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What does not kill you makes you stronger: Entrepreneurs' childhood adversity, resilience, and career success

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ABSTRACT

Childhood adversities, such as neglect, abuse, and poverty, lead to negative career outcomes. Anecdotal stories of entrepreneurs, however, present a contrasting picture, showing that many successful entrepreneurs had a difficult childhood. Building on the underdog framework of entrepreneurship and the stress inoculation model, we resolve the puzzle by hypothesizing the inverted U-shaped relationship between entrepreneurs' childhood adversities and career success that is mediated by resilience. Using data from a representative sample of 573 U.S. entrepreneurs from the Midlife in the United States (MIDUS) study, we find support for the hypotheses. We further find resilience is more important for less-successful entrepreneurs. Our results are robust to various checks, including an additional study based on a sample of U.S. entrepreneurs from the Qualtrics online panel. Our study indicates the need to consider nonlinear and context-specific implications of childhood adversities and examine performance-related outcomes, thus enriching existing research on childhood adversities and entrepreneurship.

1. Introduction

Abuse, neglect, poverty… these words elicit strong reactions, particularly when they concern children. We feel sorry for those who go through a difficult childhood when they instead should experience love and warmth. Childhood adversities negatively affect subsequent life, with increased risk of poor mental and physical health and suicide (Brent & Silverstein, 2013; Ferraro, Schafer, & Wilkinson, 2016; Kessler, Davis, & Kendler, 1997; Kessler et al., 2010; McLaughlin, Conron, Koenen, & Gilman, 2009) as well as negative career outcomes, such as unemployment and poor work performance (Anda et al., 2004; Metzler, Merrick, Klevens, Ports, & Ford, 2017). Childhood adversity is one of the most influential factors predicting negative adult outcomes (Heckman, Pinto, & Savelyev, 2013; Kessler et al., 2010).

Such negative outcomes could be examined within entrepreneurship, a context that entails uncertainty and obstacles but also has room for autonomy (Benz & Frey, 2008a, 2008b; Knight, 1921). Entrepreneurship offers opportunities to thrive for individuals who are different (Baron, Franklin, & Hmieleski, 2016). Adverse childhood experiences may generate adaptative capacity in entrepreneurs and create resilient "underdog" entrepreneurs (Miller & Le Breton-Miller, 2017). Indeed, anecdotal evidence seems to suggest such a possibility. For example, several highly successful entrepreneurs, such as Howard Schultz (Fisher, 2019), Oprah Winfrey (Saner, 2018), and Meg Whitman (Wilding, 2016), have attributed their success to the severe adversities they endured during their childhood.

Drawing from the stress inoculation model (e.g., Rutter, 2006, 2012; Fergus & Zimmerman, 2005), we propose that *low to moderate levels* of childhood adversity offer individuals opportunities to build resilience, which enables them to cope with future stressors more effectively (Seery, Holman, & Silver, 2010; Seery, Leo, Lupien, Kondrak, & Almonte, 2013). Thus, although childhood adversity may lead to some undesirable consequences, it helps build an important psychological capacity—resilience—which can be particularly important for entrepreneurs' career success because of the uncertainty and obstacles it entails (Ayala & Manzano, 2014). We further extend our understanding by examining contingencies, suggesting that resilience is more beneficial when entrepreneurs are in a more disadvantageous position (i.e., when

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they are currently less successful). Overall, we build a moderated mediation theoretical model that examines the link between childhood adversity and entrepreneurs' career success in a nuanced way.

We test our model based on a representative sample of U.S. entrepreneurs from the Midlife in the United States (MIDUS) study. Using personal income from occupation as a measure of career success (Hamilton, 2000; Wolfe & Patel, 2018), we find support for our model, and our results are largely robust to various checks including alternative resilience and success measures.

Our research makes two major contributions to the entrepreneurship literature. On the one hand, it contributes to the underdog approach of entrepreneurship. This approach (Miller & Le Breton-Miller, 2017) recognizes that individuals with challenging personal circumstances (e.g., disabilities, mental disorders, recent immigrants) may thrive in entrepreneurship contexts because they can adapt their work to fit their own idiosyncratic characteristics and because entrepreneurial work requires creativity, improvisation, and ability to bear uncertainty—capabilities that can develop from facing adversity. Recent research has started to examine challenging experiences such as disability, ADHD, and impulsivity (Wiklund, Hatak, Patzelt, & Shepherd, 2018; Wiklund, Patzelt, & Dimov, 2016; Wiklund, Yu, Tucker, & Marino, 2017), suggesting such experiences can lead to advantages in entrepreneurship (e.g., Lerner, Verheul, & Thurik, 2019; Yu, Wiklund, & Pérez-Luño, 2018). Our research contributes to the underdog framework of entrepreneurship and extends the emergent literature by being one of the first papers to examine *how* and *when* childhood adversity (as an important negative personal circumstance critical for adult emotional, cognitive, and career development) influences entrepreneurs' career success. Our nonlinear moderated mediation model also answers the call by scholars (e.g., Miller & Le Breton-Miller, 2017) to investigate the nuanced mechanisms and contingencies linking negative personal experiences to entrepreneurship.

On the other hand, we contribute specifically to the emerging entrepreneurship research (Cheng, Guo, Hayward, Smyth, & Wang, 2021; Awaworyi Churchill, Munyanyi, Smyth, & Trinh, 2021) on childhood adversity in three ways. First, we expand previous literature by studying entrepreneurial career success, which is a performance-related metric. Cheng et al. (2021) looked at the Chinese famine of 1959–61 and examined how surviving children became migrant entrepreneurs later in life. Awaworyi Churchill et al. (2021) investigated the same relationship but instead focused on the Vietnam War, using bombing intensity as the proxy for the severity of the war. Zhao and Li (2022) examined eight types of adversities, such as parental divorce and poverty, on entrepreneurial behaviors. Although these studies suggest the relevance of childhood adversities to entrepreneurship, their examinations stay at the entrepreneurial entry level. We extend these studies by looking at the career success of these children after they become entrepreneurs. Entrepreneurial entry alone does not reveal whether childhood adversities enable individuals to develop the adaptive abilities beneficial for themselves and their businesses after they enter the entrepreneurship journey.

Second, we also expand previous literature by examining resilience as a specific core psychological mechanism through which adversity influences entrepreneurs' career success. Emerging studies either examine the bivariate relationships between childhood adversity and entrepreneurial outcomes (e.g., Cheng et al., 2021) or focus on potential mechanisms such as human capital, social capital, and risk attitude (Awaworyi Churchill et al., 2021; Zhao & Li, 2022). Our research provides an important extension by explicitly theorizing and examining resilience as a key mechanism and by delineating the boundary conditions of when such resilience built from childhood adversity is more and less beneficial.

Third, we also extend previous literature by examining a comprehensive set of childhood adversities. Both Cheng et al. (2021) and Awaworyi Churchill et al. (2021) looked at the specific and discontinuous type of adversity—extreme childhood poverty from famine and war experiences. While it is undisputable that these are rare and life-changing experiences, most childhood adversities are experienced in a more continuous way and closer to daily life. For example, Kessler et al. (2010) found that parental death, abuse, and family violence are common types of childhood adversities. Hence, we extend the literature and join Zhao and Li (2022) by focusing on the commonly examined childhood adversity types and their relevance to entrepreneurship. In this regard, our theorizing and finding of the nonlinear impact of these adversities also provide a nuanced addition and help resolve the inconsistent findings as to whether childhood adversities are beneficial or detrimental to entrepreneurship (Cheng et al., 2021; Awaworyi Churchill et al., 2021; Zhao & Li, 2022).

2. Theoretical background and development

2.1. An underdog framework of childhood adversity

While abundant entrepreneurship research focuses on positive personal and environmental characteristics as conducive to entrepreneurship (e.g., self-efficacy, intelligence, human capital, financial resources), some research suggests that individuals with serious life challenges seem to have powerful roles to play in entrepreneurship. This includes immigrants (Hart & Acs, 2011) and individuals with mental disorders such as ADHD or dyslexia (Logan, 2009; Wiklund et al., 2017). With that background, Miller and Le Breton-Miller (2017) coined the term "underdog" entrepreneurship and proposed that disadvantaged individuals develop coping capabilities to overcome their adversities and transfer these capabilities into entrepreneurship. These include being used to working hard for things most people take for granted, finding creative solutions to everyday problems, and dealing with and overcoming failure. All these represent potential success factors in entrepreneurship.

Research in developmental psychology defines childhood adversity as "exposure during childhood or adolescence to environmental circumstances that are likely to require significant psychological, social, or neurobiological adaptation by an average child and that represent a deviation from the expected environment" (McLaughlin, 2016, p. 363). This literature provides childhood adversity as an umbrella term for early encounters with the types of adversities observed by Miller and Le Breton-Miller (2017) and provides a theoretical framework detailing how these early experiences translate into later-life behavior. Adversity can include interpersonal loss (e.g., parental death and parental divorce), parental maladjustment (e.g., mental illness, substance misuse, and violence), maltreatment (e.g., physical and emotional abuse and neglect), low family socioeconomic status (e.g., financial hardship), and physical illness (e.g., poor health) (Hill, Turiano, & Burrow, 2018; Kessler et al., 1997). Experiences like these can be conceptualized as influential stressors (Dienstbier, 1989; Seery et al., 2010) occurring early in life, with consequences carrying over into adulthood. For example, childhood adversities have a detrimental influence on personality development (e.g., neuroticism and negative affect) (Rosenman & Rodgers, 2006), mental and physical health (Brent & Silverstein, 2013; Ferraro et al., 2016; Kessler et al., 1997; Kessler et al., 2010; McLaughlin et al., 2009), employment, income potential (Metzler et al., 2017), and work performance (Anda et al., 2004). The negative work consequences are driven by the tendency of individuals with childhood adversities to not follow organizational norms, show deference to organizational leaders, and rein in negative emotions.

