

S Y M P O S I U M

DEPRESSION AND ENTREPRENEURIAL EXIT

JOLANDA HESSELS
CORNELIUS A. RIETVELD
Erasmus University Rotterdam

A. ROY THURIK
Montpellier Business School (Labex Entreprendre)

PETER VAN DER ZWAN
Leiden University

Entrepreneurs frequently work in highly unpredictable environments and are involved in a wide variety of tasks for which they are often ill prepared. Good mental health is of utmost importance to adequately manage the challenges, adversity, and stressors that come with running a business. However, little is known about how mental health affects entrepreneurs and the performance of their businesses. Drawing on the literature of personality and entrepreneurial exit as well as on evidence from large-scale survey data on the relation between depression and entrepreneurial exit, we show that there is ample opportunity for research investigating the relation between mental health and entrepreneurship. Five directions for future research on this topic are highlighted.

Numerous studies have investigated the detrimental effects of mental illness in the workplace (Danna & Griffin, 1999; Grant, Christianson, & Price, 2007; Spell & Arnold, 2007). Mental health problems can, for example, reduce employees' performance at work and increase job absenteeism. Given these

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either DSS or the Melbourne Institute. C. A. Rietveld acknowledges funding from the Netherlands Organisation for Scientific Research (NWO Veni grant 016.165.004). The present study is done as part of the initiatives of the Erasmus University Rotterdam Institute of Behavior and Biology. We would like to thank Phillip Phan, Joern Block, participants of the Entrepreneurs' Mental Health Workshop at Syracuse University (October 2016), and two anonymous reviewers for valuable comments on earlier versions of this paper.

potential negative outcomes, large organizations are increasingly devoting attention to the mental health of their employees through specific programs, training, services, and awareness campaigns (Holmes, 2016; Utley, 2017). Thus far, however, little is known about the consequences of mental illness for entrepreneurs, despite the importance of entrepreneurs for establishing and running new organizations (Gartner, 1988; Hitt, Ireland, Sirmon, & Trahms, 2011; Torrès, 2012) and their unique position at the top of organizational hierarchies (Benz & Frey, 2008).

Entrepreneurs frequently work in highly unpredictable environments and are involved in a wide variety of tasks for which they are not always well prepared (Baron, 2008). Good mental health is of utmost importance to adequately handle challenges, adversity, and stressors as well as to accomplish their goal of running a successful business. Entrepreneurs play an important role in the economy as job creators and innovators (Audretsch & Thurik, 2001), and their job-creating role will become more important as automatization and robotization increasingly put pressure on traditional jobs (Thurik, Audretsch, & Stam, 2013). This makes

the maintenance and promotion of good (mental) health among entrepreneurs a high priority for society.

In this paper, we focus on the effect depression may have on entrepreneurial exit, while considering the role of personality in this relationship.

Entrepreneurial exit is an important part of the entrepreneurial process and a common phenomenon since entrepreneurs will exit the firm they helped to create at some point in time (DeTienne & Cardon, 2012). Entrepreneurial exit, then, can be defined as “the process by which the founders of privately held firms leave the firm they helped to create; thereby removing themselves, in varying degree, from the primary ownership and decision-making structure of the firm” (DeTienne, 2010, p. 203). Following this definition, we identify an entrepreneurial exit as individuals leaving the firm that they helped to create and subsequently attaining either a new labor market position or a position outside of the labor force. Unsurprisingly, a growing number of studies focus on the phenomenon of entrepreneurial exit: Knowledge about how and why people exit entrepreneurship provides insight into realization of the economic benefits of entrepreneurship (Patel & Thatcher, 2014; Raffiee & Feng, 2014). However, the role of mental health, specifically depression, in the process of entrepreneurial exit is underexplored.

This is a particularly important oversight given the prevalence of depression. In fact, depression is the most prevalent mental disorder: Globally, an estimated 350 million people suffer from it (World Health Organization, 2016). The one-year prevalence rate of depression is approximately 7% in the United States (National Institute of Mental Health, 2017). Depression is a form of mental illness characterized by symptoms such as negative emotions (such as sadness, loss of pleasure, low feelings of self-worth), poor physical functioning (such as fatigue, lack of appetite), and reduced cognitive abilities (such as difficulties with concentration and memory). It is known to have an adverse impact on several aspects of life, including an individual’s capability to function at work.¹

To explain how suffering from depression may lead to entrepreneurial exit, we turn to self-efficacy theory (Maddux, 1995). Self-efficacy refers to a person’s

beliefs in his/her ability to organize and effectively accomplish tasks to achieve goals (Bandura, 2001) and is positively associated with business performance (Rauch & Frese, 2007). Self-efficacy theory provides a framework to explain how adverse personal circumstances, such as depression, may reduce self-efficacy and, ultimately, negatively impact persistence in entrepreneurship, thus inducing an exit.

More specifically, a depression may lower self-efficacy by adversely affecting entrepreneurs’ functioning. The reduced social, physical, and cognitive functioning of depression hampers adequate execution of tasks, which may be detrimental to entrepreneurial performance (Cella, Dymond, & Cooper, 2010; Leykin, Roberts, & DeRubeis, 2011; Must, Horvath, Nemeth, & Janka, 2013) and eventually lead to a cessation of entrepreneurial activities. Moreover, the reduced functioning in entrepreneurship and the entrepreneurs’ deteriorated *beliefs* about their functioning that result from depression could result in exit from entrepreneurship. Earlier literature relates depression to such reduced beliefs (lower levels of self-efficacy; Lewinsohn & Hoberman, 1982; Maddux, 2009). Given that high levels of self-efficacy are associated with positive entrepreneurial outcomes (Rauch & Frese, 2007), we contend that depression may lead to withdrawal from business operation, either voluntarily or involuntarily, through reduced levels of self-efficacy.

The value of research on mental health and exit extends beyond the mere prediction of entrepreneurial exits for at least two reasons. First, an exit has consequences for individual entrepreneurs, firms, industries, and the economy as a whole (DeTienne, 2010), while mental health problems can adversely affect value creation through exit. For entrepreneurs, an exit provides an important opportunity to “harvest” value from their businesses. In the harvest, entrepreneurs liquidate their investment, for example, by selling the business to another entrepreneur. A substantial share of entrepreneurs have an exit strategy (DeTienne & Cardon, 2012), but it is evident that not every entrepreneur is able to take (substantial) value from an exit, especially when an exit is not completed as planned. For example, this includes the case when a flourishing business falls into financial distress before the harvest. Mental health problems may make it increasingly difficult for entrepreneurs to adequately assess their own managerial ability, the significance of competing products, or market sentiments, as well as to find suitable candidates to buy or take over the firm. Hence, mental health problems may negatively influence

¹ A recent study calculates that depression in the United States costs society \$210 billion per year, which includes costs due to reduced workplace productivity (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015).

the value created by an exit, which has consequences for different actors in the economy. Research on the relationship between mental health and exit has the potential to find ways to recover this value.

Second, it is well known that entrepreneurs who exit often re-enter as entrepreneurs (Hessels, Grilo, Thurik, & Van der Zwan, 2011; Nielsen & Sarasvathy, 2016). Re-entry after exit is common because the entrepreneurial process involves learning in all of its stages, including the exit stage (Minniti & Bygrave, 2001). Learning from exit is focused on the future, enhancing, for example, the amount of preparation for new entrepreneurial endeavors (Cope, 2011). Such learning throughout all stages helps entrepreneurs improve their entrepreneurial abilities. Mental health problems, however, may hamper such learning, including learning from exit, with the potential to impede re-entry or, if re-entry does occur, to result in lower entrepreneurial quality than would have been the case in the absence of such mental health problems. In this setting, research on the relation between mental health and exit has the potential to find ways to improve the process of “entrepreneurial recycling” (Mason & Harrison, 2006).

This article provides early evidence on the relation between depression and entrepreneurial exit using large-scale survey data. Analyzing the connection between depression, the most prevalent mental disorder, and entrepreneurial exit, an important element of the entrepreneurial process, provides a meaningful example of the interplay between (mental) health and entrepreneurship. Moreover, this article proposes five avenues for future research on this topic.

HEALTH AND ENTREPRENEURSHIP

In this section, we review research that offers insight into the role of health in the entrepreneurial context. First, we illustrate that entrepreneurs are generally healthier than wage workers and provide possible explanations for this based on existing literature. Then, we highlight the literature on the role of health in the performance of entrepreneurs and their businesses, which provided the motivation for our research.

