

**Focus on opportunities as a mediator of the relationship between
business owners' age and venture growth**

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Abstract

Combining upper echelons and lifespan theories, we investigated the mediating effect of focus on opportunities on the negative relationship between business owners' age and venture growth. We also expected that mental health moderates the negative relationship between business owners' age and focus on opportunities. Path analytic findings based on data from 84 business owners (mean age = 44, range 24-74) supported these hypotheses. Findings suggest that focus on opportunities is a psychological mechanism that links business owners' age with venture growth. Our findings also indicate that mental health helps maintain a high level of focus on opportunities with increasing age.

1. Executive summary

Demographic change necessitates a better understanding of the role of business owners' age for important business outcomes and of the underlying mechanisms that explain the effects of aging. However, business owners' age is a neglected variable in entrepreneurship research. A recent exception is a theoretical article by Lévesque and Minniti (2006), which proposes that entrepreneurial activity declines with increasing age. We aim to contribute to the entrepreneurship literature by considering business owners' age as a substantial variable and by testing a model that links business owners' age with focus on opportunities and venture growth. Based on upper echelons theory (Hambrick & Mason, 1984), we argue that business owners' age is negatively related to venture growth. According to Hambrick (2007), the mediating processes in the relationship between business owners' age and venture growth need further examination. We suggest that focus on opportunities – a concept from the domain of lifespan psychology (P. B. Baltes, 1987) – mediates the negative relationship between business owners' age and venture growth. Focus on opportunities is a cognitive-motivational construct that describes how many new goals, plans, options, and opportunities people believe to have in their personal future (Zacher & Frese, 2009). Lifespan theory provides a useful theoretical basis for our study because business owners often remain in the top manager position over several decades. We hypothesize that focus on opportunities decreases with increasing age and this decrease is responsible for lower venture growth rates of older business owners. Furthermore, we argue that declines in focus on opportunities and venture growth over the lifespan are not inevitable. Specifically, we suggest that mental health moderates the direct negative effect of business owners' age on focus on opportunities and the indirect negative effect of business owners' age on venture growth

(through focus on opportunities). Older business owners should maintain a high level of focus on opportunities and venture growth if they possess high levels of mental health.

We collected interview and questionnaire data from 84 small business owners in Germany (mean age = 44 years, range 24-74 years). To test our hypotheses, we conducted path analytic calculations. The results provided support for our hypotheses. Business owners' age was negatively related to focus on opportunities, and focus on opportunities was positively related to venture growth. Focus on opportunities mediated the negative relationship between business owners' age and venture growth. In addition, mental health moderated the negative relationship between business owners' age and focus on opportunities. Older business owners high in mental health maintained a focus on opportunities that was similarly high as younger business owners' focus on opportunities. In contrast, older business owners low in mental health had a significantly lower focus on opportunities. We also tested conditional indirect effects of business owners' age on venture growth (through focus on opportunities). The indirect negative effect of business owners' age on venture growth was significant for low and moderate levels of mental health. The indirect effect was weak and non-significant for high levels of mental health.

Our findings indicate that combining upper echelons theory (Hambrick & Mason, 1984) with lifespan psychology (P. B. Baltes, 1987) might add to our understanding of the psychological processes that link business owners' age with venture growth. We found that focus on opportunities functions as a mediator in the negative relationship between business owners' age and venture growth. Thus, our study suggests that business owners can uphold high levels of venture growth by maintaining high levels of focus on opportunities. We further found that mental health buffers the negative indirect effect of business owners' age on venture growth through focus on opportunities. Thus, the relationship is not generally negative and mental health

might be an important factor that explains plasticity in business owners' lifespan development. Our findings suggest that business owners can protect themselves against decreases in focus on opportunities and venture growth with increasing age by fostering their mental health.

2. Introduction

Business owners' age is a neglected variable in entrepreneurship research. This is surprising, given that an early literature review emphasized the potential importance of age for understanding entrepreneurial motivation and behavior (Hisrich, 1990). In addition, population aging in most Western countries (Cohen, 2003) and some developing countries (e.g., China; Shrestha, 2000) is assumed to have significant effects on entrepreneurial activities over the next decades (Bönte, Falck, & Heblich, 2007; Shane, 1996). Longer and healthier lives, shrinking retirement security, and continued personal ambitions also make later-life entrepreneurship an increasingly attractive option for many older individuals (de Bruin & Firkin, 2003; Miner, 1999; Rogoff, 2007). Yet most studies in the field have so far treated age, if at all, as a control variable. One notable exception is a recent theoretical article by Lévesque and Minniti (2006) who suggested that age is generally negatively related to entrepreneurial attitudes and activity. However, empirical research on the role of age in entrepreneurship, especially on the processes linking age to important business outcomes, is still sparse. Our first goal in this study, therefore, is to empirically investigate a model which proposes that the concept of focus on opportunities can lead to a better understanding of the process that links business owners' age and venture growth. Our second goal is to expand the theoretical proposition that age is generally negatively related to entrepreneurship by showing that the concept of mental health may buffer the negative effects of older age. Entrepreneurship scholars have suggested that mental health may be an important personal resource for business owners (Hisrich, Langan-Fox, & Grant, 2007).

We base our research model on two overarching theoretical frameworks that provide explanations for why and how business owners' age should be related to venture growth. First, upper echelons theory (Hambrick & Mason, 1984) suggests that psychological processes within

top managers influence firm performance and that demographic variables, such as age of the top manager, can be used as indicators for these psychological processes. More specifically, upper echelons theory proposes that firms with younger top managers experience higher growth rates (Hambrick & Mason, 1984). Second, we draw on lifespan theory (P. B. Baltes, 1987) to account for the fact that many small business owners who start a business remain in the business as CEOs until retirement or at least over several decades (Beckhard & Dyer, 1983). Lifespan theory asserts that a central aspect in understanding the aging process is people's decreasing focus on opportunities with increasing age. The concept of focus on opportunities captures how many new goals, plans, options, and opportunities people believe to have in their personal future (Cate & John, 2007; Zacher & Frese, 2009, in press). Research showed that the decrease in focus on opportunities accounts, among other factors, for changes in individuals' goals and motives as well as for lower performance (Carstensen, 2006; Lang & Carstensen, 2002; Zacher, Heusner, Schmitz, Zwierzanska, & Frese, 2010). Integrating the two theoretical frameworks, we draw on upper echelons theory to suggest that business owners' age should have a negative effect on venture growth. We build on lifespan theory to further propose that this negative effect should only be indirect and that business owners' focus on opportunities should be a mediating psychological process that accounts for the decrease in venture growth.

Furthermore, we argue that models in the entrepreneurship literature which equate aging with decline in psychological functions are too simplistic. Instead, we suggest that a decrease in business owners' focus on opportunities with increasing age is not inevitable. Based on the lifespan literature on successful aging (M. M. Baltes & Carstensen, 1996), we propose that mental health is an important personal resource at higher ages that helps older business owners to maintain their focus on opportunities. Specifically, mental health should buffer the negative

effect of age on focus on opportunities, such that the relationship between age and focus on opportunities is weaker for business owners high in mental health than for business owners low in mental health. Figure 1 depicts the model guiding our study.

We seek to contribute to the entrepreneurship literature with this study in two ways. First, we seek to investigate a model that explains why age is negatively related to venture growth, as suggested by upper echelons theory (Hambrick & Mason, 1984). To this end, we introduce the concept of focus on opportunities to the entrepreneurship literature as a psychological process that is argued to mediate age-related changes in motivation and behavior (Cate & John, 2007; Zacher & Frese, 2009). Second, by investigating the interplay between business owners' age, focus on opportunities, and mental health in predicting venture growth, we seek to broaden the perspective on aging in the entrepreneurship literature that there is a generally negative relationship between age and important entrepreneurial outcomes (cf., Lévesque & Minniti, 2006). We argue that mental health is an important boundary condition of this generally negative relationship and that a decline in entrepreneurship over the lifespan is not obligatory. In summary, our model seeks to explain *why* (through focus on opportunities) and *under which conditions* (in case of low levels of mental health) business owners' age is related to venture growth. In this regard, our model corresponds to a moderated mediation model integrating two different research questions (cf., Preacher, Rucker, & Hayes, 2007).

