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Innovators' careers

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Extended summary

The success or failure of most organizations is heavily dependent on innovation. However, this innovation is only possible through a special group of employees: the so-called innovators. These scientists, researchers, and developers are vital for the innovativeness of the organization. In my dissertation, I examine innovators' careers from their organization's point of view. In particular, my objective is to develop a more balanced approach to innovators' careers than is offered in the contemporary career management literature.

Some researchers argue that organizational career management has become more important because of the war for talent, whereas others postulate that organizations withdraw from career management because of the changing definitions of a career. These contrasting viewpoints leave organizations without a clear guideline for managing their key players' careers. In order to provide such a guideline, in this thesis I address three central research questions by drawing on a cross-level sample of 625 innovators and 37 HR (human resources) managers from 37 organizations.

First, I analyze why some innovators leave their technical field of specialization to become managers. The results reveal that new career attitudes and organizational culture have an influence. More specifically, innovators with a self-directed career attitude, a boundaryless mindset, and a preference for organizational mobility often have a high managerial orientation, whereas the opposite is the case for innovators with a more values-oriented career attitude. Furthermore, it is more likely in organizations with a supportive and collaborative culture that innovators will want to advance their career in a management

position than in organizations with a culture in favor of innovativeness, power sharing, and learning and development.

Second, I investigate whether organizational career management can still influence innovators' careers. My results reveal that this is the case. In particular, they show that organizations should apply their organizational career management intensively, but should refrain from using too many practices and from further diversifying an already intensively applied organizational career management. Moreover, my study indicates that organizations profit from increasing innovators' perceived career management support because it boosts the match between individual and organizational career plans.

Third, I examine how organizations can use dual ladders to raise innovators' organizational commitment and career satisfaction. I identify the perceived recognition and transparency of the dual ladder as factors integral to the success of this career management instrument. My analyses illustrate that both are positively related to innovators' organizational commitment and career satisfaction. In addition, my results reveal that self-directed career management weakens the positive relationships between the perceived recognition of the dual ladder and organizational commitment and career satisfaction.

Based on the conceptual arguments and empirical results, I provide recommendations for organizations on how to handle innovators' careers in the era of the new career. Therefore, I provide easy-to-use guidelines on how to keep innovators in their technical positions and roles, how to use organizational career management, and how to make dual ladders work. Last, but not least, I focus on the limitations of my study and point to future research possibilities.

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Abbreviations and acronyms

b	Unstandardized regression coefficient
CO	Control variable
CEO	Chief Executive Officer
CFI	Comparative fit index
DV	Dependent variable
e.g.	Exempli gratia (for example)
GFI	Goodness-of-fit index
HLM	Hierarchical linear modeling
HR	Human resources
i.e.	Id est (that is)
IV	Independent variable
MOD	Moderator
OLS	Ordinary least squares
p	Probability value
PwC	PricewaterhouseCoopers'
R	Reverse scored
R ²	Coefficient of determination
R&D (lab)	Research and development (laboratory)
RMSEA	Root mean square error of approximation
s. d.	Standard deviation
s. e.	Standard error

1 Introduction

1.1 Relevance of the thesis

Strong international competition and accelerating changes in consumer proclivities have made organizations highly dependent on innovation (Drucker, 1998; Eisenhardt & Tabrizi, 1995; Hoegl, 1998). The results of the PricewaterhouseCoopers' (PwC) 15th Annual Global CEO Survey 2012, which is based on data from 1,250 organization leaders from 60 countries, show that *“improving the effectiveness of innovation continues to be a major strategic priority.”* According to this survey, organizations require innovation because they will not survive if they do not continuously create new products or services for customers. The increase in the importance of organizational innovativeness is mainly due to rapid technological advances in many industries (Baldwin, Hienerth, & von Hippel, 2006; Hienerth, Keinz, & Lettl, 2011). Consequently, innovativeness has become an ever more important strategic competitive advantage and the primary differentiator for organizations in highly dynamic markets (Danneels & Kleinschmidt, 2001; Hoegl, Weiss, Gibbert, & Välikangas, 2009a, 2009b).

Innovators, such as scientists, researchers, and developers, are a special group of employees that shape and promote the innovativeness of an organization (Domsch & Gerpott, 1985; Ladwig & Domsch, 2011; Walter, Parboteeah, Riesenhuber, & Hoegl, 2011). To secure its economic well-being, the organization should retain these technical talents (Pfeffer, 1994; Rothwell & Poduch, 2004; Stewart, 1997). This is especially important as CEOs across all industries reported in the PwC Annual Global CEO Survey 2012 that it has become more and more difficult to hire technical specialists, especially in knowledge industries such as pharmaceuticals, or in heavy industries such as the automotive industry.

However, there are many reasons why innovators leave positions and roles focused on innovative technical work (Ball, 1998; Gerpott, 1994; Higgins, 2001). For example, they might be dissatisfied with their career prospects. In such cases, innovators have two distinct options: First, they can move into a management position, or second, they can leave their employer and move to another organization where they might find better work conditions and career development opportunities (Cordero, DiTomaso, & Farris, 1994a; Stumpf, 1988; Sturges, Guest, Conway, & Mackenzie Davey, 2002). The consequence of both options is that the innovators' technical talent is at least partly lost to the organization (Allen & Katz, 1986; Gerpott, Domsch, & Keller, 1988; Kim & Cha, 2000).

