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Sticking It Out: Individual Attributes and Persistence in Self-Employment

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There is evidence that individual attributes play an important role in self-employment entrance decisions. Drawing on the personality, psychological well-being, and goal attainment literature, the authors ask, What individual attributes are associated with persistence in self-employment? First, they theoretically develop the concept of self-employment persistence and then empirically assess the effects of individual attributes on self-employment persistence, while including the baseline effects of these individual attributes on self-employment entrance. They use a semiparametric, reduced-form, multiple-state transition model and control for demographic and social determinants. Using employment history data of a cohort of 2,839 individuals from 1957 to 2004, the authors find that openness to experience, autonomy, and tenacious goal pursuit increase persistence in self-employment, whereas neuroticism reduces persistence in self-employment. They discuss the theoretical and practical implications of the findings.

Keywords: *self-employment; Big Five personality traits; psychological well-being; individual attributes; goal pursuit*

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Introduction

Over the past several decades, research has shown that self-employment is central to economic growth and job creation (Carlsson, Acs, Audretsch, & Braunerhjelm, 2009). A self-employed individual derives residual income through active involvement in a going concern such as a trade or a business (Reid, 1962). Relatedly, entrepreneurs engage in "the discovery, evaluation, and exploitation of future goods and services . . . [by] creation or identification of new ends and means previously undetected or unutilized by market participants" (Eckhardt & Shane, 2003: 336). Both self-employed individuals and entrepreneurs derive residual income, but entrepreneurs engage mainly in novel combinations of means-and-ends relationships. Thus, all entrepreneurs are self-employed, but not all self-employed individuals are entrepreneurs. Not only does self-employment provide avenues for economic mobility for people who are economically disadvantaged and for ethnic minorities, but it also plays a central role in creating jobs (Blanchflower, 2000). Although self-employment has been traditionally construed as a lagging indicator of economic cycles, a recent study across 22 OECD countries from 1972 to 2007 (Koellinger & Thurik, 2009) finds that self-employment is a leading indicator in economic cycles. Hence, self-employment is crucial to promoting growth in an economy.

Much prior research has considered that both "push" and "pull" factors drive the choice of self-employment. As the unemployed may see self-employment as a viable alternative to seeking employment, unemployment is one of the most widely studied push factors leading to choice of self-employment. However, recent research has found that the effect size of unemployment as a push factor into self-employment is rather small (Thurik, Carree, Van Stel, & Audretsch, 2008; von Greiff, 2009). Alternatively, research has increasingly shown that *individual* push factors play an important role in choice of self-employment (Baumgartner & Caliendo, 2008; Knabe & Ratzel, 2011).

However, to realize the economic benefits of self-employment, individuals must not only choose to become self-employed but also persist in self-employment. Entrance into self-employment is the decision to become a recipient of residual income through active involvement in a trade or business rather than work for someone else. Persistence in self-employment occurs when individuals who are engaged in self-employment decide to stay self-employed. Alternatively, self-employment exit, or the end of a self-employment episode, is defined as ''the process by which the founders of privately held firms leave the firm they helped to create; thereby removing themselves, in some degree, from the primary ownership and decision-making structure of the firm'' (DeTienne, 2010: 205).

Persistence in self-employment differs from the initial decision to enter into self-employment because the decision to persist in self-employment requires a person to leverage his or her individual attributes, knowledge, and experience to manage the challenges of operating a going concern. Due to the high failure rates of small businesses, persistence in self-employment is crucial to realizing economic benefits from self-employment at the individual, firm, and economic levels. Despite the necessity of understanding self-employment persistence, most research has focused on differentiating between individuals who enter self-employment from those who do not. Limited research has explored the role of

individual attributes in explaining differences between individuals who persist in self-employment from those who do not. Thus, the main contribution of this study is to investigate the extent to which individual attributes help us differentiate individuals who persist in self-employment from those who exit self-employment.

Despite continued interest in the role of stable individual characteristics in explaining entrance into self-employment, the effects of these attributes on persistence in self-employment are missing in the literature. Our primary contribution is to explain the role of individual attributes on persistence in self-employment. Using multiple self-employment episodes over the life course of an individual, we hypothesize and test whether the effects of individual attributes that lead to self-employment entrance continue to influence persistence in self-employment. Such tests of the "fixed effects" of individual attributes, beyond their effects on choice of self-employment, help further corroborate the importance of such attributes on persistence in self-employment. Such a bridging framework could help connect the well-established literature on self-employment entrance to the less explored literature on self-employment persistence. Due to significant theoretical overlap between self-employment and entrepreneurship, we integrate literature from the entrepreneurship literature where relevant and also draw upon self-employment studies from the fields of sociology, economics, and psychology.

Second, while much of the literature has focused on the role of the Big Five personality characteristics and self-efficacy, additional individual attributes could be relevant in explaining both entry into and persistence in self-employment. Shane, Nicolaou, Cherkas, and Spector (2010) and Nicolaou, Shane, Cherkas, and Spector (2008) suggest that genetic factors explain between 37% and 42% of variance in self-employment entrance. In a meta-analysis of 116 independent samples, Rauch and Frese (2007) identify traits that are matched to the task of running a business[1] and traits that are not matched to the task of running a business. They find that the traits matched to the task of running a business had a higher correlation with business creation (corrected $r = .247$) than traits that were not matched to the task of running a business (corrected $r = .124$). In addition, traits matched to the task of running a business had a higher correlation with business success (corrected $r = .250$) than traits not matched to the task of running a business (corrected $r = .028$). Comparing the moderate effect sizes from the meta-analysis by Rauch and Frese (2007) with the medium effect sizes explained by genetics (Nicolaou, Shane, Cherkas, Hunkin, & Spector, 2008), and the strong correlation between genes and personality suggested elsewhere (Brandstätter, 2011), it is plausible that additional stable characteristics could explain both entry into and persistence in self-employment decisions. Therefore, our secondary contribution is to extend the self-employment literature by introducing two additional stable individual attributes—psychological well-being (Ryff, 1989) and goal attainment approaches (Brandtstädter, 1984)—that may be pertinent in self-employment entrance and persistence.

Persistence in Self-Employment

During the early stages of firm establishment, individuals focus on acquiring resources, establishing firm boundaries, and sustaining economic exchanges (Katz & Gartner, 1988). After the

firm is established, self-employed individuals engage in strategic initiatives to survive or grow in markets dominated by larger firms. Persistence in self-employment is critical for fulfilling personal goals and realizing economic benefits. However, persistence in self-employment is not singularly driven by firm performance. A myriad of factors could affect why some individuals choose to persist in self-employment after they have entered it. Extant literature on self-employment has focused on exit but not on persistence. Self-employed individuals could exit due to declining performance (Wennberg, 2008), lack of strategic resources (Michael & Combs, 2008), inadequate planning strategies (Van Gelderen, Thurik, & Patel, 2011), inability to cope with uncertainty (McGrath, 1999), and inability to learn (Cardon, Stevens, & Potter, 2011; Corbett, 2007). Several others have proposed that exit could be driven by gender and lack of family–life balance (DeTienne, 2010), opportunity costs (Gimeno, Folta, Cooper, & Woo, 1997), age (Wennberg, Wiklund, DeTienne, & Cardon, 2010), and personal evaluations of business success (Stam, Thurik, & Van der Zwan, 2010).

Despite significant research on reasons for entrepreneurial exit, there remain limited explanations for why some individuals persist in self-employment while others do not. Individual characteristics such as extraversion and openness to experience could explain how individuals not only acquire but also leverage strategic resources (Michael & Combs, 2008; Nadkarni & Herrmann, 2010). While individuals sensitive to opportunity costs are likely to exit self-employment (Gimeno et al., 1997), individual attributes could explain why some individuals are less sensitive to opportunity costs and thus more likely to persist over a course of action (Tetlock, Peterson, & Berry, 1993). Individual attributes reflect the ability to plan and anticipate (Lachman & Burack, 1993; Van Gelderen et al., 2011), the ability to cope with environmental needs (McGrath, 1999; O'Brien & DeLongis, 1996), and the willingness to learn (Busato, Prins, Elshout, & Hamaker, 1998; Corbett, 2007), which may increase self-employment persistence. Judge, Higgins, Thoresen, and Barrick (1999) find that personality is relevant to career persistence, and we argue that this also will be true in the self-employment context. Finally, studies suggest that personality plays a key role in managing work–life balance (e.g., Noraini, 2003). Overall, we posit that individual attributes play a critical role in explaining why individuals persist in self-employment.

Individual Attributes and Persistence in Self-Employment

Certain individual attributes are associated with self-employment entrance, and such attributes could also be relevant for self-employment persistence. The continuity of the effects of individual attributes on career choice and subsequent career success are well documented in the vocational behavior research. Summarizing prior findings on personality and vocational behavior, Mount, Barrick, Scullen, and Rounds state,

> One common thread that links personality traits and vocational interests is that they influence behavior through motivational processes. That is, they influence choices individuals make about which tasks and activities to engage in, how much effort to exert on those tasks, and how long to persist with those tasks. (2005: 447)

Clearly, the effects of individual attributes affect choice and performance in an occupation and thus are likely to affect individual choice and persistence in self-employment.

According to Wille, De Fruyt, and Feys (2010), personality characteristics affect not only the choice of certain occupations but also the length of time individuals persist in current occupations. The bridging effects of individual characteristics on occupational choice and occupational persistence have been studied with respect to political skill (Blickle et al., 2008), self-efficacy (Larson, Wu, Bailey, Gasser, Bonitz, & Borgen, 2010), conscientiousness (Brown, Lent, Telander, & Tramayne, 2010), competencies and personal dispositions (Sodano, 2011), Big Five personality characteristics (Seibert & Kraimer, 2001), mental ability (Judge et al., 1999), and biological markers (Nicholson & de Waal Andrews, 2005). Overall, there is significant evidence in the vocational behavior literature that individual characteristics that lead to choice of an occupation also determine continuance in a career. Thus, in the self-employment context, individual attributes that lead to self-employment entrance should also affect self-employment persistence.

A few studies in the entrepreneurship literature have investigated the relationship between individual characteristics and entrepreneurship choice and success.[2] Although self-employment is a broader construct than entrepreneurship, the findings in entrepreneurship can provide guidance for attributes that may be relevant for self-employment decisions. Obschonka, Silbereisen, and Schmitt-Rodermund (2010) and Zhao, Seibert, and Lumpkin (2010) find that entrepreneurial intentions play a key role in entrepreneurial success. Similarly, in a meta-analysis, Rauch and Frese (2007) find that individual traits that are matched to the task of running a business lead to business creation (corrected $r = .25$) and explain business success (corrected $r = .25$). Work by Ciavarella, Buchholtz, Riordan, Gatewood, and Stokes (2004) proposes the importance of conscientiousness on firm survival, while other studies have found support for the role of conscientiousness on entrepreneurship (Brandstätter, 2011). Similarly, several factors, such as risk taking (Stewart & Roth, 2001), identity (Lau, Shaffer, & Au, 2007), achievement motivation (Stewart & Roth, 2007), social skills (Baron, 2009), passion (Baum & Locke, 2004), and intelligence (Baum & Bird, 2010), have been shown to influence entrepreneurial entrance. Drawing on these findings in the vocational behavior and entrepreneurship literature, we posit that individual attributes will lead to persistence in self-employment.

Personality and Persistence in Self-Employment

We now turn our attention to individual attributes related to personality that may influence persistence in self-employment. Consistent with previous literature, we propose baseline hypotheses relating personality to self-employment entrance, followed by our main hypotheses on the effects of personality on self-employment persistence.

Big Five Personality Traits

Few studies have explicitly examined the relationship between the Big Five personality traits and self-employment decisions; thus, we draw on entrepreneurship literature where

research has investigated the personality–entrepreneurship choice relationship. According to a recent meta-synthesis of five meta-analyses on individual attributes and entrepreneurship, the Big Five personality factors have been consistently relevant in entrepreneurship choices (Brandstätter, 2011). Taking a broad definition of an entrepreneur as "someone who is the founder, owner, and manager of a small business and whose principal purpose is growth" and of a manager as being "of all ranks and functions," Zhao and Seibert (2006: 262-263) find that compared with managers, entrepreneurs are low on neuroticism and agreeableness and high on openness to experience and conscientiousness. Zhao et al. (2010) find that conscientiousness, openness to experience, emotional stability, and extraversion increase entrepreneurial intention and firm performance, whereas agreeableness reduces entrepreneurial intentions and firm performance. These findings provide support that the Big Five personality traits affect intermediate outcomes (e.g., entrepreneurial intentions, self-efficacy) that could lead to self-employment entrance and persistence.