3. Development of hypotheses

3.1. Business owners' age, focus on opportunities, and venture growth

In accordance with upper echelons theory (Hambrick & Mason, 1984), we argue that business owners' age is negatively related to venture growth. Upper echelons theory asserts that organizational outcomes, such as venture growth, are reflections of the psychological

idiosyncrasies of their top managers. To bypass measuring complex psychological operations, psychological differences among top managers can be captured by using managerial demographic characteristics, such as their age, as proxy measures. In general, upper echelons theory proposes that top managers' personalized information processing is the central mechanism through which top managers influence firm performance. This process is biased by psychological characteristics, such as top managers' personality, values, experience, and their cognitive base, for example, how they make assumptions about future events. With specific regard to top managers' age, upper echelons theory suggests that several psychological processes might be responsible for an effect of top managers' age on firm performance (Hambrick & Mason, 1984). For example, older top managers are more conservative, show less physical and mental persistence, and may be less able to grasp new ideas or to integrate new information. Additionally, older top managers might have higher commitment to the status quo and seek financial security rather than take risks. In sum, these processes should result in a negative effect of top managers' age on venture growth (Hambrick & Mason, 1984). In the small business management literature, there is some empirical support of an overall negative relationship between business owners' age and venture growth. In a survey of over 18,000 small businesses in the United Kingdom, Carter, Mason, and Tagg (2004) found a negative association between the age group of business owners and the proportion of corresponding businesses reporting growth in sales, profitability, and employees. For example, the proportion of businesses reporting a growth in sales was 65% among business owners between 22 and 34 years old, but only 53% for business owners between 55 and 64 years old. Thus, based on propositions from upper echelons theory, which are supported by findings from the domain of small business management, we hypothesize that business owners' age is negatively related to venture growth.

Hypothesis 1: Business owners' age is negatively related to venture growth.

It is important to note, however, that the mediating “psychological and social processes [...] still remain largely a mystery” (Hambrick, 2007, p. 337) and relatively little research has investigated the inside of the “black-box” that links age with venture growth. We suggest that the overall negative relationship between business owners' age and venture growth can be explained by lifespan theory (P. B. Baltes, 1987). Lifespan theory is a meta-theory that describes individual development of psychological functioning over the life-course in multiple domains (P. B. Baltes, Staudinger, & Lindenberger, 1999). In general, lifespan theory proposes that ontogenetic development is a lifelong process and no specific age period is predominant regarding an individual's development. Furthermore, age-related development is comprised of gains and losses in psychological functioning but, with increasing age, the losses outbalance the gains across different domains. The degree of the losses, however, depends on individual as well as socio-cultural characteristics (P. B. Baltes, 1987).

We propose that lifespan theory offers a useful approach in understanding the role of age and aging in small business management because, in this context, business owners manage and influence their companies over several decades. Changes in business owners' individual characteristics due to their ongoing ontogenetic development should influence the performance and growth of their companies (Frese, 2009; Hambrick & Mason, 1984; Rauch & Frese, 2007). Therefore, it is important to take into account the general development processes and changes that occur over the lifespan. Research from the domains of adult development and lifespan psychology showed that the aging process goes along with changes in cognitive ability (P. B. Baltes et al., 1999; Kanfer & Ackerman, 2004) as well as in emotional and motivational characteristics (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Lang & Carstensen, 2002).

These changes should affect work performance (Kanfer & Ackerman, 2004). Regarding cognitive ability, the lifespan perspective notes that people experience a loss in fluid intellectual abilities (i.e., abilities to reason and understand complex ideas), but – at the same time – they experience a gain in crystallized intelligence (i.e., knowledge and skills) over the life course. As a consequence, the gain in crystallized intelligence may compensate for the loss in fluid intelligence (Kanfer & Ackerman, 2004). Regarding motivational changes, the lifespan perspective assumes that people reorganize their motives and goals and change their priorities and interests with increasing age (Kanfer & Ackerman, 2004).

Since the loss in fluid intellectual abilities may be compensated by gains in crystallized intelligence (in fact, meta-analytic research in the entrepreneurship domain showed that both are positively related to venture performance (Unger, Rauch, Frese, & Rosenbusch, 2006) which supports the compensation proposition), we suggest that it is important to take emotional and motivational changes over the life course into consideration to explain why age negatively affects venture growth. However, an important finding from lifespan research is that some of the emotional and motivational changes are not caused by age per se but by the remaining time and opportunities people perceive in their lives (Carstensen, 2006; Cate & John, 2007; Lang & Carstensen, 2002). The remaining opportunities people perceive in their lives are captured by the construct of focus on opportunities which describes how many new goals, plans, options, and opportunities people believe to have in their personal future (Cate & John, 2007; Zacher & Frese, 2009). Holding people's focus on opportunities constant or changing it experimentally eliminates the effect of age on people's motives, goals, and performance (Carstensen, 2006; Lang & Carstensen, 2002; Zacher et al., 2010). From a lifespan perspective, focus on opportunities is

thus a central individual characteristic that affects individual goal choice, changes in motives, and performance.

In general, focus on opportunities decreases with age (Cate & John, 2007; Zacher & Frese, 2009). Using both cross-sectional and longitudinal data, Cate and John (2007) found that young adults had a stronger focus on opportunities than older adults. Zacher and Frese (2009) investigated focus on opportunities in the occupational context and also found that it decreased linearly with age. Similar to these findings, we hypothesize that older business owners' focus on opportunities should be lower than younger business owners' focus on opportunities. Lifespan theory assumes that with age several internal and external conditions change which cause a decline in focus on opportunities. For example, with age, a number of important personal resources such as time left in the future and physical stamina become increasingly limited (Schulz & Heckhausen, 1996). These resources, however, are important for a focus on opportunities because they equip business owners with the means to take on new, uncertain, and future-oriented endeavors. At least some remaining time is necessary in order to believe that one can achieve new goals and exploit upcoming opportunities in the future. Based on findings that these personal resources are becoming more and more depleted with increasing age, researchers have suggested that older individuals discount future-oriented activities and outcomes and, instead, focus more on maximizing their present outcomes such as immediate financial returns (Lévesque & Minniti, 2006) or personal satisfaction (Lang & Carstensen, 2002).

Furthermore, investing effort into activities such as learning about new technologies and other developments in the field is useful for maintaining a focus on opportunities, but can also be a frustrating experience, especially at higher ages when information processing abilities become more and more limited (P. B. Baltes, 1997). Learning about new technologies and developments

contributes to identifying and exploiting opportunities (Ravasi & Turati, 2005). Therefore, experiencing that information processing capabilities decline with age and that the acquisition of necessary technological knowledge becomes more and more difficult should result in lower expectations that the future holds many opportunities that can be identified and exploited.

Older business owners are also more likely than younger business owners to have already achieved their most important personal and business goals as well as a level of income from their businesses that they consider satisfactory (Smallbone & Wyer, 2006). Thus, they may not believe that the future offers many new goals, opportunities, and challenges for them. They are instead more inclined to maintain the status quo and “reap what they have sown”.

Finally, age-related norms and constraints in the environment (Neugarten, Moore, & Lowe, 1965), such as conventional retirement ages and institutional age discrimination, may reduce the number of future opportunities perceived by older business owners. For example, in most Western societies, older individuals are generally expected to plan for their life after retirement instead of seeking new opportunities (Hershey, Jacobs-Lawson, & Neukam, 2002; Usui, 1998). Older business owners may also experience more difficulties in finding support for their future-related endeavors. For example, older business owners’ beliefs concerning future opportunities should decline when a bank rations credits due to advanced age (Freel, 2007). Such external cues should influence business owners’ cognitions regarding future opportunities such as future goals and plans for their businesses. This line of reasoning leads to the following hypothesis:

Hypothesis 2: Business owners’ age is negatively related to focus on opportunities.

We further argue that focus on opportunities and venture growth are positively related. Focus on opportunities is inherent in individuals’ cognitions and these cognitions have a motivational effect because they influence individuals’ goal choice, effort, and persistence

(Carstensen, 2006; Cate & John, 2007; Lang & Carstensen, 2002; Zacher et al., 2010). This means that focus on opportunities regulates goal-directed behavior (i.e., goal selection and pursuit) and thus exerts a strong influence on people's performance (Aspinwall, 2005; Carstensen, 2006; Cate & John, 2007; Seijts, 1998; Zacher et al., 2010). Business owners' performance can be captured by the growth rates their ventures achieve (Baron, 2007). Venture growth depends on intentional actions by the business owner (Frese, 2009). Business owners manage their firms and thus influence business success. Actions are directly dependent on motivational factors such as goal choice, effort, and persistence. These factors facilitate or impede business owners' actions. Consequently, motivational factors manifested in business owners should have an effect on venture growth (Frese, 2009; Shane, Locke, & Collins, 2003).

