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# Growth intentions among research scientists: A cognitive style perspective

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## ABSTRACT

Although academic entrepreneurship has taken place in some U.S. universities for many decades, it is only over the past few decades that there has been an increased interest by universities worldwide to engage in their third mission related to entrepreneurship and economic development. Recently, researchers studying academic entrepreneurship have increasingly focused on understanding research scientists' entrepreneurial intentions. It has however also been acknowledged that, next to understanding entrepreneurial intentions, it is important to generate insights into growth intentions. This is because growth is unlikely to be achieved if no growth intention exists. Taking a cognition and self-efficacy perspective, our study explores how cognitive styles are associated with growth intentions within a group of research scientists having entrepreneurial intentions. Our study indicates that a planning cognitive style promotes while a knowing cognitive style curbs growth intentions. Further, working experience mitigates the negative impact of a knowing style on growth intentions. Our research has practical implications and implications for technology management, academic entrepreneurship and entrepreneurial intentions literatures.

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## 1. Introduction

This study aims at understanding future academic entrepreneurs' growth intentions and particularly focuses on the link between cognitive styles and these intentions. Academic entrepreneurs engage in technological entrepreneurship and are academics whose primary occupation, prior to playing a role in a start-up, and possibly concurrent with that process, was that of lecturer or researcher affiliated with a higher education institute (Samson and Gurdon, 1993). Academic entrepreneurship is often considered crucial for competitive advantage (OECD, 2003) and academic research is a crucial ingredient for the development of new products and processes (Mansfield, 1991). O'Shea et al. (2008) reviewed the literature on the impact of academic entrepreneurship on regional economic development and concluded that academic ventures constitute an economically powerful group of high-technology companies. Furthermore, firms operating in technologically intensive industries contribute significantly to economic

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growth and innovation (Newbert et al., 2008), regional prosperity and transformation and create individual wealth (Venkataraman, 2004), and new firm creation has been found vital for economic growth (Kirchhoff and Phillips, 1988).

While academic entrepreneurship may generate substantial societal benefits (Shane, 2004; Kroll and Liefner, 2008), it poses major challenges often related to the tension between academic and commercial demands (Massa and Testa, 2008; Van Burg et al., 2008; Van Geenhuizen and Soetanto, 2009; Sohn et al., 2013). Specifically, Kidwell (2013) indicates that challenges occur at any stage of the university commercialization process, ranging from technology identification, through market assessment to business development. Despite these challenges, a number of U.S. universities and technical schools have paid significant attention to entrepreneurship for many decades. In particular, such academic entrepreneurship has flourished over the last decades as universities have increasingly engaged in their so-called "third mission" related to entrepreneurship and economic development (Etzkowitz, 2003; Chang et al., 2006; Todorovic et al., 2011), next to their traditional activities of research and teaching (Wright et al., 2008). As a result, there has been an increase in academic entrepreneurship initiatives worldwide over the past decades and the academic literature has dedicated significant attention to the

phenomenon of academic entrepreneurship. While, initially, most of the empirical literature on academic entrepreneurship referred to top research institutes in highly developed environments such as Stanford and Boston, more recent research has also studied academic entrepreneurship at mid-range universities operating within less developed high-tech environments in different regions worldwide (Wright et al., 2008; Breznitz et al., 2008). This is, amongst others, caused by the fact that, in the U.S., the Bay–Dole Act 1980 provided incentives for firms and universities to commercialize university-based inventions, while several European and Asian countries adopted similar legislation only from the 1990s onwards (Grimaldi et al., 2011). We refer to Rothaermel et al. (2007), Markman et al. (2008) and Djokovic and Souitaris (2008) for excellent reviews of the academic entrepreneurship literature. In summary, this literature has focused on the macro (studying the role of government and industry), meso (focusing on the university) and micro (studying firms and individual entrepreneurs) levels. Recently, researchers within the micro level have focused on research scientists' motivations (e.g. Lam, 2011) and intentions to engage in academic entrepreneurship (e.g. Goethner et al., 2012; Prodan and Drnovsek, 2010). Intentions are good predictors of planned behavior (Bagozzi et al., 1989) especially if the phenomenon is rare, obscure, or involves unpredictable time lags, which is typically the case in entrepreneurship (Krueger et al., 2000). Entrepreneurial intentions have been studied in diverse contexts (e.g. Lee et al., 2011; Souitaris et al., 2007; Thompson, 2009). The study of intentions in an academic context is important given the overarching presence of entrepreneurial potential through new research knowledge (Obschonka et al., 2012). We identify two important gaps in the entrepreneurial intentions and academic entrepreneurship literatures.