Conscientiousness. Conscientious individuals are meticulous, conform to rules and procedures, and have a strong proclivity toward maintaining high standards of performance (Costa, McCrae, & Dye, 1991). A key component of conscientiousness is achievement orientation. Individuals high on achievement orientation search and seek alternative solutions to enhance their environments. Achievement-oriented individuals are capable of developing intentions, behaviors, and actions to develop entrepreneurial self-efficacy (Boyd & Vozikis, 1994) and to become entrepreneurs (Zhao et al., 2010). As indicated in the recent meta-synthesis by Brandstätter (2011), conscientiousness is positively related to choosing entrepreneurship. As entrepreneurs are a subset of the self-employed and the decision to become self-employed requires responsibility and dependability, we believe that conscientiousness will be related to self-employment entrance.

Driven by a strong sense of responsibility, industriousness, and dependability, conscientious individuals experience high levels of career success (Kern, Friedman, Martin, Reynolds, & Luong, 2009; Seibert & Kraimer, 2001). As the self-employed must work harder than traditional employees (Barrick & Mount, 1991), dependability is a discerning trait that could enhance persistence in self-employment. The achievement motivation component of conscientiousness could drive self-employed individuals to seek, develop, implement, and exploit solutions to overcome the liabilities of smallness. Conscientious individuals are hardworking, achievement-oriented, and persevering (Ciavarella et al., 2004; Yeo & Neal, 2004). Conscientiousness reinforces goal-directed behavior and control-related traits (DeNeve & Cooper, 1998) that increase persistence. The ability to put in intense effort not only is a signal that enhances legitimacy among stakeholders (Low & MacMillan, 1988) but also is critical to managing the risks and challenges of sustaining a profitable business (Ciavarella et al., 2004; Hamilton, 2000). Thus, we posit the following hypotheses:

Hypothesis 1a: Individuals with higher levels of conscientiousness are more likely to enter into self-employment than those with lower levels of conscientiousness.

Hypothesis 1b: Individuals with higher levels of conscientiousness are more likely to persist in self-employment than those with lower levels of conscientiousness.

Openness to experience. Individuals with high levels of openness to experience are intellectually curious, seek new experiences, and explore novel ideas (Costa et al., 1991). Such individuals are creative, intelligent, innovative, reflective, untraditional, and divergent in their thinking (McCrae, 1987). Individuals high on openness to experience not only undertake a variety of educational experiences and explore different functional areas (Digman, 1989; Eby, Butts, & Lockwood, 2003) but are also able to creatively leverage human capital when seeking information and knowledge in identifying opportunities for self-employment (Lazear, 2004; Matzler, Renzl, Müller, Herting, & Mooradian, 2008; Ployhart, Weekley, & Baughman, 2006). Individuals high on openness to experience are also able to develop social support from a diverse of range of stakeholders (Asendorpf & Wilpers, 1998), resulting in multimodal social networks that are important when entering into self-employment (Gimeno et al., 1997).

According to Busato et al. (1998), openness to experience enables accurate assessments of environmental needs and enhances the creativity that is necessary to solve everyday problems and develop effective reactions to problems associated with small businesses (Marcati, Guido, & Peluso, 2008). In addition, individuals with high openness to experience are inquisitive and tolerant and are able to respond to stressful situations (Pucik & Welbourne, 1999) such as the day-to-day running of a business. Identity flexibility is one result of openness to experience (Whitbourne, 1986). As the self-employed, like entrepreneurs, are required to wear different hats in managing a business, identity flexibility is an important capability when persisting in self-employment (Shepherd & Haynie, 2009). Thus, we expect the following:

Hypothesis 2a: Individuals with higher levels of openness to experience are more likely to enter into self-employment than those with lower levels of openness to experience.

Hypothesis 2b: Individuals with higher levels of openness to experience are more likely to persist in self-employment than those with lower levels of openness to experience.

Extraversion. Extraverts exhibit high levels of sociability, high energy levels, positive emotionality, and excitement seeking (DeNeve & Cooper, 1998). Extraversion relates to two distinct aspects of personality: (a) sociability or gregariousness and (b) assertiveness or dominance (McCrae & Costa, 1997). Both of these aspects are important in contexts that require high levels of social interaction (Hogan, Curphy, & Hogan, 1994) such as self-employment (Allen, 2000; Brüderl & Preisendörfer, 1998).

Extraverts are often interested in enterprising and social careers and garner social support through persuasion (Judge & Kammeyer-Mueller, 2007). For example, outsiders who encourage self-employment undertakings perceive extraverted individuals as self-motivated leaders (Lord, De Vader, & Alliger, 1986; Vecchio, 2003). Extraverts tend to have high levels of positive affect (Fleeson, Malanos, & Achille, 2002), and recently, Baron (2008) proposed the importance of positive affect in the development of entrepreneurial intentions, actions, and behaviors. Similarly, Cardon, Wincent, Singh, and Drnovsek (2009) proposed that entrepreneurial passion (a correlate of extraversion; Duckworth, Peterson, Matthews, & Kelly, 2007; Gubman, 2004) increases engagement in entrepreneurship. Overall, high levels

of extraversion result in the development of human and social capital that fosters a desire for self-employment.

Extraversion is also likely to increase persistence in self-employment, as extraversion facilitates learning, coping, and the ability to manage a firm. Extraversion is positively related to the learning necessary for managing different facets of a business such as discerning meanings from industry and market factors, recursively adapting routines and capabilities to novel situations, and enhancing legitimacy (Busato et al., 1998). Extraverted individuals are adept at learning from diverse sources and are capable of developing novel responses required to cope with uncertainty (Greco & Roger, 2001).

Because extraverted individuals are likely to have high levels of social competence they are able to enhance venture performance by acquiring resources from their social contacts (Baron, 2009). Recently, Van Der Gaag and Snijders (2005) found support for the role of extraversion as a key resource generator. From the perspective of political skills, extraverted individuals are more capable of managing day-to-day firm activities, as they are assertive and forceful in communicating their opinions and vision, socialize effectively, and resolve internal conflicts (Baron & Markman, 2003; Baum, Locke, & Smith, 2001; McCrae, 1987; McCrae & Costa, 1997). Furthermore, extraverted individuals are more likely to create symbols, meanings, and narratives to enhance their social, cognitive, and institutional legitimacy and thereby increase the chances of firm survival (Downing, 2005). We expect the following:

Hypothesis 3a: Individuals who are more extraverted are more likely to enter into self-employment than those who are less extraverted.

Hypothesis 3b: Individuals who are more extraverted are more likely to persist in self-employment than those who are less extraverted.

Neuroticism. Neurotic individuals experience negative emotions such as anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa et al., 1991). Neuroticism limits the information gathering, learning experiences (Tokar, Thompson, Plaufcan, & Williams, 2007), and development of human and social capital that are important to the self-employed (Davidsson & Honig, 2003; Judge, Erez, Bono, & Thoresen, 2002). Furthermore, neurotic individuals have problems with interpersonal competence (Tokar, Fischer, & Subich, 1998) and tend to be unsuited for complex and high-stress jobs (Spector, Jex, & Chen, 1995).

Neurotic individuals may lack the social competence required to develop the social networks necessary for mobilizing the resources to start a business. Due to low self-esteem, neurotic individuals are likely to have low self-confidence (Koivula, Hassmen, & Fallby, 2002), to have a limited locus of control (Judge et al., 2002), and to be risk averse (Zuckerman & Kuhlman, 2000) and are therefore less likely to believe that they can engage in self-employment. Neuroticism restricts the development of human and social capital (Argyle & Lu, 1990) that, in turn, limits the learning experiences, social support, and development of individual behaviors necessary for entrance into self-employment.

Faced with the considerable rejection, failure, and difficulty associated with self-employment, highly neurotic individuals that enter self-employment are unlikely to persist in self-employment. Entrepreneurial individuals are typically visualized as emotionally stable

(the opposite of neurotic) individuals who are unfazed in the face of pressure, stress, and uncertainty (Locke & Baum, 2007). Compared with employees in firms who operate in structured environments with a secure paycheck, the self-employed must be able to emotionally cope with the lack of structure and security (Baron, 2008). The ability to manage the role stress related to self-employment and entrepreneurial efforts is critical to venture success (Pareek, 1994; Wincent, Ortqvist, & Drnovsek, 2008). High levels of emotional stability are thought to lead to venture survival (Ciavarella et al., 2004) and have been found to lead to better performance in franchise operations (Morrison, 1997). Likewise, we expect the following:

Hypothesis 4a: Individuals who are more neurotic are less likely to enter into self-employment than those who are less neurotic.

Hypothesis 4b: Individuals who are more neurotic are less likely to persist in self-employment than those who are less neurotic.

Agreeableness. Agreeableness refers to the ability to foster consensus while maintaining mutual understanding and trust (Costa et al., 1991). Agreeable individuals are good listeners and are patient, empathetic, and harmonious in their social interactions (Graziano & Eisenberg, 1997). Agreeableness enhances the quality of relationships through cooperation and trust (DeNeve & Cooper, 1998); when establishing a business, these relationships are essential for the development of social and financial support (Stevenson & Gumpert, 1985). In the absence of efficient resource markets, individuals must accrue resources from their social networks, and individuals who are high in agreeableness tend to be courteous, forgiving, and better able to secure and manage their networks. Thus, we believe that agreeableness will lead to self-employment entrance.

Due to liquidity constraints, self-employed individuals in small businesses do not have access to resources from traditional factor markets. When efficient resource markets do not exist, trust is substituted for efficient network exchanges (Fafchamps, 2003) and may facilitate key resource exchanges (Cable & Shane, 1997). Individuals high in agreeableness are able to engender trust and cooperation to maintain resource flows and exchanges even under the liability of smallness (Evans & Revelle, 2008). Although Zhao and Seibert (2006) posit that agreeableness leads to a reduced ability to drive hard bargains and hence may be detrimental to a small firm, we posit that agreeableness could be a lubricant in managing power imbalances in an amicable fashion. Due to the liabilities of smallness, self-employed individuals low on agreeableness may not be in a position to drive hard bargains, and such behavior could, in fact, restrict resource availability and material support from stakeholders.

Hypothesis 5a: Individuals who are more agreeable are more likely to enter into self-employment than those who are less agreeable.

Hypothesis 5b: Individuals who are more agreeable are more likely to persist in self-employment than those who are less agreeable.

In addition to the Big Five personality variables discussed above, we focus on two additional individual attributes—psychological well-being (PWB) and goal attainment approaches—that are potentially important in entering into and persisting in self-employment.

Psychological Well-Being and Persistence in Self-Employment

PWB is an individual's perceptions of his or her ability to cope with different challenges (Ryff, 1989). The six PWB dimensions are (1) autonomy, the belief that one desires independence and self-determination; (2) environmental mastery, the belief that one is able to manage and control one's life; (3) personal growth, the belief that one is open to new experiences; (4) positive relations with others, the belief that one has satisfying, high-quality relationships; (5) purpose in life, the belief that one's life is meaningful; and (6) self-acceptance, the belief that one has a positive attitude toward oneself (Ryff, 1989).

Stability of PWB. Like personality traits that are typically considered to be stable throughout an individual's life span, there is theoretical and empirical support for the stability of PWB. The stability of PWB dimensions draws from hedonic treadmill theory that argues that although good and bad events temporarily affect well-being, individuals quickly adapt to hedonic neutrality (Keely, 2005). Recently, Diener, Lucas, and Scollon (2006) suggested that the degree of variability in well-being resulting from good or bad events is contingent on an individual's temperament and hedonic set points driven by stable individual attributes. Likewise, other research has shown that PWB attributes are relatively enduring (Abbott, Croudace, Ploubidis, Kuh, Richards, & Huppert, 2008; Costa, Zonderman, McCrae, Huntley, Locke, & Barbano, 1987; George, 1978; Lucas, Clark, Georgellis, & Diener, 2003; Ryff, 1989; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997).

Self-employment and autonomy, environmental mastery, and personal growth. The PWB dimensions reflect two types of orientation—motivation orientation and social orientation. The dimensions that reflect a motivation orientation are autonomy, environmental mastery, and personal growth, whereas the dimensions reflecting a social orientation are positive relations with others, purpose in life, and acceptance by others (Keyes, Shmotkin, & Ryff, 2002). We focus on those PWB dimensions that represent a motivation orientation, as this is one of the key theoretical mechanisms underlying self-employment decisions (Ryan & Deci, 2000; Shepherd & Cardon, 2009).