Triggered by this observation, many organizations desperately search for ways to retain specialists in their innovation process (Domsch & Gerpott, 1985; Kieser & Walgenbach, 2003). Therefore, they try to improve their understanding of their innovators' intentions to move into a management position, their organizational career management system as a whole, and their organizational career management practices in use, such as the dual ladder (Aryee, 1992; Seema & Sujatha, 2012; Stumpf, 1988). In other words, organizations strive to influence their innovators' careers, for example, with activities, tools, and techniques for handling innovators' career planning and management (Ladwig & Domsch, 2011; Pfeffer, 1994; Sadler-Smith & Badger, 1988).

These efforts build on extant studies on career orientation, organizational career management systems, and organizational career management practices (Baruch & Peiperl, 2000; Currie, Tempest, & Starkey, 2006; Sturges, Conway, Guest, & Liefoghe, 2005). Research in that area is based on well-established theories, such as the social exchange theory (Blau, 1964; Homans, 1958) or the organizational support theory (Aselage & Eisenberger, 2003). It acts on the assumption that career management help by the employer

in some way supports the development of employees' organizational commitment and increases career satisfaction as well as the match between individual and organizational career plans (Granrose & Portwood, 1987; Sturges et al. 2002).

In contrast to this increasing interest of research and practice in organizational career management, contemporary career research postulates that organizations are no longer involved and have no say in managing their employees' careers (Aselage & Eisenberger, 2003; Chen, Tsui, & Zhong, 2008; Sturges et al., 2005). Whereas in the past organizations offered long-term employment and linear career progression in return for loyalty and hard work (Baruch, 2006; Valcour & Tolbert, 2003; Whyte, 1956), nowadays the connections between employer and employee have been eroded by organizational change, such as downsizing and delayering (De Vos, Dewettinck, & Buyens, 2009; De Vos & Soens, 2008; Sullivan & Baruch, 2009).

This has changed the psychological contract (Rousseau, 1995), which has been defined as an implicit agreement between the individual and the organization (Rousseau, 1995), to a "new deal," indicating that there is no longer an automatic promise or an expectation of a career for life (De Vos & Soens, 2008; Sullivan & Arthur, 2006). Hence, organizations do not try as much to influence their employees' careers anymore (Briscoe, Hoobler, & Byle, 2010; Lips-Wiersma & Hall, 2007).

Hitherto, a few studies have concentrated on the changing understanding of a career for organizations and individuals (Baruch & Peiperl, 2000; Currie, Tempest, & Starkey, 2006; Lips-Wiersma & Hall, 2007). Two theories, namely, the protean career and the boundaryless career, dominate the new career development discourse (Arthur, 1994; De Vos & Soens, 2008; Rousseau, 1995). The ultimate goal of a protean career is subjective career success. To attain this, individuals are supposed to take over the responsibility of driving

their career from their employing organization (Brousseau, Driver, Eneroth, & Larsson, 1996; Crowley-Henry & Weir, 2009; Van Buren III, 2003). The boundaryless career concept proposes that, in reaction to the ongoing reduction of hierarchical levels in organizations, nowadays careers go beyond the boundaries of a single organization (Defillippi & Arthur, 1994; Robinson & Miner, 1996; Thomas & Higgins, 1996). Consequently, intraorganizational careers are becoming less important than interorganizational careers (Arthur & Rousseau, 1996c; Bird, 1994; Weick, 1996), which means organizations have become less interested in organizational career management.

In sum, whereas some researchers suggest that organizational career management has become more and more important because of the war for talent, others suggest that organizations withdraw from career management because of the changing notion of careers (Arnold & Cohen, 2008; Dries, Van Acker, & Verbruggen, 2012a). In other words, new career theories, such as the protean career theory and the boundaryless career theory, challenge existing assumptions of the employer-employee relationship, which are based on theories such as the social exchange theory (Blau, 1964; Homans, 1958) or the organizational support theory (Aselage & Eisenberger, 2003).

Due to these contradictions, in this doctoral thesis I will investigate if, from the organization's point of view, innovators' careers can still be influenced and developed, and if so, how it should be done. Furthermore, by drawing on the empirical evidence of a large-scale study, I attempt to supplement career theories such as the protean career and the boundaryless career (Arthur, 1994; Hall, 1976). The overall contribution is the development of a more balanced view on innovators' careers than is offered in the contemporary career literature.

This balanced view might lie somewhere in between the two extremes of the organization man (Whyte, 1956) on the one hand and the job hopper without any commitment to the organization on the other (De Vos, Dewettinck, & Buyens, 2008; Inkson, Ganesh, Roper, & Gunz, 2010; Inkson, Gunz, Ganesh, & Roper, 2012), and might connect the basic ideas behind the new career theories with those behind the more traditional career theories (Arthur, 1994; Aselage & Eisenberger, 2003; Hall, 1976). Organizations and individuals might require some stability and commitment (Becker & Haunschild, 2003; Dries et al., 2012a; Sturges et al., 2002).