The Health of Entrepreneurs Versus the Health of Wage Workers

Working as an entrepreneur differs from working as a salaried employee in many ways. Being healthy is particularly important for entrepreneurs because entrepreneurship is associated with uncertainty and

challenges that the entrepreneur must handle while accomplishing the personally relevant goal of building a successful business. The work environment for employees is more predictable and less challenging, as they usually need to accept organizational hierarchies, follow instructions from superiors, and adjust their behavior to the prevailing organizational culture (Patzelt & Shepherd, 2011). Entrepreneurs often work long hours (Hyytinen & Ruuskanen, 2007) and perform a broad range of tasks to start and operate their business (Lazear, 2005). For example, they need to gather financial and other resources to start or grow their business, conduct strategic and financial business planning, and undertake efforts to promote the sales of their products or services. Such characteristics, which differentiate the career of an entrepreneur from that of an employee, have motivated researchers to investigate the relationship between health and entrepreneurship. Empirical findings suggest that good health is practically a precondition to adequately handle entrepreneurial tasks and challenges, and thus for successful entrepreneurship (Gielnik, Zacher, & Frese, 2012; Rietveld, Van Kippersluis, & Thurik, 2015).

The importance of health, as a combination of physical and mental health, for entrepreneurship is evidenced by an emerging set of studies showing that entrepreneurs are generally healthier than wage workers (Rietveld et al., 2015; Toivanen, Griep, Mellner, Vinberg, & Eloranta, 2016). Entrepreneurs also perceive less work-related stress (Hessels, Rietveld, & Van der Zwan, 2017) and life stress (Baron, Franklin, & Hmieleski, 2016) than do wage workers. The main reason for the better health of entrepreneurs is that healthier individuals are more likely to select into entrepreneurship (Rietveld et al., 2015). In further support of the existence of this selection mechanism, in a sample of non-entrepreneurs (wage workers), Rietveld, Bailey, Hessels, and Van der Zwan (2016) found that better health is associated with a number of subjective beliefs that are known to increase chances of becoming an entrepreneur, such as a high self-belief in having the skills to run a business, a strong recognition of start-up business opportunities, and a low fear of potential business failure. It is also more difficult for less healthy (potential) entrepreneurs to obtain the necessary financial capital to start their business (Beck & Demirgüç-Kunt, 2006). Compared to wage work, income in entrepreneurship hinges much more on the individual's ability to work; thus, considerations about the long working hours, the increased

difficulty of accomplishing the tasks that running a business involves, and costly health insurance for entrepreneurs may cause less healthy individuals to abstain from an entrepreneurial career (Yoon & Bernell, 2013).

Entrepreneurs are generally in better health than wage workers, but entrepreneurship may also be a suitable career choice for some individuals with health issues (Shepherd & Patzelt, 2017). Some individuals simply do not have alternative employment options and need to run their own business to be active in the labor force. However, the increased flexibility of entrepreneurship compared to wage work, such as when and where to perform work (Benz & Frey, 2008; Prottas & Thompson, 2006), may also offer individuals suffering from health problems the possibility to not work during the hours they do not feel well and to plan their work around doctor visits. Thus, although the tasks and challenges of entrepreneurship generally require good health, the flexibility of entrepreneurship may facilitate participation in the labor market by individuals who suffer from certain health-related problems.

The Role of Health in the Performance of Entrepreneurs

Moving beyond research on health differences between entrepreneurs and wage workers, recent work has started to focus on the role of health in the performance of entrepreneurs and their ventures. Gielnik and colleagues (2012) showed that better mental health positively affects the ability to focus on venture opportunities among business owners. This corresponds with the finding of Rietveld and colleagues (2016) that the healthiest business owners run the companies with the highest growth expectations. Because growth expectations predict actual growth (Cassar & Gibson, 2007; Delmar & Wiklund, 2008), this can be interpreted as evidence that healthy entrepreneurs transform their input into growth-enhancing, rather than unproductive, entrepreneurial activities.

Although the studies in this domain are still limited, the findings suggest that when entrepreneurs encounter health problems, it is likely to impede their entrepreneurial performance and to be detrimental for the performance of their businesses. Health problems may eventually result in an exit from entrepreneurship, an area of research that we explore in detail below. First, we focus on the literature about entrepreneurial exit, after which we dig into the relationship between mental health, specifically depression, and entrepreneurial exit.

ENTREPRENEURIAL EXIT

Entrepreneurs exit both from firms that are in financial trouble and from those that are performing well (Wennberg, Wiklund, DeTienne, & Cardon, 2010). Thus, entrepreneurial exit is not the same as failure. In 2016, the most frequently mentioned motive for entrepreneurs worldwide to exit was that their business was unprofitable, followed by personal reasons, which might involve health problem (Global Entrepreneurship Monitor, 2017). Exit is also an important part of the entrepreneurial process, as it provides an important opportunity to liquidate the value of the business (DeTienne, 2010). Despite its importance, there is a paucity of research compared to that on entrepreneurial entry.

The literature that does exist on entrepreneurial exit primarily focuses on firm-level determinants of entrepreneurial exit and notes negative associations between exit and firm size and firm age. Notably, individual characteristics also play an important role in explaining entrepreneurial exit (Cefis & Marsili, 2005; Van Gelderen, Thurik, & Pankaj, 2011). Prior research also concentrates on human capital aspects, such as the entrepreneur's level of education, age, and entrepreneurial experience (Wennberg et al., 2010). Human capital generally inhibits exit from entrepreneurship. Parker (2009) concluded that "the entrepreneur's education, age, and duration in entrepreneurship are the major determinants of survival at the individual level" (p. 393). Additionally, hybrid entrepreneurship is shown to be a popular career path, with individuals starting a business while having a wage job, and it appears that a staged entry (from hybrid entrepreneurship to full-time entrepreneurship) positively affects survival rates (Raffiee & Feng, 2014). A limited number of studies have analyzed entrepreneurial exit from a personality perspective (Caliendo, Fossen, & Kritikos, 2014; Ciavarella, Buchholtz, Riordan, Gatewood, & Stokes, 2004; Stam, Thurik, & Van der Zwan, 2010; Zhao, Seibert, & Lumpkin, 2010), but research has not yet addressed mental health (depression).

In the next sections, we discuss the expected link between depression and entrepreneurial exit, focusing on the role of personality and, in particular, of self-efficacy in this relationship. Because high levels of self-efficacy are related to positive entrepreneurial outcomes (Rauch & Frese, 2007) and depression is related to lower levels of self-efficacy (Lewinsohn & Hoberman, 1982; Maddux, 2009), we argue that

decreased self-efficacy is a potential channel through which depression may lead to an exit from entrepreneurship.

DEPRESSION AND ENTREPRENEURIAL EXIT

Few prior studies have focused specifically on depression in the context of entrepreneurship. Corresponding to the findings of better general health for entrepreneurs, sparse evidence from prior studies supports the notion that individuals with depressive symptoms are less likely to become entrepreneurs. Bradley and Roberts (2004) found that individuals suffering from depression are less likely to be entrepreneurs, although this applies only to short-term (not long-term) depression. And Lange (2012) observed that depressed men are less likely to be entrepreneurs and that there is no such association for women. Rietveld and colleagues (2015) found that the chances to be an entrepreneur are lower for individuals who suffer from mental health issues, although this relation is not significant once demographic and job characteristics are taken into account.

Studies show that depression among employees reduces performance and functioning at work (Berndt et al., 1998; Ettner, Frank, & Kessler, 1997; Murray & Lopez, 1996; Price, Choi, & Vinokur, 2002). Specifically, depression reduces working hours and earnings, while also increasing the likelihood of unemployment (Ettner, Frank, & Kessler, 1997; Hamilton, Hoffman, Broman, & Rauma, 1993). The reduced cognitive, physical, and social functioning that results from depression (Berndt et al., 2000) and the lower level of educational attainment of depressed persons (Berndt et al., 2000; Fletcher, 2008, 2010) could be detrimental to the performance of entrepreneurs for several reasons. First, entrepreneurs operate in an environment that is complex and uncertain (Baron, 2008). In such an environment, mental health is of utmost importance to adequately handle challenges, adversity, and stressors while working toward accomplishing the (personally relevant) goal of having a successful business or achieving a high level of work satisfaction. Entrepreneurship is associated with long working hours (Hyytinen & Ruuskanen, 2007) and a broad range of tasks (Lazear, 2005). Long working hours are often challenging for those suffering from depression because depression can manifest itself in reduced physical functioning.