The social orientation components of PWB—positive relations with others, purpose in life, and acceptance from others—are oriented toward developing and maintaining personal relationships to enhance eudaimonic well-being (Burns & Machin, in press; Reker, Peacock, & Wong, 1987). The social orientation components are related to the existential aspects of human functioning, whereas the motivation orientation components are related to the utilitarian aspects of human functioning (Ryff & Singer, 2008). The utilitarian gains from motivation orientation are directly related to the material and social resources necessary to start and persist in a business, whereas existential gains have less relevance in the self-employment context. Supporting the applicability of motivation orientation in enhancing utilitarian gains, meta-analyses on PWB have found support for significant effects of autonomy, environmental mastery, and personal growth, but not for the remaining three dimensions, in explaining vocational success (Abbott et al., 2008; Ryff & Singer, 2008). Overall, we focus on the motivation orientation components of autonomy, environmental mastery, and personal growth of PWB to understand entrance into and persistence in self-employment.

Autonomy. Autonomy refers to a belief that one should act independently and be self-directed in the pursuit of goals (Lumpkin, Cogliser, & Schneider, 2009).[3] Prior work has found support for the relationship between the need for autonomy and choice of self-employment (Hundley, 2001; Noorderhaven, Thurik, Wennekers, & Van Stel, 2004). In a study on career choice, Kolvereid (1996a) finds that approximately 40% of those who prefer self-employment to organizational employment list autonomy as the prime reason. Due to the necessity of diverse human capital in starting a business, a self-employed individual must be a jack-of-all-trades (Åstebro & Thompson, 2011; Lazear, 2004). Autonomy is strongly related to diverse educational and professional pursuits that are helpful for those who are self-employed (Ryan & Deci, 2006). The expectation of autonomy-related nonpecuniary benefits increases actions and behaviors necessary to engage in self-employment (Aronson, 1997). Overall, autonomy should lead to self-employment entry decisions.

Autonomous individuals tend to have self-protective attributions that create cognitive and behavioral buffers that enable persistence in the face of uncertainty (De Rijk, Le Blanc, Schaufeli, & de Jonge, 1998). Autonomous individuals value the freedom that is associated with working independently and are therefore more likely to persist in ventures (Katz, 1994; Stam et al., 2010). Locke and Baum (2007) find that autonomous entrepreneurs make business decisions independently, rely on personal judgment, and defy traditional means of doing things. Autonomous individuals are also likely to experiment in the face of uncertainty (Edmondson, Bohmer, & Pisano, 2001), which increases knowledge of the business environment necessary to enhance firm growth and mitigate competitive challenges (Kolvereid, 1996b). Finally, Deci and Ryan (1987) argue that autonomy enhances learning by promoting greater cognitive flexibility, creativity, and conceptual learning—skills essential in sustaining a business (Rauch & Frese, 2007). Furthermore, self-employed individuals fear the loss of the nonpecuniary benefits associated with autonomy by transitioning out of self-employment (Bosma, de Wit, & Carree, 2005). Thus, we hypothesize the following:

Hypothesis 6a: Individuals with higher levels of autonomy are more likely to enter into self-employment than individuals with lower levels of autonomy.

Hypothesis 6b: Individuals with higher levels of autonomy are more likely to persist in self-employment than those with lower levels of autonomy.

Environmental mastery. Engaging in environmental mastery, the belief that one can engage in innovative and novel approaches to change the environment (Ryff, 1989), is an important element in the decision to enter into self-employment. Individuals with a sense of environmental mastery feel confident in responding to unexpected events (Carver, 1998; Wrosch, Scheier, Miller, Schulz, & Carver, 2003) such as those encountered while mobilizing resources to start a business. Environmental mastery also leads to effective engagement with participants in a social network (Billings & Moos, 1981) through enhanced social functioning (Gross & John, 2003). Effective social functioning provides support and relational interactions leading to the development and exchange of tacit knowledge (e.g., specific human capital) necessary for undertaking commercialization efforts (Elfring & Hulsink, 2003). Environmental mastery leads individuals to seek, identify, shape, and manage their social networks to mobilize resources for starting a business (Barbosa, Gerhardt, & Kickul, 2007).

Environmental mastery is also an important ingredient for perseverance in self-employment. Self-employed individuals face high levels of failure rates resulting from significant environmental threats (Fritsch, Brixy, & Falck, 2006). Challenges related to developing legitimacy, acquiring resources, engaging in continued exchanges with stakeholders, and maintaining firm boundaries require novel responses on multiple dimensions. Those with high levels of environmental mastery tend to be reliable, make efficient use of opportunities, and work hard in day-to-day activities (Ryff, 1989; Schmutte & Ryff, 1997) and therefore should be able to meet these uncertain challenges. More importantly, those with high levels of environmental mastery believe they can shape the environment. Being self-employed provides numerous opportunities to shape the environment, thus encouraging an individual to stay self-employed. Therefore,

Hypothesis 7a: Individuals with higher levels of environmental mastery are more likely to enter into self-employment than those with lower levels of environmental mastery.

Hypothesis 7b: Individuals with higher levels of environmental mastery are more likely to persist in self-employment than those with lower levels of environmental mastery.

Personal growth. Compared with traditional employment, self-employed individuals must summon diverse human and social capital to facilitate organization emergence. Due to the necessity for learning a wide variety of skills and acquiring diverse knowledge to successfully engage in self-employment, Lazear (2004) refers to self-employed individuals as jacks-of-all-trades. Recent research on entrepreneurial learning has suggested that personal growth is a driver for individuals to invest in transaction-specific human capital (Corbett, 2007; Politis, 2005). Individuals high on personal growth are more likely to pursue and acquire a diverse range of knowledge and abilities that have a limited scope of alternate uses (Ryan & Deci, 2000) such as those needed for entering self-employment. Thus, the need for personal growth is a key component of self-employment entrance (Kuratko, Hornsby, & Naffziger, 1997).

As self-employed individuals are the key decision makers, the need for personal growth is critical to the continued scanning, monitoring, forecasting, and assessing of environmental factors that affect the firm and the development of strategic responses. In a small firm setting, the owner acts as a key knowledge repository (Block & Sandner, 2009). Therefore, a self-employed individual with a high need for personal growth will invest in individual learning to provide adequate strategic human capital to the firm. Self-employed individuals seeking education and training to enhance their business skills tend to be more successful than those who do not seek education and training (Huang & Brown, 1999; Lange, Ottens, & Taylor, 2000). Overall, a focus on personal growth enables the maintenance of high levels of purpose in the face of the cumulative adversity found in self-employment activities (Ryff, Singer, Love, & Essex, 1998; Singer, Ryff, Carr, & Magee, 1998). Thus,

Hypothesis 8a: Individuals with a higher need for personal growth are more likely to enter into self-employment than those with a lower need for personal growth.

Hypothesis 8b: Individuals with a higher need for personal growth are more likely to persist in self-employment than those with a lower need for personal growth.

Goal Attainment Approaches and Persistence in Self-Employment

In addition to personality traits and PWB dimensions, goal attainment approaches may directly affect entrance and persistence in self-employment (Cardon et al., 2011; Luszczynska, Diehl, Gutiérrez-Doña, Kuusinen, & Schwarzer, 2004). As a stable attribute, goal attainment circumscribes the attitudes, intentions, and actions that lead to goal realization (Brandtstädter, 1984). Goals are cognitive representations of desired endpoints that potentially impact evaluations, emotions, and behaviors (Austin & Vancouver, 1996). Goals give structure and meaning to endeavors (Brunstein, Schultheiss, & Maier, 1999), but they can also turn into sources of dissatisfaction and depression when they become unattainable or exceed individual resources (McIntosh & Martin, 1992). Brandtstädter and Renner (1990) propose two approaches associated with goal attainment: tenacious goal pursuit (TGP) and flexible goal adjustment (FGA). TGP requires intentional agency to assimilate activities into the final goal. FGA, in contrast, is not intentional and suggests that individuals alter their goals to accommodate their environmental or social context.

Flexible goal adjustment. As individuals face significant challenges in identifying opportunities and gathering resources to enter self-employment, having goal flexibility may be important. Individuals must engage in the processes of bricolage (Garud & Karnoe, 2003) and improvisation (Baker, Miner, & Eesley, 2003) to make do with limited legitimacy and resources when contemplating self-employment. As individuals alter their goals to accommodate the context they increase their chances of realizing their goals (Salmela-Aroa, 2009). The accommodative nature of an individual with high FGA enables the development of equifinal paths toward self-employment entry (Brandtstädter, 2002). Overall, an FGA approach helps individuals adapt to opportunities as they are presented and optimize limited resources (Meeus & Oerlemans, 2000).

An individual using an FGA approach deploys accommodative coping functions to protect against perceptions of loss (Schwarzer & Knoll, 2003) and maintains a positive perspective in the face of adversity (Rasmussen, Wrosch, Scheier, & Carver, 2006). Individuals using an FGA approach are able to actively seek and accommodate support from a diverse range of stakeholders (Kim, Aldrich, & Keister, 2006). Furthermore, these individuals develop buffers to manage unexpected events and are therefore able to manage stress (Park, 1998), engage in adaptive learning (Riediger, Li, & Lindenberger, 2006), and have effective action control (Brandtstädter & Baltes-Götz, 1990). Most importantly, individuals using an FGA approach are able to alter their goals and accommodate to the environment, leading to self-employment persistence (Trevelyan, 2011).

Hypothesis 9a: Individuals with a more flexible goal adjustment approach are more likely to enter into self-employment than those with a less flexible goal adjustment approach.

Hypothesis 9b: Individuals with a more flexible goal adjustment approach are more likely to persist in self-employment than those with a less flexible goal adjustment approach.

Tenacious goal pursuit. Individuals who are disposed toward TGP engage in goal-directed activities and assimilate life circumstances in quest of that goal (Brandtstädter &

Rothermund, 2002). Undeterred by obstacles, individuals with high TGP who are motivated to become self-employed find solutions to potential and real problems. Focusing on the role of tenacity on self-employment choice, Markman, Baron, and Balkin (2005) find that entrepreneurs starting their businesses in the medical industry scored high on perceived control over adversity. Faced with adversity, individuals high on TGP develop control and appraisal strategies to manage adversity by reframing negative feedback and developing alternate solutions (Van Gelderen, in press). The ability to engage in self-regulation and develop novel responses to adversity during the business development process is important for self-employment entrance.

Baum and Locke (2004) found that tenacity is important to firm growth among the self-employed, and Cope (2003) found that tenacity in the face of adversity helped entrepreneurs learn from the environment and cope with uncertainty. Such learning is key to perseverance in self-employment efforts (Van Gelderen, in press). Timmons and Spinelli (2003) explain that entrepreneurs who continue their course in the face of adversity increase the chances of venture survival. Due to the relatively low legitimacy accorded to small businesses, seeking and leveraging stakeholder ties is marred with rejection. Utilizing a TGP approach enables individuals to handle rejection and accept failure (Sneed & Whitbourne, 2005). Van Gelderen (in press) finds that perseverance helps individuals manage the effects of adversity, reframe challenging goals, change attitudes toward adversity, and develop novel responses to mitigate adversity. Proactive behavior among individuals with high TGP plays an important role in assessing and forecasting market and resource gaps and developing strategies to address such gaps (Schwarzer & Taubert, 2002). Therefore,

Hypothesis 10a: Individuals with a more tenacious goal pursuit approach are more likely to enter into self-employment than those with a less tenacious goal pursuit approach.

Hypothesis 10b: Individuals with a more tenacious goal pursuit approach are more likely to persist in self-employment than those with a less tenacious goal pursuit approach.

Method

Data and Sample

The data contain information about a cohort of individuals from the Wisconsin Longitudinal Survey (WLS) from 1957 to 2004. The WLS has been used for research in fields such as sociology (Warren, Sheridan, & Hauser, 2002), medicine (Wood & Joseph, 2010), gerontology (Sewell, Hauser, Springer, & Hauser, 2003), education (Plug, 2004), and labor economics (Morgan, Grusky, & Fields, 2006). The WLS started with a random sample of 10,317 women and men who graduated from Wisconsin high schools in 1957 (this represented one third of the total number of high school graduates in Wisconsin). The follow-up surveys were conducted in 1964, 1975, 1992, and 2004. The sample retention chart over the four waves is presented in Appendix A. Unlike other large longitudinal studies of school-based samples, the WLS contains information on individual attributes as well as information on respondents' labor market histories. For additional information on the data, we refer interested readers to the *Wisconsin Longitudinal Study Handbook*[4] and WLS data documentation.[5]

The outcomes of interest (entry into self-employment and persistence in self-employment) before 1992 are taken from retrospective work history questionnaires in 1992-1993, and the employment spells for the period between 1993 and 2004 were coded from the 2004-2005 data wave. Therefore, the 1992-1993 and 2004-2005 data waves provide records of all employment, unemployment, and self-employment spells that the individual held since high school in 1957 until 2004. As employment transitions represent a major change in an individual's life, retrospective recall bias is unlikely to be significant, as reported in other contexts (DiPrete & McManus, 2000).