Lifespan theory notes that when time and opportunities are perceived as unlimited, people prioritize goals that aim at growth and expansion. In contrast, when time and opportunities are perceived as limited, people prioritize short-term goals which aim at maintaining the status quo (P. B. Baltes et al., 1999; Carstensen, 2006). Markus and colleagues propose that people who perceive more opportunities in the future set themselves more challenging goals and have higher standards for evaluating their achievements (Cross & Markus, 1994; Markus & Nurius, 1986). Extending this line of reasoning to the occupational setting, Zacher and colleagues (2010) argue that expected future opportunities have a functional value similar to ambitious standards or goals. People who expect to have many opportunities in their personal future strive to reduce the discrepancy between their current situation and their envisioned future. This should result in higher levels of effort and persistence. Oettingen and Mayer (2002) provided evidence for this line of reasoning by demonstrating that positive expectations about the future predict high effort

and successful performance. Similarly, Foo, Uy, and Baron (2009) showed that entrepreneurs show more effort when their temporal focus is oriented towards the future.

Applying these findings to small business management, we suggest that older business owners should experience lower venture growth because of their reduced focus on opportunities which goes along with setting less challenging growth-oriented goals and showing less effort and persistence. Research from the entrepreneurship domain showed that top managers, who set less challenging goals, are less successful in terms of venture growth than top managers, who set high growth goals (e.g., Baum, Locke, & Smith, 2001). Similarly, research provided evidence that effort and persistence in the face of obstacles is related to entrepreneurial success and venture growth (Frese, Fay, Hilburger, Leng, & Tag, 1997; Markman, Baron, & Balkin, 2005). In conclusion, we hypothesize that focus on opportunities is positively related to venture growth. Moreover, we hypothesize that focus on opportunities mediates the negative relationship between business owners' age and venture growth. In other words, as business owners grow older, they generally believe to have fewer opportunities in the future, which in turn is associated with lower venture growth.

Hypothesis 3: Focus on opportunities is positively related to venture growth.

Hypothesis 4: Focus on opportunities mediates the negative relationship between business owners' age and venture growth.

3.2. The role of mental health

With the exception of two studies that compared business owners with non-owners (Protta & Thompson, 2006; Tetrick, Slack, Da Silva, & Sinclair, 2000), not much research on the mental health of business owners exists. According to Hisrich and colleagues (2007), this is due to the fact that "entrepreneurship has been synonymous with economic well-being, far removed from

psychological well-being” (p. 582). While many different definitions of mental health exist, a widely accepted one describes it as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (World Health Organization, 2004, p. 12). We argue for a moderator effect of mental health on the relationship between business owners’ age and focus on opportunities. Recently, Lévesque and Minniti (2006) suggested that age is generally negatively related to entrepreneurial attitudes and activities. In contrast to this universal proposition, we believe that a decline over time is not inevitable because high levels of mental health may help older business owners to maintain high levels of focus on opportunities which should be beneficial for their entrepreneurial performance in terms of venture growth. Mental health thus constitutes an important boundary condition of the generally negative relationship between business owners’ age and focus on opportunities.

Lifespan theory states that aging is not solely a time of decline, rather maintaining adequate levels of functioning continues to be possible with increasing age (P. B. Baltes, 1987). Lifespan theory argues against models of aging that focus exclusively on decrements and stresses plasticity and multidirectionality of development throughout the life (i.e., growth, decline, and maintenance of psychological functioning). A key proposition from lifespan theory is that much intraindividual plasticity (i.e., within-person modifiability) is found in psychological development (P. B. Baltes, 1987). This means that individual development is not predetermined by aging processes alone, but that individual and socio-cultural characteristics influence the degree of gains and losses an individual experiences with increasing age. According to lifespan theory, research should investigate factors that influence the effects of age on individual development, the plasticity of development, and the malleability of age effects (P. B. Baltes,

1987). One individual factor that received considerable attention is mental health (Keyes, 2007; Lazarus & DeLongis, 1983).

Consistent with lifespan theory, we argue that mental health is a factor that influences the negative effects of age on focus on opportunities and helps older business owners to maintain high levels of focus on opportunities for several reasons. Focus on opportunities decreases with age because personal resources become limited, learning becomes more difficult, important goals have already been achieved, and social norms and constraints enhance intentions to retire. Mental health should buffer those processes that lead to a decline in focus on opportunities with increasing age. The aging literature suggests that older individuals generally have fewer personal resources as well as more problems than younger individuals to replenish personal resources (P. B. Baltes, 1987, 1997). However, scholars from various disciplines suggested that mental health contributes to successful aging because it helps older individuals to obtain, protect, and replenish other important personal resources such as competencies and social networks (Hobfoll & Wells, 1998; Keyes, 2007; Knight, Kaskie, Shurgot, & Dave, 2006; Lazarus & DeLongis, 1983; Staudinger & Kunzmann, 2005; Warr, 1997). Mental health is also positively related to learning motivation (Colquitt, LePine, & Noe, 2000). Engaging in learning activities may be accompanied by stressful and unpleasant situations for many older individuals. Older business owners high in mental health should frame those experiences in a more positive light. Furthermore, older business owners high in mental health should also be less prone to settle for the status quo and instead strive for continuously setting and pursuing new goals. Older people high in mental health have high levels of functional goals and expectations of what they (still) want to achieve in their lives (Keyes, 2007). Finally, older business owners high in mental health should be better in dealing actively with various age-related demands, constraints, and changing circumstances

that may be hindrances for future goals, plans, and opportunities. Lazarus and DeLongis (1983) proposed that mentally healthy individuals are better able to deal with age-related stressors and changing circumstances as they grow older. A reason for this may be that older individuals high in mental health appraise age-related demands, constraints, and changes more positively than older individuals low in mental health (Lazarus & DeLongis, 1983). Hobfoll and Wells (1998) similarly suggested that mental health can help older individuals frame negative experiences in a more positive way. In conclusion, mental health should have the functional value of a personal resource that helps older business owners maintain high levels of focus on opportunities as they grow older. We therefore hypothesize:

Hypothesis 5: Mental health moderates the negative relationship between business owners' age and focus on opportunities, such that the relationship is weaker for business owners high in mental health than for business owners low in mental health.

4. Method

4.1. Participants and procedure

Data for this study came from 84 small business owners in Germany. Of the participants, 71 (84.5%) were male and 13 (15.5%) were female. Mean age was 44.02 years ($SD = 10.12$) and ranged from 24 to 74 years. Specifically, 34 business owners were 40 years old or younger, 27 were between 41 and 50 years old, and 23 were 51 years old or older. On average, participants currently employed 3.55 employees ($SD = 8.58$). Twenty participants (23.8%) owned businesses in the manufacturing industry sector (e.g., construction, food production, crafts), and 64 (76.2%) owned businesses in the service industry sector (e.g., catering, retail, consulting).

We randomly selected 200 small businesses from the yellow pages of a medium-sized city in central Germany. Out of these 200 businesses, we were able to contact 170 owners personally

or by phone, and 99 business owners agreed to participate in our study. We conducted face-to-face interviews with these 99 business owners at their company site, which lasted about one hour each and included filling out a standardized questionnaire. The questionnaire contained questions on demographic characteristics and items on focus on opportunities, need for achievement, internal locus of control, physical and mental health, and venture growth and took about 20-30 minutes to fill out. The interviewer was present in the room while the business owners filled out the survey to assist with any questions. The participants were assured that participation in the study was completely anonymous. Before we started the interview we made sure that the person we talked to had founded the business, still owned it, and regarded him- or herself as CEO or general manager of the business. We had to exclude 14 business owners from the final sample because they did not answer the venture growth items. In addition, we excluded one participant because his overall value of venture growth (580%) departed more than three standard deviations from the sample mean (i.e., 121.22%). Thus, we were able to use complete data provided by 84 business owners. Results of non-parametric Mann-Whitney-U-tests indicated that there were no significant differences in terms of age, physical and mental health, focus on opportunities, firm size, and industry sector between the 84 participants included and the 15 participants not included in the study. However, the number of female participants excluded (8 out of 21) was disproportionately larger than the number of male participants excluded (7 out of 78; $\chi^2[1, N = 99] = 10.91, p < .01$).

