007; Ebert et al., 2018), we calculated the share of the labor force (US Census Bureau, 2017) employed in manufacturing industries (“Manufacturing”; $M = 0.08$, $SD = 0.04$, $Min = 0.01$, $Max = 0.28$) and used a patent-based measure of technological specialization (standard location quotient; e.g., Ebert et al., 2018) to capture the degree of a region’s technological specialization (“Technol. Specialization”; $M = 8.16$, $SD = 7.73$, $Min = 1.25$, $Max = 78.26$).⁴ Third, to account for the effects of regional prosperity (Audretsch & Mahmood, 1995), we gathered indexed unemployment rates (“Unemployment”; $M = 110.99$, $SD = 31.89$, $Min = 50.10$, $Max = 188.40$) and GDP per worker (“GDP per Worker”; $M = 117.37$, $SD = 28.75$, $Min = 65.50$, $Max = 199.90$) from the latest version of the Innovation Index 2.0 data (Slaper et al., 2016). Fourth, to account for the composition of start-up cohorts in terms of company size (Singh & Lumsden, 1990), we controlled for the share of micro-start-ups that entered the market with four or less employees (“Micro Start-ups”; $M = 85.5$, $SD = 3.13$, $Min = 75.22$, $Max = 92.11$). Finally, we control for population density (“Population Density”; $M = 118.78$, $SD = 129.59$, $Min = 2.69$, $Max = 1,022.79$) as a catch-all variable (Obschonka et al., 2015) reflecting many kinds of regional characteristics—such as the availability of infrastructure, the size of the regional labor market, or land prices—that have previously been linked to entrepreneurship (Cader & Leatherman, 2011).

6 | SPATIAL DISTRIBUTION OF COURAGE WITHIN THE UNITED STATES

As this is the first study to investigate regional differences in courage, we first explored whether there is systematic geographical variation in regional levels of courage across U.S. MSAs.

6.1 | Methodological mapping approach

To visualize distributional patterns across the 283 MSAs, we applied a hot spot analysis (Kondo, 2016). Hot spot analyses reveal larger areas in which high (hot spots) or low values (cold spots) of a given study object (courage in our case) spatially cluster. To assess the degree of spatial clustering, we first needed to quantify the connections between the spatial entities (MSAs in our case) by means of a spatial-weight matrix. The most common approach to quantify the relationship between two spatial entities is a binary matrix in which each cell indicates whether two regions share a border or not. However, MSAs do not cover the full surface of the United States and our sample does not comprise all MSAs. Consequently, 38 out of the 283 included MSAs did not border onto another MSA. Hence, in lieu of an actual neighbor, we used the nearest MSA for which data were available in these cases (Obschonka et al., in press). Based on this spatial-weight matrix, we then calculated the Getis-Ord G^* -statistic as a measure of local clustering (Getis & Ord, 1992; Ord & Getis, 1995). The Getis-Ord G^* -statistic compares the value of an MSA and its neighbors against the overall value across all regions. The more the local value deviates from the overall sum, the more clustering of high (or low) values happens in this area. The Getis-Ord G^* -statistic can be mathematically defined as:

$$G_i^* = \frac{\sum_{j=1}^n w_{ij}x_j - \bar{X} \sum_{j=1}^n w_{ij}}{S \sqrt{\frac{n \sum_{j=1}^n w_{ij}^2 - (\sum_{j=1}^n w_{ij})^2}{n-1}}}, \quad (1)$$

where $w_{i,j}$ is the weight between the regions i and j , x_j is the actual value in the region, and S is the sum of all weights. The output of this equation is a z -score directly indicating the significance of the deviation.