Of the initial 10,317 high school graduates in the random sample, 8,493 received the 1992 mail questionnaire and 6,875 individuals responded. After eliminating cases with fewer than three waves of employment history data, individuals reporting farm employment, individuals reporting unemployment,[6] and those missing control variable indicators, the final sample consists of 2,839 adults with work histories from 1957 to 2004. Overall, our final sample represents 41.29% of the respondents who completed the 1992 survey (6,875 individuals).

To assess sample representativeness, we calculated the sampling error at 95%, conducted *t* tests on several demographic dimensions, and assessed self-selection effects. The 1957 data represent a random sample of one third of 30,951 high school graduates from Wisconsin in 1957, resulting in 10,317 individuals. Using 30,951 as the total population and our final sample of 2,839, the sampling error at 99.9% confidence interval is 1.7%. The sampling error is below the recommended cutoff of 6% (Särndal, Swensson, & Wretman, 2003). Thus, the sample is representative of 1957 graduates in Wisconsin. Based on information in the 1957 wave, we conduct *t* tests[7] on differences in sex (*t* test = 0.31, *df* = 2,676.29, $p > .10$; effect size Cohen's $d = .01$)[8] and ethnicity (*t* test = 1.28, *df* = 2,587.77, $p > .10$; effect size Cohen's $d = .05$). Based on information in the 1974 wave, we conduct *t* tests for education (*t* test = 0.46, *df* = 2,680.34, $p > .10$; effect size Cohen's $d = .02$) and number of siblings (*t* test = 0.67, *df* = 2,675.89, $p > .10$; effect size Cohen's $d = .26$). Next, based on the average over the 1975, 1992-1993, and 2004-2005 waves, we conduct *t* tests for marital status (*t* test = 0.26, *df* = 2,617.12, $p > .10$; effect size Cohen's $d = .01$), number of children (*t* test = 1.27, *df* = 2,586.61, $p > .10$; effect size Cohen's $d = .03$), average income over a lifetime (*t* test = 0.84, *df* = 2,586.61, $p > .10$; effect size Cohen's $d = .03$), average number of changes in spells of employment and self-employment (*t* test = 1.07, *df* = 2,617.98, $p > .10$; effect size Cohen's $d = .04$), and occupational prestige based on the Nakao score (*t* test = 0.92, *df* = 2,537.88, $p > .10$; effect size Cohen's $d = .04$).

Tables 1 and 2 show transitions of individuals between the self-employment and employment phases between the 1957 wave and the 2004-2005 wave. Data on individual attributes (personality, PWB, and goal attainment) were collected in a 1992-1993 mail questionnaire sent to 8,493 members of the original survey. This questionnaire collected information on respondents' personality traits based on the Big Five Inventory, which was developed by John, Donahue, and Kentle (1991), as well as the PWB (Ryff, 1989) and goal attainment scales (Brandtstädter, 1984; Brandtstädter & Renner, 1990).

We do not find significant differences between individuals included in the sample and the individuals dropped from the sample for openness to experience (*t* test = 0.51, *df* = 2,547.31, $p > .10$; effect size Cohen's $d = .02$), conscientiousness (*t* test = 0.86, *df* = 2,505.18, $p > .10$; effect size Cohen's $d = .03$), extraversion (*t* test = 0.62, *df* = 2,654.26, $p > .10$; effect size

Table 1
Transition Intensities

	Destination State	
Origin State	Self-Employed	Employed
Self-employed	–	$\theta_{se-e}(t \mid Z;\beta)$
Employed	$\theta_{e-se}(t \mid Z;\beta)$	–

Table 2
Number of Observations for Each Transition

	Destination State		
Origin State	Self-Employed	Employed	Censored
Self-employed	141	278	163
Employed	479	2,085	2,406

Cohen's d = .02), agreeableness (t test = 0.60, df = 2,539.07, p > .10; effect size Cohen's d = .02), neuroticism (t test = 0.55, df = 2,690.22, p > .10; effect size Cohen's d = .02), autonomy (t test = 0.53, df = 2,514.63, p > .10; effect size Cohen's d = .02), environmental mastery (t test = 1.00, df = 2,616.83, p > .10; effect size Cohen's d = .04), personal growth (t test = 0.90, df = 2,639.42, p > .10; effect size Cohen's d = .04), TGP (t test = 1.20, df = 2,591.68, p > .10; effect size Cohen's d = .05), and FGA (t = 1.00, df = 2,633.90, p > .10; effect size Cohen's d = .04). Thus, results from sampling error and t tests indicate that the sample used for estimation is representative of individuals included in the WLS.

Measures

Dependent variables. To assess entry into and persistence in self-employment, we use a semiparametric, reduced-form, multiple-state transition model (Lancaster, 1992; Martinez-Granado, 2002; Steele, Kallis, Goldstein, & Joshi, 2005). We are interested in two employment options: entering into self-employment (coded as 1 at each instance of switching to self-employment and 0 if switching from one job to another) and persisting in self-employment (a censored variable, measured as the amount of time, in months, in state 1).[9] The empirical specification takes into account state dependence, duration dependence, lagged duration dependence, and unobservable heterogeneity. State dependence accounts for the possibility that the transition probabilities depend on the origin and destination states (e.g., self-employed or employed respondents). Duration dependence and lagged duration dependence account for the possibility that the time during which the current state has been occupied and the length of previous visits to the different states (e.g., income or tenure)

affect the transition probabilities. Unobservable heterogeneity matters in this context due to differences in tastes, abilities, or preferences that cannot be observed. The transitions between the states are estimated using the maximum likelihood estimator of Heckman and Singer (1984), which approximates the distribution function of the unobservables by a finite mixture distribution (Martinez-Granado, 2002).

Independent variables. A complete listing of all the variables in our model and all the items that comprise the variables are shown in Table 3. According to Fornell and Larcker (1981: 45-46) to assess discriminant validity between two constructs *X* and *Y,* the average variance extracted (AVE) for *X* and *Y* must be greater than the square of the correlation. As our highest correlation is .22 (and the squared term of the correlation is .05) and the lowest AVE is 0.60, the measures exhibit high discriminant validity. An alternative rule of thumb is that AVEs exhibit greater discriminant validity when they are above the .5 cutoff (Shook, Ketchen, Hult, & Kacmar, 2004). The constructs show acceptable levels of reliability and discriminant validity: conscientiousness (α = .82, AVE = .64), openness to experience (α = .79, AVE = .66), extraversion (α = .92, AVE = .62), neuroticism (α = .88, AVE = .64), agreeableness (α = .87, AVE = .68), autonomy (α = .77, AVE = .68), environmental mastery (α = .78, AVE = 0.64), personal growth (α = 0.70, AVE = 0.64), FGA (α = 0.84, AVE = .64), and TGP (α = .82, AVE = .60). To further test for discriminant validity, we assess differences in chi-square values between (1) an unconstrained model that frees the correlation between the two constructs and (2) a constrained model that restricts the correlation between the two constructs to one. We compare chi-square values for all possible pairs of constructs. The lowest change in the chi-square value was for the autonomy–TGP relationship, $\Delta\chi^2(\Delta df)$ = 6.55(1), $p < .001$. Confirmatory factor analysis shows adequate measurement model fit (χ^2 = 1,477.24; df = 958; χ^2/df = 1.54, $p < .10$; comparative fit index = 0.94, Tucker-Lewis index = 0.92, root mean square error of approximation = 0.06, root mean square residual = 0.02).

Control variables. Our choice of control variables include demographic characteristics, cognitive ability, family socioeconomic background, family structure, academic achievements/ aspirations, past occupational characteristics, and the remaining PWB dimensions that have a social orientation and about which we did not formally hypothesize. Refer to Table 3 for a list and description of control variables. Past research suggests that males and females undertake self-employment for different reasons (Boden, 1996) and that their reasons for persisting in self-employment may differ as well (Burke, Fitzroy, & Nolan, 2002). The age of an individual is also a key driver in self-employment entrance and persistence, as prior research suggests that midcareer individuals are more likely to engage in self-employment as they procure work experience (Robinson & Sexton, 1994) and financial capital (Dunn & Holtz-Eakin, 2000). We therefore control for sex (1 = male, 0 = female) and age. A significant amount of research has consistently shown differences between the cognitive abilities of self-employed individuals and employees (Forbes, 1999). To control for cognitive abilities, we include scores of IQ at childhood and IQ during adulthood. Childhood IQ is measured using the Henmon-Nelson IQ test that was administered during high school, and adulthood IQ is measured using the Wechsler Adult Intelligence test that was administered to respondents in the 1992-1993 data

Table 3
Variable Descriptions

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
Dependent Variables						
Entry into self-employment[a]	Coded 1 at each instance of switching to self-employment; 0 if switched from one job to another.[b]					
Persistence in self-employment[c]	Measured as amount of time (in months) in state 1 under entry into self-employment.					
Independent Variables						
Big Five personality[d]	1 (*strongly disagree*) to 6 (*strongly agree*) to "I see myself as someone who . . ."					
Conscientiousness	does a thorough job.	3.04	0.90	.86***	.82	.64
	is a reliable worker.			.77***		
	tends to be disorganized. (Reverse coded [R])			.73***		
	is lazy at times. (R)			.75***		
	does things efficiently.			.85***		
	is easily distracted. (R)			.82***		
Openness to Experience	prefers the conventional, traditional. (R)	2.97	1.28	.86***	.79	.66
	prefers work that is routine and simple. (R)			.74***		
	values artistic, aesthetic experiences.			.74***		
	has an active imagination.			.83***		
	wants things to be simple and clear-cut. (R)			.74***		
	is sophisticated in art, music, or literature.			.85***		
Extraversion	is talkative.	3.55	0.82	.83***	.92	.62
	is reserved. (R)			.79***		
	is full of energy.			.94***		
	tends to be quiet (R)			.96***		
	is sometimes shy, inhibited. (R)			.89***		
	generates a lot of enthusiasm.			.88***		
Neuroticism	is emotionally stable, not easily upset. (R)	3.13	1.04	.83***	.88	.64
	worries a lot.			.84***		

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
	remains calm in tense situations. (R)			.91***		
	gets nervous easily.			.95***		
Agreeableness	tends to find fault with others. (R)	3.58	0.73	.76***	.87	.68
	is sometimes rude to others. (R)			.85***		
	is generally trusting.			.88***		
	can be cold and aloof. (R)			.82***		
	is considerate to almost everyone.			.89***		
	likes to cooperate with others.			.84***		
Psychological well-being[e]	1 (*strongly disagree*) to 6 (*strongly agree*)					
Autonomy	My decisions are not usually influenced by what everyone else is doing.	3.76	1.22	.85***	.77	.68
	I have confidence in my opinions even if they are contrary to the general consensus.			.77***		
	I tend to worry what other people think of me. (R)			.78***		
	I often change my mind about decisions if my friends or family disagree. (R)			.73***		
	I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.			.76**		
	Being happy with myself is more important to me than having others approve of me.			.89***		
	It is difficult for me to voice my opinions on controversial matters.			.81***		
Environmental mastery	I am good at juggling my time so that I can fit everything in that needs to get done.	3.40	0.89	.75***	.78	.64
	I often feel overwhelmed by my responsibilities. (R)			.79***		

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
	I am quite good at managing the many responsibilities of my daily life.			.79***		
	I do not fit very well with the people and community around me. (R)			.78***		
	I have difficulty arranging my life in a way that is satisfying to me. (R)			.73***		
	I have been able to create a lifestyle for myself that is much to my liking.			.79***		
	I generally do a good job of taking care of my personal finances and affairs.			.73***		
Personal growth	I am not interested in activities that will expand my horizons. (R)	3.90	1.59	.66***	.70	.64
	I have the sense that I have developed a lot as a person over time.			.69***		
	When I think about it, I haven't really improved much as a person over the years. (R)			.67***		
	I think it is important to have new experiences that challenge how I think about myself and the world.			.74***		
	I don't want to try new ways of doing things—my life is fine the way it is. (R)			.76***		
	I do not enjoy being in new situations that require me to change my old familiar ways of doing things. (R)			.68***		
	There is truth to the saying you can't teach an old dog new tricks. (R)			.75***		
Goal attainment[f]	1 (*strongly disagree*) to 6 (*strongly agree*)					