As creators of new businesses, entrepreneurs may face extensive resource constraints (Baker & Nelson, 2005), high uncertainty, and high probability of failure (McGrath and MacMillan, 2000; Shepherd, 2003), and therefore, mental toughness is needed. Recent evidence (Cheng et al., 2021; Awaworyi Churchill et al., 2021) shows that experiencing severe famine and war during childhood and specific forms of childhood adversity are positively linked to entrepreneurial entry. However, the mechanisms explaining this entry are underinvestigated, and there is also opposing evidence suggesting that childhood adversities are

detrimental to entrepreneurial entry (Zhao & Li, 2022). Moreover, whether these entrepreneurs are successful compared to entrepreneurs without adversity experience is unknown. More importantly, the mechanisms linking childhood adversities to entrepreneurial entry could be quite different from those linking childhood adversities to entrepreneurial performance. For example, childhood adversities may push people into entrepreneurship due to the lower human capital and the risk-taking tendency of these individuals; however, this combination may lead to unnecessary risk-taking in the venture development phase, resulting in poor performance. Similarly, childhood adversities could spur the individual's need for autonomy, which may be a stronger correlator to business creation than to success (see Rauch & Frese's 2007 *meta*-analysis).

In this paper, we focus on one particular pathway that we deem crucial for the success of entrepreneurs: the path through the development of resilience. Resilience is related to stress tolerance, which is more important to success than business creation (Rauch & Frese, 2007). We theorize that childhood adversity would result in more successful entrepreneurs through resilience. Next, we discuss the stress inoculation model, which explains why childhood adversities could be linked to resilience.

2.2. Childhood adversity and the stress inoculation model

A small but growing literature indicates the potential of adversity being translated to strength. The stress inoculation model of childhood adversity (e.g., Lyons & Parker, 2007; Meicheribaum & Novaco, 1985; Rutter, 2006, 2012; Fergus & Zimmerman, 2005) draws an analogy of a small to moderate amount of adversity to the experience of vaccination, where a small dose of pathogens leads to immunity to later exposure. Adversity creates opportunities for the individual to garner the internal and external resources to cope and adapt (Yates, Egeland, & Sroufe, 2003; Rutter, 2012). These skills then become valuable in making future coping efforts more efficient (Lyons & Parker, 2007). While the exact mechanisms of stress inoculation are subjective to more examination, Rutter (2006, p. 30) suggests that the process may involve "physiological adaptation, psychological habituation, the achievement of a sense of self-efficacy, the acquisition of effective coping strategies, and also a cognitive redefinition of the experience." The seminal paper by Fergus and Zimmerman (2005) formally acknowledges the potential "steeling" effect of adversity by proposing it as a challenge model of resilience. They suggest that whether the adversity leads to risk or promotive challenge depends on the level of exposure.

The inoculation effect of exposure to stressors has been found in both animal and human samples. For example, adult animals exposed to early life stress, such as electroshock, showed less fearful reactions to later threats (Denenberg, 1967). Research on mice shows that early life stress assists their responsiveness to stress and enables them to better cope with a challenging adult environment (Santarelli et al., 2017). In another study, scholars found that 81.9% of older men living in senior communities drew strength from previous experiences of coping with adverse life stressors (Aldwin, Sutton, & Lachman (1996). Similarly, childhood adversity studies show that adolescents exposed to moderate levels of childhood stressors displayed more positive emotional responses to recent life stressors than adolescents who had minimal early stress exposure (Shapero et al., 2015). In short, early experience of stressors and adversity can help individuals across different age groups to develop psychological toughness.

2.3. Childhood adversities and entrepreneurs' resilience

Our review of previous research above (e.g., Dienstbier, 1989; Rutter, 2006; Seery et al., 2010) suggests that childhood adversity is a form of early life stressor leading to an inoculation or toughening effect in later life. This effect can be best captured by the concept of resilience (Seery et al., 2010; Seery et al., 2013). Resilience is "the capability of individuals to cope successfully in the face of significant change, adversity, or risk" (Stewart, Reid, & Mangham, 1997, p. 22). Some researchers define resilience as "the capacity to maintain, or regain, psychological well-being in the face of challenge" (Ryff, Friedman, Morozink, & Tsenkova, 2012, p. 74). Organizational behavior scholars view resilience as a valuable psychological trait that enables individuals to sustain and bounce back when facing problems and adversity (Luthans, Avolio, Avey, & Norman, 2007). Despite differing definitions in the existing literature, scholars tend to agree that resilience has two key components (Fletcher & Sarkar, 2013; Masten et al., 1999; Seery et al., 2010): it is reflected in adverse or threatening events, and it is about the capacity to adapt to or even thrive under adversity.

Although childhood adversity may foster resilience (Seery et al., 2010), we argue that the relationship between the two is unlikely to be linear. Instead, moderate levels of adversity result in higher resilience than either low or high levels of adversity. Moderate levels of adversity allow individuals opportunities to deal with adversity yet recover from it. After recovering from an adverse situation, individuals can develop the perception of mastery, control, and toughness (Seery et al., 2010), which enables them to perceive future stressful situations to be controllable and experience fewer negative consequences (e.g., lowered self-esteem, mental health, and well-being). In contrast, minimal or no adversity deprives individuals of opportunities to fully develop valuable capacities for personal coping and mastery. However, highly adverse situations may go beyond one's ability to cope. Being exposed to such situations, especially multiple times, individuals may feel that they cannot change the situation, resulting in learned helplessness (Maier & Seligman, 1976). Therefore, for entrepreneurs who experience either minimal or high childhood adversity, their resilience will be low. Accordingly, we propose:

Hypothesis 1: Childhood adversities have an inverted U-shaped relationship with entrepreneurs' resilience.

2.4. Resilience and entrepreneurs' career success

Resilience is the capacity to bounce back and/or thrive in the face of problems, adversity, uncertainty, and failure (Luthans, 2002; Luthans et al., 2007). Entrepreneurship is a process fraught with challenges, setbacks, uncertainty, stress, and even failures (Knight, 1921; Ucbasaran, Shepherd, Lockett, & Lyon, 2013; Wincent & Örtqvist, 2009a, 2009b). Entrepreneurial firms, especially those in early stages, are likely to suffer from liability of newness and smallness (Freeman, Carroll, & Hannan, 1983), which make the acquisition of external critical resources (e.g., financial, human, customer, and supplier resources) very difficult for entrepreneurs, thereby posing as a threat to the survival and development of the venture and stress to entrepreneurs. Resilience thus can be beneficial for entrepreneurs to deal with these challenges and setbacks and perform better in the "fuzzier" world of entrepreneurship (Ayala & Manzano, 2014; Fisher, Maritz, & Lobo, 2016; Hmieleski & Carr, 2007; Korber & McNaughton, 2018; Markman & Baron, 2003; Stoltz, 2000). Below, we further delineate how resilience helps entrepreneurs to achieve career success.

First, resilient individuals use positive coping strategies in response to stress. For example, resilient individuals are good at using cognitive reappraisal, which enables them to reappraise, reframe, and find positive meaning in adversity (Affleck & Tennen, 1996; Folkman & Moskowitz, 2000b; Tugade & Fredrickson, 2004). As a result, they often perceive stressful events as less threatening and remain optimistic about their ability to cope with them (Folkman & Moskowitz, 2000b; Southwick, Vythilingam, & Charney, 2005). Furthermore, resilient individuals use more problem-focused coping strategies, which enable them to deal effectively with the source of the problem, generate feelings of mastery and control, and enhance their well-being (Folkman & Moskowitz, 2000a; Steinhardt & Dolbier, 2008). In the entrepreneurship context, we thus can expect resilient entrepreneurs to view the stressful entrepreneurial process in a positive way, staying motivated while

dealing with the various challenges and setbacks in the daunting entrepreneurial process (Bullough & Renko, 2013). These entrepreneurs are also better able to use problem-based coping to manage the stressors in the process, alleviate causes of stress (Uy, Foo, & Song, 2013), and energetically pursue their business goals, making career success more likely.

Second, scholars who have explored the factors that account for people's adaptive ways of dealing with stressors find that resilience is an important factor, enabling people to experience positive emotions (Ong, Zautra, & Reid, 2010; Tugade & Fredrickson, 2004; Tugade, Fredrickson, & Barrett, 2004). According to the broaden-and-build theory (Fredrickson, 2001), positive emotions can broaden people's thought-action repertoire and expand the range of cognitions and behaviors that come to mind. These broadened mindsets can then build people's physical, intellectual, and social resources. In the entrepreneurship context, the broadened cognitions and behaviors enable entrepreneurs to identify and act on new opportunities for venture growth, and come up with innovative solutions (Reinmoeller & van Baardwijk, 2005; Sweetman, Luthans, Avey, & Luthans, 2011) that make the venture compete more effectively and perform better in the dynamic business environment (Luthans, Avolio, Walumbwa, & Li, 2005; Reinmoeller & van Baardwijk, 2005; Youssef & Luthans, 2007).