4.2. Measures

Focus on opportunities was measured with five items adapted from Carstensen and Lang's (1996) German future time perspective scale (Cate & John, 2007; see also Lang & Carstensen, 2002; Zacher & Frese, 2009, in press; Zacher et al., 2010). The items are "Many opportunities

await me in my occupational future”, “I expect that I will set many new goals in my occupational future”, “My occupational future is filled with possibilities”, “I could do anything I want in my occupational future”, and “There are only limited possibilities in my occupational future” (reverse coded). Participants gave their answers on 5-point scales ranging from 1 (does not apply at all) to 5 (applies completely). Cronbach’s alpha of the scale was .88.

Venture growth was measured with five items adapted from Krauss, Frese, Friedrich, and Unger (2005). The items ask business owners to indicate percent changes in sales, profit, transaction volume, income, and number of employees in the year 2007 compared to the previous year. No change in these factors was indicated by 100%. A sample item is: “Compared to 2006, have your sales increased or decreased or did they stay the same in 2007? By what percentage have they in/decreased?” Cronbach’s alpha of the scale was .79.

Mental and physical health were measured with twelve items from the German SF-12 health survey (Bullinger & Kirchberger, 1998; Ware, Kosinski, & Keller, 1996). Besides mental health, we also assessed and controlled for physical health because research showed that physical health is negatively related to focus on opportunities (Zacher & Frese, 2009). The SF-12 items cover different health domains such as bodily pain, vitality, and physical and social functioning. As suggested by the scale authors, participants answered four dichotomous items, two 3-point items, three 5-point items, and three 6-point items. The two composite scores for physical and mental health are computed using a three-step scoring algorithm included in a SPSS syntax provided by the scale authors (Bullinger & Kirchberger, 1998). First, all item response choices are converted into separate indicator variables for physical and mental health. Second, the indicator variables are weighted using norm-based regression weights. Finally, the weighted indicator variables are aggregated and standardized to form the composite scales. The SF-12 is

widely used in research and practice and has been shown to be a highly reliable, valid, and practical measure for physical and mental health (Ware et al., 1996). Cronbach's alphas were .76 for physical health and .77 for mental health.

Participants further indicated their age, gender (0 = female and 1 = male), number of employees, and a description of their industry sector. We used number of employees as a measure for our control variable of *firm size*. For *industry* we created a dummy-coded variable (0 = manufacturing, 1 = service) and used it as an additional control variable. To control for *prior venture growth*, we calculated the compound annual growth rate of employees for the time from start-up to the time of the survey. Employment growth correlates significantly with other measures of growth (e.g., sales or assets) and can be thus considered as an indicator of venture growth (Weinzimmer, Nystrom, & Freeman, 1998). The compound annual growth rate represents a smoothed annual growth rate and thus represents an estimation of prior venture growth over the period of one year.

A question is whether focus on opportunities adds to our understanding beyond other motivational constructs or not¹. To examine this question, we measured two of the most important motivational variables that have been shown to be effective for predicting success in entrepreneurs: need for achievement and internal locus of control (Rauch & Frese, 2007; Shane et al., 2003). *Need for achievement* reflects people's drive to meet standards of excellence and to perform successfully in competitive situations (McClelland, 1967). People high in need for achievement set challenging promotion goals while people low in need for achievement are more likely to set security goals (Higgins, 1998). *Internal locus of control* reflects the degree to which people think they are masters of their own fate (Rotter, 1966). Business owners with an internal locus of control should exert more effort and persistence towards achieving their goals and

¹ We thank an anonymous reviewer for bringing up this point.

growing a business because they believe that they are able to control outcomes and that their own actions determine the achievement of rewards (Rauch & Frese, 2007). By controlling for need for achievement and internal locus of control, we can test whether focus on opportunities has a motivational effect on venture growth beyond these two variables. We measured need for achievement with seven items (Cronbach's alpha = .79) developed by Modick (1977) and adapted by Frese (1998; see also Rauch, Frese, & Sonnentag, 2000; Utsch, Rauch, Rothfuss, & Frese, 1999). A sample item is "I find it important to achieve more than others". We used six items from a well-established German scale by Krampen (1991) to measure internal locus of control (Cronbach's alpha = .78). A sample item is "If I get what I want, it is always a consequence of my efforts and personal engagement". We measured all items using five-point Likert scales.

4.3. Analyses

Our theoretical model corresponds to a moderated mediation model with an indirect effect of business owners' age on venture growth via focus on opportunities that varies in strength conditional on the level of mental health (Edwards & Lambert, 2007; MacKinnon, Fairchild, & Fritz, 2007; Preacher et al., 2007). A moderated mediation model assumes that an indirect effect does not remain constant across different values of a moderator variable; instead, it is assumed that the indirect effect varies across different values of the moderator (Preacher et al., 2007).

We first tested our hypotheses regarding the direct, indirect (i.e., mediation), and moderation effects. To simultaneously test these effects, we calculated a path model using LISREL 8.70 (Jöreskog & Sörbom, 2001). We tested the moderating effect of mental health on the relationship between business owners' age and focus on opportunities using the approach recommended by Cortina, Chen, and Dunlap (2001; see also Williams, Edwards, & Vandenberg,

2003). This approach suggests to use aggregate measures as variables in the model and to fix factor loadings and error variances based on scale reliabilities and scale variances to correct for measurement errors. In the first step, we computed aggregate measures for all variables as described in the section on the measures of the present study. In the second step, we centered and multiplied the measures for business owners' age and mental health to compute the variable for the interaction term. In the third step, we determined the factor loadings and error variances for the variables to fix the respective values in the path model. The factor loadings for the measures are computed by extracting the square root of the measures' reliabilities. The measurement errors are computed by multiplying the measures' variance with one minus the measures reliabilities. We determined the reliability of the interaction term by following the approach developed by Bohrnsted and Marwell (1978). We then used the reliability of the interaction term in the same way as for the other variables to calculate the factor loading and error variance. In the fourth step, we computed an asymptotic covariance matrix as input for LISREL using PRELIS 2.70 (Jöreskog & Sörbom, 2002). We had to use an asymptotic covariance matrix because product terms (in our case the interaction term) do not have a normal distribution, which violates the assumption of normality that is necessary for maximum likelihood estimations (Bollen, 1989). A violation of normality inflates standard errors and Chi^2 -statistics. By using an asymptotic covariance matrix as input, LISREL is prompted to compute the Satorra-Bentler (Satorra & Bentler, 1994) correction which adjusts standard errors and Chi^2 -statistics according to the degree of non-normality. In the final step, we compared a nested baseline model without the path from the interaction term to the dependent variable of focus on opportunities with a model that included the path. The null hypothesis that there is no moderation is rejected when the second model has a significant better model fit (Cortina et al., 2001; Williams et al., 2003). The relevant

test statistic is the corrected χ^2 -statistics. To determine the fit of our overall model, we used the corrected χ^2 -statistic, the root mean square error of approximation (RMSEA), the squared root mean residual (SRMR), and the comparative fit index (CFI). Hu and Bentler (1999) suggest that a RMSEA of or smaller than .06, a SRMR of or smaller than .08, and CFI larger than .95 indicate good model fit.

Second, we examined the indirect effect of business owners' age on venture growth (through focus on opportunities) conditional on different levels of mental health. To this end, we calculated two additional LISREL models (cf., Tein, Sandler, MacKinnon, & Wolchik, 2004). Usually, the moderator is centered at the mean before computing the interaction term. Accordingly, the resulting indirect effect represents the conditional indirect effect at the mean value of the moderator. Centering the moderator at values other than the mean before computing the interaction term and then re-running the model results in indirect effects of different magnitude; these indirect effects represent the conditional indirect effects at the respective values of the moderator (Preacher et al., 2007; Tein et al., 2004). This approach implies that a new interaction term is computed and that the parameter estimates are calculated for the respective conditional values of the moderator. We conducted additional analyses of the indirect effect of business owners' age on venture growth for one standard deviation below (low) and one standard deviation above (high) the mean value of mental health. The indirect effect of business owners' age on venture growth for moderate levels of mental health corresponds to the indirect effect of the original model. To obtain the indirect effects for low and high levels of mental health, we modified the scale for mental health so that zero corresponded to one standard deviation above and below the mean before computing the interaction term. We then re-ran the LISREL

calculations with the respective interaction terms. The results for the indirect effects correspond to the indirect effects for the respective levels of mental health.