1.2 Need for a balanced view on contemporary careers of innovators

According to contemporary career management research, the meaning of having a career has changed tremendously from the traditional conception (Baruch, 2006; Briscoe, Hall, & Frautschy DeMuth, 2006; Hall & Moss, 1998). Whereas in the past careers were seen as a series of upward moves and promotions in a work-related hierarchy, nowadays careers are described as a life-long sequence of jobs, irrespective of advancement (Arthur, Hall, & Lawrence, 1989; Hall, 2002; Peiperl & Baruch, 1997). As a result of the research and ongoing debate, two main concepts have been developed on the changing context of careers: the protean career and the boundaryless career (Arthur, 1994; Briscoe et al., 2006; Hall, 1996a, 1996b).

The former emerged in the 1970s and was first mentioned by Hall (1976). According to protean career theory, the main objective of a career is the attainment of psychological success (Arthur & Rousseau, 1996a; Hall, 2002, 2004). This means that an individual has the feeling of personal accomplishment and is proud of her or his achievements (Briscoe et al., 2006; Hall, 1996b, 2002). In contrast to the traditional view on careers, psychological

success in the new career does not necessarily come from promotions, but can be achieved in various ways, such as having an adequate work-life balance (Crowley-Henry, 2007; De Vos & Soens, 2008; Leisa & Shelley, 2007).

The concept clearly takes into account the overlap of work and nonwork roles (Briscoe et al., 2010; De Vos et al., 2009; Sullivan & Arthur, 2006; Sullivan & Baruch, 2009). Both roles help to shape and define a person's identity. As a result, careers are described as a life-long series of identity changes and a process of continuous learning (Hall, 1996a, 1996b; Hall & Chandler, 2005).

Recent conceptualizations of the protean career define it along two dimensions (Briscoe & Hall, 2006; Briscoe et al., 2006). First, a person can be self-directed in personal career management. This implies that the individual does not seek external direction but acts independently in career management (De Vos & Soens, 2008; Hall, 2002, 2004). Second, a person can be values-driven, meaning that an individual's internal values provide guidance and a measure of success, as opposed to borrowing external standards (Briscoe & Finkelstein, 2009; Briscoe et al., 2006).

Furthermore, protean career theory offers new ways of thinking about the employer-employee relationship, which is sometimes referred to as a new psychological contract (Gerber, Grote, Geiser, & Raeder, 2012; Sturges et al., 2005). Individuals are supposed to take care of and manage their own careers (Aselage & Eisenberger, 2003; Ellig & Thatchenkery, 1996; Hall & Moss, 1998; Rousseau & McLean Parks, 1993). To do so, they constantly search for better internal or external job alternatives. However, this points to the downside of protean careers: Some individuals might struggle with self-definition and lack long-term commitment to the employing organization (Baruch, 2001; Baruch, 2006; Çakmak-Otluoğlu, 2012; King, 2003).

The second new career theory, the boundaryless career, distinguishes traditional careers that unfold within an organization (Banai & Harry, 2004; Sullivan, 1999; Tulgan, 2001), from boundaryless careers, which consist of a series of job opportunities that go beyond the boundaries of an organization (Becker & Haunschild, 2003; Mirvis & Hall, 1994; Tian & Han, 2011). The concept is based on the assumption that careers are shaped by the evolution of organizational forms, such as hierarchy, management processes, and configuration (Hall, 1985; Miles & Snow, 1978; Roos Jr, 1978; Zeitz, Blau, & Fertig, 2009).

With the ongoing organizational change, careers have become more and more dynamic and flexible (Allen, Jimmieson, Bordia, & Irmer, 2007; Armstrong-Stassen, 1994, 2003; Tolbert, 1996). As a result, individuals need to adapt by showing greater employment flexibility (Colakoglu, 2009; Eby, Butts, & Lockwood, 2003; Tremblay, 2003). Hence, establishing networks has become ever more important for individuals (Dany, Louvel, & Valette, 2011; Ellig & Thatchenkery, 1996; Hoegl, Parboteeah, & Munson, 2003).

Sullivan and Arthur (2006) defined the boundaryless career along two dimensions of physical and psychological mobility. An individual with a high level of organizational mobility will prefer to work for more than just one employer throughout her or his career (Dowd & Kaplan, 2005; Granrose & Chua, 1996; Higgins, Dobrow, & Roloff, 2010). Whereas this attitude focuses on the interfirm mobility preference of an individual, a person with a high boundaryless career attitude is supposed to be enthusiastic about creating and sustaining active working relationships across organizational boundaries, but is not necessarily organizationally mobile (Granrose & Chua, 1996; Higgins et al., 2010; Ituma & Simpson, 2009).

Nevertheless, we should keep in mind that not all researchers positively describe boundaryless careers (e.g., Bagdadli, Solari, Usai, & Grandori, 2003; Baruch & Peiperl,

2000; Forret, Sullivan, & Mainiero, 2010; Higgins et al., 2010; Pang, Chua, & Chu, 2008). For instance, Van Buren III (2003) pointed out that boundaryless careers might be beneficial to highly qualified individuals with valuable skills, but potentially harmful to many others.