Taking all these studies together, we can expect that resilient entrepreneurs use more problem-focused coping and cognitive reappraisal and experience more positive affect than their less resilient counterparts. These characteristics are all crucial for entrepreneurs to adapt quickly, effectively operate their venture, enhance its performance in the entrepreneurial process, and achieve career success. Accordingly, we suggest the following:

Hypothesis 2: Resilience relates positively to entrepreneurs' career success.

2.5. The mediating role of resilience

With the aforementioned hypotheses, it is reasonable to argue that resilience has a mediating role in the relationship between childhood adversities and career success. As Miller and Le Breton-Miller (2017) described, "this recurrent need to struggle, and most importantly, the small, encouraging successes that come from such struggle, may breed confidence in one's ability to meet challenges, and optimism about the merits of effort" (p. 4).

The relevance of resilience to childhood adversities and entrepreneurship has been alluded to in recent entrepreneurship studies, although not examined empirically. In connecting famine experience to entrepreneurial entry, Cheng et al. (2021) argued that individuals who survive hardships can become more resilient, which enables individuals to cope with losses, to mitigate the negative impact on the self and others, to enhance self-esteem and self-efficacy, to find opportunities to recover, and to engage in entrepreneurial activities where resilience is highly important (Ayala & Manzano, 2014; Bullough, Renko, & Myatt, 2014). Similarly, Awaworyi Churchill et al. (2021) argued that the Vietnam War could have prompted the victims to develop resilience essential for entrepreneurship. We thus suggest the following:

Hypothesis 3: Resilience mediates the relationship between childhood adversities and entrepreneurs' career success.

2.6. Conditional career success

Despite the general trend, we also suggest that resilience is more important to promote career success for less successful entrepreneurs than for more successful ones.

Resilience is particularly useful under situations of difficulties, challenges, and stress (Luthans et al., 2005), and resilient individuals have been found to cope and perform better in demanding situations (Parker, Jimmieson, Walsh, & Loakes, 2015). People of different levels of success, such as different income levels, may face different work and family environments (Eide & Showalter, 1999; Koenker & Hallock, 2001), and we argue that less-successful entrepreneurs are more likely to experience hardships, challenges, and stress in their life environment than their more successful counterparts. Entrepreneurs who are less successful may earn lower employment income and run businesses with worse financial performance than those who are more successful. As a result, businesses run by less-successful entrepreneurs could face many challenges and hardships in the business environment. For example, a business may have few opportunities to obtain external investment and talent because of its poor financial performance and its limited ability to offer competitive compensation packages. It may also be difficult for the business to find good suppliers who may have concerns about doing business with a firm in poor financial status, and the business may not be able to pay suppliers on time. Finally, the market demand for the products of a financially poor business may also be limited because customers may doubt the quality of the products and the business may have limited resources to devote to product innovation and marketing strategies. Any of the above setbacks and challenges may require entrepreneurs to devote substantial time and energy to resolve issues, not only leading to entrepreneur role overload and high stress (Buttner, 1992; Wincent & Örtqvist, 2009b) but also leaving fewer cognitive resources for the family domain, resulting in business-to-family role conflict and strain in the home (Greenhaus & Powell, 2003; Parasuraman & Simmers, 2001). In this situation, high resiliency is critical and beneficial for entrepreneurs. As we argued previously, resilient entrepreneurs are likely to use adaptive coping strategies (Affleck & Tennen, 1996; Folkman & Moskowitz, 2000b; Tugade & Fredrickson, 2004), which may help them deal with the stressors in the business domain effectively (Folkman & Moskowitz, 2000a; Steinhardt & Dolbier, 2008), thereby enhancing business performance. Less stress and better functioning in the business domain may also release additional time and cognitive resources and generate positive emotions that enable entrepreneurs to engage better in the family domain (Chan et al., 2016; Rothbard, 2001), leading to increased family satisfaction (Nicklin & McNall, 2013), which in turn can contribute to job satisfaction and career success (Carlson, Hunter, Ferguson, & Whitten, 2014; Greenhaus & Powell, 2006). Therefore, the relationship between resilience and career success can be stronger for less-successful entrepreneurs.

In contrast, more-successful entrepreneurs with higher employment income may run a business that performs better financially. Such businesses should face a less challenging business environment because it may be easier to obtain human, financial, supplier, and customer resources, which can be used to deal with business issues. For example, entrepreneurs may have capable employees to delegate work to or have sufficient resources to hire talented people to help them deal with daily hassles and unexpected requirements from suppliers or customers. Furthermore, better business performance may generate positive emotions or release cognitive resources that enable entrepreneurs to function better in the family domain. As a result, more-successful entrepreneurs may have a lower need, compared with their less successful counterparts, to rely on their psychological resources to cope with stress in the business and family domains, and resilience is less needed. In sum, we anticipate that resilience, as a capacity to buffer stress for individuals and help them to adapt and bounce back in adverse

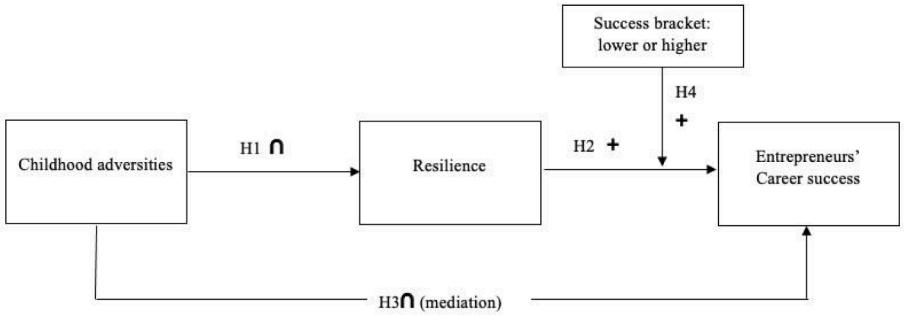

Fig. 1. Theoretical model.

situations, can contribute more to career success for less-successful entrepreneurs.

Hypothesis 4: Resilience is more positively related to career success for less-successful entrepreneurs than more-successful ones.

Our theoretical framework is displayed in Fig. 1.

3. Methodology

We tested our hypotheses based on two entrepreneur samples collected at different points in time and with different designs and measures. The first sample comes from the Midlife Development in the United States (MIDUS) data. The second sample also targeted U.S. entrepreneurs and was collected by the online survey research firm Qualtrics. The two surveys differ in terms of the fundamental design and the measures of key constructs. For example, for the MIDUS sample we used a residual method for the measure of resilience, but for the Qualtrics sample we used a direct and established trait resilience scale. These notable differences between the two studies help establish the validity and robustness of our results across different samples and measures, thus heeding the call by management and entrepreneurship scholars (e.g., Bettis, Helfat, & Shaver, 2016; Van Witteloostuijn, Dejardin, & Pollack, 2018) for more replication and quasi-replication work.

3.1. Data and sample

MIDUS is a high-quality longitudinal data set surveying the U.S. population on comprehensive areas of physical health, mental health, childhood experience, personality, occupation characteristics, family conditions, etc. Starting in 1995, MIDUS surveyed over 7,000 Americans aged 25 to 74 using a random digit dial (RDD) method. The original aim of MIDUS was to understand the role of behavioral, psychological, and social factors in the aging process, but it also provides information allowing the study of entrepreneurs' well-being (see Patel, Wolfe, & Williams, 2019, for an example). MIDUS includes a multitude of pre-tested psychological assessments, and its population-level inquiry and scope provide a representative sample of research participants. MIDUS has three waves of data collection, each around 10 years apart. Since we are interested in entrepreneurs, we focus on the sample of individuals who indicated that they were self-employed at the time of the first-wave survey.[1]

The initial sample from MIDUS covers 975 self-employed individuals. After deleting missing values in focal variables, our final sample includes 573 entrepreneurs. The large drop in the number of observations is because of the considerable number of variables we used to construct the adversity and resilience measure (as we will show below) and because around 14% of these people did not complete the self-administered questionnaire. We took special care to check if the missing pattern is systematic and conducted *t*-tests comparing complete cases to missing cases. We find no significant differences for childhood adversities ($t = -0.05$; $p = .96$), resilience ($t = -1.11$; $p = .27$), startup experience ($t = -1.13$; $p = .26$), education ($t = 1.53$; $p = .13$), age ($t = 0.07$; $p = .94$), and gender ($t = -0.01$; $p = .99$).

Note that for our main analyses, we rely on the first-wave data to ensure we have an adequate sample of prime-age entrepreneurs.[2] In our robustness tests, we also use the second-wave data.

3.2. Measures[3]

3.2.1. Dependent variable: Career success

Personal income, including salary and other stipends from the occupation, is an objective and widely used proxy for career success (Judge, Higgins, Thoresen, & Barrick, 1999). In the entrepreneurship context, income or earnings has also been widely used to capture the financial success achieved by entrepreneurs (e.g., Baron & Markman, 2003; Shane & Nicolaou, 2013; Wolfe & Patel, 2018) or in general entrepreneurial success or performance (see the three *meta*-analyses: Unger, Rauch, Frese, & Rosenbusch, 2011; Zhao, Connor, Wu, & Lumpkin, 2021; Van der Sluis, Van Praag, & Vijverberg, 2005). While income often does not capture the capital appreciation of the business, it is found to be the major source of most entrepreneurs' earnings and less influenced by text considerations (Hamilton, 2000).