5. Results

5.1. Intercorrelations of study variables

Table 1 shows the descriptive statistics and intercorrelations of the study variables. The relationship between business owners' age and venture growth was negative and significant ($r = -.28, p < .01$). Business owners' age was also negatively related to physical health ($r = -.23, p < .05$) and focus on opportunities ($r = -.41, p < .01$). Focus on opportunities was positively related to venture growth ($r = .33, p < .01$). The control variable gender correlated significantly with mental health ($r = .39, p < .01$), indicating that female business owners reported lower levels of mental health. Gender also correlated significantly with line of industry ($r = -.24, p < .05$), indicating that female business owners more often owned businesses in the service sector. Prior venture growth correlated significantly with venture growth ($r = .35, p < .01$) and with firm size ($r = .54, p < .01$).

5.2. Test of hypotheses

Following the recommendations by Cortina and colleagues (2001), we computed two different path models with all main variables and all control variables of the study. The first model was a nested baseline model without the path from the interaction term of business owners' age and mental health to focus on opportunities. The model yielded a Satorra-Bentler adjusted χ^2 -statistic of 22.27 ($df = 43; p = 1.00$). To test Hypothesis 5, which states that mental health moderates the relationship between business owners' age and focus on opportunities, we computed a second model. The second model included the path from the interaction term to focus on opportunities. This model is depicted in Figure 2. The second model yielded a Satorra-

Bentler adjusted χ^2 -statistic of 7.15 ($df = 42; p = 1.00$). The test against the baseline model revealed that the second model fitted the data significantly better (Satorra-Bentler corrected χ^2 difference (1) = 15.12; $p < .01$). Thus, the data provided support for a significant interaction between business owners' age and mental health on focus on opportunities. In addition, the fit statistics of the second model showed acceptable to good model fit (Satorra-Bentler corrected χ^2 (19) = 7.15; RMSEA = .06; SRMR = .09; CFI = 1.00). This allowed us to interpret the path coefficients to test the remaining hypotheses (see Figure 2).

We hypothesized that business owners' age and venture growth are negatively related (Hypothesis 1). We found a significant and negative correlation between the two constructs ($r = -.28, p < .01$; see Table 1) supporting our hypothesis. Hypothesis 2 states that business owners' age is negatively related to focus on opportunities. The path coefficient from business owners' age to focus on opportunities was negative and significant ($\beta = -.50; p < .01$). Thus, Hypothesis 2 found support in the data. Furthermore, the path coefficient from focus on opportunities to venture growth was positive and significant ($\beta = .38; p < .01$). This result supports Hypothesis 3 that focus on opportunities is positively related to venture growth. To test whether focus on opportunities mediates the negative relationship between business owners' age and venture growth (Hypothesis 4), we used the Sobel-test (Sobel, 1982) to examine the indirect effect of business owners' age on venture growth via focus on opportunities. The indirect effect of business owners' age on venture growth was negative and significant (standardized indirect effect: $-.19, p < .01$), providing support for Hypothesis 4. Focus on opportunities is thus a mediator in the relationship between business owners' age and venture growth. Additional support for Hypothesis 5 – that mental health moderates the negative effect of business owners' age on focus on opportunities – was provided by the significant path coefficient from the

interaction term between business owners' age and mental health to focus on opportunities ($\beta = .34; p < .05$). The path coefficient was positive. To illustrate the interaction, we adapted the procedure described by Aiken and West (1991) to create a plot that depicts the nature of the moderated relationship (see Figure 3). Figure 3 shows that we found a strong (negative) relationship between business owners' age and focus on opportunities in case of low levels of mental health while the relationship was weaker for high levels of mental health. Simple slope analyses (Tein et al., 2004) revealed that the path coefficient for low mental health was significant ($\beta = -.89; t = -3.92, p < .01$) while the path coefficient for high mental health was not ($\beta = -.10; t = -0.51, ns.$). These results suggest that the negative effect of business owners' age on focus on opportunities becomes weaker with increasing levels of mental health.

We further tested whether the indirect effect of business owners' age on venture growth varied with different levels of mental health. The indirect effect of business owners' age on venture growth for moderate levels of mental health corresponds to the indirect effect of our original model (standardized indirect effect: $-.19, p < .01$). We calculated two additional LISREL models with the moderator variable of mental health centered at low (one standard deviation below the mean) and high (one standard deviation above the mean) values before computing the interaction term. In our additional analyses, we found significant indirect effects of business owners' age on venture growth for low levels of mental health (standardized indirect effect: $-.34, p < .01$), but not for high levels of mental health (standardized indirect effect: $-.04, ns.$). The findings reveal that the indirect effect of business owners' age on venture growth is significant for low and moderate levels of mental health and it becomes non-significant for high levels of mental health.

5.3. Post-hoc analyses to oppose alternative explanations

Due to the cross-sectional nature of this study, an alternative model with a reversed causal path may exist. Specifically, business owners' focus on opportunities may be a psychological reaction to their levels of venture growth. To investigate this possibility, we estimated an alternative path analytic model with venture growth as the antecedent and focus on opportunities as the outcome variable (the other variables in the model were identical). Researchers have suggested that testing such reversed causal models may provide preliminary evidence for the direction of causality (e.g., Cole, Walter, & Bruch, 2008). Results showed that the fit of this alternative model was significantly worse (Satorra-Bentler adjusted $\chi^2(42) = 45.63$) than our hypothesized model (Satorra-Bentler adjusted $\chi^2(42) = 7.15$; χ^2 difference to alternative model = 38.48; $p < .01$). We note that the comparison of our hypothesized model with the alternative model still does not allow drawing definite causal conclusions. However, the results suggest that our hypothesized model represents the empirical data well.

We hypothesized that our effects are due to aging processes across business owners' lifespan. An alternative explanation might be that the effects are due to different birth cohorts and not to developments across the lifespan. To argue against this alternative explanation, we estimated three additional models using different subsamples of our total sample². Based on the Gross Domestic Product (GDP) growth or decline for the time period given by the age range of our sample, we created three cohorts: high GDP growth (one standard deviation above the mean), low GDP growth (one standard deviation below the mean), and average GDP growth (between one standard deviation above and below the mean). To estimate the three additional models with a sufficiently high number of subjects, we formed the first subsample by excluding the high GDP growth cohort from our total sample, the second subsample by excluding the low GDP growth cohort from our total sample, and the third subsample by excluding both high and

² We thank the editor Phillip Phan for pointing this out to us.

low GDP growth cohorts. The three additional models using the different subsamples revealed the same pattern of results as for our model based on the total sample. These findings make it less likely that our results are due to cohort effects.

6. Discussion

6.1. Interpretation of results and theoretical implications

The aim of the present study was twofold. First, we wanted to investigate the concept of focus on opportunities as a mediating psychological process in the relationship between business owners' age and venture growth. The concept of focus on opportunities might help explain why age should have a negative effect on important entrepreneurial outcomes (cf., Hambrick & Mason, 1984; Lévesque & Minniti, 2006). Second, we sought to examine the role of mental health as a factor that might maintain entrepreneurial behavior in old age as it buffers the negative effect of business owners' age on focus on opportunities. We argued that mental health contributes to plasticity in business owners' development and thus constitutes an important boundary condition of the generally negative relationship between aging and venture growth.

Our results showed that business owners' age had a negative indirect effect on venture growth. This negative indirect effect was mediated by focus on opportunities which was negatively related to business owners' age and positively related to venture growth. Furthermore, we found that mental health moderated the negative relationship between business owners' age and focus on opportunities. Our analyses revealed that high levels of mental health buffered the negative effect of business owners' age on focus on opportunities. In this case the relationship between business owners' age and focus on opportunities was weak and non-significant. In the case of low mental health, we found a strong negative effect of business owners' age on focus on opportunities. Additional analyses of conditional indirect effects revealed that the indirect effect

of business owners' age on venture growth (through focus on opportunities) was dependent on the level of mental health. The indirect effect was significant for low and moderate levels of mental health, but was not significant for high levels of mental health. Thus, business owners maintain a focus on opportunities, which contributes to their venture growth, if they possess high levels of mental health.

We seek to contribute to the entrepreneurship literature in several ways. Our study is among the first empirical studies in the entrepreneurship domain to simultaneously examine why and under which conditions business owners' age is negatively related to venture growth. Drawing on upper echelons theory (Hambrick & Mason, 1984) and lifespan theory (P. B. Baltes, 1987), we show that the construct of focus on opportunities has a mediating function in the process that leads from business owners' age to venture growth. Additionally, we conceptualize the important construct of mental health as a moderator variable that facilitates the discussion and modeling of the mediating function of focus on opportunities in the relationship between age and venture growth. In other words, mental health and focus on opportunities are key mechanisms that add to a better understanding of the plasticity inherent in the process that links business owners' age and entrepreneurial outcomes such as venture growth.