Second, as entrepreneurship requires a large degree of personal involvement and effort,

entrepreneurs are usually highly dedicated and psychologically attached to their business (Failla, Melillo, & Reichstein, 2017; Pierce, Kostova, & Dirks, 2001). Often, they have invested personal money in their business, realize their own ideas in it, and aim to derive personal financial and non-financial gains, such as prestige and reputation, that result from running their businesses successfully. Entrepreneurship provides an individual challenge to start, organize, and manage a business, which requires the individual to take personal responsibility (Segal, Borgia, & Schoenfeld, 2002). It is highly relevant to the entrepreneur to achieve the goals of the business, as it will have personal implications should it fail. Depressed individuals are likely to be more pessimistic when confronted with demanding entrepreneurial situations and more likely to take such events more personally (Alloy & Ahrens, 1987).

Third, there is ample evidence of the relationship between mental health and suboptimal decision making (Cella et al., 2010; Leykin et al., 2011; Must et al., 2013). It is likely to be more difficult for individuals who suffer from depression to accomplish tasks and challenges associated with entrepreneurship than for those who do not suffer from depression. For example, poor mental health negatively influences executive functions such as planning and problem solving (Naismith et al., 2003), inhibition and semantic fluency (Gohier et al., 2009; Ravnkilde et al., 2002), and decision making and various aspects of memory processes (Rose & Ebmeier, 2006; Tavares et al., 2007).

Fourth, relatively low social security coverage (Hessels, van Stel, Brouwer, & Wennekers, 2007) and the lack of employer-provided health insurance (Fairlie et al., 2011; Hamilton, 2000) for entrepreneurs make entrepreneurship unattractive for individuals suffering from depression. Although an entrepreneurial career may offer a solution for some of those suffering from depression to remain actively working, for example because of the flexibility regarding when to work, such endeavors are likely to be the exception rather than the rule.

Suffering from a depressive disorder is likely to form a barrier to functioning well in entrepreneurship. Eventually, (in)voluntary exit may become a realistic scenario. It may be voluntary when the entrepreneur makes the conscious decision that staying in entrepreneurship is no longer meaningful. It may be involuntary if stakeholders make the entrepreneur abandon the business due to the consequences of the entrepreneur's illness.

THE ROLE OF PERSONALITY

Depression is closely related to one's personality. Personality traits matter for different phases of entrepreneurship, such as business intentions, business creation, and business success (Brandstätter, 2011; Rauch & Frese, 2007; Zhao & Seibert, 2006). Self-efficacy, i.e., self-belief in one's competence to successfully accomplish a task to achieve certain goals (Bandura, 1997), is a personality characteristic that is important in this respect. Judgments of self-efficacy differ between depressed individuals and those who are not: Depressed individuals indicate lower self-efficacy than individuals who are not (Kanfer & Zeiss, 1983). Self-efficacy may develop or change over time, and depression may impact one's self-efficacy (Gecas, 1989). Depression leads to reductions in judgments of self-efficacy (Lewinsohn & Hoberman, 1982) and may change how people see and evaluate themselves in a negative way, as one of the symptoms of depression is low self-efficacy (Maddux, 2009).

Self-efficacy theory proposes that one's beliefs of whether one is able to accomplish certain tasks or behaviors affects whether one continues with these tasks or behaviors (Maddux, 1995). Self-efficacy concerns the belief that one can effectively handle changing and challenging situations. The work situation for entrepreneurs is likely to be uncertain. Entrepreneurship involves dealing with changing and challenging situations (not the execution of well-defined tasks). In the context of entrepreneurship, self-efficacy theory implies that confidence in whether one has the skills to cope capably with the challenges and demands of entrepreneurship determines survival in entrepreneurship. Self-efficacy helps in achieving personal goals (Bandura, 1997). People with low self-efficacy are likely to see challenging tasks as threats that they need to avoid (Margolis & McCabe, 2006). Individuals with a high degree of self-efficacy will exert effort to meet their commitments and persevere in tasks even in the face of obstacles. They blame the failure to succeed on factors that they control rather than on external conditions (Bandura, 1994). Confidence in one's ability to successfully fulfill tasks is required for entrepreneurs. Self-belief is needed to give customers confidence in one's products while marketing and selling them. If this self-belief deteriorates, it becomes more challenging to remain active in entrepreneurship. Thus, low self-efficacy is likely to increase exits from entrepreneurship. However, self-efficacy has not yet been investigated with respect

to exit from entrepreneurship. Because depression is likely to lower self-efficacy, it can be proposed that self-efficacy is a specific mechanism through which depression leads to exit from entrepreneurship. Thus, depression-induced changes in self-efficacy are likely to result in exit from entrepreneurship.

ILLUSTRATIVE ANALYSIS

For illustration, we analyze the relationship between depression, entrepreneurial exit, and the role of self-efficacy using a large-scale survey. For this purpose, we employ data from the Household, Income and Labor Dynamics in Australia (HILDA) survey covering 2001 to 2013. The sample is representative of the Australian population. Entrepreneurship is operationalized in terms of self-employment (see also Patel & Thatcher, 2014). Depression is measured using the five-item Mental Health Inventory (MHI) (see Appendix). We focus on self-employed individuals and identify an exit from self-employment when an individual *ends self-employment and switches to* wage work, unemployment (seeking a job), a position out of the labor force, or another self-employment job. We are able to distinguish between six exit routes in total, because we also exploit information about whether people are seeking work or not, and some reasons for switching to a position outside of the labor force. Hence, the exit routes are as follows: 1) exit to wage work (seeking work); 2) exit to wage work (not seeking work); 3) exit to unemployment; 4) exit outside labor force due to illness; 5) exit outside labor force due to voluntary reasons; and 6) exit to self-employment.

There are 2,496 instances of entrepreneurial exit in the data, of which 1,433 relate to a switch to wage work (226 currently seeking work while in wage work; 1,207 not seeking work while in wage work); 102 to a switch to unemployment; 87 to a switch outside the labor force due to illness; 678 to a switch outside the labor force for voluntary reasons; and 196 to a switch to a new job in self-employment. There are 12,293 cases in our analysis sample for which no exit from self-employment is recorded (survival). A summary of the results of our empirical analysis follows, and details about the sample, measures, and regression results are provided in the Appendix.

The regression analysis reveals that depression is significantly and positively related to the probability of exiting entrepreneurship: A one-unit increase in depression (measured between 0 and 10) increases the probability of entrepreneurial exit by

1.1 percentage points. This is a considerable change given that the probability of experiencing an exit is only 17%. Further analyses reveal that this association is driven by a relatively strong relationship between depression and exiting to wage work (and seeking work while having a job), unemployment, and a position outside the labor force (for involuntary reasons). The relation between depression and exiting to wage work (and not seeking work while in wage work) and a position outside the labor force (for voluntary reasons) is also significant but relatively weaker. As expected, we do not find a significant relationship between depression and exiting to a new self-employed position. Overall, we find that depression is positively related to an exit from self-employment, and this relationship seems to hold for the more involuntary exit paths. Importantly, 32% of the relationship between depression and exit is mediated by self-efficacy. Hence, our findings for self-efficacy are consistent with our idea that reduced self-efficacy is a mechanism through which depression results in entrepreneurial exit.

DIRECTIONS FOR FUTURE RESEARCH

Although the empirical findings in the previous paragraph highlight some noteworthy aspects of the relationship between mental health and entrepreneurship, clearly more systematic research on this relationship is warranted. In this section, we propose five research directions to advance our knowledge of this topic.