During the MIDUS interview, respondents were asked to state the total dollar amount earned in ranges (only wages, stipends, and income sources from own employment), before taxes, in the previous calendar year.[4] Specifically, MIDUS includes 31 income brackets ranging from 1 (less than $0/loss) to 31 ($100,000 or more). In the entrepreneur sample, around 5% (or 30 individuals) either refused to or did not answer the question. We coded them as missing. The final distribution of the

[1] The question was: What is your current employment situation? Are you working for pay, self-employed, looking for work, temporarily laid off, retired, a homemaker, a full-time or part-time student, or something else?

[2] We have 573 entrepreneurs in the first wave, which shrinks to 168 entrepreneurs in the second wave and to 71 entrepreneurs to the third wave. The considerable shrink of sample size is mostly due to the long time lag between each wave (around 10 years), as designed by MIDUS. Hence, the first-wave data is more comprehensive and representative of entrepreneurs covered by MIDUS. Further, in the first wave, the majority of those 573 entrepreneurs were prime-age workers (meaning that they are below or equal to age 55). However, at waves two and three, only very small numbers of entrepreneurs remaining were at prime age. There is reason to believe that life attitudes, income, and other characteristics change with aging, so using those observations would add noise.

[3] The detailed measures and coding schemes for some of the key measures and data items are shown in online appendices.

[4] The exact question was: What was your own personal earnings income in the past 2 months, before taxes? Count only wages and other stipends from your own employment, not pensions, investments, or any other financial assistance or income.

variable shows that the mean income level for entrepreneurs in our sample is around 20 (or $17,000–17,999 per year before taxes), with around 56% earning above $20,000.

3.2.2. Independent variable: Childhood adversities

Childhood adversities were measured by a set of items asking respondents the extent to which they had difficulty when they were growing up until age 16. We included 14 indicators of childhood adversities, including family socioeconomic status (SES), health adversity, parental emotional and physical abuse, and household composition. These categories are common indicators of different kinds of childhood adversities and have been extensively used in previous studies (e.g., Ferraro et al., 2016; Kessler et al., 2010).

Specifically, family SES was measured with three items: receipt of welfare (defined as ever receiving welfare during childhood or adolescence), poor financial standing (ranging from "a lot better off" to "a lot worse off" compared to other families), and household head education attainment (father or mother if there was no father present, ranging from "less than 8 years of schooling" to "professional degree").

Health adversity was measured with two items: self-rated physical and mental health at age 16, ranging from "poor" to "excellent.".

Parental emotional and physical abuse was measured with six items: father physical and severe physical abuse from a list of behaviors such as kicking, pushing, or burning, ranging from "never" to "often"; mother physical and severe physical abuse from the same list of behaviors, ranging from "never" to "often"; father emotional abuse from a list of items such as insulting, threatening, or sulking, ranging from "never" to "often"; mother emotional abuse from the same list of items, ranging from "never" to "often.".

Household composition was measured with three items: no male in the household, parental divorce before age 16, and father or mother death before age 16.

Since these categories of adversities were not measured on the same scale, we followed Schafer, Ferraro, and Mustillo (2011) and recoded those nondichotomous items into binary ones (0 for did not experience one adversity and 1 for experienced one adversity). Doing this also ensures that the ones that are coded 1 represent adversity, not just normal hardship (e.g., for the seven-point Likert scale of financial standing, only responses with "somewhat worse off" or "a lot worse off" are set to 1; other responses ranging from "a lot better off" to "a little worse off" are set to 0).

Because different adversity types usually covary and the influence of adversities could be better examined in a nested and cumulative manner (Schafer et al., 2011), we created a summary score of the 14 adversity items. Such an accumulation model of adversity has been extensively used by childhood adversity research (see Smith & Pollak, 2021, for elaborated review and discussion) and found to be robust (Dunn et al., 2019). It also reflects the fact that, first, it is not a specific risk factor but a more comprehensive history that shapes individual development (Fergusson & Horwood, 2003). Research shows that cumulative adversity is a more powerful predictor of adult outcomes than any single risk factor (Rutter, 1979). Second, various kinds of adversity appear to exert similar effects on behaviors (Smith & Pollak, 2021). For example, increased rates of all subtypes of adversity are associated with borderline personality disorder (Porter et al., 2020). Indeed, as McLeod and Almazan (2003, p. 401) put it, "attempts to disaggregate the effects of clustered adversities may offer relatively little insight into processes of risk and resilience.".

In our sample, the childhood adversities measure ranged from 0 to 11. The variable is right skewed, with around 35% of respondents having zero or no childhood adversity, 21% having one adversity, 18% having two adversities, and 26% having more than two adversities. Such distribution of childhood adversity is similar to other studies (e.g., Kessler et al., 2010). Among all adversity items, the most frequent occurrences are related to family malfunctioning, with around 42% of entrepreneurs ever having any emotional or physical mistreatment from parents. Low household SES is the second most frequent occurrence, with 35% of entrepreneurs having at least one adversity in terms of family socioeconomic status. The tetrachoric correlations among adversity items show an average correlation of 0.21, a figure close to what Kessler et al. (2010) found in their cross-country WHO World Mental Health Surveys. Also similar to their finding, we find that the dysfunctional family items of parental physical and emotional abuse are more highly interrelated (factor loadings between 0.52 and 0.92) than other aversity items.

3.2.3. Mediator: Resilience

We followed Boardman, Blalock, and Button (2008) and operationalized resilience as our measure of positive psychological well-being despite chronic and accurate exposures to recent life stressors. This operationalization is consistent with the definition of resilience, which is the capacity to bounce back or remain functional despite obstacles or adversities. In particular, following Boardman, Blalock, and Button (2008), Agnafors et al. (2017), Miller-Lewis et al. (2013), and Bowes et al. (2010), we determined resilience by regressing personal well-being on a comprehensive set of recent life stressors identified and taking the residual term as the resilience score. The resilience score reflects the difference between an individual's actual well-being and his/her expected well-being in response to chronic and life stressors. Positive residualized scores indicate individuals with greater than expected well-being, hence those who are more resilient. Conversely, negative residualized scores indicate individuals with less than expected well-being, who are hence less resilient.

Specifically, psychological well-being was measured using the short version of Ryff's (1989) well-established psychological well-being scale. The scale includes six dimensions, including positive relations with others, self-acceptance, autonomy, personal growth, environmental mastery, and purpose in life. We created an average score for all items.

Similar to Boardman, Blalock, and Button (2008), we included the following chronic and acute stressors as predictors of psychological well-being: spousal strain (e.g., whether your spouse or partner had alcohol or substance problems in the past 12 months), child strain (e.g., whether any of your children had chronic disease or disability in the past 12 months), parent strain (e.g., whether your parents or those who raised you had frequent minor illness in the past 12 months), friends strain (e.g., whether your friends make too many demands on you), family support (e.g., how much your family members understand the way you feel about things), friends support (e.g., how much your friends really care about you), job strain (e.g., whether you have a choice in deciding how you do your tasks at work), job support (e.g., whether you get help and support from your coworkers), financial strain (e.g., how you rate your financial situation these days), and health strain (e.g., how you rate the amount of control you have over your health these days).

Some respondents had no child, spouse, or living parent. We imputed zero for the corresponding strains. In addition, we included dummy variables for whether respondents had children, spouses, or parents, since having them was likely to affect the respondents' well-being (e.g., Kim & McKenry, 2002).

3.2.4. Control variables

We controlled for variables that would influence the recall and experience of childhood adversity, as well as the entrepreneur's income. These include age, gender (2 = female, 1 = male), education (1 = high school or less; 2 = some college or more), previous entrepreneurial experience (whether the respondent was self-employed 10 years ago, as asked in MIDUS), and the sample group (in addition to the main RDD [random digit dialing] sample, MIDUS includes an oversample of five metropolitan areas [city oversample], siblings of individuals from the main RDD sample [sibling sample], and a national RDD sample of twins [twin sample] to enhance the demographical representativeness).[5]

3.3. Analytical methods

We used OLS regression with robust standard errors to test Hypotheses 1 and 2. In particular, we test the following equation for Hypothesis 1.

$$Resilience_i = \alpha + \beta_1 Adversity + \beta_2 Adversity^2 + \gamma X_i + \varepsilon_i \quad (1)$$

$Resilience_i$ is the resilience for entrepreneur *i*. *Xi* is a vector of control variables. *Adversity* is our focal childhood adversity variable, and $Adversity^2$ is the squared term of it. We are interested in β_2 to test the inverted U-shaped effect.

We test the following equation for Hypothesis 2.

$$Career\ success_i = \alpha' + \beta_0 Resilience + \beta_{1'} adversity + \beta_{2'} adversity^2 + \gamma' X_i + \varepsilon'_i \quad (2)$$

Career success $_i$ is the outcome variable for entrepreneur *i*. β_0 identifies the impact of resilience on career success.