By establishing theoretical linkages and providing first empirical evidence for the mediating effect of focus on opportunities and the moderating effect of mental health, we see our study as a starting point for further research on the impact of aging on entrepreneurial outcomes and the beneficial role of mental health in this process. We investigated the effect of mental health as a moderator of the direct effect of business owners' age on focus on opportunities and of the indirect effect of business owners' age on venture growth. Proposing and testing the boundary conditions of relationships between predictor and criterion variables are important

steps to advance theory in a given field. With this study, we extend previous research on the role of age in entrepreneurship (e.g., Lévesque & Minniti, 2006) by showing that business owners' mental health functions as an important boundary condition of the negative effect of increasing age. Our findings suggest that a decline in focus on opportunities and venture growth with increasing age is not obligatory. In accordance with lifespan psychology, we propose that the ontogenetic development of business owners is characterized by plasticity in such a way that individual or socio-cultural context factors exert an important influence on the losses and gains business owner experience over the lifespan. Researchers have suggested that mental health is a particularly important personal resource at higher ages because it helps to protect, retain, and replenish personal resources, to frame negative experiences positively, and to deal successfully with age-related demands, difficulties, and constraints (Hobfoll & Wells, 1998; Keyes, 2007; Knight et al., 2006; Lazarus & DeLongis, 1983). Our findings thus challenge assumptions that the relationship between age and entrepreneurial activity is generally negative.

We also seek to contribute to the theoretical discussion of upper echelons theory (Hambrick & Mason, 1984) in the scholarly domain of entrepreneurship. Previous entrepreneurship research suggests that upper echelons theory might be useful to understand the link between business owners and firm performance (e.g., Baum & Locke, 2004; Baum et al., 2001). Upper echelons theory proposes that top managers' age is negatively related to firm growth; however, the processes that mediate this relationship are not yet fully understood (Hambrick, 2007; Hambrick & Mason, 1984). We suggest that the entrepreneurship literature might benefit from taking into account propositions from lifespan theory that stress the importance of the concept of focus on opportunities for various motivational and performance-related outcomes that change with increasing age (P. B. Baltes, 1987; Carstensen, 2006; Cate &

John, 2007; Zacher et al., 2010). Our findings show that, in the domain of small business management where business owners usually remain in a top manager's position over several decades, business owners' age has a negative indirect effect on venture growth via focus on opportunities. We thus provide evidence that propositions from upper echelons theory hold true in the domain of small business management and we extend this view by pointing to the importance of considering a lifespan psychology approach when top managers remain in their position over a longer period of time. We also add to the theoretical conception of upper echelons theory (Hambrick & Mason, 1984) by examining the mediating effect of how business owners regard their future. A main focus of upper echelons theory with regard to the psychological mechanisms that link the individual with the firm is the top managers' approach towards information processing. In the entrepreneurship literature, scholars adopted a cognitive perspective to explain why the entrepreneur influences firm levels outcomes and focused on concepts such as biases in the entrepreneurial decision making processes, entrepreneurial expertise, alertness, or effectuation (Baron, 2004; Mitchell et al., 2007). In addition to these processes, we suggest that business owners' focus on opportunities, which describes how many new goals, plans, options, and opportunities they believe to have in their occupational future, is an important psychological mechanism that contributes to our understanding of the effects of business owners' age. Believing that the future holds many opportunities is a cognition that should affect several motivational aspects (e.g., goal choice as well as effort and persistence in goal pursuit) and thus influence entrepreneurial success measures, such as venture growth.

6.2. Limitations

Like any study, this study has a number of limitations. A first limitation is the cross-sectional design of our study which does not allow definite conclusions about causal processes

and intraindividual changes over time (i.e., aging). Therefore, it may also be possible that older business owners' lower levels of venture growth lead to a lower focus on opportunities in this age group. We took two empirical steps in this study that may partially mitigate this limitation. First, we controlled for prior levels of venture growth in our path analytic models in order to achieve a closer approximation of time-lagged effects of focus on opportunities on venture growth. Second, we specified an alternative, reversed causal path model which assumed that venture growth affects focus on opportunities. The results showed that our original model, in which focus on opportunities has an effect on venture growth, achieved a better fit to the data than this alternative model. We further argue that the flow of causality as suggested by our mediation model is also more plausible from a theoretical perspective than the flow of causality in an alternative model with a reversed path from venture growth to focus on opportunities. Specifically, age has to be the initial variable in our theoretical model as it cannot be the outcome of business owners' focus on opportunities or their levels of venture growth. Proposing the person-level variable of focus on opportunities to be the mediator in the negative relationship between business owners' age and venture growth is theoretically plausible because focus on opportunities is conceptually more proximal to age than to the organization-level variable of venture growth. Lifespan psychologists have suggested that changes in focus on opportunities are due to age-related changes in individuals' perceptions of remaining time in life (Cate & John, 2007). Focus on opportunities as a cognitive-motivational concept, in turn, is conceptually more proximal to venture growth than the initial variable of age. As outlined in the introduction, the action theory perspective on entrepreneurship (Frese, 2009) suggests that cognitive and motivational concepts impact business-level outcomes such as venture growth. Based on these arguments, which are also consistent with upper echelons theory (Hambrick & Mason, 1984) and

are supported by our empirical results, we suggest that the causal flow from age over focus on opportunities to venture growth is more plausible than the reversed causal ordering.

One might also criticize that our findings are influenced by differences between different birth cohorts or selection effects (P. B. Baltes & Nesselroade, 1979; Hofer & Sliwinski, 2006). For example, business owners born in the 1980's might report higher levels of focus on opportunities because this cohort sees more opportunities for themselves in comparison to the cohort of business owners born in the 1950's. We cannot completely rule out this possibility in this study, but longitudinal research showed that focus on opportunities generally decreased with age even across different age cohorts (Cate & John, 2007). Furthermore, we re-estimated our models with three different cohorts based on GDP growth or decline across the age range of our sample. The three models based on different cohorts did not reveal different patterns of results; all coefficients were of similar magnitude and pointed in the same direction as our model based on the total sample. We are therefore confident that the effects of business owners' age are not cohort effects.

Furthermore, it is important to note that venture growth is a multi-faceted construct and there are several ways to assess venture growth. Acknowledging the heterogeneity of venture performance, scholars advocate using multiple indicators to capture the different aspects of venture growth (Delmar, Davidsson, & Gartner, 2003). For this reason, we used several measures and combined data on sales, profit, transaction volume, income, and number of employees to one composite score of venture growth. The analysis of internal consistency justified the computation of a single scale. Furthermore, instead of hard data on profit or sales we measured venture growth using business owners' own evaluations. In small business settings it is often difficult to acquire exact performance data (Sapienza, Smith, & Gannon, 1988) and data on

the financial performance might be manipulated for tax reasons (Smith, 1996). Our approach of measuring venture growth is in line with other studies conducted in small business settings (e.g., Baum et al., 2001; Delmar & Wiklund, 2008; Wiklund & Shepherd, 2003). In addition, research supports the validity of this approach by showing a positive relationship between business managers' subjective performance statements with independent expert ratings of businesses' performance or with objective performance data (Frese et al., 2007; Wall et al., 2004).

We also have to state that our outcome variable of venture growth is on the firm level while our predictor variables are on the individual level. Relating variables on different levels has certain empirical challenges. An important empirical challenge is the proximity of respondents to the outcome variables. The validity of measures might be flawed if respondents base their responses on assumptions rather than first-hand experience. In our study, we asked business owners to report data on venture growth. Business owners, particularly of small businesses, should have first-hand knowledge and a comprehensive overview of their firm performance (Wall et al., 2004). Therefore, the validity of our outcome variable should not be compromised because of cross-level measurement. Another empirical challenge is if a single respondent has to provide data across several units on a higher level. Different anchors across respondents and respondents' different proximities to the units might flaw the validity of the data. In our study, the business owners reported data on their respective firms. Accordingly, our study does not face the empirical challenge of responses across units. A third point is the selection of appropriate control variables. Including non-personal variables as controls is an appropriate approach to address empirical challenges due to cross-level linkages (Davidsson, 2007). Our empirical model includes firm size, prior venture growth, and industry as non-personal control variables. The individual-level variables of focus on opportunities and business

owners' age have significant direct and indirect effects on venture growth over and above the firm-level control variables. This provides additional support for the validity of our findings.