In sum, the protean career and the boundaryless career are highly related but distinct theories (Briscoe & Hall, 2006; Gerber, Grote, Geiser, & Raeder, 2012; Sturges et al., 2005). Whereas the protean career focuses on the attainment of psychological success and a more self-reliant career management, the boundaryless career highlights the growing importance of employment flexibility and networking for individuals (Arthur, 1994; Briscoe & Finkelstein, 2009; Briscoe et al., 2006; Peiperl & Baruch, 1997).

The development described in new career theory strongly affects individuals and organizations and puts existing theories of organizational career management into question (Briscoe & Hall, 2006; Segers, Inceoglu, Vloeberghs, Bartram, & Henderickx, 2008; Volmer & Spurk, 2011). For example, many assumptions on the psychological contract between employer and employee differ strongly between new career theory and organizational support theory. Although the changes described in new career theory might influence innovators' career orientation, organizational career management, and HR practices, research on these relationships has been scarce.

As a result, there is a strong need for research that connects investigations on innovators' career orientation, organizational career management, and organizational career management practices with protean and boundaryless career theory (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007). In my dissertation, I will not only attempt to offer such a combined approach, but I will, furthermore, integrate the results to establish a more balanced view on contemporary careers of innovators than offered in new career

literature. In the following, I will describe the research gaps and the contributions of this doctoral thesis.

1.3 Research gaps and contributions

1.3.1 Managerial orientation

Despite the current efforts of many organizations to retain and promote valuable technical talents in their technical field of interest, many innovators see an opportunity for career advancement in a move into a management position (Aryee, 1992; Ball, 1998; Mainiero, 1986). At first glance, this does not seem to pose a serious problem, as it is reasonable to assume that technical talents are valuable and even essential in managerial positions as well (Bailyn, 1991; Coetzee, Bergh, & Schreuder, 2010). Nevertheless, many organizations struggle to obtain an adequate work-force to handle the innovation process when there is intense competition for talent (Beechler & Woodward, 2009; Michaels, Handfield-Jones, & Axelrod, 2001; Muethel, Gehrlein, & Hoegl, 2012).

An additional, and even more important, issue connected with innovators' drift away from the R&D function is that their tasks usually demand a high level of specialized and tacit knowledge (Bertels, Kleinschmidt, & Koen, 2011; Goffin & Koners, 2011; Moenkemeyer, Hoegl, & Weiss, 2012). It is highly unlikely that substitutes can easily and quickly ameliorate the loss of this knowledge attached to specific individuals (Ladwig & Domsch, 2011; Gerpott et al., 1988; Kim & Cha, 2000). In this regard, Kochanski and Ledford (2001) estimated the cost connected with losing innovators in their field of specialization to be three to six times the cost of losing an administrative professional, such as from HR, finance, or facilities.

As a result, the retention of innovators acting in their original capacity has become an important issue in innovation management and research (Cha, Kim, & Kim, 2009; Han & Froese, 2010; Younger & Sandholtz, 1997). The attempts to build on career management research have paid more attention to the managerial career orientation (Forrier, Sels, & Stynen, 2009; Gerber, Wittekind, Grote, Conway, & Guest, 2009; Gerber, Wittekind, Grote, & Staffelbach, 2009).

Managerial career orientation can be defined as a set of needs and values influencing an individual's career decisions (Igarria & Baroudi, 1993; Igarria, Kassicieh, & Silver, 1999). An individual with a high managerial orientation is mainly concerned with movement into positions of managerial responsibility (Dalton & Thompson, 1985; Gerpott et al., 1988). The objective in such instances is to be promoted into upper levels of management, to become a decision-maker, and to lead staff (Aryee, 1992; Kim & Cha, 2000). However, although many studies concentrate on how managerial career orientation influences different work-related outcomes, such as performance, career satisfaction, or reward preferences (e.g., Aryee, 1992; Bailyn, 1991; Gerpott et al., 1988; Igarria et al., 1999; Kim & Cha, 2000), there are few studies of the determinants of different levels of managerial career orientation (Gerpott et al., 1988; Kim & Cha, 2000).

Nevertheless, this research has not considered the effects that career attitudes, such as a values-driven career management or a boundaryless mindset (Briscoe & Hall, 2006; Briscoe et al., 2006; Lips-Wiersma & Hall, 2007), might have on managerial career orientation, although these relationships have been proposed by the theory of reasoned action and the theory of planned behavior, respectively (Ajzen, 1988, 1991; Ajzen & Fishbein, 1980). Investigating such influences is especially important because new career theory

postulates that career attitudes have changed strongly in recent years (Arthur, 1994; Briscoe et al., 2006; Hall, 1976, 2004).

Furthermore, studies on organizational culture have shown that it affects individuals' career aspirations (Derr & Laurent, 1989; Schein, 1985). In line with that, it can be assumed that organizational culture might influence individuals' career orientation as well. This assumption is also supported by research on organizational socialization and on the person-environment fit (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994; Edwards, 1996; Jones, 1986; Miller & Wager, 1971).