The combination of equations (1) and (2) enables us to test Hypothesis 3—the mediation effect. In particular, the mediation effect is calculated as ($\beta_1 + 2\beta_2$ *adversity* $_{low}$) * β_0 and ($\beta_1 + 2\beta_2$ *adversity* $_{high}$) * β_0 when childhood adversities are low and high, respectively. We followed Hayes and Preacher's (2010) recommendations for testing nonlinear mediation models, using the bootstrapping method (bootstrapping 1,000 times).

For Hypothesis 4, we conducted sequential quantile regression (Stata command: sqreg) to examine how resilience relates to career success for entrepreneurs at the 25th, 50th, and 75th income quantiles with the following equation.

$$Career\ success_i = \alpha'^p + \beta_0^p Resilience + \beta_{1'}^p adversity + \beta_{2'}^p adversity^2 + \gamma'^p X_i + \varepsilon'^p_i \quad (3)$$

We are interested in β_0^p where p can be at different quantiles, such as the 25th, 50th, or 75th quantiles. β_0^p can be interpreted as the change in the p th quantile of the outcome when resilience increases by 1 unit.

Different from traditional regressions that examine conditional mean relationships, quantile regressions look at the conditional quantiles, hence allowing us to examine how the relationship between x and y varies for the different quantiles of the conditional distribution of y. The quantile regression method has been advocated by previous management research (e.g., Li, 2015) to better examine the heterogeneous management population and has been fruitfully adopted to examine conditional contingencies (e.g., Ramdani & Witteloostuijn, 2010).

4. Results

Table 1 shows the descriptive statistics for the variables used in the study. As shown in the table, the average age of our sampled entrepreneurs was 46, with 358 (or 62%) being male. On average, respondents experienced 1.8 incidents of childhood adversities. The pairwise correlations show that childhood adversities relate to education and gender. Individuals who experienced more childhood adversities had lower educational attainment, which is consistent with previous literature (e.g., Montez & Hayward, 2014).

Table 2 shows the OLS regression results for our sample of entrepreneurs. As can be seen from Model 2, the first-degree coefficient for childhood adversities is positive (coefficient = 0.235; p <.05) and the second-degree coefficient (childhood adversities squared) is negative (coefficient = –0.038; p <.05), suggesting that there is an inverted U-shaped relationship between childhood adversities and resilience for entrepreneurs. Specifically, the inflection point is 3.08, suggesting that entrepreneurs with around three incidences of childhood adversity develop the highest resilience capacity. We further followed Haans et al. (2016) and tested whether the inverted U shape really exists. First, the slopes at the low and high ends of the predictor need to be at different directions and both statistically significant. We find that this is the case, with the slope of childhood adversity being 0.159 (p =.013) at 1, –0.606 at 11 (p =.001), and –0.682 at 12 (p =.001). Second, the inflection point and its 95% confidence interval need to be within the range of × in the sample. The 95% Fieller interval for the inflection point is 1.512 to 4.182, which is within the range of our childhood adversity measure (i.e., [0, 11]). Overall, these results support Hypothesis 1. An intuitive representation of the inverted U shape is shown in Fig. 2.

Considering that the majority of entrepreneurs (around 74%) in our sample experiences fewer than three incidences of adversity, we further look at the marginal effect for each level of childhood adversities, as shown in Table 3. We can see that the effects of adversities are positive and statistically significant up until the point of three, and after that, become negative and statistically significant. This suggests that most of our sampled entrepreneurs experience the positive effect of childhood adversities for their resilience.

Table 2 also shows the total effect between childhood adversities and career success. From Models 3 and 4, we see limited overall impact of childhood adversities, in the linear or nonlinear form. This suggests that without considering specific mechanisms (or mediators), childhood adversities are likely to have both positive and negative mechanisms (Cheng et al., 2021; Awaworyi Churchill et al., 2021; Zhao & Li, 2022) leading up to career success, with the overall effect of cancelling each other out. Model 6 shows the OLS regression results for the relationship between resilience and career success. We can see that resilience is positively (coefficient = 0.364, p <.05) related to entrepreneurs' career success, proxied by their personal income. Thus, Hypothesis 2 is also supported.

Table 4 shows the indirect effects for entrepreneurs. The THETA statistic indicates the instantaneous indirect effect at specific values of × (i.e., childhood adversities) through the mediator, or in other words, the rate of change (or slopes) of career success through resilience as childhood adversities change by one unit at specific values of childhood adversities (see Hayes & Preacher, 2010, for detailed formulas). This instantaneous indirect effect is estimated by using the bootstrapping method, in which a certain number of resamples are drawn from the original sample to construct the confidence interval of our statistic of interest: the THETA. We bootstrapped 1,000 times. Table 4 shows that for entrepreneurs, a low level of childhood adversity (one incidence of adversity) increases career success through resilience (indirect effect = 0.058; the 95% confidence interval does not include zero), and a high level of childhood adversity (11 incidences of adversity) reduces career success through resilience (indirect effect = –0.221; the 95% confidence interval does not include zero). This suggests that for entrepreneurs, the indirect influence of childhood adversities on career success through resilience is an inverted U shape. Hypothesis 3 is thus supported. Fig. 3 shows the marginal effect of the indirect relationships. We can see that as childhood adversities increase, the slopes change from positive to

[5] Note that we could potentially control for more variables, but considering that in the construction of the resilience measure we have included a comprehensive set of stressor-related items, there is no need to further repeat those variables as these relevant stress variables have been accounted for in measuring resilience.

Table 1
Descriptive statistics and correlation matrix.

Variable	Mean	S. D.	Min	Max	1	2	3
1. Income	20.187	8.974	1	31			
2. Main probability sample	0.506	0.5	0	1	–0.033		
3. Sibling sample	0.157	0.364	0	1	0.038	–0.437*	
4. Twin sample	0.241	0.428	0	1	–0.034	–0.570*	–0.243*
5. City oversample	0.096	0.295	0	1	0.059	–0.330*	–0.141*
6. Education (1 = high school or less; 2 = some college or more)	1.677	0.468	1	2	0.126*	0.027	0.021
7. Age	46.466	11.289	24	74	–0.024	–0.007	0.099*
8. Gender (1 = male; 2 = female)	1.375	0.485	1	2	–0.454*	0.009	0.002
9. Previously self-employed (1 = yes; 0 = no)	0.511	0.5	0	1	0.140*	–0.009	0.000
10. Resilience	–0.002	1.847	–6.949	5.75	0.06	0.07	–0.098*
11. Childhood adversities	1.775	2.01	0	11	–0.126*	0.065	–0.107*
Variable	4	5	6	7	8	9	10
5. City oversample	–0.184*						
6. Education (1 = high school or less; 2 = some college or more)	–0.100*	0.073					
7. Age	–0.091*	0.022	0.000				
8. Gender (1 = male; 2 = female)	0.044	–0.081	–0.035	–0.076			
9. Previously self-employed (1 = yes; 0 = no)	0.036	–0.037	–0.100*	0.324*	–0.115*		
10. Resilience	–0.036	0.055	0.074	–0.083*	0.030	–0.112*	
11. Childhood adversities	0.022	–0.011	–0.228*	–0.064	0.090*	–0.063	–0.005

Note: * shows significance at the 0.05 level; N = 573.

Table 2
Regression results for entrepreneurs.

DV	Resilience		Income				25th income quantile	50th income quantile	75th income quantile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Childhood adversities	–0.011	0.235*	−0.248	−0.111	–0.244	–0.197	0.242	–0.164	–0.032
	(0.040)	(0.093)	(0.174)	(0.412)	(0.175)	(0.413)	(0.774)	(0.501)	(0.387)
Childhood adversities ^{2}		–0.038**		−0.0212		–0.007	–0.078	–0.020	–0.069
		(0.013)		(0.0594)		(0.060)	(0.108)	(0.080)	(0.083)
Resilience					0.367*	0.364*	0.636*	0.121	–0.018
					(0.177)	(0.179)	(0.276)	(0.186)	(0.139)
Sibling sample	–0.533*	–0.509*	1.106	1.120	1.302	1.305	1.908	0.408	0.738
	(0.225)	(0.222)	(0.929)	(0.933)	(0.917)	(0.920)	(1.465)	(1.041)	(0.650)
Twin sample	–0.228	–0.223	−0.0273	−0.0249	0.056	0.057	0.092	0.125	–0.158
	(0.196)	(0.194)	(0.825)	(0.826)	(0.821)	(0.822)	(1.384)	(0.911)	(0.868)
City oversamples	0.164	0.194	0.877	0.893	0.817	0.823	–2.657	0.825	1.221
	(0.252)	(0.259)	(1.246)	(1.250)	(1.257)	(1.260)	(3.018)	(1.126)	(0.812)
Education	0.231	0.272	2.081**	2.104**	1.996**	2.005**	1.677	3.259***	2.278*
	(0.180)	(0.180)	(0.715)	(0.717)	(0.716)	(0.717)	(1.246)	(0.943)	(1.014)
Age	–0.008	–0.009	−0.0867**	−0.0873**	–0.084**	–0.084**	–0.122**	–0.039	–0.011
	(0.007)	(0.007)	(0.0316)	(0.0319)	(0.032)	(0.032)	(0.047)	(0.040)	(0.030)
Gender	0.091	0.095	−8.068***	−8.066***	–8.102***	–8.101***	–11.980***	–10.577***	–5.856***
	(0.163)	(0.162)	(0.719)	(0.719)	(0.715)	(0.716)	(1.363)	(1.198)	(0.853)
Previous self-employed	–0.314+	–0.360*	2.405***	2.379***	2.520***	2.510***	3.236**	2.092*	1.125+
	(0.167)	(0.164)	(0.713)	(0.719)	(0.711)	(0.718)	(1.248)	(1.034)	(0.633)
Constant	0.164	–0.006	30.78***	30.68***	30.718***	30.686***	33.516***	31.456***	30.821***
	(0.544)	(0.544)	(2.219)	(2.205)	(2.218)	(2.201)	(3.838)	(3.132)	(2.504)
N	573	573	573	573	573	573	573	573	573
adj. R^2	0.0186	0.0296	0.2325	0.2313	0.2368	0.2354	N/A	N/A	N/A
Pseudo R^2	N/A	N/A	N/A	N/A	N/A	N/A	0.1954	0.1786	0.1181