We sought to minimize the problem of common method bias of our study by including an objective independent variable in our model (age), and by using different scale anchors and answer formats for focus on opportunities, mental health, and venture growth (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). It is also important to note that moderation and moderated mediation effects are not influenced by common method bias (Evans, 1985; Schriesheim & DeNisi, 1981).

A further limitation of our study may be that we investigated the relationship between business owners' focus on opportunities and venture growth in the past year, thereby predicting an outcome variable measured in the past with a future-oriented predictor variable. However, we believe that our findings are valid as previous research showed that focus on opportunities does not decline substantially within a short period of time such as several months or one year, but rather over longer periods of time such as ten years (Cate & John, 2007; Zacher & Frese, 2009).

Finally, our sample size might be considered too small for calculating path analytic models. We note that we reduced the number of parameters to be estimated by calculating a path analytic model and not a full structural equation model with a measurement and a structural model. We further used maximum-likelihood estimation which should also contribute to the robustness of our findings; Monte Carlo studies showed that bias in parameter estimates is of no practical importance for sample sizes as low as 50 in the case of maximum-likelihood estimations (Anderson & Gerbing, 1984; Gerbing & Anderson, 1985). Statistical inferences based on tests of significance remain valid because standard errors of the path coefficients are adjusted according to the sample size. Additional Monte Carlo studies demonstrated that

technical problems in path analytic models are negligible with sample sizes approaching 100 (Hoyle & Kenny, 1999). Furthermore, bias in parameters is substantially reduced if scholars account for the unreliability of measurements (Hoyle & Kenny, 1999). We corrected for measurement errors by fixing factor loadings and error variances of our variables in the model according to the reliability of the measures. We therefore think that our model is a valid representation of the examined processes.

In summary, we acknowledge that particularly the cross-sectional design of our study, the sample size, and the subjective ratings of venture growth may potentially limit the internal and external validity of our findings. Future research needs to replicate our findings using more objective and longitudinal data to provide more compelling evidence for our theoretical model. However, our theoretical model is based on theoretical propositions from upper echelons theory (Hambrick & Mason, 1984) and lifespan theory (P. B. Baltes, 1987), justifying our hypotheses and validating our results. Furthermore, the potential limitations do not impair the theoretical contribution of our study. By combining upper echelons and lifespan theory, we were able to develop a theoretical model that links business owners' age with venture growth and that explains why and under what conditions these two constructs are linked. Our model represents a novel way of thinking about aging in the entrepreneurial process from the perspectives of upper echelons and lifespan theories. Introducing the constructs of focus on opportunities and mental health enabled us to argue for plasticity in the ontogenetic development of business owners and the maintenance of entrepreneurial activity over the lifespan. Thus, in combination, the constructs of focus on opportunities and mental health add importantly to our understanding of the role of aging in the entrepreneurial process.

6.3. Implications for future research

The limitations of the current study notwithstanding, we consider the theoretical contribution of our model important and worthy of future empirical study. For example, future research might investigate whether focus on opportunities also mediates the relationships between business owners' age and additional indicators of entrepreneurial success, such as owner satisfaction or the capability to remain an active member of the business at higher ages.

Another interesting avenue for future research may be to identify additional personal (e.g., self-regulatory strategies) as well as situational resources (e.g., family or subordinate support) that moderate the relations between business owners' age, focus on opportunities, and venture growth. We investigated mental health as a boundary condition of the mediating function of focus on opportunities. Mental health might be one important boundary condition that can be influenced by business owners themselves as well as policy makers to increase the plasticity of the process leading from age over focus on opportunities to venture growth. In addition to mental health, other constructs might have a similar function and constitute additional boundary conditions of the generally negative relationship between business owners' age and venture growth. For example, Zacher and Frese (in press) showed that employees who used the self-regulatory strategies of selection, optimization, and compensation (SOC; P. B. Baltes et al., 1999) maintained higher levels of focus on opportunities across the lifespan. Similar effects might be observable among older business owners.

Furthermore, the role of mental health in entrepreneurship needs further investigation. Mental health might be generally important for business owners at all ages, and not only in relation to focus on opportunities and venture growth (Hisrich et al., 2007). For example, high levels of mental health increase the motivation to learn, self-regulatory activity, and a generally optimistic outlook (Colquitt et al., 2000; Keyes, 2007; Warr, 1994). Previous research showed

that these factors affect entrepreneurial outcomes (e.g., Frese, 2009; Hmieleski & Baron, 2009; Ravasi & Turati, 2005). Establishing the link between mental health and important entrepreneurial outcomes and providing insights into the mediating mechanisms would further enhance our understanding of the process that leads to entrepreneurial success.

We proposed that focus on opportunities is positively related to venture growth through the motivational mechanisms of goal choice and goal pursuit (i.e., effort and persistence). Future research could investigate whether cognitive mechanisms mediate the relationship between focus on opportunities and venture growth in addition to motivational mechanisms. Research showed that aging and the shortening of individuals' perceived future time affect attentional processes (Mather & Carstensen, 2003; Ouweland, de Ridder, & Bensing, 2008). Accordingly, business owners' focus on opportunities could direct attentional processes towards profit- or growth-relevant information. For example, believing that the future holds many opportunities could direct business owners' attention towards information about events and changes in the environment entailing the possibility for profit opportunities such as new technologies, political and regulatory changes, changes in trends, and social or demographic changes.

Another important task for future research is to examine how focus on opportunities relates to other concepts discussed by entrepreneurial cognition researchers (Baron, 2004; Baron & Ward, 2004; Mitchell et al., 2007). For example, Baron (2004) suggested that business owners with a strong promotion focus (Higgins, 1998) are more likely to search for opportunities and to generate hypotheses concerning opportunities. Even though a certain degree of overlap between focus on opportunities and promotion focus may be expected, we believe that focus on opportunities is a unique cognitive-motivational construct due to its relationship with age. In

contrast, cognitive constructs such as promotion focus or counterfactual thinking (Baron, 2004) are conceptualized to be more stable over time.

6.4. Conclusions and practical implications

The findings of our study also have practical implications for business owners and policy makers. First, the findings on the important role of mental health for maintaining high levels of focus on opportunities with increasing age suggest that older business owners should find ways to maintain or improve their mental health. Policy makers could provide older business owners with information and support in this endeavor. A large number of factors influence mental health (Keyes, 2007; Warr, 1994). For example, Warr (1987) outlines nine features of the environment which positively influence mental health: Opportunity for control, opportunity for skill use, externally generated goals, variety, environmental clarity, availability of money, physical security, opportunity for interpersonal contact, and a valued social position. Business owners and policy makers should ensure that these conditions are met. In addition, older business owners with particularly low levels of mental health should be encouraged to seek professional help.

Second, considering that venture growth is probably the most important indicator of entrepreneurial success (Davidsson, Delmar, & Wiklund, 2002), and that focus on opportunities is positively associated with this indicator, it seems important to find additional ways to increase older business owners' focus on opportunities and to maintain it with increasing age. Besides increasing mental health, a promising approach may be that entrepreneurship associations provide older business owners with more learning and development possibilities. In addition, reducing age-related constraints and discrimination in institutions and society, encouraging and supporting flexibility at higher ages, and recognizing that many individuals want to keep

working and pursuing business opportunities at higher ages may be important ways to assist older business owners in maintaining a focus on opportunities (Rogoff, 2007).

Our findings further showed that a weak focus on opportunities among older business owners is responsible for lower levels of venture growth in this age group. So far, studies have only found empirical evidence for an overall negative relationship between business owners' age and venture growth (Carter et al., 2004) or theoretically proposed negative relationships between age and entrepreneurial outcomes (Lévesque & Minniti, 2006). Generally, the identification of mediators of relationships between age and important indicators of business success, such as venture growth, is important because demographic changes will lead to higher numbers of older business owners over the next decades (Rogoff, 2007). A better understanding of the mediating mechanisms may help practitioners and policy makers design interventions which influence these mechanisms and enhance older entrepreneurs' venture growth.