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
Flexible goal adjustment	If I don't get something I want, I take it with patience.	2.14	0.63	.78***	.84	.64
	It is very difficult for me to accept a setback or defeat. (R)			.76***		
	I find it easy to see something positive even in a serious mishap.			.85***		
	When everything seems to be going wrong, I can usually find a bright side to a situation.			.88***		
	In general, I am not upset very long about an opportunity passed up.			.79***		
Tenacious goal pursuit	Even when things seem hopeless, I keep on fighting to reach my goals.	2.56	0.77	.77***	.82	.60
	I stick to my goals and projects even in the face of great adversity.			.84***		
	The harder a goal is to achieve, the more appeal it has to me.			.76***		
	I can be very stubborn in pursuing my goals.			.86***		
	To avoid disappointment, I don't set my goals too high. (R)			.84***		
Control Variables						
Individual controls						
Demographics						
Gender (male)[g]	Dummy variable; 1 = male	0.43	0.48			
Age	Age at the beginning of the spell/10	--	--			
Cognitive ability						
IQ (childhood)[h]	Based on average of four Henmon-Nelson IQ tests during high-school	108.24	17.15			
IQ (adult)[i]	Wechsler Adult Intelligence Scale	103.29	17.54			
Family socioeconomic background[j]						

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
Parents' schooling	Total years of schooling completed by parents	22.16	4.13			
Parents' income	In $000s from 1957 Wisconsin State tax records	7.22	8.12			
Father's occupational status	Duncan 1970 Socio-economic Index (SEI) score for father's 1957 occupation	31.22	24.18			
Father's self-employed status	Dummy variable; 1 = self-employed, 0 = other	0.29	0.55			
Father's farmer status	Dummy variable; 1 = father is a farmer, 0 = other	0.16	0.22			
Family Structure[k]						
Intact Family	Dummy variable; 1 = respondent lives with both parents until senior year	0.89	0.31			
Sibling Size	Respondent's number of brothers and sisters	3.88	1.95			
Birth order	1 minus proportion of all brothers and sisters older than the respondent	0.64	0.19			
Sibling density	Number of siblings born within two years of respondent's birth date	0.51	0.70			
Academic achievements/aspirations[l]						
Class rank	Average grades in high school; ranked and normalized	42.03	29.24			
Years of schooling	Respondent's completed years of schooling	13.71	2.55			
Occupational aspirations	Duncan 1970 SEI of occupation respondent eventually hoped to enter	59.54	20.48			
Past occupational characteristics[m]						
Income in current spell	$000s	40.74	10.89			
Job prestige	Nakao prestige rating (for each job)					
Self-employment experience	Years before the spell spent self-employed	5.87	8.52			

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
Employment experience	Years before the spell spent as an employee of someone else	32.43	4.32			
Other psychological well-being dimensions[n]	1 (*strongly disagree*) to 6 (*strongly agree*)					
Positive relation with others	I don't have many people who want to listen when I need to talk. (R)	3.17	1.36	.73***	.68	.66
	I enjoy personal and mutual conversations with family members and friends.			.67***		
	I often feel lonely because I have few close friends with whom to share my concerns. (R)			.66***		
	It seems to me that most other people have more friends than I do. (R)			.69***		
	People would describe me as a giving person, willing to share my time with others.			.67***		
	Most people see me as loving and affectionate.			.69***		
	I know I can trust my friends and they know they can trust me.			.68***		
Purpose in life	I enjoy making plans for the future and working to make them a reality.	3.55	1.60	.78***	.81	.69
	My daily activities often seem trivial and unimportant to me. (R)			.87***		
	I am an active person in carrying out the plans I set for myself.			.88***		
	I tend to focus on the present because the future nearly always brings me problems. (R)			.75***		
	I don't have a good sense of what it is I'm trying to accomplish in life. (R)			.85***		

(continued)

Table 3 (continued)

Variable	Description/Scale Items	*M*	*SD*	Item Loading	α	Average Variance Extracted
	I sometimes feel as if I've done all there is to do in life. (R)			.83***		
	I used to set goals for myself but that now seems like a waste. (R)			.84***		
Self-acceptance	I feel like many of the people I know have gotten more out of life than I have. (R)	3.69	1.40	.84***	.77	.62
	In general, I feel confident and positive about myself.			.87***		
	When I compare myself to friends and acquaintances, it makes me feel good about who I am.			.83***		
	My attitude about myself is probably not as positive as most people feel about themselves. (R)			.78***		
	I made some mistakes in the past, but I feel that all in all everything has worked out for the best.			.70***		
	The past had its ups and downs, but in general, I wouldn't want to change it.			.75***		
	In many ways, I feel disappointed about my achievements in life. (R)			.71***		

[a]Job history between 1975 and 1992 measured from 1992 wave; job history from 1992 to 2004 compiled from 2005 wave.
[b]Of the sample, 11.32% experienced self-employment at some point during the life course.
[c]Job history between 1975 and 1992 measured from 1992 wave; job history from 1992 to 2004 compiled from 2005 wave.
[d]Personality measures from 1992 telephone survey.
[e]Psychological well-being measures from 1992 telephone survey.
[f]Goal attainment measures from 1992 telephone survey.
[g]From 1957 wave.
[h]From 1957 wave.
[i]Measured in 1992-1993 wave.
[j]From 1957, 1975, and 1992 waves.
[k]From 1975 and 1992 waves.
[l]From 1957 and 1975 waves.
[m]From 1992 wave and subsequent wave in 2004-2005.
[n]Telephone interview in 1992 wave.
***$p < .001$.

wave. We control for parents' years of schooling (Hout & Rosen, 1999), parents' income (Corak & Heisz, 1999), occupational status of the father (Honig, 1998), whether the father was self-employed (Bowen & Hisrich, 1986), and whether the father was a farmer (Blanchflower & Oswald, 1990), as these factors have been shown to significantly impact proclivity toward self-employment.

According to Halaby (2003), family structure could affect choice of risk-seeking activities such as self-employment. Additionally, based on Hundley (2006), sibling size, birth order, and sibling density explain the availability of resources, potential opportunities, and behaviors that influence the aptitude toward self-employment. As human capital is central to success in self-employment efforts, we control for class rank and years of schooling as proxies for human capital and cognitive capability (Schmitt-Rodermund, 2004). We also control for occupational aspirations (Sewell, Hauser, & Wolf, 1980), as they explain aptitudes toward certain professions (Cubico, Bortolani, Favretto, & Sartori, 2010).

High income in a given employment spell could limit individual motivations to undertake a risky endeavor such as self-employment (Hyytinen & Rouvinen, 2008). Similarly, high job prestige may lower the likelihood of leaving employment and engaging in self-employment. Lastly, we control for the three remaining attributes of PWB (positive relations with others, purpose in life, and self-acceptance) about which we do not hypothesize.

Empirical Specifications

We use semiparametric, reduced-form, multiple-state transition models. Detailed mathematical specifications, identification, and estimation procedures are in Appendix B.

Unemployment and self-employment. In our analysis, we dropped 14 individuals who reported an unemployment spell for longer than a year. In a recent study by the U.S. Department of Labor, an average individual stayed unemployed anywhere from 7 to 22 weeks[10] between 1948 and 2008. As WLS is a longitudinal survey spanning from 1957 to 2004, short unemployment spells are less likely to be reported. Of the 14 individuals reporting unemployment for longer than a year, 3 chose self-employment in the following phase, and the remaining 11 accepted employment at companies. As the 14 individuals represent 0.49% of 2,839 individuals, increasing the model complexity by specifying four additional transition possibilities (employment to unemployment, self-employment to unemployment, unemployment to self-employment, and unemployment to employment) is not particularly meaningful. However, we specified an alternate model with the four additional transition probabilities and did not find significant differences with respect to the magnitude, direction, and significance of the hypothesized estimates. Furthermore, the effects of the independent variables on the four additional transitions related to unemployment were insignificant (the highest estimate was reported for the autonomy and unemployment–self-employment persistence transition relationship: $\beta = .003$, $p = .872$).

Results

Table 4 is a correlation matrix between the independent, control, and self-employment variables in our model.

We start by assessing whether unobserved heterogeneity must be modeled in the analysis. A Wald test of the joint hypothesis that all the parameters related to heterogeneity are zero gives us a value of 300.02, distributed as χ^2 with 30 degrees of freedom. Therefore, the null hypothesis of no unobservable heterogeneity cannot be accepted. Next, we test the validity of the following specifications: (1) duration dependence (Wald $\chi^2 = 426.25$, $df = 42$, $p < .001$), (2) monotone duration dependence (Wald $\chi^2 = 322.51$, $df = 36$, $p < .001$), (3) unobserved heterogeneity (Factor 1; Wald $\chi^2 = 117.55$, $df = 6$, $p < .001$), (4) unobserved heterogeneity (Factor 2; Wald $\chi^2 = 122.32$, $df = 6$, $p < .001$), and (5) alternate unobserved heterogeneity specification where loading parameters for Factor 1 are equal for destination states and the loading parameters for Factor 2 are equal for origin states (Wald $\chi^2 = 67.26$, $df = 6$, $p < .001$). As all the specifications are significant, we model for these relationships among states.

The results of our hypothesis testing are shown in Table 5. A positive coefficient for persistence in self-employment indicates an increased likelihood of transiting out of self-employment, whereas a negative coefficient indicates an increased likelihood of persisting in self-employment. Hypotheses 1a and 1b proposed that individuals scoring higher on conscientiousness are more likely to enter into self-employment (Hypothesis 1a: $\beta = .08$, $p > .10$) and are also more likely to persevere in self-employment (Hypothesis 1b: $\beta = .02$, $p > .10$) than individuals scoring lower on conscientiousness, respectively. The results suggest that conscientiousness does not affect self-employment entrance or persistence. Individuals scoring higher on openness to experience are not only more likely to choose self-employment (Hypothesis 2a: $\beta = .16$, $p < .01$), but they also are more likely to persist in self-employment (Hypothesis 2b: $\beta = -.16$, $p < .01$) than individuals scoring lower on openness to experience, supporting Hypotheses 2a and 2b. Hypothesis 3a proposed that individuals who are more extraverted are more likely to enter into self-employment ($\beta = .07$, $p > .10$) than individuals who are less extraverted. Hypothesis 3b proposed that individuals who are more extraverted are more likely to persist in self-employment than individuals who are less extraverted ($\beta = -.07$, $p > .10$). The results show that Hypotheses 3a and 3b were not supported; extraversion does not impact entry into or persistence in self-employment. Respondents who are more neurotic are less likely to become self-employed (Hypothesis 4a: $\beta = -.15$, $p < .01$) and less likely to persist in self-employment (Hypothesis 4b: $\beta = .10$, $p < .01$) than those who are less neurotic, supporting Hypotheses 4a and 4b. Finally, agreeableness is not significantly related to entry (Hypothesis 5a: $\beta = -.12$, $p > .10$) or persistence (Hypothesis 5b: $\beta = .15$, $p > .10$) in self-employment.