Note: + p <.1; * p <.05; ** p <.01; *** p <.001; Models 1–6 are based on OLS, and Models 7–9 are based on quantile regression; robust standard errors in parentheses for Models 1–5; bootstrapped standard errors in parentheses for Models 6–8 (robust standard errors are not allowed in simultaneous quantile regressions).

negative, suggesting the indirect relationship is also an inverted U shape. However, it is worthy to note as well that for the majority of our sampled entrepreneurs, such effect is positive as they experience fewer than three incidences of adversities.

Models 7–9 in Table 2 list the quantile regression results. We can see that resilience has a positive and statistically significant influence (coefficient = 0.636; p <.05) on career success for the 25th quantile income entrepreneurs, but not for the 50th or the 75th quantile income entrepreneurs. A further comparison of coefficients suggests that these differences are statistically significant ([q25] resilience = [q50] resilience: F = 3.72 [p =.05]; [q25] resilience = [q75] resilience: F = 4.37 [p =.04]). This confirms our Hypothesis 4 that lower-income entrepreneurs would benefit more from resilience than do higher-income counterparts. A more intuitive representation of the decreasing effect of resilience along the income distribution of entrepreneurs is shown in Fig. 4. As we can see, the influence of resilience on the career success of entrepreneurs declines as entrepreneurs move up the income brackets from the 0.2 quantile to the 0.8 quantile.

5. Robustness checks

5.1. Endogeneity concerns

There are potentially four sources of endogeneity for our study that

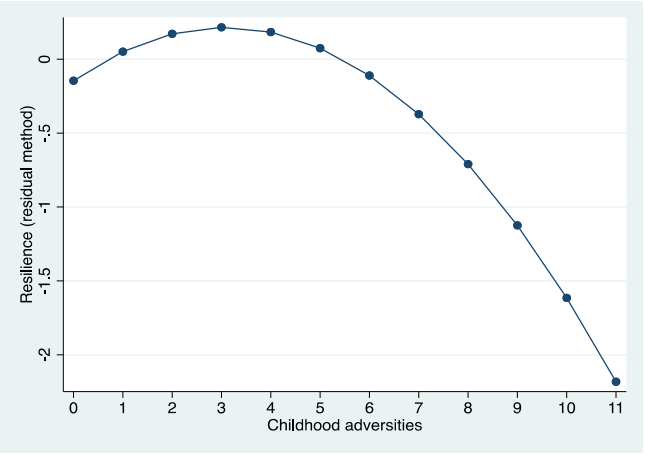

Fig. 2. The inverted U-shaped relationship between childhood adversities and resilience.

Table 3
Effect of each level of childhood adversities on resilience.

Childhood adversities	Slope	t-value	p
0	0.235	2.519	0.006
1	0.159	2.227	0.013
2	0.082	1.584	0.057
3	0.006	0.148	0.441
4	−0.071	−1.715	0.043
5	−0.147	−2.655	0.004
6	−0.223	−2.962	0.002
7	−0.300	−3.066	0.001
8	−0.376	−3.104	0.001
9	−0.453	−3.119	0.001
10	−0.529	−3.123	0.001
11	−0.606	−3.124	0.001
12	−0.682	−3.122	0.001

Note: Based on Fieller U-shape test.

Table 4
Bias corrected bootstrap confidence interval for instantaneous indirect effect.

Childhood adversities	THETA (Instantaneous indirect effect)	[95% bias corrected conf. interval]	[90% bias corrected conf. interval]
0	0.086	[0.008, 0.239]	[0.017, 0.219]
1	0.058	[0.003, 0.173]	[0.010, 0.153]
2	0.030	[−0.003, 0.106]	[0.001, 0.089]
3	0.002	[−0.025, 0.040]	[−0.020, 0.033]
4	−0.026	[−0.094, −0.001]	[−0.083, −0.002]
5	−0.054	[−0.163, −0.005]	[−0.142, −0.012]
6	−0.081	[−0.227, −0.007]	[−0.205, −0.019]
7	−0.109	[−0.307, −0.011]	[−0.275, −0.026]
8	−0.137	[−0.386, −0.015]	[−0.346, −0.032]
9	−0.165	[−0.458, −0.018]	[−0.416, −0.039]
10	−0.193	[−0.530, −0.022]	[−0.487, −0.046]
11	−0.221	[−0.597, −0.025]	[−0.557, −0.052]
12	−0.249	[−0.669, −0.027]	[−0.628, −0.058]

Note: 1,000 bootstrap samples.

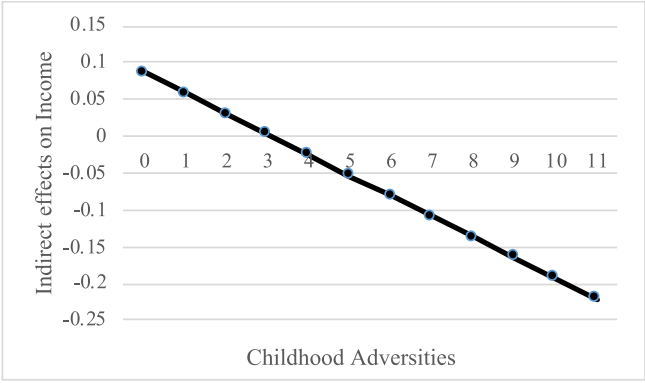

Fig. 3. The indirect effects between childhood adversities and income through resilience.

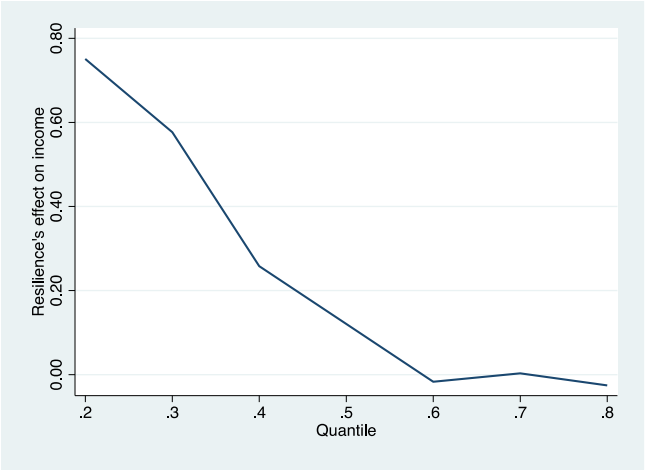

Fig. 4. Relationship between resilience and income at different quantiles of income distribution.

are worth discussion.

First, omitted variables. Respondents may have unobservable characteristics that influence both their experience of childhood adversities and adult resilience. Considering that our capture of childhood adversities covers quite comprehensive spheres of childhood environment, such unobservable characteristics may arise from inborn traits, such as genes. We have limited evidence that there are such specific inborn traits. Even if there were, those plausible factors may underestimate our effects. For example, those who were born more impulsive may receive more punishment from parents and at the same time may develop less resilience in adulthood. If that's the case and if the true effect is nil, we would observe a negative relationship between childhood adversities and resilience, not the positive effect we found for low to moderate adversities. To further ensure that omitted variables are not driving our results, we followed previous literature (e.g., Wang et al., 2021; Prakash & Kumar, 2021) and used Oster's (2019) tests. Oster's (2019) tests can calculate both the treatment effect assuming certain maximum R^2 and the effect of unobservables needed to drive the treatment effect to zero. Results of Oster's (2019) tests are shown in Table B.1 in Appendix B. We can see that first, the estimates (for both childhood adversity squared and resilience) in the bounded set are in the same direction as our main estimates and do not include zero, under the assumption that the maximum R^2 is 1.3 times the R^2 from the controlled model. Further, the effect of unobservables would have to be more than 12 and 18 times as important as the observables to bring the effects of childhood adversities and resilience down to zero. These tests indicate that the omitted variables are not likely driving our results.

Second, simultaneity. As we indicated previously, we used the first-wave income of entrepreneurs to ensure that we have a sufficient and representative sample of prime-age entrepreneurs to test our hypotheses. However, this may lead to simultaneity bias, as the independent variables and dependent variables are measured in the same wave. Hence, we conduct a robustness test in which we use the second-wave income of entrepreneurs (those who were entrepreneurs in the first wave and remained entrepreneurs in the second wave). Results are consistent, as shown in Table B.2 and B.3 in Appendix B.