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Table 1

Means (*M*), Standard Deviations (*SD*), and Intercorrelations of Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Age	44.02	10.12	-										
2. Gender	0.85	0.36	.21	-									
3. Physical health	53.03	6.00	-.23*	.18	(.76)								
4. Mental health	48.88	9.57	.20	.39**	-.14	(.77)							
5. Focus on opportunities	3.58	0.94	-.41**	-.05	.10	.10	(.88)						
6. Venture growth	115.75	33.83	-.28**	-.01	.18	-.16	.33**	(.79)					
7. Firm size	5.74	9.67	.18	.01	-.05	.00	-.08	.18	-				
8. Industry sector	0.76	0.43	-.13	-.24*	-.02	-.18	-.02	.13	-.09	-			
9. Prior venture growth	0.18	0.32	-.08	-.14	.09	-.07	.04	.35**	.54**	-.13	-		
10. Need for achievement	4.05	0.63	-.05	-.12	.04	.12	.04	.18	.06	.04	.07	(.79)	
11. Locus of control	3.80	0.61	.04	.02	.12	.13	.18	.13	-.01	.03	-.04	.44**	(.78)

Note. Listwise $N = 84$. For gender, 0 = female, 1 = male. For industry sector, 0 = manufacturing, 1 = service. Scale reliabilities

(Cronbach's alpha) in parentheses where applicable. * $p < .05$. ** $p < .01$.

Fig. 1. Model of the mediating effect of focus on opportunities and the moderating effect of mental health in the relationship between business owner's age and venture growth.

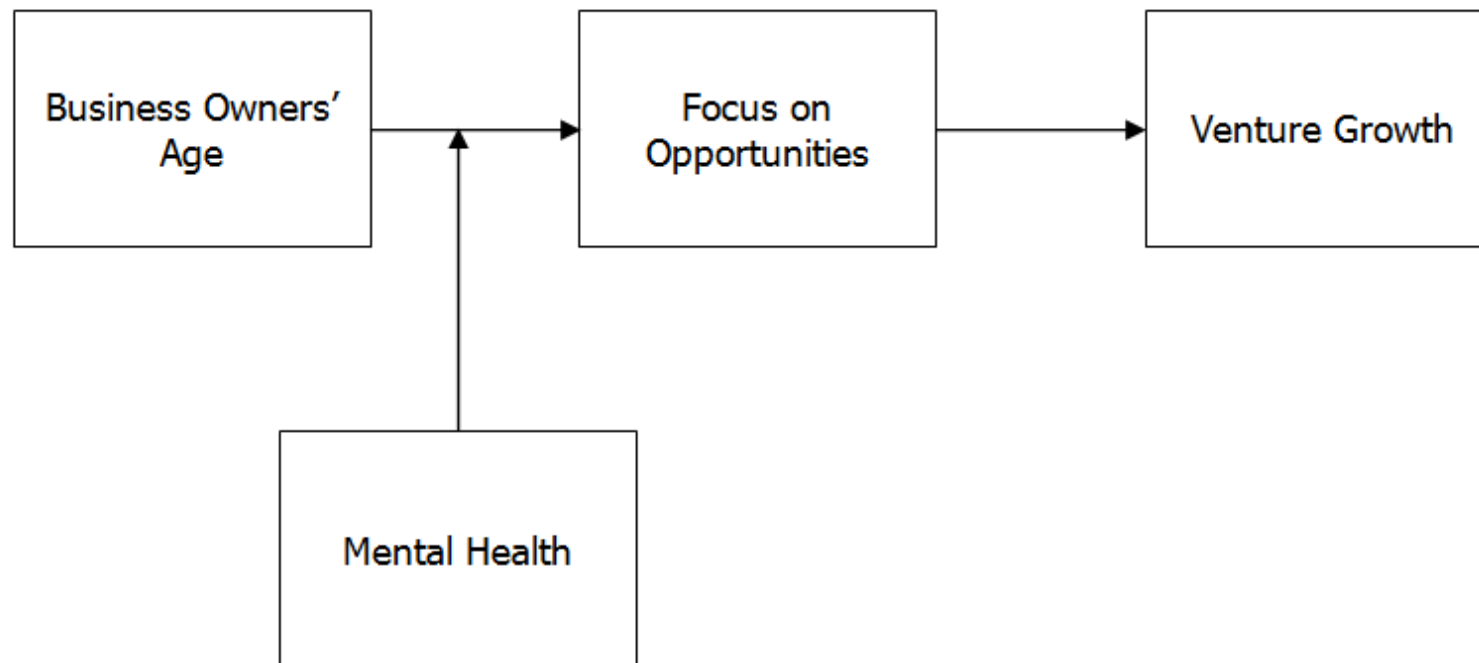


Fig. 2. Hypothesized model and standardized parameter estimates from path analytic calculations (intercorrelations between control variables and correlations between control and main variables are not depicted for reasons of clarity). Fit statistics: Satorra-Bentler corrected $\chi^2(42) = 7.15$; RMSEA = .06; SRMR = .09; CFI = 1.00.

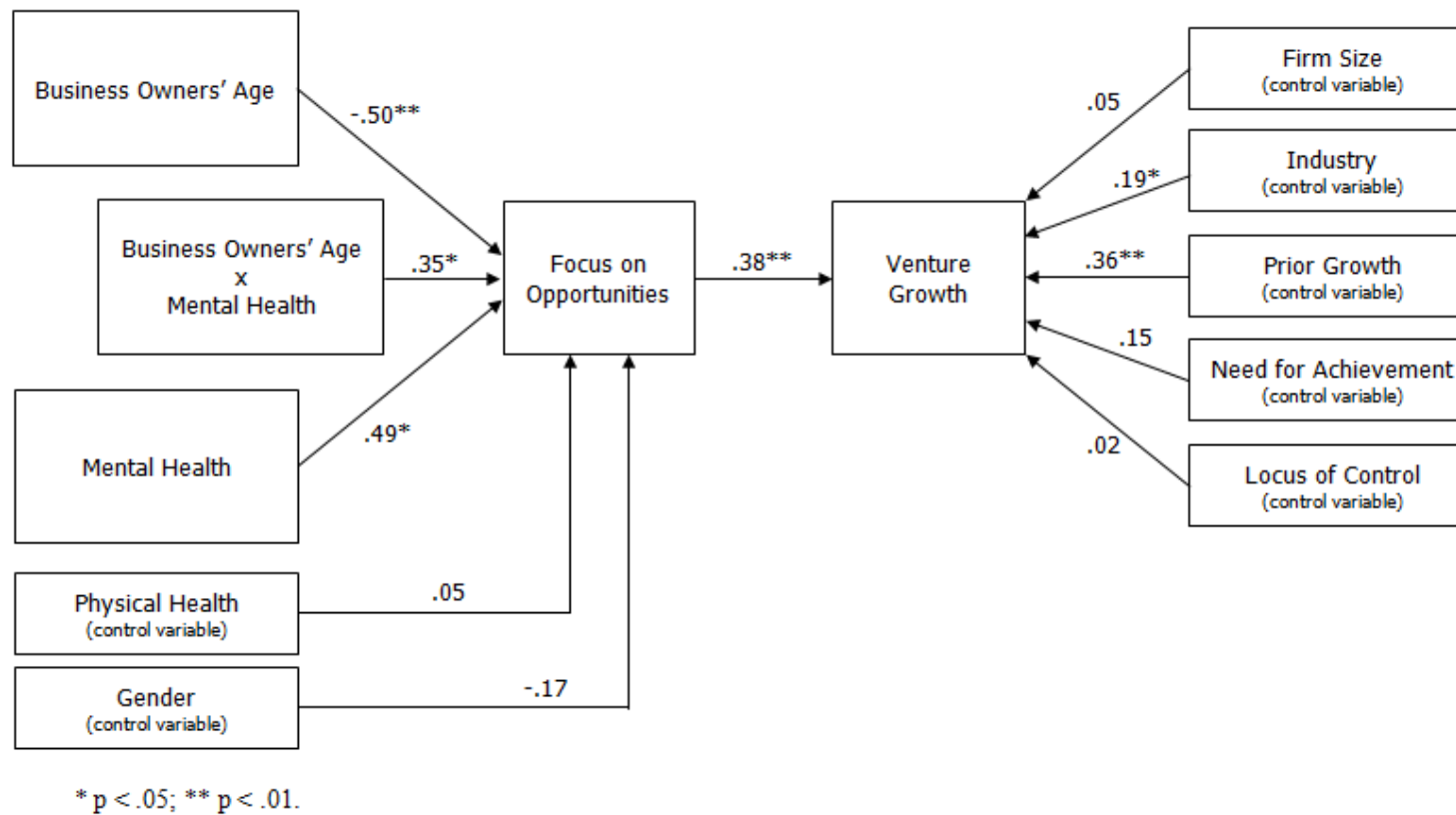


Fig. 3. The moderating effect of mental health on the relationship between business owners' age and focus on opportunities.