Selection Issues

The first area requiring further attention is the selection into entrepreneurship based on mental health. The general perception is that good mental health is a precondition to adequately handle entrepreneurial tasks and challenges (Gielnik et al., 2012; Rietveld et al., 2015). Moreover, reduced social security and health insurance coverage for entrepreneurs may cause mentally ill individuals to refrain from entrepreneurship. However, entrepreneurship may be a suitable career choice for some individuals with mental health issues (Shepherd & Patzelt, 2017). Those who suffer from mental health issues could perceive entrepreneurship as an attractive career option given the high level of flexibility and decision autonomy that is associated with entrepreneurship (Benz & Frey, 2008; Hamilton, 2000; Hundley 2001; Parasuraman & Simmers, 2001). In addition, the options to obtain a position in wage

work may be more limited for those with depressive disorder symptoms (e.g., because they function less well in wage work than those who do not suffer from depressive disorders), which may encourage some individuals suffering from depression to become entrepreneurs. Moreover, certain types of depression and creativity are related (Baas, Nijstad, Boot, & De Dreu, 2016). As the creation of novel and useful ideas is central to many forms of entrepreneurship (Ward, 2004), a relevant issue to consider is how society can better take advantage of the creativity of depressed people for entrepreneurship (or business in general), for example as an input for new business ideas. Hence, insight is needed into the conditions under which entrepreneurship can be a suitable labor market option for people suffering from mental health issues and to what extent there is a person-environment fit (Kristof-Brown, Zimmerman, & Johnson, 2005) between mentally ill individuals and entrepreneurship.

Decision Making and Performance

Within the entrepreneurial context, we need to better understand how mental health affects entrepreneurial decision making and performance. This is the second direction for future research, and the analysis presented in the previous section fits in this area. Our study indicates that self-efficacy is one mechanism through which depression results in an exit from entrepreneurship. Future studies can further analyze the role of self-efficacy and look at other personality traits of entrepreneurs that correlate with business success and that could change as a result of a depression, such as the need for achievement and autonomy, as well as stress tolerance, innovativeness, and proactiveness (Rauch & Frese, 2007). These psychological mechanisms are closely linked to cognitive processes. Mental health issues are known to distort rational decision making; thus, future research on the relation between mental health and entrepreneurial performance may focus on cognitive biases, such as biased attention, biased processing, and biased memory (Disner, Beevers, Haigh, & Beck, 2011). In this respect, our finding that depression may lead to exit could be linked to the emotive approach to entrepreneurial exit (Khelil, 2016), which emphasizes the role of psychological factors in determining exit (Patel & Thatcher, 2014). According to discrepancy theory, entrepreneurial exit depends on the entrepreneur's satisfaction level, which is determined by the gap between the firm's performance level and the individual's monetary goals, nonmonetary goals, and

expectations (Cooper & Artz, 1995; Gimeno, Folta, Cooper, & Woo, 1997). Entrepreneurs suffering from depressive disorder symptoms could be more negative about their ability to achieve initial goals or expectations than they should be objectively, thus influencing the exit decision. However, the exit decision can also be a rational economic choice. Apart from these psychological and cognitive explanations, the link between mental illness and reduced physical strength and its consequences (such as a reduced capacity to exert effort and increased difficulty of obtaining financing) should be considered part of this research direction.

Organizational Context

The organizational context in which entrepreneurs operate is the third direction for future research. While some entrepreneurs work completely on their own, others have employees or work in teams (Hundley, 2001). Upper echelon theory explains that organizational outcomes are partially predicted by managerial background characteristics (Hambrick & Mason, 1984), and it may be expected that small organizations suffer more from mentally ill entrepreneurs than larger organizations in which some tasks can be handled (temporally) by other people in the organization. We need research on how the mental health condition of the owner–manager interacts with firm-level and other characteristics, including firm age, firm size, and industry aspects, to obtain a fuller picture of how mental health influences business performance. For example, with increasing firm age, experience with adverse situations could increase, thereby decreasing the negative performance effects of an entrepreneur’s unfavorable mental health condition. With increasing firm size, interventions of other leading personnel could have a similar effect. On the other hand, fierce industry competition could exacerbate the harmful effect of an owner–manager’s poor mental health condition on business performance.

Exogeneity of Mental Health in Entrepreneurship

The fourth direction for future research concerns the exogeneity of mental health in entrepreneurship. In the title of one of the first studies on the relation between entrepreneurship and health, Buttner (1992) posed the intriguing question “Entrepreneurial stress: Is it hazardous to your health?” There is also some empirical evidence that features of the entrepreneurial process affect whether one becomes

depressed or not (Buttner, 1992; Dahl, 2011; Jamal, 1997; Lewin-Epstein & Yuchtman-Yaar, 1991; Parslow et al., 2004; Yoon & Bernell, 2013). Moreover, exiting from entrepreneurship for involuntary reasons (or experiencing financial difficulties) could be related to an increase in depression in subsequent periods (see also Singh, Corner, & Pavlovich, 2007). This raises doubt about the possibility of treating mental health as purely exogenous information in the relation between mental health and entrepreneurship. It could be argued that features such as the challenges and demands of entrepreneurship may contribute to developing mental health problems, whereas decision authority and entrepreneurial success may counter these negative effects (Hessels et al., 2017; Rietveld et al., 2015). The demands and challenges encountered are highly likely to vary between different types of entrepreneurs (Wennberg & De Tienne, 2014)—these are, for example, higher for high-growth entrepreneurs than for so-called lifestyle entrepreneurs, who just want to make enough money to be able to uphold a certain way of living (Bhide, 1996)—making it relevant to distinguish different entrepreneurial types as part of this future research stream. Theoretical perspectives, such as the job demand–control model, the job demand–control–support model (Karasek, 1979; Van der Doef & Maes, 1999), and others, should be applied in future research to adequately investigate the two-way relationship between mental health and entrepreneurship. We recommend that future studies use a longitudinal design to measure mental health and entrepreneurial status at various moments across time. In this way, one can distinguish between an effect of mental health on entrepreneurship and an effect of entrepreneurship on mental health, thus determining the dominating effect. We acknowledge that establishing causal relationships will be very difficult in this research area, but more relaxed estimations of causality (such as Granger causality) may be possible to achieve. See Rietveld and colleagues (2015) for such an estimation.

Policies and Training Programs

Finally, there is clearly scope for developing specific policies and training programs to tackle the adverse effects of mental health on entrepreneurship. In this fifth direction of future research, the effectiveness of training or support programs to help entrepreneurs dealing with mental health issues should be investigated. Experimental setups using randomization techniques could be instrumental in this research direction, and, if the effectiveness of

certain policies or programs is proven, one could weigh the costs and benefits of such programs against one another. General governmental support (for example, by creating more incentives for bailouts or relaxing bankruptcy laws) and targeted support could help entrepreneurs who are depressed to increase their chances of survival, thus reducing personal and societal costs. Future studies must elucidate the most effective way to structure such interventions.

CONCLUDING REMARKS

In this study, we highlight the importance of good mental health for functioning well in entrepreneurship. We argue that survival in entrepreneurship is less likely for depressed individuals and that the reduced self-efficacy that comes with depression is one mechanism explaining this relationship. In the coming years, the challenge for management research will be to obtain a deeper understanding of these complex relationships to improve entrepreneurial and organizational functioning. The current sparseness of empirical data on this topic highlights the need for future data collection efforts that take into account mental health and personality as drivers of entrepreneurial exit. Many people worldwide suffer from mental health issues, and they cannot be ignored. Management research may be instrumental in helping them find the most suitable positions in the labor market and within organizations.

REFERENCES

- Allison, P. D. (1982). Discrete-time methods for the analysis of event histories. In S. Leinhardt (Ed.), *Sociological Methodology* (Vol. 13, pp. 61–98). Hoboken, NJ: Wiley.
- Alloy, L. B., & Ahrens, A. H. (1987). Depression and pessimism for the future: Biased use of statistically relevant information in predictions for self versus others. *Journal of Personality and Social Psychology*, *52*(2), 366–378.
- Audretsch, D. B., & Thurik, A. R. (2001). What is new about the new economy: Sources of growth in the managed and entrepreneurial economies. *Industrial and Corporate Change*, *10*(1), 267–315.
- Baas, M., Nijstad, B. A., Boot, N. C., & De Dreu, C. K. W. (2016). Mad genius revisited: Vulnerability to psychopathology, biobehavioral approach-avoidance, and creativity. *Psychological Bulletin*, *142*(6), 668–692.
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). New York: Academic.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1–26.
- Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*, *33*(2), 328–340.
- Baron, R. A., Franklin, R. J., & Hmieleski, K. M. (2016). Why entrepreneurs often experience low, not high, levels of stress. The joint effects of selection and psychological capital. *Journal of Management*, *42*(3), 742–768.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.
- Beck, T., & Demirgüç-Kunt, A. (2006). Small and medium-size enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance*, *30*(11), 2931–2943.
- Benz, M., & Frey, B. S. (2008). Being independent is a great thing: Subjective evaluations of self-employment and hierarchy. *Economica*, *75*(298), 362–383.
- Berndt, E. R., et al. (1998). Workplace performance effects from chronic depression and its treatment. *Journal of Health Economics*, *17*(5), 511–535.
- Berndt, E. R., et al. (2000). Lost human capital from early-onset chronic depression. *American Journal of Psychiatry*, *157*(6), 940–947.
- Bhide, A. (1996). The questions every entrepreneur must answer. *Harvard Business Review*, *74*(6), 120–130.
- Bradley, D. E., & Roberts, J. A. (2004). Self-employment and job satisfaction: Investigating the role of self-efficacy, depression, and seniority. *Journal of Small Business Management*, *42*(1), 37–58.
- Brandstätter, H. (2011). Personality aspects of entrepreneurship: A look at five meta-analyses. *Personality and Individual Differences*, *51*(3), 222–230.
- Buttner, E. H. (1992). Entrepreneurial stress: Is it hazardous to your health? *Journal of Managerial Issues*, *4*(2), 223–240.
- Caliendo, M., Fossen, F., & Kritikos, A. S. (2014). Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics*, *42*(4), 787–814.
- Cassar, G., & Gibson, B. (2007). Forecast rationality in small firms. *Journal of Small Business Management*, *45*(3), 283–302.