Individuals with higher levels of autonomy (Hypothesis 6a: $\beta = .21$, $p < .01$) and environmental mastery (Hypothesis 7a: $\beta = .11$, $p < .01$) are more likely to engage in self-employment than individuals with lower levels of autonomy and environmental mastery. Although individuals with higher levels of autonomy are more likely to persist in self-employment (Hypothesis 6b: $\beta = -.21$, $p < .01$) than individuals with lower levels of autonomy, there is no support for the hypothesis that individuals with higher environmental

Table 4
Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Gender (male)	1																																	
Age	.03	1																																
IQ (childhood)	.01	.05	1																															
IQ (adult)	.03	.06	.49	1																														
Parents' schooling (years)	.08	.03	.07	.05	1																													
Parents' income	.09	.06	.02	.05	.13	1																												
Father's occupational status	.02	.06	.04	.07	.10	.12	1																											
Father's self–employed status (0/1)	.04	.03	.01	.05	.03	.05	.04	1																										
Father's farmer status (0/1)	.01	.02	.01	.01	–.05	–.07	.02	.03	1																									
Intact family	.06	.04	.03	.12	.08	.02	.07	.04	.04	1																								
Sibling size	.03	.02	.04	.03	.03	–.08	–.04	.03	.03	.05	1																							
Birth order	.08	.02	.07	.07	.02	.06	.02	.01	.02	.07	.02	1																						
Sibling density	.02	.04	.06	.01	.06	.03	.03	.01	.02	.03	.09	.05	1																					
Class rank	.01	.02	.07	.09	.04	.06	.12	.01	.03	.11	.02	.06	.01	1																				
Years of schooling	.06	.06	.03	.03	.15	.26	.22	.04	.02	.04	.02	.03	.07	.05	1																			
Occupational aspirations	.03	.02	.02	.05	.12	.19	.18	.02	.02	.03	.05	.07	.09	.02	.08	1																		
Income in current spell	.03	.04	.05	.03	.05	.04	.04	.06	.05	.05	.04	.04	.05	.05	.03	.06	1																	
Job prestige	.04	.04	.03	.02	.02	.05	.02	.03	.03	.05	.05	.04	.03	.03	.04	.06	.06	1																
Self–employment experience	.04	.06	.05	.03	.03	.06	.04	.02	.03	.06	.02	.04	.05	.02	.06	.06	.06	.06	1															
Employment experience	.04	.06	.03	.03	.03	.06	.05	.05	.02	.04	.04	.04	.04	.05	.05	.04	.04	.05	0.02	1														
Extraversion	.08	.05	.06	.17	.02	.08	.03	.01	.03	.07	.09	.02	.06	.08	.07	.03	.06	.03	0.05	0.02	1													
Agreeableness	.02	.03	.01	.05	.03	.09	.05	.04	.04	.02	.03	.03	.08	.01	.08	.03	.03	.05	0.05	0.05	0.15	1												
Conscientiousness	.05	.03	.11	.03	.05	.07	.01	.03	.02	.05	.03	.07	.02	.08	.03	.08	.06	.05	0.04	0.02	0.14	0.07	1											
Neuroticism	.09	.06	.08	.02	.03	.09	.13	.05	.04	.09	.03	.06	.08	.09	.03	.06	.03	.02	0.02	0.05	0.13	–0.02	0.13	1										
Openness to experience	.03	.06	.11	.07	.06	.05	.03	.02	.01	.12	.05	.04	.05	.06	.01	.02	.05	.05	0.03	0.05	0.13	0.21	0.19	0.09	1									
Autonomy	.01	.04	.06	.11	.05	.08	.13	.01	.02	.11	.08	.01	.09	.09	.04	.03	.03	.05	0.06	0.06	0.08	0.19	0.11	0.06	–0.16	1								
Environmental mastery	.04	.02	.02	.17	.06	.08	.02	.02	.04	.05	.05	.07	.01	.09	.06	.11	.03	.05	0.05	0.04	0.14	0.21	0.17	0.03	0.05	0.12	1							
Personal growth	.04	.03	.18	.12	.06	.09	.03	.04	.04	.02	.03	.02	.04	.01	.07	.05	.04	.04	0.06	0.06	0.13	0.06	0.13	0.15	–0.07	0.14	0.16	1						
Positive relations with others	.07	.04	.03	.12	.05	.01	.09	.04	.04	.04	.06	.06	.01	.09	.09	.03	.06	.04	0.05	0.04	0.15	0.13	0.06	0.18	–0.19	0.11	0.09	0.19	1					
Purpose in life	.08	.04	.17	.07	.05	.02	.06	.02	.03	.05	.01	.03	.02	.05	.03	.03	.02	.04	0.05	0.04	0.13	0.09	0.21	0.12	–0.07	0.10	0.09	0.2	0.16	1				
Self–acceptance	.04	.05	.09	.18	.05	.04	.13	.04	.04	.08	.06	.05	.02	.08	.06	.07	.05	.06	0.03	0.03	0.10	0.16	0.01	0.14	–0.09	0.13	0.12	0.14	0.14	0.14	1			
Flexible goal adjustment	.08	.03	.05	.19	.06	.06	.05	.02	.04	.03	.08	.09	.02	.07	.09	.04	.06	.05	0.04	0.06	0.19	0.1	0.12	0.05	0.12	–0.09	–0.16	0.13	0.17	–0.04	–0.07	1		
Tenacious goal pursuit	.09	.06	.04	.06	.06	.11	.07	.01	.05	.04	.02	.04	.05	.08	.03	.05	.05	.03	0.05	0.02	0.04	0.14	–0.15	0.12	–0.16	0.18	0.12	–0.05	0.02	0.15	0.13	–0.21	1	
Self–employed (= 1)[a]	.04	.03	.01	.09	.02	.01	.01	.06	.01	.02	.01	.03	.01	.01	.02	.06	.04	.03	0.04	0.04	0.08	0.09	–0.06	0.08	–0.14	0.08	0.07	0.02	0.03	0.02	0.07	0.09	0.13	1

Note: All correlations above |.08| are significant at .05 or below (two–tailed test). All correlations above |.12| are significant at .01 or below (two–tailed test).

[a]Coded as 1 if an individual experienced a self–employment episode during the period of observation.

Table 5
Maximum Likelihood Estimates for the Transition Equations Controlling for Unobserved Heterogeneity (nonparametric maximum likelihood estimator)

	Entry Into Self-Employment		Persistence in Self-Employment[a]	
	Coefficient	*t* Ratio	Coefficient	*t* Ratio
Intercept	–4.25	–8.14	3.14	1.98
Big-Five personality				
Conscientiousness (Hypotheses 1a & 1b)	0.08	1.16	0.02	1.55
Openness to experience (Hypotheses 2a & 2b)	**0.16**	**3.69**	**–0.16**	**–2.54**
Extraversion (Hypotheses 3a & 3b)	0.07	1.16	–0.07	–1.01
Neuroticism (Hypotheses 4a & 4b)	**–0.15**	**–2.16**	**0.10**	**3.13**
Agreeableness (Hypotheses 5a & 5b)	–0.12	–0.58	0.15	0.54
Psychological well-being				
Autonomy (Hypotheses 6a & 6b)	**0.21**	**2.85**	**–0.21**	**–2.01**
Environmental mastery (Hypotheses 7a & 7b)	**0.11**	**1.96**	0.03	1.04
Personal growth (Hypotheses 8a & 8b)	0.04	0.85	0.02	0.14
Goal attainment approaches				
Flexible goal adjustment (Hypotheses 9a & 9b)	–0.15	–1.16	0.17	1.45
Tenacious goal pursuit (Hypotheses 10a & 10b)	**0.18**	**4.27**	**–0.21**	**–2.51**
Demographic variables/cognitive ability				
Gender (male)	**0.13**	**4.42**	**–0.16**	**–2.01**
Age	**–0.03**	**–1.84**	**–0.04**	**–1.83**
IQ (childhood)	**0.11**	**2.00**	–0.08	–0.77
IQ (adult)	**0.43**	**2.90**	0.09	0.96
Family socioeconomic background				
Parents' schooling (years)	**0.06**	**2.09**	–0.02	–0.52
Parents' income	**0.08**	**2.66**	**–0.03**	**–2.15**
Father's occupational status	**0.10**	**1.91**	–0.08	–1.06
Father's self-employed status (0/1)	**0.17**	**3.18**	**–0.12**	**–2.56**
Father's farmer status (0/1)	0.01	0.41	0.01	0.92
Family structure				
Intact family	0.02	0.54	0.03	0.10
Sibling size	0.01	0.81	0.01	0.29
Birth order	0.03	0.79	0.05	0.71
Sibling density	0.04	0.63	0.03	0.62
Academic achievement and aspirations				
Class rank	0.02	1.29	0.01	1.64
Years of schooling	0.02	1.04	0.03	1.23
Occupational aspirations	**0.09**	**1.89**	–0.14	–1.06
Past occupational characteristics				
Income in current spell	**–0.26**	**–3.14**	**–0.32**	**–4.52**
Job prestige rating (for each job)	**–0.22**	**–3.00**	–0.03	–1.04
ln(duration/12)	0.24	1.04	0.69	2.16
Spline duration = 6	–0.03	–1.06	–0.09	–1.12
Spline duration = 9	–0.09	–0.61	–0.10	–1.04
Spline duration = 12	0.12	0.10	0.12	1.21
Self-employment experience	0.05	1.36	**–0.08**	**–3.05**
Employment experience	–0.02	–1.02	0.03	1.46

(continued)

Table 5 (continued)

	Entry Into Self-Employment		Persistence in Self-Employment[a]	
	Coefficient	*t* Ratio	Coefficient	*t* Ratio
Other psychological well-being dimensions				
Positive relations with others	0.02	0.78	0.05	1.27
Self-acceptance	0.05	1.03	0.02	1.05
Purpose of life	0.04	1.12	0.03	1.01
Self-acceptance	0.05	1.03	0.02	1.05
δ	1	–	3.17	3.51
λ	1	–	–2.87	2.47
	$v_1^a = 0$ $v_1^b = 2.86$			
	$v_2^a = 0$ $v_2^b = 3.52$			
	$p_1 = .59, p_2 = .12, p_3 = .12, p_4 = .18$			
Log-likelihood	–10,221.08			
Observations	2,839			

Note: Bolded numbers are significant at $p < .05$ or below.
[a]A negative coefficient for persistence in self-employment indicates a higher likelihood of persisting in self-employment, whereas a positive coefficient for persistence in self-employment indicates an increased likelihood of transiting out of self-employment.

mastery are more likely to persist in self-employment (Hypothesis 7b: β = .03, $p > .05$) than individuals with lower environmental mastery. Thus, Hypotheses 6a, 6b, and 7a were supported, but Hypothesis 7b was not supported. Hypotheses 8a and 8b proposed that individuals with a higher need for personal growth would be more likely to enter into self-employment (Hypothesis 8a: β = .04, $p > .10$) and persist in self-employment (Hypothesis 8b: β = .02, $p > .10$) than individuals with a lower need for personal growth. Neither Hypothesis 8a nor 8b were supported.

Finally, individuals with a more FGA approach are not more likely to enter self-employment (Hypothesis 9a: β = –.15, $p > .10$) or persist in self-employment (Hypothesis 9b: β = .17, $p > .10$) than individuals with a less FGA approach. There is no support for Hypotheses 9a and 9b. Finally, supporting Hypotheses 10a and 10b, individuals with a more TGP approach are more likely to engage in self-employment (Hypothesis 10a: β = .18, $p < .01$) and persevere in self-employment (Hypothesis 10b: β = –.21, $p < .01$) than individuals with a less TGP approach.

Discussion

We focus on assessing the role of stable individual attributes that are critical to understanding persistence in self-employment. Despite significant efforts toward explaining why some individuals enter self-employment and others do not, there is limited exploration focused on why some individuals persist in self-employment and others do not. Focusing on persistence is particularly important, as economic gains can only be realized at the individual,

societal, and national levels if individuals thrive in and continue with their self-employment efforts. By concentrating on self-employment persistence, we extend the three-decade-long research intent on understanding the effects of stable individual attributes on self-employment entrance decisions. Using a comprehensive data set from 1957 to 2004 and applying econometric methods, we assess the effects of the Big Five personality factors, three of the PWB dimensions, and goal attainment approaches on self-employment persistence.

Our results show that individual attributes play a key role in decisions to enter into and persist in self-employment. These findings are robust after controlling for social and economic explanations, unobserved heterogeneity at the individual level, and other econometric variables such as duration dependence. Of the Big Five personality traits, greater openness to experience positively predicted that an individual would enter into and persist in self-employment, whereas individuals higher on neuroticism are not only less likely to choose self-employment but also less likely to persist in self-employment. Higher levels of conscientiousness, extraversion, and agreeableness did not influence the decision to enter into self-employment, nor did they influence the decision to persist in self-employment.

The current results show some consistency with the findings in the meta-synthesis by Brandstätter (2011). In the meta-synthesis, Brandstätter (2011) found that entrepreneurs had higher levels of conscientiousness, openness to experience, and extraversion than managers and that entrepreneurs had lower levels of neuroticism and agreeableness than managers. In our analysis, openness to experience and neuroticism explained self-employment entrance. Additionally, according to Brandstätter (2011), conscientiousness, openness to experience, and extraversion increased entrepreneurial performance, and neuroticism lowered entrepreneurial performance. Although persistence in self-employment cannot proxy directly for entrepreneurial performance, our results show that openness to experience increases persistence in self-employment and neuroticism lowers persistence in self-employment. Overall, although our effects are consistent with Brandstätter (2011) on openness to experience and neuroticism, we do not find support for the remaining three Big Five personality dimensions. These discrepancies highlight the importance of carefully distinguishing between activities associated with entrepreneurship and activities associated with self-employment. Furthermore, persistence in self-employment is a qualitatively different construct than entrepreneurial performance.

With respect to the PWB dimensions, individuals who scored higher on autonomy were more likely to enter into and persist in self-employment than individuals who scored lower on autonomy. Greater environmental mastery positively predicted entry into self-employment but did not predict persistence in self-employment. The need for personal growth did not affect entry into or persistence in self-employment. Individuals with a TGP approach not only are more likely to enter into self-employment but are also more likely to persist in self-employment. A FGA approach did not influence entry into or persistence in self-employment. This is the first study to investigate the extent to which PWB dimensions and goal attainment approaches affects both self-employment entrance and persistence.