6.2 | Mapping regional differences in courage

Mapping the z -scores of the Getis-Ord G^* -statistic revealed areas in which positive or negative clustering occurs. Figure 2 shows that the regional distribution of courage across the United States broadly conformed to an East-West and North-South division. We found highly significant clustering of comparatively low

values (i.e., cold spots) of courage in an extensive area spanning eastwards from the Midwest (i.e., Dakotas, Minnesota, Iowa, Nebraska, and Missouri), across the so-called Rust Belt (i.e., Illinois, Indiana, Pennsylvania, New York, and New Jersey) up to Boston, and down to the Carolinas. In comparison, we found significant clustering of comparatively high values (i.e., hot spots) of courage in an extensive area reaching from California, Arizona, Utah, Colorado, and New Mexico to Texas and Oklahoma. Furthermore, the state of Florida also consistently showed increased levels of courage. Taken together, our mapping approach demonstrated that there was indeed pronounced and systematic variation in the national distribution of courage.

7 | REGIONAL COURAGE AND ENTREPRENEURSHIP

After showing that systematic regional differences in courage exist within the United States, we examined how courage related to our two outcome indices of regional entrepreneurship (i.e., entrepreneurial activity and entrepreneurial survival) in a multivariate setting. Specifically, we determined the extent to which courage could explain additional variance in regional entrepreneurship beyond a conservative list of economic control variables. Thereby, we followed a two-pronged analysis strategy: the first set of models examined the respective link of MSA-level courage with entrepreneurial activity, operationalized as start-up density of the 2014 U.S. business cohort (US Census Bureau, 2018). Meanwhile, the second set of models considered the link between courage and entrepreneurial survival, operationalized as the share of companies of the 2009 U.S. business cohort that survived until 2014 (i.e., 5-year survival rate). In both cases, initially a so-called null model was run, entering courage as the only predictor (Tables 1 and 2, Models 1a and 2a). In the next step, only the control variables were included (Tables 1 and 2, Models 1b and 2b), and in the final step courage was considered simultaneously with the control variables (Tables 1 and 2, Models 1c and 2c). Table 3 reports the bivariate correlations between all included variables showing that all indicators exhibit considerable unique variance. Furthermore, tests for multicollinearity among independent variables did not detect any problems ($VIF < 3$ for all variables across all model conditions). To ease interpretation, all beta coefficients are standardized.

Model 1a demonstrates that courage was positively and significantly related to start-up density ($b = 0.20, p = 0.002$). Model 1b accounted for an array of important economic factors, that is, regional human capital, university spending, prosperity, unemployment, industrial structure, and urbanity. Several significant predictors emerged from the analyses. First, echoing previous research (Armington & Acs, 2002),