- Cefis, E., & Marsili, O. (2005). A matter of life and death: Innovation and firm survival. *Industrial and Corporate Change*, 14(6), 1167–1192.
- Cella, M., Dymond, S., & Cooper, A. (2010). Impaired flexible decision-making in major depressive disorder. *Journal of Affective Disorders*, 124(1), 207–210.
- Ciavarella, M. A., Buchholtz, A. K., Riordan, C. M., Gatewood, R. D., & Stokes, G. S. (2004). The Big Five and venture survival: Is there a linkage? *Journal of Business Venturing*, 19(4), 465–483.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155–159.
- Cooper, A. C., & Artz, K. W. (1995). Determinants of satisfaction for entrepreneurs. *Journal of Business Venturing*, 10(6), 439–457.
- Cope, J. (2011). Entrepreneurial learning from failure: An interpretative phenomenological analysis. *Journal of Business Venturing*, 26(6), 604–623.
- Dahl, M. S. (2011). Organizational change and employee stress. *Management Science*, 57(2), 240–256.
- Danna, K., & Griffin, R. W. (1999). Health and well-being in the workplace: A review and synthesis of the literature. *Journal of Management*, 25(3), 357–384.
- Delmar, F., & Wiklund, J. (2008). The effect of small business managers' growth motivation on firm growth: A longitudinal study. *Entrepreneurship Theory and Practice*, 32(3), 437–457.
- DeTienne, D. R. (2010). Entrepreneurial exit as a critical component of the entrepreneurial process: Theoretical development. *Journal of Business Venturing*, 25(2), 203–215.
- DeTienne, D. R., & Cardon, M. S. (2012). Impact of founder experience on exit intentions. *Small Business Economics*, 38(4), 351–374.
- Disner, S. G., Beevers, C. G., Haigh, E. A., & Beck, A. T. (2011). Neural mechanisms of the cognitive model of depression. *Nature Reviews. Neuroscience*, 12(8), 467–477.
- Ettner, S., Frank, R., & Kessler, R. (1997). The impact of psychiatric disorders on labor market outcomes. *Industrial & Labor Relations Review*, 51(1), 64–81.
- Failla, V., Melillo, F., & Reichstein, T. (2017). Entrepreneurship and employment stability: Job matching, labour market value, and personal commitment. *Journal of Business Venturing*, 32(2), 162–177.
- Fairlie, R. W., Kapur, K., & Gates, S. (2011). Is employer-based health insurance a barrier to entrepreneurship? *Journal of Health Economics*, 30(1), 146–162.
- Fletcher, J. M. (2008). Adolescent depression: Diagnosis, treatment, and educational attainment. *Health Economics*, 17(11), 1215–1235.
- Fletcher, J. M. (2010). Adolescent depression and educational attainment: Results using sibling effects. *Health Economics*, 19(7), 855–871.
- Gartner, W. B. (1988). "Who is an entrepreneur?" is the wrong question. *American Journal of Small Business*, 12, 11–32.
- Gecas, V. (1989). The social psychology of self-efficacy. *Annual Review of Sociology*, 15(1), 291–316.
- Gielnik, M. M., Zacher, H., & Frese, M. (2012). Focus on opportunities as a mediator of the relationship between business owners' age and venture growth. *Journal of Business Venturing*, 27(1), 127–142.
- Gimeno, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly*, 42(4), 750–783.
- Global Entrepreneurship Monitor. (2017). *Global report 2016/2017*. Retrieved from <http://gemconsortium.org/report/49812>
- Gohier, B., et al. (2009). Cognitive inhibition and working memory in unipolar depression. *Journal of Affective Disorders*, 116(1), 100–105.
- Grant, A. M., Christianson, M. K., & Price, R. H. (2007). Happiness, health, or relationships? Managerial practices and employee well-being tradeoffs. *Academy of Management Perspectives*, 21(3), 51–63.
- Greenberg, P. E., Fournier, A. A., Sisitsky, T., Pike, C. T., & Kessler, R. C. (2015). The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *Journal of Clinical Psychiatry*, 76(2), 155–162.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193–206.
- Hamilton, B. H. (2000). Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *Journal of Political Economy*, 108(3), 604–631.
- Hamilton, V. L., Hoffman, W. S., Broman, C. L., & Rauma, D. (1993). Unemployment, distress, and coping: A panel study of autoworkers. *Journal of Personality and Social Psychology*, 65(2), 234–247.
- Hessels, J., Grilo, I., Thurik, A. R., & Van der Zwan, P. (2011). Entrepreneurial exit and entrepreneurial engagement. *Journal of Evolutionary Economics*, 21(3), 447–471.
- Hessels, J., Rietveld, C. A., & Van der Zwan, P. (2017). Self-employment and work-related stress: The mediating role of job control and job demand. *Journal of Business Venturing*, 32(2), 178–196.
- Hessels, J., van Stel, A., Brouwer, P., & Wennekers, S. (2007). Social security arrangements and early-stage entrepreneurial activity. *Comparative Labor Law & Policy Journal*, 28(4), 743–774.