First, entrepreneurial intentions' researchers have recently recognized that it is not only essential to study entrepreneurial intentions, but to distinguish between individuals with low growth intentions and those who aspire to start ventures with a potentially larger impact on the economy (Cassar, 2007; Douglas, 2013). Some people are content with a venture that merely survives while others favor high growth ventures (Gundry and Welsch, 2001). Studying growth intentions is important as growth creation is not trivial and requires large investments which will not be made if the intention to grow is absent (Autio and Acs, 2010). Many ventures do not achieve substantial growth, simply because the entrepreneur did not intend to have the venture reach substantial size (Cliff, 1998; Davidsson, 1989). Such growth intentions predict post-founding growth and delineate rapid-sales growth firms from other firms (Barringer et al., 2005; Delmar and Wiklund, 2008). Indeed, researchers studying the impact of academic entrepreneurship (e.g. Colombo et al., 2010; Wennberg et al., 2011; Zhang, 2009) have to a large extent emphasized growth as an important performance measure. To our knowledge, however, no research has investigated the determinants of growth intentions in academic entrepreneurship. Studying growth intentions in an academic context is important because, while academic entrepreneurship generates employment opportunities for university-based researchers and graduate students from technological spillovers (Siegel et al., 2007), there is a social cost due to the loss in academic research productivity. For instance, Buenstorf (2009) found that academics' publications and citations decreased once they became founders, and Toole and Czarnitzki (2010) warn of the effects of an academic brain drain through spin-off creation. To justify such negative social effects, the social impact of the spin-off firm should be sufficiently high, and that will only be the case if the new venture's return and growth is sufficiently high. Further, studying growth intentions is relevant as technology transfer offices often face significant time constraints (Lockett and Wright, 2005), and thus may benefit from understanding which future academic entrepreneurs are likely to exhibit growth intentions and which are less likely to found growth-oriented

ventures. Along the same lines, Douglas (2013) recommends the identification of individuals who are predisposed to manage growth-oriented firms, preferably at the stage when entrepreneurial intentions are forming.

Second, researchers studying growth intentions in a non-academic entrepreneurial context have identified a number of individual-level characteristics affecting growth intentions, including household income and education (Cassar, 2006), significance an individual attaches to financial success (Cassar, 2007), strategic intentions (Gundry and Welsch, 2001), and innovative behavior (Stenholm, 2011). Although these studies made important contributions, the cognitive style perspective remains silent in predicting growth intentions. Such silence is surprising as cognitive styles have been shown to explain entrepreneurial behaviors (Carland et al., 2002; Mitchell et al., 2000), such as distinguishing entrepreneurs from non-entrepreneurs (Allinson et al., 2000; Buttner and Gryskiewicz, 1993), and understanding why some people discover and exploit particular entrepreneurial opportunities, while others do not (Dimov, 2007; Hmieleski and Corbett, 2006). Cognitive styles have also been shown to have an important impact on risk preferences, decision making and information processing (Dutta and Thornhill, 2008), and entrepreneurial self-efficacy (Kickul et al., 2009). To address the identified gaps, we examine how cognitive style—defined as the characteristic way in which individuals process and evaluate information, solve problems, and make decisions (Goldstein and Blackman, 1978; Hayes and Allinson, 1994)—predicts growth intentions. In doing so, we specifically focus on research scientists having entrepreneurial intentions and study their growth intentions in terms of firm size. In the next section, we first offer a literature review on cognitive styles, followed by a presentation of our theoretical framework, linking different cognitive styles to growth intentions, hereby building on self-efficacy theory. Following that, we describe the study methodology. Next, we present our results, and provide conclusions, discussion and directions for further research.

## 2. Fundamentals of style: literature review on cognitive styles

Several individual factors such as race (Edelman et al., 2010), age (Cassar, 2006), and gender (Cliff, 1998) have been shown to predict entrepreneurial behavior. Unlike these factors, cognitive styles are preferences or habitual strategies determining how individuals perceive, remember, think, solve problems, and relate to others (Witkin et al., 1977). That is, cognitive styles serve as high-level heuristics in complex processes that are applied spontaneously across situations and form an enduring basis for behavior (Messick, 1976). Traits such as the Big Five personality traits tend to be stable, even over a period of 45 years as Soldz and Vaillant (1999) discovered. In contrast, cognitions are malleable and intervention strategies can be used to change how information is processed (Resick and Schnicke, 1992). The term 'cognitive style' was first used by Allport (1937) launching it in his work on the psychological interpretation of personality. Subsequently, the first major systematic study of cognitive styles and the development of a theory was made by Witkin (1962). Witkin's work was the start of what became a very active and productive field of study. Consequently, by the late 1960s, cognitive styles research had expanded to such an extent that individual differences psychologists had investigated stylistic differences across a wide range of cognitive functioning (e.g. Pask, 1972). Subsequently, over the past 40 years, researchers in business and management have further demonstrated a willingness and enthusiasm to embrace the concept of style and have explored its relevance for a range of issues in organizational settings, including innovation (Kirton, 1976), decision making (Hough and Ogilvie, 2005), person-environment fit (Chilton et al., 2005; Cools et al., 2009), and various aspects of entrepreneurship (Brigham et al.,

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