Hotspot Analysis - Courage

Spatial Level: Metropolitan Statistical Areas

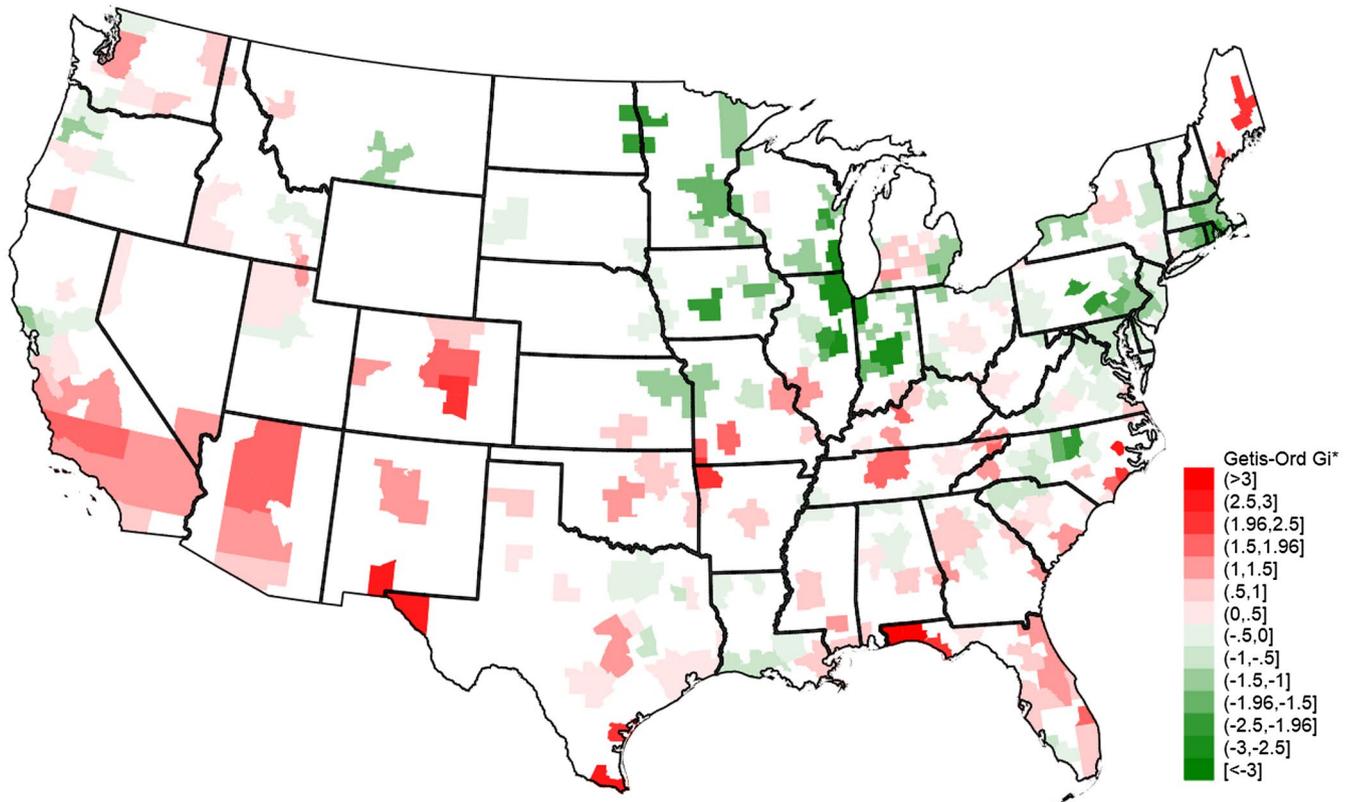


FIGURE 2 The regional variation of courage across the United States (hotspot analysis, $N = 390,341$ respondents from 283 MSAs) [Colour figure can be viewed at wileyonlinelibrary.com]

DV: start-up rate per 1,000 establishments	1a Courage	1b Controls	1c Courage + Controls
Courage	0.197 ** (0.062)		0.134 * (0.056)
STEM		-0.056 (0.063)	-0.053 (0.062)
University		-0.121 * (0.061)	-0.098 (0.062)
Manufacturing		-0.361 *** (0.050)	-0.333 *** (0.051)
Technol. specialization		-0.195 ** (0.072)	-0.200 ** (0.071)
Unemployment		0.089 (0.052)	0.121 * (0.053)
GDP per worker		-0.001 (0.059)	0.015 (0.059)
Micro start-ups		0.341 *** (0.050)	0.344 *** (0.050)
Population density		0.229 *** (0.063)	0.222 *** (0.062)
Constant	0.012 (0.059)	-0.003 (0.048)	0.004 (0.048)
Obs.	283	283	283
R^2	0.035	0.370	0.383

TABLE 1 Regression results for entrepreneurial activity

Note. Standard errors are in parenthesis. All variables were z-standardized. Bold values are statistically significant at the 5% level.

*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

higher regional levels of technological specialization ($b = -0.20$, $p = 0.007$) and a strong manufacturing sector ($b = -0.36$, $p < 0.001$) were negatively related to start-up density.