Third, recall bias. Respondents may recall the occurrence of childhood events differently depending on their current condition. In particular, individuals who are more resilient may downplay the occurrence and intensity of childhood adversities. If so, then underestimation, rather than overestimation, is more likely. This issue has also been discussed as well in previous literature (e.g., Dube et al. 2003; Schafer et al., 2011), pointing to the lesser problem of recall bias using recall measures of childhood events.

Finally, selection bias. There could be sample selection bias with our examination of childhood adversities and entrepreneurs' career success—that is, whether individuals with childhood adversities are more or less likely to become entrepreneurs. There is reason to believe that individuals with more adverse childhood experiences due to impaired mental and physical health make entrepreneurship less likely. If this is the case, then those who become entrepreneurs have a higher likelihood of scoring high on unobserved abilities (other than resilience), making success more probable. The other side of the story is also possible. Due to the need to survive and the limited occupational choices in other areas, individuals with more adversities are likely to be pushed into entrepreneurship out of necessity, and these individuals may earn relatively lower income. Hence, it is important to test if such selection bias may exist. We hence test how childhood adversities would predict the probability of being self-employed vs. being an employee (Table B.4 in Appendix B). We find that at least within the MIDUS sample, we did not find influence of childhood adversities on entrepreneurial entry (coefficient = 0.041; $p > .1$), suggesting a limited selection effect (Certo et al., 2016).

5.2. Additional checks and analysis

We conducted several additional analyses to ensure the robustness of results. Results are shown in online Appendix C. The first check concerns model choice. Specifically, we test whether the mediation model or the moderation model of resilience would be more appropriate. Results (see Table C.1) indicate insignificant impact of the moderating role of resilience for entrepreneurs' career success, which suggests that validity of using the mediating model.

The second check concerns the measure of childhood adversities. In the main analyses, we dichotomized continuous adversity measures and created summed scores. As a robustness test, we standardized and then summed the adversity items. Results are similar to the main analyses (see Tables C.2 and C.3).

The third check concerns the relatively small sample size of our study, which may violate the assumptions of OLS regression. Hence, we conducted an additional analysis using the bootstrap standard errors. Results based on 1,000 bootstrap samples are robust (see Table C.4).

The fourth check concerns the conditional impact of resilience on career success. In addition to the quantile regression method we adopted, we reason that individuals high on resilience should respond better to exogeneous economic shocks. In MIDUS all respondents were surveyed around the year 1995, so we do not have financial crisis experienced by some entrepreneurs but not others. However, we are able to use industry variations in unemployment rate to proxy for the intensity of exogeneous economic shocks experienced by entrepreneurs. The severity of the shock to an industry is measured as the standardized change in the unemployment rate in the year 1995, a figure that has long been used to evaluate crises' effects on the macro environment and labor market (e.g., Forsythe et al., 2020). We match the MIDUS industry classifications with U.S. Bureau of Labor Statistics industry classifications and got the unemployment measure from U.S. Bureau of Labor Statistics as well. Using the severity of industry shock as the moderator, we conduct the additional analysis and find that, indeed, resilience shows a higher and significant correlation with career success in more adverse industries than in less adverse industries (see Table C.5).

Finally, we are interested in whether our results would generalize to different samples and different measures of resilience and career success, corresponding to the call by management and entrepreneurship scholars (e.g., Bettis et al., 2016; Van Witteloostuijn et al., 2018) for more replication and quasi-replication. We thus collaborated with Qualtrics, a leading survey and research company, and collected a second data source, coming from a survey distributed to entrepreneurs who are at least 18 years old, live in the United States, and own and manage their businesses. The Qualtrics sample differs from the MIDUS sample in several aspects: it covers a different sample of entrepreneurs in a more recent era; it measures childhood adversities using the revised inventory of Adverse Childhood Experiences (ACE) (Finkelhor, Shattuck, Turner, & Hamby, 2013, 2015); it measures resilience using a direct and established trait resilience scale (Campbell-Sills & Stein, 2007); and it covers a wider range of entrepreneurs' career success measures, including income earning, subjective career satisfaction (Greenhaus et al., 1990), and subjective venture performance (Wiklund & Shepherd, 2005). Results based on the Qualtrics sample are largely consistent with previous findings, and interested readers can refer to Appendix D, where we provide detailed descriptions of the sample, measures, and results.

6. Discussion

Anecdotal evidence suggests that childhood adversity may contribute to the success of entrepreneurs in adulthood (Fisher, 2019; Saner, 2018; Wilding, 2016). This contrasts with the dominant view of the negative consequences of adversity for career outcomes (Anda et al., 2004; Metzler et al., 2017; Shonkoff et al., 2012). To unravel this puzzle, we drew on the underdog framework of entrepreneurship (Miller & Le Breton-Miller, 2017) and the stress inoculation model (e.g., Rutter, 2006) and investigated why and how childhood adversities influence entrepreneurs' career success. Based on data from the MIDUS study and various robustness checks, we found that childhood adversity has an inverted U-shaped relationship with resilience, which positively predicts entrepreneurs' career success. We further found that the relationship between resilience and career success is generally more positive for less successful entrepreneurs than for their more successful counterparts. We discuss the theoretical and practical implications below.

6.1. Theoretical implications to the underdog approach of entrepreneurship

First, we join a small but growing literature (Cheng et al., 2021; Morgan, 2020; Saxena & Pandya, 2018) that builds on the underdog framework of entrepreneurship, which highlights the potential positive implications of negative personal circumstances. The explanation is that these negative characteristics, such as ADHD (Wiklund et al., 2016; Wiklund et al., 2017), dyslexia (Logan & Martin, 2012), impulsivity (Wiklund et al., 2017), and childhood adversities, create adaptive responses that fit with the characteristics of the entrepreneurship context, such as high uncertainty, risk, demanding creativity, fast decisions, and action (Verheul et al., 2015), thereby leading to positive entrepreneurial outcomes. However, among a myriad of potential negative experiences, it is surprising to find that limited attention has been given to childhood adversity (except for Cheng et al., 2021; Awaworyi Churchill et al., 2021; Zhao & Li, 2022), which is a strong environmental factor in the formative years with long-lasting impacts on individuals' development (Brent & Silverstein, 2013; Ferraro et al., 2016; Kessler et al., 1997; Kessler et al., 2010; McLaughlin et al., 2009). While Cheng et al. (2021)

found that famine experience, one form of childhood adversity, predicted entrepreneurial entry (becoming migrant entrepreneurs), the reason for this entry could be the underdog advantages. It could also be the lack of adherence to social norms or the lower social economic status result in difficulty getting suitable jobs (i.e., necessity entrepreneur). While not discounting these possibilities, we find that entrepreneurs who faced low to moderate childhood adversity are more resilient and subsequently more successful.

There is research showing that childhood adversity could be one of the root causes of developmental challenges, such as impulsive behaviors (Griskevicius et al., 2013) and ADHD (Lara et al., 2009), both of which have been suggested or shown to relate positively to entrepreneurial outcomes (Wiklund et al., 2018; Yu et al., 2018). Further, compared to negative traits such as ADHD and dyslexia, which occur in about 5% of the population (Czamara et al., 2013), the occurrence of childhood adversities is much higher, being around 38% to 39% in Kessler et al.'s (2010) cross-country study. Hence, together with recent findings on the positive link between childhood adversities and entrepreneurial entry (Cheng et al., 2021; Awaworyi Churchill et al., 2021), the first and foremost contribution of our study is to ignite research interest in and relevance of childhood adversities to entrepreneurship.

Second, an important understanding of the linkage between underdogs and entrepreneurship is to move beyond the simple direct relationships and establish core mechanisms and contingencies. This is especially important for the research tradition in the underdog framework of entrepreneurship for several reasons. First, different negative experiences may entail different mechanisms to entrepreneurship, as shown in Miller and Le Breton-Miller's (2017) framework. For example, while we argue resilience is a key pathway linking childhood adversities to entrepreneurial success, negative circumstances may create vulnerabilities that disrupt the entrepreneurial process (Zhao & Li, 2022), rendering the importance of examining multiple pathways, both positive and negative. For example, Wiklund et al. (2017) found that ADHD is conducive to entrepreneurship through sensation seeking and lack of premeditation, but, on the other hand, it is not conducive through urgency. Second, entrepreneurship is a heterogeneous phenomenon with different entrepreneurs, types of opportunities pursued, and stages of development. This necessitates conditional examination to see how advantages and disadvantages developed by negative experiences may pan out in entrepreneurship. Indeed, Miller and Le Breton-Miller's (2017) underdog framework of entrepreneurship not only proposes how life challenges can propel and enable entrepreneurship, but also suggests some conditional factors for this relationship, such as personal goals, personality factors, and environmental factors (e.g., government policies and environmental resources).