Therefore, in Chapter 3 of this thesis I will analyze the relationships between new career attitudes and managerial career orientation. By doing so, I provide a more comprehensive understanding of the influence that the changing notion of careers has on employees' choice of career route. In the next step, I investigate how organizational culture is related to managerial career orientation. This is of utmost importance because of the effects it has on many domains of employee behavior (Cullen, Parboteeah, & Hoegl, 2004; Hoegl, Parboteeah, & Muethel, 2012; Muethel, Hoegl, & Parboteeah, 2011). In a third step, I will provide guidelines for managers on how to adjust their organization to retain innovators in the innovation process.

1.3.2 Organizational career management

The current career management literature conveys the impression that in the past all organizations had a formal hierarchy and operated in stable environments (Baruch & Peiperl, 2000; Hall, 1996a). This combination made it possible for organizations to plan the career progression and development of their employees (Cappelli, 1999; Jacoby, 1999). In contrast,

nowadays organizations are supposed to be in a state of constant change, which makes it very difficult to manage careers (Baruch, 2006; Coetzee et al., 2010; Hall, 1996a). Due to this, many new career theorists postulate that organizations gradually withdraw from career management as individuals assume this responsibility (De Vos et al., 2009; Lips-Wiersma & Hall, 2007).

However, other career researchers build on organizational support theory and propose that the growing importance of innovation has increased the need for adequate organizational career management in recent years (Ladwig & Domsch, 2011; Park & Rothwell, 2009; Silzer & Dowell, 2010). The idea behind this is that career management help offered by an organization signals to its employees the extent to which the organization values their contributions and cares about their well-being (Aselage & Eisenberger, 2003; Eisenberger, Huntington, Hutchison, & Sowa, 1986). As a result, organizations can secure their innovativeness by using organizational career management to retain and promote valuable technical talents.

Organizational career management can be defined as all the activities of organizations that are used to shape and influence their employees' careers (Baruch & Peiperl, 2000; Forster, 1993; Stumpf, 1988). For example, it includes career counseling by the direct supervisor or the HR department and formal mentoring, as well as education and training (Hack, 2011; Latack, 1990; Orpen, 1994). The primary objective of organizational career management is to increase employees' perceived career management support (Carter, 2002; Portwood & Granrose, 1986; Yamnill & McLean, 2001).

Based on social exchange theory (Blau, 1964; Homans, 1958) and the norm of reciprocity (Gouldner, 1960), research has shown that perceived organizational support is positively related to affective commitment to the organization (Shore & Wayne, 1993), work

attendance (Eisenberger et al., 1986), job performance (Eisenberger, Fasolo, & Davis-LaMastro, 1990), citizenship behavior (Shore & Wayne, 1993), and job satisfaction (Eisenberger, Cummings, Armelo, & Lynch, 1997). However, systematic approaches to the study of careers in an organizational context are rare and need to be strengthened (Baldwin & Ford, 1988; Currie et al., 2006; Desimone, Werner, & Harris, 2002; Reitman & Schneer, 2008; Sadler-Smith, Allinson, & Hayes, 2000). One of the few exceptions is Baruch and Peiperl's (2000) study, which categorized a series of organizational career management instruments into five groups: formal, basic, active planning, active management, and multidirectional. They have thereby provided a starting point for more research on organizational career management.

In the scientific discourse on careers, the changing meanings of having a career triggered by organizational change have been described as huge and fundamental (Arthur & Rousseau, 1996b; Bird, 1994; Evans & Gunz, 1996). However, in practice the changes appear to be only moderate (Baruch, 2006; Lips-Wiersma & Hall, 2007). Although there is no doubt that careers have changed, it is doubtful that the changes are as strong as the career management literature suggests (Guest & MacKenzie Davey, 1996; Pringle & Mallon, 2003; Vandenbrande, Coppin, & van der Hallen, 2006). Even if the management of careers has shifted from the employer to the employee, as postulated by the protean career theory and the boundaryless career theory, it does not necessarily mean that organizations have lost all influence on their employees' careers (Baruch, 2006; Brousseau et al., 1996; Zhou & Li, 2008).

In light of these contrasting views between organizational support theory on the one hand and new career theory on the other, in Chapter 4 of this thesis I will investigate how organizations should try to influence their innovators' careers to their own advantage. To do

this, I will analyze how intensively organizations should apply their organizational career management practices and how diversified their bundle of instruments should be. The results will deepen the understanding of the role organizational career management plays for the employer-employee exchange relationships, even in protean and boundaryless times (Aselage & Eisenberger, 2003; Chen et al., 2008; Rigotti, 2009; Rousseau, 1995; Turnley & Feldman, 1998).

After that, I will investigate if organizational career management support can increase the match between organizational and individual career plans. I will thereby support the career management research that postulates the importance of organizational career management (Baruch & Peiperl, 2000; London & Stumpf, 1982; Stumpf, 1988), and I will address the question of why organizations should use organizational career management to increase innovators' perceived career management support.