Second, also in line with the said previous research, urbanity ($b = 0.23$, $p < 0.001$) and the presence of many small-scale businesses ($b = 0.34$, $p < 0.001$) positively related to start-up

TABLE 2 Regression results for entrepreneurial survival

DV: 5-year survival rate	2a Courage	2b Controls	2c Courage + Controls
Courage	-0.322^{***} (0.059)		-0.133[*] (0.060)
STEM		0.036 (0.065)	0.035 (0.065)
University		0.110 (0.065)	0.091 (0.065)
Manufacturing		-0.019 (0.056)	-0.039 (0.057)
Technol. specialization		-0.073 (0.076)	-0.061 (0.075)
Unemployment		0.196^{***} (0.054)	0.164^{**} (0.055)
GDP per worker		0.096 (0.062)	0.082 (0.062)
Micro Start-ups		-0.090 (0.054)	-0.081 (0.053)
Population density		-0.082 (0.067)	-0.082 (0.067)
Start-up density		-0.414^{***} (0.060)	-0.395^{***} (0.060)
Constant	-0.008 (0.056)	0.003 (0.050)	-0.003 (0.050)
Obs.	283	283	283
R-squared	0.096	0.292	0.305

Note. Standard errors are in parenthesis. All variables were z-standardized. Bold values are statistically significant at the 5% level.

*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

density. Finally, a marginally significant (and non-robust) effect emerged for university spendings ($b = -0.12$, $p = 0.049$). When entering courage and the controls simultaneously (i.e., Model 1c), the findings remained largely unchanged. As such, no major changes occurred in the control variables, apart from regional levels of unemployment now approaching significance and university spending no longer meeting the 5% significance threshold. Most importantly, although reduced in size, the positive link between courage and start-up density ($b = 0.13$, $p = 0.017$) was retained.

Overall, Model 1c accounted for 38.3% of the observed variance in start-up density, suggesting considerable explanatory power. The achieved results lend support to our first hypothesis that regions with comparatively high levels of courage show elevated levels of entrepreneurial activity. Although courage only added a small incremental portion of explained variance (i.e., an additional 1.3%), the effect appears very robust and persists against a large and conservative set of control variables and robustness checks. We therefore conclude that courage indeed explains a unique share of variance in regional start-up rates that conventional economic models have previously not picked up.

The second set of models shed light on the relationships between courage and the share of start-ups surviving the first 5 years after foundation. We had set up two competing hypotheses: a positive effect of courage on survival (H2a) versus a negative effect of courage on survival (H2b). Model 2a (see Table 1, Model 2a) revealed that when entering courage as the only predictor, a strong negative relationship between courage and start-up survival emerged ($b = -0.322$, $p < 0.001$). In conceptual equivalence to Model 1b, the

aforementioned list of control variables was entered in Model 2b. Importantly, research stemming from Organizational Ecology highlights that fierce competition among companies at their time of foundation might lead to a liability of scarcity that imprints itself into organizational processes (Singh & Lumsden, 1990). Therefore, we additionally controlled for the start-up density in 2009 (i.e., at the beginning of the 5-year survival period). This time, only two control variables were significantly related to the outcome variable. First, as postulated by Organizational Ecology, a high density of start-ups ($b = -0.41$, $p < 0.001$) negatively predicts survival rate, which is a typical finding in such research (Mata, Portugal, & Guimarães, 1995; Singh & Lumsden, 1990). Second, regional levels of unemployment positively predicted start-up survival ($b = 0.20$, $p < 0.001$) which might indicate that start-ups found out of necessity reasons tend to be less risky and induce higher pressure on their owners to stay in business (Chivers, 2017). Entering courage and the controls simultaneously (Model 2c) did not produce any changes in the control variables. Most importantly, despite being somewhat diminished in size, the negative effect of courage on start-up survival ($b = -0.13$, $p = 0.026$) was reproduced and thus holds beyond the included controls.