Our study is built with this spirit of pathway and contingency building in mind, hence contributing to more nuanced theory and empirical testing in the underdogs and entrepreneurship literature. We theoretically and empirically establish why childhood adversities could lead to resilience, and when resilience is an important success factor in the entrepreneurship context. We offer empirical evidence that resilience developed by overcoming adverse circumstances influences the career success of less-successful entrepreneurs more than that of more-successful entrepreneurs. Our explanation pertains to the levels of challenges and resources available in the business environment faced by these two types of entrepreneurs. Compared with more-successful entrepreneurs, less-successful entrepreneurs with lower employment income are likely less established (Singh, Tucker, & House, 1986; Uy, Sun, & Foo, 2017), have lower legitimacy, and face a more challenging business environment offering fewer external resources for entrepreneurs to navigate through hardships to perform well. Therefore, less-successful entrepreneurs need to rely more on their personal resources, such as resilience, which is most useful under circumstances of adversity, stress, and high control (Luthans et al., 2005; Parker et al., 2015). In contrast, more-successful entrepreneurs have more external resources to leverage, and therefore resilience is less needed to enhance their career success. Our explanation also resonates with the contextual view of management research generally and entrepreneurship research specifically (e.g., Acs & Audretsch, 2003), which argues that contexts create opportunities and constraints on the impact of individual behaviors.

There are two important issues to note. For one, although our theoretical model examines the mediating role of resilience only, we do not preclude other mechanisms (e.g., human capital, social capital, and risk attitude) (Cheng et al., 2021; Awaworyi Churchill et al., 2021) that could also be at play here. Our empirical model is focused on testing the resilience pathway fitting with our theoretical hypotheses. Second, we do not suggest that resilience is unimportant for more-successful entrepreneurs. Resilience is still crucial for more-successful entrepreneurs, as these entrepreneurs are likely to face challenges of running larger-scale businesses. Overall, our second theoretical contribution to the underdog framework of entrepreneurship is to advance the process and conditional view.

Third, although Miller and Le Breton-Miller's (2017) theoretical framework shows how traumatic experiences may lead to positive entrepreneurial outcomes, they do not delineate how varying levels of traumatic experiences may exert different effects. However, the stress inoculation model (e.g., Rutter, 2006) and childhood adversity research in psychology (e.g., Seery et al., 2010; Seery et al., 2013) suggest that only low to moderate levels of adversities can induce adaptive responses (e.g., resilience), whereas minimal or high levels of adversities may have only negative impact on individuals. Similarly, the literature on post-traumatic growth, the phenomenon of positive changes after experiencing stressful and life-challenging events (Tedeschi & Calhoun, 2004), also suggests an inverted U-shaped relationship between post-traumatic stress and post-traumatic growth (an adaptive outcome) in non-entrepreneurship contexts (Colville & Cream, 2009; Joseph, Murphy, & Regel, 2012; Kleim & Ehlers, 2009; Kunst, 2010; McCaslin et al., 2009). That is, a moderate level of post-traumatic stress leads to higher levels of post-traumatic growth, whereas a low level or a high level of post-traumatic stress relates to low post-traumatic growth. Therefore, our research further contributes to the underdog framework of entrepreneurship by extending the framework to consider the *nonlinear* implications of the severity of negative experiences or life challenges for entrepreneurial outcomes.

6.2. Theoretical implications for the entrepreneurship research on adversities

Our research also contributes to the emerging research on childhood adversities in the entrepreneurship context. Possibly due to the emergence nature of this stream of research, existing studies (Cheng et al., 2021; Awaworyi Churchill et al., 2021; Zhao & Li, 2022) focus on the entrepreneurial entry decision and do not expand fully into the entrepreneurial success or performance-related outcomes. Furthermore, these studies find contrasting results regarding whether childhood adversities would be positive or negative for entrepreneurship. Our research thus well extends the existing literature by examining success outcomes and helps resolve the debate by offering a nonlinear theoretical explanation and empirical evidence for why and how childhood adversities contribute to entrepreneurial success.

In addition, childhood adversities come in various forms. War and famine, examined in recent studies (Cheng et al., 2021; Awaworyi Churchill et al., 2021), are two special types that may be experienced by people in certain regions/countries and/or at certain times only. Other types of childhood adversities, such as parental divorce, abuse, physical and mental health issues, and family financial status (Hill et al., 2018; Kessler et al., 1997), are experienced by more people in their daily lives. By measuring childhood adversities using a comprehensive list and demonstrating its impact on entrepreneurs' career success, our research extends prior studies focusing only on very special types of childhood adversities (Cheng et al., 2021; Awaworyi Churchill et al., 2021) and

joins a recent study (Zhao & Li, 2022) and research on the broader role of family (e.g., family support, family role models, and family relationships) in the entrepreneurial process (Aldrich & Cliff, 2003; Hahn, Minola, Bosio, & Cassia, 2020; Pittino, Visintin, & Lauto, 2018; Sieger & Minola, 2016).

We determined career success using the entrepreneurs' income comprising the salary and other stipends entrepreneurs reported as coming from their occupation. We recognize that this measure does not fully capture the capital appreciation of the business. However, the seminal study by Hamilton (2000) found that for the majority of entrepreneurs, salary (or "draw," as Hamilton called it) is the major source of entrepreneurs' earnings, and capital appreciation belongs to those "superstars." Entrepreneurial success, however, is multidimensional and reflected not only in income but also in firm performance, such as profit. Hamilton (2000) also discussed this and suggested that the profit or net income reported often understates the profits due to tax considerations, and salary ("draw") "is less likely to be influenced by tax considerations. Draw may be thought of as the amount of consumption the business generates for its owner" (pp. 610–611). Moreover, recent entrepreneurship studies have used personal income of entrepreneurs as the performance measure (e.g., Shane & Nicolaou, 2013; Wolfe & Patel, 2018), and Van der Sluis, Van Praag, and Vijverberg (2005)'s *meta*-analysis of entrepreneurial performance found that a significant percentage (54%) of studies use self-employment earnings as the performance metrics. Despite these points, future studies may include other forms of success for the entrepreneur, including those of capital appreciation, firm size, survival, growth, financial success, and subjective success (Zhao et al., 2021).

Beyond entrepreneurship, our study also enriches childhood adversity research in the developmental psychology area (Hill et al., 2018; Kessler et al., 1997; Kessler et al., 2010). The link between childhood adversity and career performance still remains largely negative in psychology research (e.g., Anda et al., 2004; Metzler et al., 2017). A limited number of studies (e.g., Howells & Fletcher, 2015; Sarkar, Fletcher, & Brown, 2015) have explored the positive role of adversities (both childhood-related and non-related) in career performance, but they focus on an athletic situation, without theoretically and empirically delineating the mechanisms and boundary conditions in the broader occupational context. Our study thus extends this body of literature and paints a more complete picture by showing the enhancing effect of childhood adversity on career success via resilience in entrepreneurship, and how this relationship may differ for individuals in the varying quantiles of the success distribution.

Another theoretical implication of our work is for resilience and psychological capital research. Entrepreneurship scholars have generally focused on the positive effects of resilience—for example, resilience enhances entrepreneurial success (Ayala & Manzano, 2014; Bullough et al., 2014; Fisher et al., 2016; Markman & Baron, 2003). We not only offer additional empirical evidence to support prior research but also extend our understanding of resilience as a psychological resource by showing a boundary condition for it to have positive influence.

6.3. Practical implications

Practically, because resilience is a valuable capacity that enables individuals to work in stressful environments (e.g., entrepreneurship) to achieve career success, parents and career advisers who identify individuals demonstrating this resilient capacity can suggest them to consider career options such as being an entrepreneur. Communities and policy makers can also organize various support, skill development, and health behavior programs to foster children's resilience, which potentially can contribute to their future career success in entrepreneurship, which is characterized by high uncertainty, complexity, and stress. At the same time, training on the nature, process, demands, and advantages of entrepreneurship can also be provided to individuals who have experienced moderate levels of childhood adversity to help them develop a better knowledge of entrepreneurship, which may become a career option for them.

6.4. Limitations and future research

Our research has several limitations, which offer opportunities for future research. First, we only examine resilience as the mediator for the relationship between childhood adversities and career success. There are other potential mediators that future research can investigate, such as self-reliance, self-exploration, and resourcefulness (Cheng et al., 2021; Awaworyi Churchill et al., 2021), and individuals' personality development (Rosenman & Rodgers, 2006). Second, we have examined personal income in the MIDUS data and subjective satisfaction and venture performance in the additional study. However, entrepreneurs' career success is multidimensional. Future studies can explore the influence of childhood adversity and resilience (and/or other mediators) on other dependent variables—for example, entrepreneurial well-being and persistence. Third, though our results show that the relationship between resilience and career success is stronger for less-successful entrepreneurs, we could not empirically confirm whether these entrepreneurs have fewer resources or face more challenging business environments than more-successful entrepreneurs. Future research can use more nuanced measures to reflect this, such as organizational slack, to test our model. Resilience could also be more helpful for nascent entrepreneurs as the early stages of venture creation usually involve more uncertainty and resource limitation. Fourth, since the measures were self-reported, measurement errors, such as under- or over-reporting, cannot be completely avoided. Finally, we acknowledge the potential endogeneity problems in our identification strategy. While we tried to discuss and address potential sources of endogeneity in our paper, the common childhood adverse experience could hardly be exogenously assigned and then tracked over time. Thus, our findings need to be considered in view of this limitation. A possible solution is to look at identical twins who are raised apart from each other. Thus, we call for future research to consider this approach.

CRediT authorship contribution statement

Wei Yu: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Fei Zhu:** Writing – review & editing, Writing – original draft, Investigation. **Maw Der Foo:** Writing – review & editing, Writing – original draft. **Johan Wiklund:** Writing – review & editing, Writing – original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2022.06.035.

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