- Hitt, M. A., Ireland, R. D., Sirmon, D. G., & Trahms, C. A. (2011). Strategic entrepreneurship: Creating value for individuals, organizations, and society. *Academy of Management Perspectives*, 25(2), 57–75.
- Hmieleski, K. M., & Baron, R. A. (2008). When does entrepreneurial self-efficacy enhance versus reduce firm performance? *Strategic Entrepreneurship Journal*, 2(1), 57–72.
- Hoetker, G. (2007). The use of logit and probit models in strategic management research: Critical issues. *Strategic Management Journal*, 28(4), 331–343.
- Holmes, L. (2016, December 5). What happens when major companies take mental health seriously. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/entry/mental-health-workplace_us_572b5a92e4b016f37894d142
- Hundley, G. (2001). Why and when are the self-employed more satisfied with their work? *Industrial Relations*, 40(2), 293–316.
- Hyytinen, A., & Ruuskanen, O. P. (2007). Time use of the self-employed. *Kyklos*, 60(1), 105–122.
- Jamal, M. (1997). Job stress, satisfaction and mental health: An empirical examination of self-employed and non-self-employed Canadians. *Journal of Small Business Management*, 35(4), 48–57.
- Kanfer, R., & Zeiss, A. M. (1983). Depression, interpersonal standard setting, and judgments of self-efficacy. *Journal of Abnormal Psychology*, 92(3), 319–329.
- Karasek, R. A., Jr. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24(2), 285–308.
- Khelil, N. (2016). The many faces of entrepreneurial failure: Insights from an empirical taxonomy. *Journal of Business Venturing*, 31(1), 72–94.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, 58(2), 281–342.
- Lange, T. (2012). Job satisfaction and self-employment: Autonomy or personality? *Small Business Economics*, 38(2), 165–177.
- Lazear, E. (2005). Entrepreneurship. *Journal of Labor Economics*, 23(4), 649–680.
- Lewin-Epstein, N., & Yuchtman-Yaar, E. (1991). Health risks of self-employment. *Work and Occupations*, 18(3), 291–312.
- Lewinsohn, P. M., & Hoberman, H. M. (1982). Behavioral and cognitive approaches. In E. S. Paykel (Ed.), *Handbook of affective disorders* (pp. 338–345). New York: Guilford.
- Leykin, Y., Roberts, C. S., & DeRubeis, R. J. (2011). Decision-making and depressive symptomatology. *Cognitive Therapy and Research*, 35(4), 333–341.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7(1), 83–104.
- Maddux, J. E. (1995). Self-efficacy theory. An introduction. In E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment* (pp. 3–33). New York: Springer.
- Maddux, J. E. (2009). Self-efficacy: The power of believing you can. In C. R. Snyder & S. J. Lopez (Eds.), *Oxford handbook of positive psychology* (pp. 335–344). New York: Oxford University.
- Margolis, H., & McCabe, P. P. (2006). Improving self-efficacy and motivation: What to do, what to say. *Intervention in School and Clinic*, 41(4), 218–227.
- Mason, C. M., & Harrison, R. T. (2006). After the exit: Acquisitions, entrepreneurial recycling and regional economic development. *Regional Studies*, 40(1), 55–73.
- McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers in econometrics* (pp. 105–142). New York: Academic Press.
- Minniti, M., & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and Practice*, 25(3), 5–16.
- Murray, C. J., & Lopez, A. D. (1996). Evidence-based health policy: Lessons from the Global Burden of Disease Study. *Science*, 274(5288), 740–743.
- Must, A., Horvath, S., Nemeth, V. L., & Janka, Z. (2013). The Iowa Gambling Task in depression—what have we learned about sub-optimal decision-making strategies? *Frontiers in Psychology*, 4(1). doi:10.3389/fpsyg.2013.00732
- Naismith, S. L., et al. (2003). Neuropsychological performance in patients with depression is associated with clinical, etiological and genetic risk factors. *Journal of Clinical and Experimental Neuropsychology*, 25(6), 866–877.
- National Institute of Mental Health. (2017). *Major depression among adults*. Retrieved June 15, 2017, from <https://www.nimh.nih.gov/health/statistics/prevalence/major-depression-among-adults.shtml>
- Nielsen, K., & Sarasvathy, S. D. (2016). A market for lemons in serial entrepreneurship? Exploring type I and type II errors in the restart decision. *Academy of Management Discoveries*, 2(3), 247–271.
- Parasuraman, S., & Simmers, C. A. (2001). Type of employment, work-family conflict and well-being: A comparative study. *Journal of Organizational Behavior*, 22(5), 551–568.

- Parker, S. C. (2009). *The economics of entrepreneurship*. Cambridge, UK: Cambridge University Press.
- Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., Strazdins, L., & D'Souza, R. M. (2004). The associations between work stress and mental health: A comparison of organizationally employed and self-employed workers. *Work and Stress, 18*(3), 231–244.
- Patel, P. C., & Thatcher, S. M. (2014). Sticking it out: Individual attributes and persistence in self-employment. *Journal of Management, 40*(7), 1932–1979.
- Patzelt, H., & Shepherd, D. A. (2011). Negative emotions of an entrepreneurial career: Self-employment and regulatory coping behaviors. *Journal of Business Venturing, 26*(2), 226–238.
- Pierce, J. L., Kostova, T., & Dirks, K. T. (2001). Toward a theory of psychological ownership in organizations. *Academy of Management Review, 26*(2), 298–310.
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*(1), 2–21.
- Price, R. H., Choi, J. N., & Vinokur, A. D. (2002). Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. *Journal of Occupational Health Psychology, 7*(4), 302–312.
- Prottas, D. J., & Thompson, C. A. (2006). Stress, satisfaction, and the work–family interface: A comparison of self-employed business owners, independents, and organizational employees. *Journal of Occupational Health Psychology, 11*(4), 366–378.
- Raffiee, J., & Feng, J. (2014). Should I quit my day job? A hybrid path to entrepreneurship. *Academy of Management Journal, 57*(4), 936–963.
- Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology, 16*(4), 353–385.
- Ravnskilde, B., Videbech, P., Clemmensen, K., Egander, A., Rasmussen, N. A., & Rosenberg, R. (2002). Cognitive deficits in major depression. *Scandinavian Journal of Psychology, 43*(3), 239–251.
- Rietveld, C. A., Bailey, H., Hessels, J., & Van der Zwan, P. (2016). Health and entrepreneurship in four Caribbean Basin countries. *Economics and Human Biology, 21*(1), 84–89.
- Rietveld, C. A., Van Kippersluis, H., & Thurik, A. R. (2015). Self-employment and health: Barriers or benefits? *Health Economics, 24*(10), 1302–1313.
- Rose, E. J., & Ebmeier, K. P. (2006). Pattern of impaired working memory during major depression. *Journal of Affective Disorders, 90*(2), 149–161.
- Segal, G., Borgia, D., & Schoenfeld, J. (2002). Using social cognitive career theory to predict self-employment goals. *New England Journal of Entrepreneurship, 5*(2), 47–56.
- Shepherd, D. A., & Patzelt, H. (2017). *Trailblazing in entrepreneurship. Creating new paths for understanding the field*. London: Palgrave Macmillan.
- Silveira, E., Taft, C., Sundh, V., Waern, M., Palsson, S., & Steen, B. (2005). Performance of the SF-36 health survey in screening for depressive and anxiety disorders in an elderly female Swedish population. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation, 14*(5), 1263–1274.
- Singh, S., Corner, P., & Pavlovich, K. (2007). Coping with entrepreneurial failure. *Journal of Management & Organization, 13*(04), 331–344.
- Spell, C. S., & Arnold, T. J. (2007). A multi-level analysis of organizational justice climate, structure, and employee mental health. *Journal of Management, 33*(5), 724–751.
- Stam, E., Thurik, R., & Van der Zwan, P. (2010). Entrepreneurial exit in real and imagined markets. *Industrial and Corporate Change, 19*(4), 1109–1139.
- Summerfield, M., et al. (2014). *HILDA user manual: Release 13*. Melbourne, Australia: University of Melbourne, Melbourne Institute of Applied Economic and Social Research.
- Tavares, J. V. T., Clark, L., Cannon, D. M., Erickson, K., Drevets, W. C., & Sahakian, B. J. (2007). Distinct profiles of neurocognitive function in unmedicated unipolar depression and bipolar II depression. *Biological Psychiatry, 62*(8), 917–924.
- Thurik, A. R., Audretsch, D. B., & Stam, E. (2013). The rise of the entrepreneurial economy and the future of dynamic capitalism. *Technovation, 33*(8-9), 302–310.
- Toivanen, S., Griep, R. H., Mellner, C., Vinberg, S., & Eloranta, S. (2016). Mortality differences between self-employed and paid employees: A 5-year follow-up study of the working population in Sweden. *Occupational and Environmental Medicine*. doi:10.1136/oemed-2015-103472
- Torrès, O. (Ed.). (2012). *La Santé du Dirigeant: de la Souffrance Patronale à l'Entrepreneuriat Salulaire*. Brussels: Groupe De Boeck.
- Utley, T. (2017, May 30). How EY is tackling stigma and promoting mental health for employees. *Forbes*. Retrieved from <https://www.forbes.com/sites/toriutley/2017/05/30/how-one-company-normalized-mental-health-and-encouraged-employees-to-ask-for-help>
- Van der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being:

A review of 20 years of empirical research. *Work and Stress*, 13(2), 87–114.

- Van Gelderen, M., Thurik, A. R., & Pankaj, P. (2011). Encountered problems and outcome status in nascent entrepreneurship. *Journal of Small Business Management*, 49(1), 71–91.
- Ward, T. B. (2004). Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, 19(2), 173–188.
- Ware, J. E., & Gandek, B. (1998). Overview of the SF-36 health survey and the international quality of life assessment (IQOLA) project. *Journal of Clinical Epidemiology*, 51(11), 903–912.
- Wennberg, K., & DeTienne, D. R. (2014). What do we really mean when we talk about “exit”? A critical review of research on entrepreneurial exit. *International Small Business Journal*, 32(1), 4–16.
- Wennberg, K., Wiklund, J., DeTienne, D. R., & Cardon, M. S. (2010). Reconceptualizing entrepreneurial exit: Divergent exit routes and their drivers. *Journal of Business Venturing*, 25(4), 361–375.
- World Health Organization. (2016). Fact sheet: Depression. Geneva: Author. Retrieved September 27, 2016, from <http://www.who.int/mediacentre/factsheets/fs369/en/>
- Yoon, J., & Bernell, S. (2013). The role of adverse physical health events on the utilization of mental health services. *Health Services Research*, 48(1), 175–194.
- Zhao, H., & Seibert, S. E. (2006). The Big Five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology*, 91(2), 259–271.
- Zhao, H., Seibert, S. E., & Lumpkin, G. T. (2010). The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review. *Journal of Management*, 36(2), 381–404.