Because self-employment has predominantly been studied as an economic or sociological phenomenon, few studies have investigated the role of individual attributes on self-employment. We build off of and integrate research from the field of entrepreneurship that has focused on linking individual attributes and entrepreneurial behaviors. Most importantly,

there is limited research that has focused on the role of individual attributes on self-employment persistence. Research on entrepreneurial exit has mainly focused on how aspects of firm performance, social commitments, and demographic factors result in exit from entrepreneurial ventures (DeTienne, 2010; Wennberg et al., 2010). The results of our study suggest that researchers interested in either self-employment exit or self-employment persistence may wish to further investigate individual attributes that reflect motivation and the ability to leverage knowledge, resources, and coping abilities.

Heterogeneity in Self-Employment Efforts

The impact of personality traits on self-employment and entrepreneurship ventures is complex (Brandstätter, 2011). This could be due to the heterogeneous and episodic nature of self-employment efforts, as these efforts range from starting a home-based business to developing a complex high-tech venture. Clearly, not all personality traits are applicable in all contexts. Thus, high levels of heterogeneity in self-employment ventures result in differential relevance of specific traits.

The episodic nature of self-employment efforts further complicates our understanding of the role of individual attributes on self-employment. Assuming that specific personality traits differentiate the self-employed from the non-self-employed and that there is an equal likelihood of personality trait distribution across a population, individuals with these specific personality traits would be self-employed most of their lives. However, prevalence rate studies have shown that at any given time 15% of adults are engaged in some type of self-employment (Dunn & Holtz-Eakin, 2000; Janvry & Sadoulet, 2001). Therefore, given the episodic nature of self-employment efforts, it is unlikely that personality factors are the only stable antecedents of entry into or persistence in self-employment. There must be certain contextual factors that impact the decision to become self-employed and stay self-employed. These contextual factors may be more a function of social dynamics than of innate personality. To that end, we explored two other antecedents of self-employment states—PWB and goal attainment—and found that across self-employment states specific dimensions of these attributes were significant for self-employment entrance and persistence.

Much of the research in entrepreneurship has focused on investigating the relationship between individual attributes and entrepreneurship without controlling for factors described in economic and sociological explanations. By econometrically specifying and accounting for a more comprehensive set of social, economic, and demographic factors, we are able to draw robust inferences about the role of individual attributes in self-employment entrance and persistence decisions. We also provide an empirical contribution to the self-employment literature by methodologically addressing the heterogeneous and episodic nature of self-employment efforts. Significant social and individual heterogeneity in self-employment situations results in differential effects of the role of specific individual attributes. Through our modeling approach we were able to address this heterogeneity. By methodologically controlling for temporal dependencies, and accounting for numerous individual, social, and economic conditions over a lifetime, we disentangle the effects of self-employment as described in the economics, sociology, and management literatures. Many of the existing

labor market studies on transitions confound age and cohort effects (Borjas, 1986). Our data provide a unique opportunity to test a cohort of individuals from high school until retirement from a specific geographical location.

Limitations and Directions for Future Research

This study is not without limitations. First, the individual attributes that we tested in our model could be intertwined. Specifically, personality traits may partially shape PWB dimensions and goal attainment approaches. This issue is not specific to this study but applicable to the broader psychology literature in general. To remove the potentially mutual causal effects of, say, personality and goal attainment approaches, the relevant instrumental variables must be identified to control for endogeneity effects. However, due to the complex genetic, social, period, and cohort effects, instrumental variables are virtually impossible to identify. A longitudinal methodology coupled with specifications for unobserved heterogeneity could partially assuage these concerns.

Future studies could identify and test dyadic or gestalt-type relationships among variables. For example, the relationship between openness to experiences and goal attainment approaches may be of particular interest, as these two attributes could jointly enhance the drive for experiencing new situations. The interaction between autonomy and conscientiousness (or, TGP) could have positive effects on entry into and persistence in self-employment.[11] Such interdependent effects could be of particular interest for future research.

Much of the data are self-reported and may suffer from traditional biases such as common method variance, among others. However, the effects of such biases are limited due to the longitudinal nature of the data. Although we attempted to account for omitted variable bias, we only considered factors that have been validated in sociological and labor market research. However, it is likely that other variables could explain the phenomenon of self-employment entrance and persistence. For example, some recent work in entrepreneurship has focused on the possible effects of emotion. It is possible that individuals with enduring positive affect may be more likely to enter into, and persevere in, self-employment than those with negative affect (Baron, 2008). Alternate biological markers could also help explain choice and persistence in self-employment (Stephan & Roesler, 2010).

The WLS does not provide consistent information on occupational codes when individuals report employment transitions, but studies on the episodic nature of employment in different occupational classes could further explain transitions to employment and the length of self-employment episodes. One could test how the role of duration and transition across different occupations increases the likelihood of entrance into and persistence in self-employment. We encourage researchers to investigate these issues in the context of self-employment.

Although the current framework focuses on the person side of the person–situation debate, future research could focus on the contingent effects of the person and situation on self-employment efforts. Other factors, such as requisite knowledge (Floyd & Wooldridge, 1999), social capital (Honig, 1998), market conditions (Knight, 2000), and opportunity costs (Amit, Muller, & Cockburn, 1995), and demographic characteristics, such as age (Blanchflower, Oswald, & Stutzer, 2001), marital status (Birley, 1989), and family background (Aldrich &

Cliff, 2003), may explain why not all individuals with similar attributes engage in and persist in self-employment. We controlled for some of these situational and demographic factors in our investigation of individual attributes, but future research could examine both person and situation factors simultaneously.

Practical Implications

One practical implication of this research is that it might help government organizations that are interested in promoting and sustaining self-employment. As proposed by Brandstätter (2011), different individual attributes could lead to self-selection into and varied responses to government-supported training programs. For example, the U.S. Department of Labor provides self-employment assistance to encourage unemployed individuals to develop small businesses. Individual states in the United States provide self-employment assistance instead of unemployment insurance benefits during the business establishment process. The weekly allowances allow an individual to cover personal expenses while establishing a business. With the knowledge that individuals with specific attributes are more likely to persist in running their own businesses, program managers can advertise their programs to attract these individuals. In addition, the training programs or financial incentives available from state and federal agencies could focus more on priming individual behaviors resulting from the specific individual attributes shown to relate to self-employment efforts in our study.

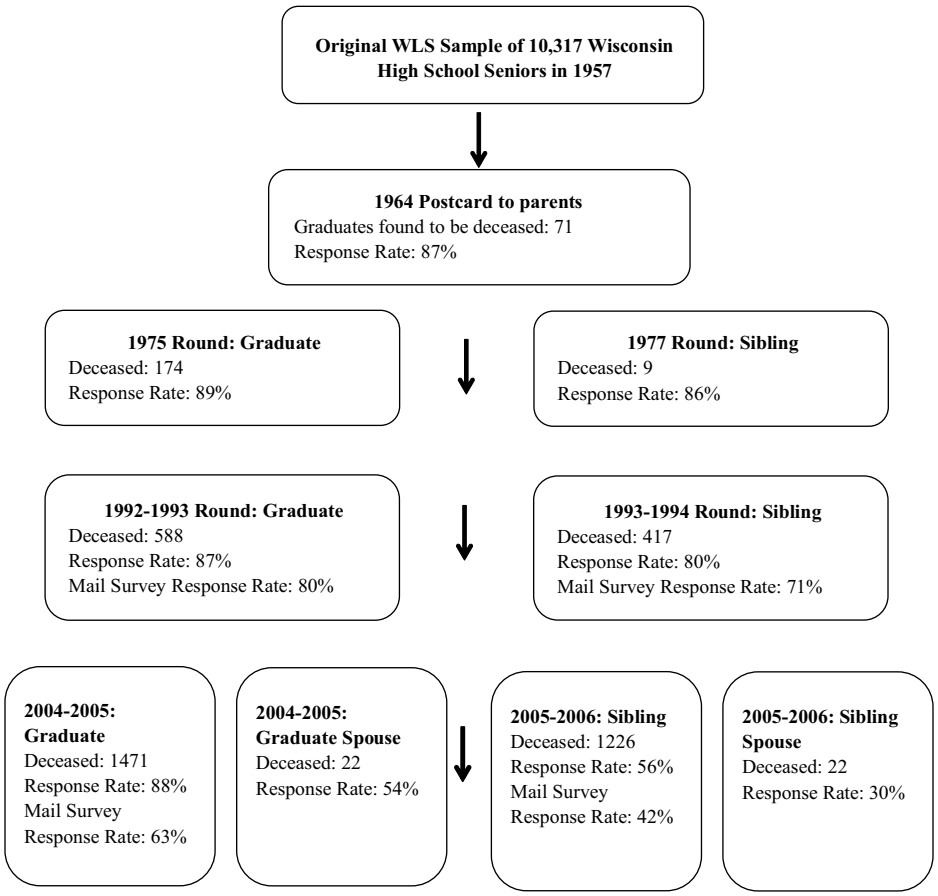
In promoting self-employment, policy makers could develop training programs based on managing cognitive and emotional states that help reinforce positive individual attributes and mitigate the effects of negative individual attributes. Significant research in the cognition literature suggests that individuals could selectively manage both the positive and negative aspects of attributes. For example, emotional regulation (Eisenberg, Fabes, Guthrie, & Reiser, 2000) or affect regulation (Fonagy, Gergely, Jurist, & Target, 2004) strategies could mitigate the negative effects of neuroticism. Alternatively, social competence could help enhance returns from openness to experience (Schneider, Ackerman, & Kanfer, 1996). Thus, by becoming aware of the positive and negative effects of individual attributes on self-employment efforts, individuals may be able to manage their actions and behaviors to enter into and persist in self-employment.

Conclusion

One of the unresolved issues in the self-employment literature is the role of individual attributes in the persistence in self-employment efforts. Moving beyond self-employment entry, we extend research to investigate the role of individual attributes on self-employment persistence. The results of our study based on a comprehensive longitudinal data set suggest that a number of individual attributes drive an individual to persist in self-employment. Individuals with low levels of neuroticism and high levels of openness to experience, autonomy, and TGP approach are likely to persist in self-employment. Sticking it out and persisting in self-employment may be determined by numerous factors, but we now know that individual attributes also play an important role in this decision.

Appendix A

Wisconsin Longitudinal Study Sample Flow



Note: Adapted from the *Wisconsin Longitudinal Study Handbook* (http://www.ssc.wisc.edu/wlsresearch/documentation/handbook/WLS_Handbook.pdf).

Appendix B

Specifications for Semiparametric, Reduced-Form, Multiple-State Transition Model

A respondent can transit between two states: origin states (first subscript) and destination states (second subscript). In order to derive the likelihood function that is to be maximized, consider a sample of N respondents. Each respondent spends time in one of the two states—employed or self-employed. The number of months spent in state k before changing to state l is called *elapsed duration*. For each respondent, i, we observe a sequence $\left\{t_i^1, t_i^2 \ldots . t_i^{C_I}\right\}$ of contiguous periods of spells in different states. Specifically, t measures the elapsed duration in a certain state. For each respondent, the spells may be completed or not completed during the time periods. In this completed or not completed condition, they would be *right censored*. The derivation of the likelihood function of N respondents requires that we distinguish between completed and uncompleted spells. The contribution to the likelihood function of an incomplete spell is the probability of surviving in a state to the time of the interview. The likelihood function of a completed spell is the probability of surviving in state k until time t (survivor function) times the probability of moving from state k to state l in the infinitesimally short subsequent interval $(t, t+\partial t)$, *transition intensity.*

We assume that respondent transitions are governed by intensity functions of the mixed proportional hazard (MPH) type (Abbring & Van den Berg, 2003). Specifically, for each spell, c, the transition intensity from state k to state l for the respondent i, θ_{kl}, is proposed to have the following functional form:

$$\theta_{kl}(t_i^c \mid X_{ikl}, v_{kl}; \beta) = h_{kl}(t_i^c)\exp(\beta_{kl}^{'} X_{ikl}) v_{ikl} \ , \tag{1}$$

where the elapsed duration enters the transition intensities (duration dependence) through the baseline function $h_{kl}(t_i^c)$. In Equation 1, X_{ikl} is a vector of exogenous observable variables consisting of the effects of independent and control variables, including the lagged duration dependence, which is a function of time spent in the previous states. These variables are assumed to affect a move from state k to state l through a vector of unknown parameters, β_{kl}, which can vary depending on the origin and destination states (state dependence). Finally, v_{ikl} is a positive random individual effect (unobservable heterogeneity) that can be due, among other reasons, to differences in a respondent's preferences or abilities to start a business. The unobserved heterogeneity term can be different depending on the origin and destination states.