1.3.3 Dual ladders

In the course of organizational change, structural developments, such as the flattening of hierarchies, have strongly increased the need for career development opportunities for innovators (Appelbaum & Grigore, 1997; Appelbaum & Lavigne-Schmidt, 1999; Meier & Schindler, 2004). Moreover, those few remaining possibilities for promotion in many cases prove unsuccessful as incentives. This is because most of them are interlinked with growing administration and team-leading tasks (Allen & Katz, 1992; Kieser & Walgenbach, 2003). However, many innovators do not want to deal with those responsibilities because they prefer to focus on technical challenges instead (Kim & Cha, 2000; Schein, 1992; Siemers, 1994). In addition, innovators who are promoted on the managerial hierarchy are no longer part of the innovation process, or at least are to a lesser extent. This is mostly neither in the

interest of the innovator, nor that of the organization (Gerpott, 1994; Kern & Schröder, 1977).

Another problem for the generation of career development opportunities and incentive systems for innovators is that in many cases those technical talents only perform a very limited number of routine tasks (Bailyn, 1985; Farris & Cordero, 2002). Furthermore, the duration of projects can be very long and sometimes innovation projects are unsuccessful, although brilliant work has been done (Balachandra, Brockhoff, & Pearson, 1996; Balachandra & Friar, 1997; Hoegl & Gemuenden, 2001; Moenkemeyer et al., 2012). What makes things even more difficult is that the success of a project in general is the result of teamwork, which makes it difficult to identify the particular contribution of each individual (Balachandra & Brockhoff, 1995; Hoegl & Proserpio, 2004; Kieser & Walgenbach, 2003; Weinkauff & Hoegl, 2002). Consequently, it is challenging to create adequate career opportunities and incentive systems for innovators (Gerpott, 1994; Gomez-Mejia, Balkin, & Milkovich, 1990; Preuschoff, 1994).

Although few studies have attempted to investigate the overall meaning of organizational career management, various approaches have analyzed the usefulness of specific organizational career management practices to tackle the problems described above (Baruch & Peiperl, 2000; Stumpf, 1988). Probably the best-known and most controversial instrument for innovators is the dual ladder career and promotional system (Allen & Katz, 1992; Kieser & Walgenbach, 2003; Ladwig & Domsch, 2011). According to this concept, organizations should implement a second hierarchy into their structure (Kern & Schröder, 1977; Ladwig & Domsch, 2011; Meier & Schindler, 2004). In this so-called technical ladder, the increase of leadership and administrative tasks that usually comes with promotion in the managerial ladder should be minimized (Allen & Katz, 1986; Domsch, 1994; Shepard,

1958). In other words, innovators can remain employed as scientists, developers, and engineers, instead of being forced into a management position (Schlichting, 2011; Smith & Szabo, 1977; Steffen, 2011). Promotions in the technical ladder should be based on technical qualifications and achievements (Allen & Katz, 1986; Stockhausen & Deuter, 2011; Van Wees & Jansen, 1994).

The dual ladder is also referred to in the terms of parallel career paths or dual hierarchy (Domsch, 1993; Gerpott, 1994; Shepard, 1958). Its implementation is supposed to increase innovators' organizational commitment and career satisfaction by creating and establishing additional opportunities for career development (Domsch, 1994; Gerpott, 1987; Katz, Tushman, & Allen, 1995).

Allen and Katz (1986) point out that the origins of the dual ladder system are unclear. Nevertheless, the concept has been widely discussed since the 1950s (McMarlin, 1957; Shepard, 1958). The proportion of practice-oriented articles among these contributions is high (see, e.g., Baldus, 1995; Baum & Laber, 1992; Cohrs, 2011; Doyé, 2007; Dubbert & Linde, 2000; Geier & Rausch, 2008; Kokoschka, 2009; Lentz, 1990; Müller & Stöpfigeshoff, 1998; Neuhäuser, Bissels, & Köhler, 2004; Olesch, 2000; Scheffler & Kern, 1991; Schütte & Zimmermann, 2006; Wuethrich & Stecher, 1992), whereas theoretical approaches and large-scale empirical studies are rare (Allen & Katz, 1986, 1992; Gerpott, 1988; Katz & Tushman, 1990; Stockhausen & Deuter, 2011).

However, the problems underlying dual ladder systems are many, which increases the need for empirical research on this subject (Allen & Katz, 1986; Cantrall, Manly, Schroeter, & Wakeham, 1977; Gunz, 1980). For example, many innovators think that technical career advancement is less attractive than managerial progression because it is less recognized and valued by the decision-makers and the colleagues of the employing organization (Gerpott et

al., 1988; Igbaria et al., 1999; Kim & Cha, 2000). Furthermore, over time, many organizations tend to sacrifice the transparency of promotion decisions and the filling of vacancies in the technical ladder because they prefer to use it as a siding for failing managers or as a consolation prize for loyalty to the organization (Bailyn, 1991; Smith & Szabo, 1977; Van Wees & Jansen, 1994).