Overall, Model 2c accounted for 30.5% of the observed variance in start-up survival, offering substantial explanatory power. Accordingly, going back to the competing second set of hypotheses, these results aligned well with hypothesis H2b, as opposed to H2a. That is, regions showing higher population-level courage had start-ups that, on average, survived *less* long. Including courage elicited an incremental gain in the explained variance of 1.6%. Again, the effect for courage

TABLE 3 Correlation matrix of the included variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. Courage	1.00															
2. E-Activity 2014	0.17*	1.00														
3. E-Survival 2009–2014	-0.31*	-0.38*	1.00													
4. STEM	-0.22*	0.02	0.17*	1.00												
5. University	-0.24*	-0.01	0.16*	0.48*	1.00											
6. Manufacturing	-0.28*	-0.41*	0.20*	0.11	0.14*	1.00										
7. Technol. specialization	0.09	-0.27*	0.02	-0.28*	-0.27*	0.10	1.00									
8. Unemployment	-0.26*	-0.01	0.22*	0.23*	-0.05	0.09	-0.05	1.00								
9. GDP per worker	-0.20*	0.03	0.11	0.44*	0.40*	0.09	-0.18*	-0.08	1.00							
10. Micro start-ups 2014	0.01	0.41*	-0.16*	0.06	0.11	-0.10	-0.19*	-0.12*	0.03	1.00						
11. Population density	-0.10	0.21*	-0.05	0.39*	0.53*	0.04	-0.30*	-0.13*	0.47*	0.17*	1.00					
12. Median age	0.04	-0.13*	-0.05	-0.14*	0.08	0.08	0.01	-0.28*	0.03	0.21*	0.17*	1.00				
13. Sex ratio	0.02	-0.09	-0.03	-0.04	0.19*	0.04	-0.01	-0.22*	-0.08	0.03	0.24*	0.41*	1.00			
14. Median income	-0.22*	0.29*	0.07	0.37*	0.45*	-0.00	-0.31*	0.20*	0.52*	0.26*	0.48*	0.07	-0.13*	1.00		
15. Entrep. personality	0.11	0.57*	-0.20*	0.19*	0.01	-0.30*	-0.19*	0.14*	0.04	0.25*	0.15*	-0.23*	-0.15*	0.28*	1.00	
16. Neuroticism	-0.03	-0.48*	0.14*	-0.09	0.13*	0.20*	0.11	-0.12*	0.05	-0.12*	0.04	0.41*	0.12*	-0.11	-0.75*	1.00

Note. $N = 283$.

*Shows significance at the 0.05 level.

held against a large and conservative set of control variables and robustness checks. We conclude that regional courage accounts for a unique share of variance in start-up survival that conventional economic models would not have accounted for.

8 | ROBUSTNESS AND LIMITATIONS

A first set of limitations of this study concerns the empirical specifications of our variables. Creating sampling weights to account for the skewed composition of our sample involves somewhat arbitrary decisions on how to demarcate demographic subgroups. Therefore, we reran our models for entrepreneurial activity and survival using unweighted raw means of courage as the independent variable (see supplement models A1.a and A2.a). Additionally, it can be questioned whether a sample of 100 participants is sufficient to represent a whole region and we therefore reran our models with the more conservative inclusion threshold of least 500 observations ($N = 120$) (see supplement models A1.b and A2.b). Furthermore, to ensure that our findings are not distorted by the peculiarities and unique characteristics of a specific cohort, we reran our models (see supplement models A1.c and A2.c) conceptualizing our DVs as the average start-up density and survival rates of the last five available cohorts (start-up density: founding cohorts 2009–2014/start-up survival: share of founding cohorts 2005–2009 that was still active 5 years later). Across all these models, the effect of courage was retained for entrepreneurial activity and survival.