The specification of the transition intensities in Equation 1 allows for state dependence, through the estimation of parameters specific to every state, along with duration dependence, lagged duration dependence, and unobservable heterogeneity. Given the form of the transition intensities in Equation 1, respondent i's probability of surviving in state k until time t for its cth spell, the survivor function in state k, can be expressed as

$$\overline{F}_k(t_i^c \mid Z_i; \Omega) = \exp\left\{-\theta_k(t_i^c \mid Z_i; \Omega)\right\} , \tag{2}$$

where θ_k is the corresponding integrated hazard function $\theta_k = \int_0^{t_i} \sum_{l \neq k} \theta_{kl}(s \mid Z_i;\Omega)\partial s$, Z_i is the vector of all observed and unobserved variables, and Ω is the vector of all unknown parameters that enter in Equation 1. To see how the model works, suppose first that there is no unobserved heterogeneity; that is, v_{kl} is 0 for all individuals. The contribution to the log-likelihood function of a respondent with a sequence of spells $\left\{t_i^1, t_i^2 \ldots\ldots t_i^{C_i}\right\}$ is

$$L_i(\Omega \mid t_i^1, t_i^2, \ldots\ldots t_i^{C_i}; X_i) = \sum_{c=1}^{C_i} \sum_{k=1}^{2} \left[\left(\sum_{l \neq k} d_{kl}^c P_{kl}(t_i^c \mid X_i;\Omega) + s_k^c \overline{F_k}(t_i^c \mid X_i;\Omega) \right) \right], \tag{3}$$

where d_{kl}^c is an indicator variable, which equals 1 if a respondent changed from state k to state l in the cth spell and 0 otherwise, and s_k^c is a dummy variable (1 = cth spell is incomplete, 0 = otherwise; Flinn, 1982). The log-likelihood function for the whole sample is the summation of Equation 3 over the N respondents. This log-likelihood function breaks into separate contributions from each type of transition. Therefore, given that the transition intensities depend upon disjoint sets of parameters, the sublikelihood functions can be maximized separately and the parameters of each transition can be estimated independently.

When there is unobservable heterogeneity among the respondents, the model becomes more complicated. The unobservable respondent effects, $v_{ikl}(\forall k, l, k \neq l)$, vary over the population. Because the v_{ikl}s are unobservable, we cannot condition the individual probabilities on v_{ikl} and use them as an additional explanatory variable. Therefore, it is necessary to integrate v_{ikl} over all possible values to get the unconditional probabilities. In addition, the effects for different origin and destination states might be correlated for every respondent.

Individual effects are assumed to be identically and independently distributed for all respondents with a joint distribution function $G(v_{iE-SE}, v_{iSE-E})$. Under this condition, the individual contribution to the log-likelihood takes the following form:

$$L_i(\Omega \mid t_{i1} \ldots\ldots t_{iC_i}, X_{ikl}) =$$
$$\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \left(\prod_{c=1}^{C} \prod_{k} \prod_{l \neq k} P_{kl}(t_c \mid X_{ikl}, v_{ikl};\Omega)^{d_{kl}^c} \right) \times \left(\prod_{c=1}^{C} \prod_{l} \overline{F}_k(t_c \mid X_{ikl}, v_{ikl};\Omega)^{s_k^c} \right) \times dG(v_{iSE-E}, v_{iE-SE}). \tag{4}$$

The log-likelihood function for the whole sample is the summation of Equation 4 over N individuals.

Identification Issues

In the model we also addressed two identification issues: (1) baseline rates of transition and (2) unobserved heterogeneity terms. Baseline rates of transition help establish granular

temporal scales along which respondents enter into and persist in self-employment. Based on the self-reported survey responses, we established time periods in which the respondents were in specific occupations. Second, the nature of the distribution of unobserved heterogeneity is important. Unlike specification of unobserved heterogeneity from a parametric statistical function, we follow a more flexible approach because of the diversity in activities undertaken by self-employed individuals. Given the significant differences in self-employment undertakings, parametric forms defining individual heterogeneity may not be useful because not all self-employed individuals can be drawn from the same underlying population. The baseline rates of transition, $h_{kl}(t_i^c)$, are assumed to be linear functions of the elapsed duration in state k before transiting to state l with splines at 6, 9, and 12 months:

$$h_{kl}(t) = \exp(\alpha_{1kl}\ln(t) + \alpha_{2kl}I(t>6)(\ln(t)-\ln(6)) + \alpha_{3kl}I(t>9)(\ln(t)-\ln(9)) + \alpha_{4kl}I(t>12)(\ln(t)-\ln(12))), \quad (5)$$

where $I(.)$ is an indicator function that equals 1 if the condition is fulfilled or 0 otherwise. The specification generalizes the traditional Weibull proportional hazard, which is the special case where $\alpha_{2kl} = 0$, $\alpha_{3kl} = 0$, and $\alpha_{4kl} = 0$ for all k and l. Note that Equation 5 allows for a nonmonotonic relationship between the elapsed duration and the transition intensities.

With respect to the unobserved heterogeneity, a completely flexible specification of the joint distribution function, $G(.)$, would imply an evaluation of an extremely complicated integral as in Equation 4. To avoid that computational burden, we assume a two-factor loading specification (Van den Berg, 2001). That is, we assume that the unobservable terms, v_{ikl}, are generated by two common factors, which reduces the dimensionality of $G(.)$ from six to two factors. Therefore, the v_{ikl} terms take the following form:

$$v_{ikl} = \exp(\delta_{kl}v_{1i} + \lambda_{kl}v_{2i}),$$

where v_{1i} and v_{2i} are the common factors independently and identically distributed across individuals with a distribution function $H(v_{1i}, v_{2i})$, and δ_{kl} and λ_{kl} are the corresponding loading parameters for different types of transitions that become parameters and estimate jointly with the rest of model parameters. This specification is tested against the more restrictive one in which each factor affects only transitions with the same origin or the same destination $(v_{kl} = \delta_k v_1 + \lambda_l v_2)$ (Van den Berg, 2001) for a similar specification of the two-factor loading. The two-factor loading specification nests a one-factor loading specification that is also tested in the estimation.

Estimation Method

The joint distribution for the unobserved heterogeneity factors, $H(v_{1i}, v_{2i})$, could be fully specified as bivariant normal, and Equation 4 could then be estimated using maximum likelihood. The results of this procedure are misleading when the chosen distribution for the unobservable term is not the true distribution (Heckman & Singer, 1984). This problem can be avoided by using the nonparametric maximum likelihood estimator (NPMLE), which

does not make any distributional assumptions. Using NPMLE approximates the distribution function of unobservables with a finite mixture distribution, which is bivariant (Meghir & Whitehouse, 1997) and denoted by $v = (v_1, v_2)$, the vector containing the two unobserved factors, each of which can take two different values, v_m^a or v_m^b ($m = 1, 2$). We can define the probabilities attached to every possible combination as follows:

$$\begin{aligned}
&\text{prob}(v = v^1) = \text{prob}(v = (v_1^a, v_2^a)) = p_1 \\
&\text{prob}(v = v^2) = \text{prob}(v = (v_1^b, v_2^a)) = p_2 \\
&\text{prob}(v = v^3) = \text{prob}(v = (v_1^a, v_2^b)) = p_3 \\
&\text{prob}(v = v^4) = \text{prob}(v = (v_1^b, v_2^b)) = 1 - p_1 - p_2 - p_3
\end{aligned} \quad .$$

The support points of the finite mixture distribution are the unknown vectors v^1, v^2, v^3, v^4 to which four unknown probabilities, p_1, p_2, p_3, p_4, are attached. The contribution to the likelihood of an individual then becomes

$$L_i(\Omega, v, p \mid t_i^1, t_i^2, \ldots\ldots t_i^{C_i}; X_i) = \sum_{m=1}^{4} \left\{ \left(\prod_{c=1}^{C} \prod_{k=1}^{3} \prod_{l \neq k} P_{kl}(t_c \mid X_i, v^m; \Omega)^{d_{kl}^c} \right) \left(\prod_{c=1}^{C} \prod_{k=1}^{3} \overline{F}_k(t_i^c \mid X_i, v^m; \Omega)^{s_k^c} \right) \right\} p_m, \quad (6)$$

where m denotes the number of support points. The log-likelihood function is the summation of Equation 6 over all the respondents. The support points, as well as the probabilities assigned to each of the respondents, are estimated jointly with the rest of the Ωs. The estimation is implemented, as proposed by Heckman and Singer (1984), by an EM algorithm. We optimized the function successively for an increasing number of support points until the criterion function and the parameters remained stable.

EM Algorithm

To estimate the likelihood function in Equation 5, the following simplified version is used:

$$L(\beta, v, \pi \mid t_i, X_i) = \sum_i \left[\sum_{m=1}^{M} f_i(t_i \mid X_i, v_m, \beta) \pi_m \right], \quad (7)$$

where $f(.)$ is the relative contribution for each respondent, conditional on the vector v_m; $t_i = \left\{ t_i^1, t_i^2 \ldots\ldots t_i^{C_i} \right\}$ with the elapsed duration in each spell; β is the vector of all parameters of interest; X_i is the vector of individual characteristics; and π_m is the probability relevant to mass point v_m.

Taking derivatives in Equation 7 and rearranging the terms, we get

$$\frac{\partial L(.)}{\partial \beta} = \sum_i \frac{\partial \ln(f_i(. \mid v_m)}{\partial \beta} \hat{\pi}_m, \quad (8)$$

where

$$\hat{\pi}_m = \frac{f_i(.\mid v_m)\pi_m}{\sum_m f_i(.\mid v_m)\pi_m} . \quad (9)$$

The proposed EM algorithm has two stages: (a) expectation and (b) maximization. In the first stage we assign starting values to all parameters followed by computing probabilities. Giving initial values for all parameters of interest, including v_m and π_m, in the first stage we compute the probabilities π_m based on Equation 9. In the second stage, the log-likelihood function $L(.)$ is maximized with respect to π_m and v_m. The resulting function, $L_1(.)$, is then used to update π_m to recalculate Equation 9. The procedure is iterated to produce a local optimum of $L(.)$. Based on Heckman and Singer (1984), the mass point probabilities are constrained to be in the unit interval.

Notes

1. The traits they match to running a business are need for achievement, generalized self-efficacy, innovativeness, stress tolerance, need for autonomy, and proactive personality.

2. Based on our review of sampling frames in these studies, a vast majority of samples focused on respondents from small firms. The sampling frame descriptions in the majority of studies fit our earlier definition of self-employment.

3. The concept of autonomy refers to a general preference toward autonomy. In the context of psychological well-being, autonomy is an internal preference rather than a structural concept, like job autonomy, in the broader organizational behavior literature.

4. Available online at http://www.ssc.wisc.edu/wlsresearch/documentation/handbook/WLS_Handbook.pdf.

5. Available online at http://www.ssc.wisc.edu/wlsresearch/documentation/.

6. Fourteen individuals reported unemployment spells lasting longer than one year; they were dropped from the sample. In an alternate analysis, we included the 14 individuals and modeled unemployment spells. We did not find any changes in the magnitude and direction of the estimates.

7. Based on unequal sample sizes and unequal variance *t* tests, the degrees of freedom are based on the Satterthwaite approximation.

8. $\text{Cohen's d} = \frac{M_2 - M_2}{SD_{within}}$; $SD_{within} = \sqrt{\frac{(n_2 - 1)SD^2_1 + (n_2 - 1)SD^2_2}{n_1 + n_2 - 2}}$.

9. The employment category consists of the following occupation codes from the 1950 Census Occupation Code: 001-057, 060-123, 124-143, 144-156, 157-233, 234-368, 369-404, 409-497, 502-504, and 505. Because transitions to and from individual occupational codes would significantly increase model complexity, we code all individual employment spells in the 1950s occupational code as 0. To test whether a particular occupational code increases the chances of entry into self-employment, we conducted a random-effects logit analysis. The results were not significant; for example, the occupational codes 001-057 (professionals, technical, and kindred workers) and 060-123 (managers, officials, and proprietors) had standardized betas of .04 and .06, respectively.

10. Labor Force Statistics are from the Current Population Survey (http://data.bls.gov/cgi-bin/surveymost?ln).

11. We thank an anonymous reviewer for this suggestion.

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