Jolanda Hessels (hessels@ese.eur.nl) is an associate professor in the Department of Applied Economics, Erasmus School of Economics, Erasmus University Rotterdam. She is the co-director of the Center for Advanced Small Business Economics (CASBEC).

Cornelius A. (Niels) Rietveld (nrietveld@ese.eur.nl) is an associate professor in the Department of Applied Economics, Erasmus School of Economics, Erasmus University Rotterdam, and executive director of the Erasmus University Rotterdam Institute for Behavior and Biology (EURIBEB).

A. Roy Thurik (thurik@ese.eur.nl) is a professor of entrepreneurship and economics at Montpellier Business

School in France and emeritus professor of economics of entrepreneurship at Erasmus University Rotterdam and the Free University in Amsterdam in the Netherlands. He is co-founder and general director of the Erasmus University Rotterdam Institute for Behavior and Biology (EURIBEB).

Peter van der Zwan (p.w.van.der.zwan@law.leidenuniv.nl) is an assistant professor in the Department of Business Studies, Leiden Law School, Leiden University. He is the Director of Entrepreneurship at the Centre for Legal Entrepreneurship and Innovation at Leiden Law School.



APPENDIX

This appendix provides detailed information about the empirical analysis reported in the main text. The analysis is based on data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, a household-based longitudinal survey that began collecting data in 2001 (Summerfield et al., 2014). The results are obtained using Stata 14.

Measures

We operationalize entrepreneurship in terms of self-employment (Patel & Thatcher, 2014). A period of self-employment is identified based on an individual's main occupation. Self-employment exit occurs when an individual is self-employed at time $t - 1$, and has left this self-employment job at time t . Between $t - 1$ and t the individual may have switched to a) wage work, b) unemployment, c) a position outside the labor force, or d) self-employment again.² The dependent variable is coded 1 if an individual indeed changes employment status and 0 otherwise.

Depressive disorder symptoms are assessed using the five-item Mental Health Inventory (MHI), which is a subscale of the SF-36 Health Survey. Respondents evaluated their mental health in the preceding four weeks using the following five items: (i) “Have you felt so down in the dumps that nothing could cheer you up?”; (ii) “Have you felt down?”; (iii) “Have you been a nervous person?”; (iv) “Have you felt calm and peaceful?”; and (v) “Have you been a happy person?” (1 = all of the time to 6 = none of the time; items (i) to (iii) are reverse coded). The answers to the five questions are recoded to ensure that higher values always reflect a *higher* prevalence of depression symptoms. Values are between 0 and 10. Cronbach's α for these items is 0.83. Ware and Gandek stated that, “The MHI assesses symptoms of depression and anxiety (nervousness,

² To identify employment switch d), information is used on whether a person is still self-employed one year later but with a different business.

depressed affect)" (Ware & Gandek, 1998, p. 21), and MHI is an indicator for depression susceptibility (Silveira et al., 2005).

Self-efficacy is measured using the following seven items (Pearlin & Schooler, 1978): (i) "I have little control over the things that happen to me"; (ii) "There is really no way I can solve some of the problems I have"; (iii) "There is little I can do to change many of the important things in my life"; (iv) "I often feel helpless in dealing with the problems of life"; (v) "Sometimes I feel that I'm being pushed around in life"; (vi) "What happens to me in the future mostly depends on me"; and (vii) "I can do just about anything I really set my mind to do" (1 = strongly disagree to 7 = strongly agree; items (i) to (v) are reverse coded). The average of the seven items is taken; a higher value indicates a higher level of self-efficacy. Cronbach's α for these items is 0.82.

We include a wide range of individual-level control variables in our empirical analysis that are shown to be important for entrepreneurial exit in earlier research (Parker, 2009; Patel & Thatcher, 2014). First, we include a set of demographics: gender (0 = female; 1 = male), age, age squared, educational attainment (0 = did not complete post-secondary education; 1 = post-secondary education or higher completed), marital status (0 = not married; 1 = married), and children (0 = no children; 1 = at least one child). Further, income is controlled for (logarithm of total yearly disposable income for the individual). Finally, we control for the industry using a one-digit industry classification (19 industries in total) because the probability of exit from self-employment is expected to be industry-dependent. Second, we control for physical health (subscale of the SF-36 Health Survey; higher values reflect better health; value between 0 and 10) and health behavior in terms of smoking (0 = never smoked or no longer smoking; 1 = otherwise) and drinking (0 = never drank alcohol or no longer drinking alcohol; 1 = otherwise) frequency to "isolate" the impact of mental health on exit from self-employment.

Methods

Our dependent variable identifies event histories in discrete time; individuals are observed yearly, either in a period of self-employment or with a changed labor market status. Given the nature of our dependent variable, we use a discrete-time multinomial logistic proportional hazard model, which is a discrete-time representation of a continuous time proportional hazard model. This multiple-event model can be estimated with a multinomial logit regression in which all time units for an individual are treated as independent observations and the dependent variable as described above is used as the dependent variable (Allison, 1982). The baseline hazard function is t and reflects the length of the current period of self-employment (from 1 to 13; $t = 1$ when an individual enters and exits self-employment in the same year; $t = 13$ when an individual is self-employed during all 13 consecutive years of data collection).

While our dependent variable measures exit from self-employment, our main independent variables are

depression and self-efficacy. These variables are included with one lag in our model specifications, which means that we use earlier information on depression and self-efficacy. Despite the use of lags, we note that our results cannot be immediately interpreted as causal relationships (see also our fourth direction for future research). The health variables used to isolate the effect of mental health (physical health and health behavior) are lagged analogously. Lagged income is included because we intend to predict exits, and hence, information on income before the exit occurred is needed. All other variables are assigned the values that they had in each year.

Descriptive statistics

Table A1 provides an overview of the independent and control variables, descriptive statistics, and a correlation matrix. There are no correlations that represent large effects in Table A1 (a threshold of 0.50, either positive or negative, is suggested by Cohen, 1992). Hence, there are no serious concerns for multicollinearity.

Regression analysis

Detailed regression results are provided in Table A2. Model 1 merely distinguishes exit (value 1) from survival (value 0). The results are to be interpreted in terms of marginal effects (ME; averaged across the observations in the estimation sample) resulting from a binary logistic regression, i.e., the change in the probability of experiencing an exit from self-employment as the result of a one-unit increase in a variable. The use of marginal effects, and calculating average values, is in line with the best practice recommendations provided by Hoetker (2007). We note that depression is significantly and positively related to exit from self-employment (ME = 0.011; $p < 0.001$). Hence, a one-unit increase in depression (measured between 0 and 10) increases the probability of exit by 1.1 percentage points. A one-unit increase is not abnormal given that the standard error of the depression variable is 1.51 (see Table A1). Hence, if someone experiences an increase of two standard deviations, the probability of exit increases by about three percentage points. Such an increase is substantial given that the average predicted probability (or "base probability"; also shown in Table A2) of experiencing an exit from self-employment in the sample is about 17%. Hence, the *relative increase* in the probability of exit, as implied by depression, is considerable. Additionally, the increase in the exit probability, as implied by depression, can be considered substantial compared to the effect sizes of other variables. These effect sizes can be easily compared given the 1/0 variables included. Other noteworthy changes are implied by gender (ME = -0.044; $p < 0.001$) and marriage (-0.025; $p < 0.001$).