As a second limitation, one could argue that the effects may not be due to regional courage as such, but due to regional differences in sociodemographic characteristics or other personality traits. With regard to sociodemographics, the most widely used indicators in geographical psychology are median age, sex ratio, and median income (e.g., Rentfrow et al., 2008; Rentfrow et al., 2015). We therefore tested our models while controlling for these sociodemographic characteristics (see supplement models A1.d and A2.d) from the American Community Survey (5-year estimate, US Census Bureau, 2017). With regard to other traits, prior research found an entrepreneurial Big Five profile (i.e., higher levels of Extraversion, Conscientiousness, and Openness; lower levels of Agreeableness and Neuroticism) to be a particularly robust and consistent predictor of entrepreneurship (Garretsen, Stokera, Soudisa, Martin, & Rentfrow, 2018; Obschonka et al., 2013; Obschonka et al., 2015). Furthermore, courage, as defined here, shows some conceptual overlap with low Neuroticism—that is, lack of anxiety, coping well with fear in novel situations (Judge, Locke, Durham, & Kluger, 1998; Magnano et al., 2017). Hence, we tested our models while controlling for regional Neuroticism and the entrepreneurial Big Five profile (see supplement models A1.e and A2.e)

from the OOS data set (Gosling et al., 2004). Again, the effect of courage was retained for both outcomes in all models.⁵

A third potential issue concerns spatial dependencies among error terms in our models violating the assumption of residual independency and eventually leading to an increased chance of Type I errors (Arbia, 2014). We therefore used the previously defined spatial-weighting matrix and applied a Moran's I test (Moran, 1950) on the residuals of Models 1c and 2c. That is, we checked whether neighboring spatial entities exhibit more similar or dissimilar residuals than distal entities. The results of these tests did not suggest the presence of any spatial clustering among our error terms (E-Activity: $b = -0.00$, $p = 0.321$; E-Survival: $b = -0.02$, $p = 0.388$).

Finally, two important limitations relate to the cross-sectional nature of our data. First, there is a time lag between the measurement of the personality constructs (2017–2018) and the measurement of our dependent variables (activity: founding cohort 2014/survival: share of founding cohort 2009 still active in 2014). Second, our data do not allow us to directly assess causality. Thus, it is possible that the relationships between our dependent and independent variables could be due to reverse causality. Such reverse causality could exist if the entrepreneurial vitality in a region alters the personality within the local population or causes certain people to immigrate to or emigrate from the region. However, regional personality differences were shown to be stable over time (Elleman, Condon, Russin, & Revelle, 2018) and still possess predictive power when excluding all migration movements from the personality data (Stuetzer et al., 2018). Taken together, while previous research suggests that the aforementioned shortcomings in our analyses are likely to be relatively minor, the cross-sectional nature of our data prevents us from addressing them directly.

9 | DISCUSSION

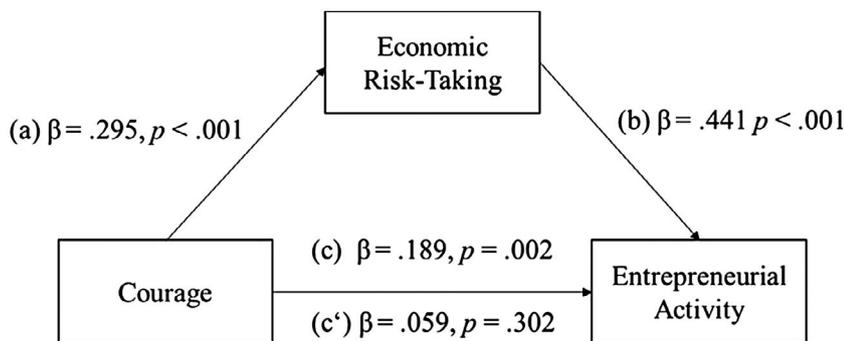
Personality not only varies between individuals, but also between geographical regions. Just like individual personality differences have important consequences for certain life trajectories and outcomes (Roberts et al., 2007), there is growing evidence that regional personality differences are also associated with important regional outcomes (Rentfrow & Jokela, 2016). Here, we presented evidence for regional courage, a personality trait that has not been previously examined across regions. Specifically, the present research focused on the links between regional courage and entrepreneurship, an economic outcome that is of central relevance for the success and well-being of regions and that is widely regarded as being driven by cultural and agentic forces (McClelland, 1961; Saxenian, 1996). We found remarkably robust effects of courage on entrepreneurial activity and survival. Interestingly, the overall picture that emerged from our analysis suggests a contrasting

role of regional courage for regional entrepreneurship: it is associated with heightened entrepreneurial activity in the regional population, but at the same time, also with a shorter survival of new start-ups. How can we explain this pattern?