In Chapter 5, I take into account the changing meaning of careers to determine whether dual ladders are adequately used as an instrument of organizational career management (Briscoe & Hall, 2006; Briscoe et al., 2006; Sullivan & Baruch, 2009). In particular, I will investigate how organizations can make dual ladders work. Therefore, I will draw on procedural justice theory (Folger & Greenberg, 1985; Folger & Konovsky, 1989; Kim & Mauborgne, 1993; Thibaut & Walker, 1975) to highlight the importance of two factors integral to the successful design of dual ladders, namely, perceived recognition and transparency. These factors are likely to increase innovators' career satisfaction and organizational commitment because they support innovators' fairness evaluations and perceptions.

I will also assess whether this ability is influenced by attitudinal changes to careers. Based on these efforts, my research will link relationships proposed by new career theory with the concepts of dual ladder systems.

1.4 Research questions

In sum, new career theories, such as the protean career and the boundaryless career, question the basic assumptions and theories of the existing research on organizational career management (Aselage & Eisenberger, 2003; Briscoe et al., 2006; Briscoe et al., 2010; Hall,

1996b). Whereas the new career theories suggest that organizations withdraw from organizational career management (Arthur, 1994; Briscoe & Finkelstein, 2009; Hall, 1976), more traditional career theories postulate that organizational career management is gaining in importance (Aselage & Eisenberger, 2003; Blau, 1964; Eisenberger et al., 1986). This is because it signals to employees that they are valued by the employing organization in a time when key talents are ever more important for the prosperity of an organization (Blau, 1964; Gouldner, 1960; Baruch & Peiperl, 2000).

These contrasting viewpoints leave organizations without a clear focus in their search for the right way to handle and manage their innovators' careers (Baruch, 2006; Lips-Wiersma & Hall, 2007; Peiperl & Baruch, 1997). This is highly problematic because innovators who are dissatisfied with their career prospects will either aim for a management position or leave the organization. Both options mean that the innovator's knowledge is at least partly lost to the organization (Allen & Katz, 1986; Gerpott et al., 1988; Kim & Cha, 2000).

Therefore, research that integrates the conflicting propositions of the new career theories and the more traditional career theories is strongly needed (Briscoe & Finkelstein, 2009; Briscoe & Hall, 2006; Briscoe et al., 2006). In order to offer such a combined approach, in this dissertation I will address the following central research questions:

1. Why do some innovators turn into managers in the course of their career? What role do new career attitudes and organizational culture play in this context?
2. Can organizational career management still influence innovators' careers in times of the new career? How can organizations improve organizational career management to increase innovators' perceived career management support?

3. What are the crucial success factors for making dual ladders increase innovators' organizational commitment and career satisfaction? Which influence do new career attitudes have on these relationships?

After that, I will connect the answers of these research questions with each other to establish a more balanced view on contemporary careers of innovators than offered by research based on the protean career theory and the boundaryless career theory. In addition, I will highlight how organizations should develop and manage their innovators' careers in times of the new career.

This comprehensive approach shows the rationale of addressing these research questions as a set in my doctoral thesis, in contrast to handling each of them separately. Only by combining the answers to my central questions, I will be able to refine the assumptions as well as the conclusions of new and traditional career theory. In addition, this proceeding will enable me to come up with a balanced approach to contemporary careers of innovators that will provide organizations with the knowledge to retain innovators in positions and roles focused on innovative technical work.

1.5 Outline of the thesis

This doctoral thesis is comprised of six chapters. Following the Introduction, in Chapter 2, I describe the design of the empirical study that is used to address the research questions and to test the proposed hypotheses. In Chapters 3-5, I conceptually and empirically investigate innovators' careers.

In Chapter 3, I analyze the effects of new career attitudes and organizational culture on the managerial career orientation of innovators. Hence, I deepen the understanding of the reactions of innovators toward various career development opportunities.

In Chapter 4, I examine the conditions in which organizational career management increases innovators' perceived career management support. The objective is to address the questions of how intensively organizations should apply their organizational career management practices and how diversified their bundle of career management instruments should be. Furthermore, I test if perceived organizational career management support increases the match between individual and organizational career plans.

In Chapter 5, I point to two factors integral to the successful application of dual ladders, namely, perceived recognition and transparency, and relate these to innovators' organizational commitment and career satisfaction. After considering the attitudinal changes to careers, I further analyze how innovators' self-directedness influences these relationships.

In the concluding Chapter 6, I address the research questions raised in Section 1.4. By summarizing and combining the results of Chapters 3-5, I offer a more balanced view on contemporary careers than provided by new career theory. Subsequently, I discuss theoretical and managerial implications, explicate limitations, and finally offer an outlook on future research. Figure 1-1 illustrates the outline of this doctoral thesis.

Chapters 3-5 are each structured as an empirical research paper. This means that they all have their own abstract, introduction, theory, hypothesis development, methods, results, and discussion section. The research presented in these chapters is based on the same dataset. Chapter 2 describes this dataset, including its collection. To provide full transparency and to show the unique contribution of each of the Chapters 3-5, Figure 1.1 includes a uniqueness

analysis as proposed by Kirkman and Chen (2011) for managing multiple papers from the same dataset.