Model 2 in Table A2 reveals the types of exit that are associated with depression and distinguishes between individuals who switch from self-employment to 1) wage

TABLE A1
Descriptive Statistics and Correlation Matrix Independent and Control Variables

	Mean	SD	Min	Max	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Depression	2.30	1.51	0	10	1.00										
2. Self-efficacy	5.59	1.04	1	7	-0.48***	1.00									
3. Physical health	8.82	1.77	0	10	-0.23***	0.27***	1.00								
4. Smoking	0.20	0.40	0	1	0.07***	-0.02	0.00	1.00							
5. Drinking	0.89	0.31	0	1	-0.01	0.07***	0.10***	0.08***	1.00						
6. Male	0.65	0.48	0	1	-0.06***	0.02	0.02***	0.07***	0.09***	1.00					
7. Age	47.31	12.15	16	89	-0.12***	-0.06***	-0.27***	-0.15***	-0.02**	0.06***	1.00				
8. Education	0.25	0.44	0	1	-0.01	0.12***	0.10***	-0.12***	0.03**	-0.07***	-0.02*	1.00			
9. Married	0.70	0.46	0	1	-0.08***	0.00	-0.03***	-0.16***	-0.02*	0.00	0.18***	0.02***	1.00		
10. Children	0.51	0.50	0	1	0.03***	-0.01	0.12***	-0.04***	0.01	-0.05***	-0.26***	0.03***	0.32***	1.00	
11. Income (log)	10.40	0.95	0	13.54	-0.07***	0.14***	0.10***	-0.07***	0.10***	0.18***	0.02*	0.19***	0.01	0.06***	1.00
12. Years in self-empl.	4.17	2.99	1	13	-0.07***	0.03*	-0.01	-0.08***	-0.01	0.10***	0.27***	-0.01	0.10***	0.00	0.12***

SD = standard deviation; Min = Minimum value; Max = Maximum value. Table based on 14,789 observations; self-efficacy is identified for 4,915 observations. Pearson correlation coefficients are shown. *** denotes p -value < 0.001; ** p -value < 0.01; * p -value < 0.05.

TABLE A2
Marginal Effects of Discrete-Time Proportional Hazard Model With Exit from Self-Employment as the Dependent Variable

	Model 1: Binomial logistic regression			Model 2: Multinomial logistic regression		
	Exit from self-employment	Exit to wage work (seeking work)	Exit to wage work (not seeking work)	Exit to unemployment	Exit outside labor force (voluntary reasons)	Exit to self-employment
Depression	0.011*** [0.008; 0.015]	0.002*** [0.001; 0.003]	0.004*** [0.001; 0.007]	0.001** [0.000; 0.002]	0.001*** [0.001; 0.002]	0.002** [0.000; 0.004]
Relative change	7%	12%	5%	15%	23%	5%
Base probability	0.169	0.015	0.082	0.007	0.006	0.046
Physical health	-0.005*** [-0.008; -0.002]	-0.001 [-0.002; 0.000]	0.003* [-0.000; 0.005]	0.000 [-0.001; 0.001]	-0.002*** [-0.002; -0.001]	0.013 [-0.004; -0.000]
Smoking	0.010 [-0.005; 0.025]	-0.000 [-0.005; 0.004]	0.006 [-0.005; 0.017]	0.004** [0.001; 0.007]	0.001 [-0.002; 0.004]	-0.004* [-0.009; 0.001]
Drinking	-0.010 [-0.029; 0.009]	-0.000 [-0.006; 0.006]	0.010 [-0.005; 0.025]	-0.003 [-0.007; 0.001]	-0.001 [-0.005; 0.002]	0.005 [-0.002; 0.012]
Male	-0.044*** [-0.058; -0.030]	-0.000 [-0.005; 0.004]	-0.014*** [-0.024; -0.004]	0.001 [-0.001; 0.004]	0.002 [-0.001; 0.005]	0.006*** [0.003; 0.010]
Age	0.000 [-0.000; 0.001]	-0.000*** [-0.001; -0.000]	-0.001*** [-0.001; -0.001]	0.000 [-0.000; 0.000]	0.000*** [0.000; 0.000]	-0.000*** [-0.000; -0.000]
Education	0.013 [-0.003; 0.028]	-0.003 [-0.008; 0.001]	0.007 [-0.005; 0.018]	0.004* [-0.000; 0.008]	0.003 [-0.002; 0.007]	0.007** [0.001; 0.012]
Married	-0.025*** [-0.039; -0.010]	-0.011*** [-0.016; -0.005]	-0.016*** [-0.027; -0.005]	-0.007*** [-0.011; -0.003]	-0.001 [-0.005; 0.002]	0.001 [-0.003; 0.006]
Children	-0.000 [-0.014; 0.014]	-0.002 [-0.007; 0.002]	0.001 [-0.010; 0.011]	0.004** [0.000; 0.007]	-0.000 [-0.003; 0.003]	-0.003 [-0.008; 0.001]
Income (log)	-0.015*** [-0.021; -0.009]	-0.002 [-0.004; 0.001]	0.001 [-0.004; 0.006]	-0.003*** [-0.004; -0.001]	-0.001 [-0.002; 0.000]	-0.000 [-0.002; 0.002]
Years in self-empl.	-0.015*** [-0.017; -0.012]	-0.001*** [-0.002; -0.000]	-0.007*** [-0.009; -0.005]	-0.001** [-0.002; -0.000]	-0.001** [-0.001; -0.000]	-0.001*** [-0.002; -0.000]
Observations	14,789			14,789		
McFadden (1973) R ²	0.041			0.074		

In each model not exiting self-employment is the reference category. Marginal effects for the sector control variables are not displayed, but are available upon request from the authors. 95% confidence intervals are presented between brackets. *** denotes p -value < 0.001; ** p -value < 0.01; * p -value < 0.05.

work (seeking work); 2) wage work (not seeking work); 3) unemployment; 4) outside the labor force due to illness; 5) outside the labor force due to voluntary reasons; or 6) self-employment. Again, we improve the interpretation of the results by calculating marginal effects resulting from a multinomial logistic regression. The marginal effects are displayed in Table A2 for the various switching possibilities for formerly self-employed individuals. The marginal effects are smaller than in Model 1 by definition because of the several categories that are distinguished in Model 2 (the probability of exit in Model 1 equals the sum of the probabilities of belonging to the various exit categories included in Model 2). For the depression variable, we also show the marginal effects relative to the base probabilities of the various exit events occurring. Although we observe significant positive relationships between depression and the probability of each exit event occurring—except for switching to self-employment—the relative increases in exit probabilities differ substantially across the exit events: 12% for an exit to wage work (and seeking work while in wage work); 5% for an exit to wage work (and not seeking work while in wage work); 15% for an exit to unemployment; 23% for an exit to the non-labor force (for non-voluntary reasons); 5% for an exit to the nonlabor force (for voluntary reasons); and 3% for a new self-employment job. Hence, depression has the strongest positive relationships with the exit paths that have a more involuntary character: wage work (and seeking work), unemployment, and outside the labor force for involuntary reasons. Depression is not significantly related to re-entry into self-employment given the nonsignificant marginal effect in the final column.

Self-efficacy is measured in waves 3, 4, 7, and 11 of the data set, but not in the other waves. Consequently, adding self-efficacy to the regressions in Table A2 would result in a substantial loss of observations. Nevertheless, we explore the role that self-efficacy plays in the relationship between

depression and exit from self-employment. To investigate such a mediation effect, we assess the reduction of the marginal effect of depression after adding the mediator (self-efficacy) to the model with exit as the dependent variable (the “difference in coefficients” approach; MacKinnon et al., 2002). There is full mediation when the marginal effect becomes non-significant after adding the mediator; partial mediation is usually more likely and occurs when the marginal effect approaches 0 but is still significantly different from 0. Without self-efficacy, the marginal effect of the depression variable equals 0.016 in this reduced sample (standard error is 0.003), and the marginal effect becomes 0.011 (standard error is 0.004) after adding self-efficacy. Hence, 32% of the relationship between depression and exit is mediated by self-efficacy.³

Possible Extensions

These analyses illustrate how mental health is related to exiting from self-employment. Future studies may consider extensions of the analyses presented here, such as analyses with yearly personality measures, thus allowing for a more detailed analysis of how personality mediates the relationship between depression and entrepreneurial exit. Future work can also include a more extensive set of control variables for industry, firm, and other relevant characteristics (including interaction effects). In addition, rather than a general measure of self-efficacy, future research could consider entrepreneurial self-efficacy, which is shown to be positively related to business performance (Hmieleski & Baron, 2008). Nevertheless, we believe that the current analysis highlights noteworthy aspects of the relationship between mental health and entrepreneurship, thus underscoring the importance and relevance of research on this topic.

³ The conditions for mediation proposed by Baron and Kenny (1986) are also fulfilled in this case. That is, depression significantly predicts exit (see Table A2), depression significantly predicts self-efficacy (coefficient is -0.307 in an OLS regression with standard error of 0.009), and self-efficacy significantly predicts exit (ME = -0.017 with standard error of 0.006).