When hypothesizing about the effect of regional courage on start-up survival, we assumed in hypothesis 2b (which was supported by the data) that courage might be associated with risk perceptions and evaluations (Keh et al., 2002; Simon et al., 2000). In fact, such a risky approach to entrepreneurial opportunities in a region could be reflected by both, more entrepreneurial activity and poorer survival chances of start-ups in a region. As for entrepreneurial activity, this means that more people take risks, or underestimate negative consequences of risks, and start their own businesses. Regarding entrepreneurial survival, start-ups might be premature and engage in more ambitious, riskier projects that have a smaller likelihood of survival, particularly start-ups located in regions with many competing, risky start-ups. In a follow-up analysis, we tested whether economic risk-taking could account for substantial shares of variance in the effect of regional courage on entrepreneurial activity and survival. We used the average debt-to-income ratio of the years 2010–2016 per MSAs (Federal Reserve System, 2018) as a proxy for

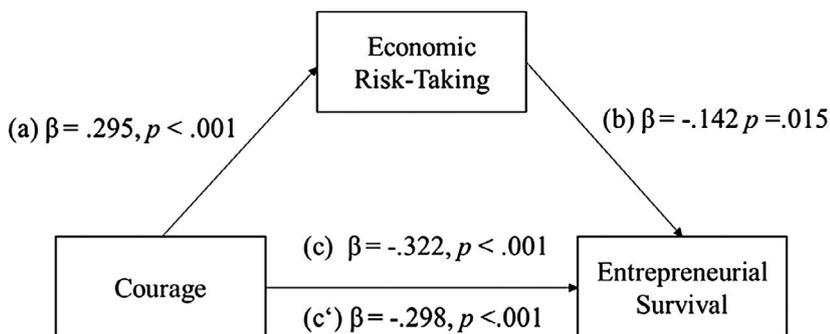
economic risk-taking. Further attesting to the external validity of courage as a regional construct, regions high in courage indeed tend to be prone to economically riskier behavior (i.e., a higher ratio of debts in relation to income). We found that economic risk-taking explains substantial portions of the effect of courage on entrepreneurial activity and survival. As evident in Figure 3, bias-corrected confidence intervals of the indirect effects after 10,000 bootstrap iterations (Hayes, 2013) excluded zero for both outcomes (E-Activity: [0.07, 0.20], E-Survival [-0.09, -0.01]).

Accordingly, courage, at least as measured in the present study, could reflect a risk-embracing, entrepreneurial climate (Saxenian, 1996; Sternberg, 2009), and also a bigger pool of risk-embracing people that could become entrepreneurs and develop their start-ups in a riskier and thus more aggressive and fragile way (Stewart & Roth, 2001). In line with this interpretation, evidence from prior individual-level research not only suggests that a risk-taking attitude is associated with an increased likelihood of becoming an entrepreneur and also having entrepreneurial success, but very high risk-taking levels are associated with a decreasing likelihood for entrepreneurial success such as survival (e.g., Caliendo, Fossen, & Kritikos, 2010). Hence, a risk-embracing regional climate



Proportion of effect accounted for: .685

Indirect Effect: $\beta = .13$, CI [.072, .201]



Proportion of effect accounted for : .123

Indirect Effect: $\beta = -.042$, CI [-.089, -.0122]

FIGURE 3 Proportion of the effect of regional courage on entrepreneurial activity and survival accounted by economic risk-taking ($N = 283$ U.S. MSAs)

driven by high regional courage levels could cause a general shift toward these very high, detrimental risk-taking levels, and a local acceptance of such tendencies, with important economic consequences for the region.

Finally, in light of the present findings, it might be worthwhile to revisit the psychological conceptualization of courage. The dominant view that has been expressed in the scientific literature has construed courage as a cardinal virtue (Dahlsgaard et al., 2005) and as a highly desirable personality trait (Magnano et al., 2017). In a rare deviation from that mainstream perspective, Pury et al. (2015) cautioned against the adoption of a purely beneficial angle and coined the term “bad courage” alluding to situations in which courage serves to pursue ignoble (e.g., terrorism; Silke, 2004) or self-harmful goals (e.g., suicide; Pury et al., 2015). Although one should be careful when deriving insights on individual-level relationships from aggregate-level findings, the present work corroborates the claim that courage should not be viewed as a purely beneficial trait. Specifically, our results might hint at another potentially detrimental outcome even of “good courage”: a discounting of risks, which may cloud people’s judgment and lead them to entrepreneurial (or otherwise) failure. Put differently, in the high-stakes game of regional entrepreneurship, a local psychological climate characterized by higher courage could stimulate more “aggressive and fragile” entrepreneurship in these regions, with implications for the economic trajectories of these regions.

Taken together, the present study suggests that regional courage is tightly linked to regional economic behavior. This opens up opportunities for future research, which should strive for a more nuanced understanding of courage. In doing so, it might be especially illuminating to identify the underlying causes of the observed regional differences in courage. Along these lines, looking through an ecological lens (Oishi, 2014), prior studies linking regional personality differences to historical living conditions (e.g., Obschonka et al., 2017; Talhelm et al., 2014) have been very informative. Accordingly, a similar approach might also be promising in the case of courage. In addition, researchers should venture beyond economic outcomes and examine the impact of regional courage on other important factors, such as health, political, and social outcomes, to gain a more comprehensive understanding of its significance and meaning for society in general.

10 | CONCLUSION

By enriching our understanding of the links between regional personality and economic outcomes, the present results give rise to the idea that regional courage may underlie, stimulate, and maintain a more risky, enterprising economic behavior in the region. This risky, enterprising behavior can

have benefits for regions (e.g., more start-ups and a general economic vitality) but potentially also unproductive consequences (e.g., more entrepreneurial failure) with economic and psychosocial costs for entrepreneurs and regions (Coad, 2014; Shepherd, 2003). We hope that our study stimulates more research on the complex real-world implications of regional courage for the psychosocial and economic trajectories of whole regions.

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CONFLICT OF INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ENDNOTES

¹To calculate baseline values for each house on all of the variables in the survey, we conducted a pilot study. In this pilot study, we recruited several hundred self-proclaimed experts from Harry Potter fan fora. These experts then took the survey on behalf of prominent characters from the respective houses to provide baseline measures which were then used as a standard of reference.

²We included the following constructs: a six-item courage measure (Howard & Alipour, 2014; Norton & Weiss, 2009), the Machiavellianism scale from the Dirty Dozen (Jonason & Webster, 2010), Conscientiousness and Agreeableness from the TIPI (Gosling, Rentfrow, & Swann, 2003), and a selection of items from the HEXACO-60 (Ashton & Lee, 2009).

³For the original measure, see Norton and Weiss (2009).

⁴To calculate the Location Quotient, we used data from the United States Patent and Trademark Office. Specifically, we divided the regional number of patents in a given technology class by the total number of patents in that region and then normalized this value using the share of patents in that technology class in the entire nation.

⁵Given that we have tested the link between courage and entrepreneurship in seven models, we ran additional analyses comparing the p -values of our models with more conservative significance thresholds that account for multiple testing. Online Supplement 3 provides a brief description and shows that all our p -values fall below the thresholds that are corrected for multiple testing (Benjamini & Yekutieli, 2001).

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SUPPORTING INFORMATION

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