<i>Chapter 2</i> Design of the empirical study			
	<i>Chapter 3</i> - <i>What makes innovators turn into managers?</i>	<i>Chapter 4</i> - <i>Effects of organizational career management</i>	<i>Chapter 5</i> - <i>The dual ladder: How to get from managerial delusion to motivational solution</i>
Research question	What makes innovators turn into managers? Investigating new career attitudes and organizational culture	How can organizations improve organizational career management to increase perceived career management support of innovators?	How can organizations make dual ladders work to increase career satisfaction and organizational commitment of innovators?
Theories used	Theory of reasoned action, theory of planned behavior, organizational socialization, person-environment fit	Organizational support theory, social exchange theory, norm of reciprocity	Procedural justice theory
Constructs/ variables¹	Self-directed career management, values-driven career management, boundaryless mindset, organizational mobility preference, innovativeness, power sharing, support and collaboration, learning and development (all IV), managerial career orientation (DV), age, gender, marital status, number of children, organizational tenure, company size, company age (all CO)	Intensity of career management, diversity of career management, combination of intensity and diversity of career management (all IV), perceived career management support (IV and DV), match between individual and organizational career plans (DV), age, gender, marital status, number of children, organizational tenure, company size, company age (all CO)	Recognition of the dual ladder, transparency of the dual ladder (both IV), organizational commitment, career satisfaction (both DV), self-directed career management (MOD), age, gender, marital status, number of children, organizational tenure, level of education (all CO)
Theoretical implications	Findings support the view that new career attitudes and organizational culture are related to innovators' managerial career orientation; study adds to the growing body of cross-level research that links individuals' vocational behaviors to culture variables.	Findings add to the literature on organizational career management.	Finding two success factors of dual ladders contributes to the literature on this career management system and provides organizations with the knowledge to build up dual ladders which achieve the objectives of their application; procedural justice theory offers a very useful framework for dual ladder research; new career attitudes pose a great challenge to organizational career management practices, but do not fundamentally question their importance.
Managerial implications	Organizations should create a work environment that is innovation-friendly, that is characterized by power sharing, and that supports a values-driven career management; managers should grant autonomy to innovators in their day-to-day conduct of work to foster a sense of individual ownership of and control over work; organizations should promote an innovative company culture, e.g., by establishing innovative mission and vision statements.	Organizations should apply human resource practices intensively, but should not simply use as many instruments as possible; it is not worth the effort to further diversify an already intensively applied organizational career management system; there is a positive relationship between innovators' perceived career management support and the match between individual and organizational career plans.	Organizations need to strengthen the recognition and transparency of their dual ladder, e.g., by not using the system as siding for failing managers.
¹ IV = Independent variable(s); DV = Dependent variable(s); CO = Control(s); MOD = Moderator			
<i>Chapter 6</i> Concluding discussion and future research			

Figure 1-1: *Outline of the thesis and uniqueness analysis*

2 Design of the empirical study

2.1 Data collection

At the beginning of data collection, I conducted a detailed analysis of the existing literature and undertook exploratory semi-standardized interviews with 13 (HR) managers of R&D departments from nine different organizations and industries (e.g., SAP AG, Freudenberg Group, Henkel, and Sirona Dental Systems GmbH). A literature review and the interviews confirmed the significance of the research questions and helped to identify the relevant variables for the following large-scale empirical study.

Therefore, I contacted the HR managers of organizations visibly pursuing innovation activities. As an incentive to participate in the study, organizations were offered a benchmarking report showing the performance of their organization compared to the organization with the best and the organization with the worst performance in the group. In addition, organization representatives received recommendations on how to handle innovators' careers in terms of a final report of the overall study and a poststudy workshop at the WHU - Otto Beisheim School of Management.

The empirical analyses of this thesis were based on data pertaining to 37 organizations in Germany. After agreeing to participate in my study, the organizations provided the contact information of one HR manager and of employees whose job descriptions complied with my definition of innovators, that is, technical specialists such as scientists, engineers, or other technical employees who are responsible for and drive the innovation processes of the organization (Chang, Choi, & Kim, 2008; Manolopoulos, 2006; Moenkemeyer et al., 2012). I invited them via e-mail to participate in a strictly voluntary and

confidential web-based survey. The acquisition of participants and data collection commenced in May 2010 and was completed in July 2011.

2.2 Measurement instrument

The two online questionnaires (one for HR managers and one for innovators) were developed and administered in German. Independent bilingual speakers translated and back-translated items and anchors (Brislin, 1986; Szabo, Orley, & Saxena, 1997). The items mainly consisted of statements rated on a five-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. I relied on existing measures in the literature where possible. The final questionnaires consisted of 152 (for innovators) and 112 items (for HR managers), respectively. However, only some of these were used for the research described in this thesis, as shown in Tables 2-1 to 2-3.

Main variables and items used in Chapter 3	
Self-directed career management (Briscoe/Hall/ Frautschy DeMuth 2006)	When development opportunities have not been offered by my company, I've sought them out on my own. I am responsible for my success or failure in my career. Overall, I have a very independent, self-directed career. Freedom to choose my own career path is one of my most important values. I am in charge of my own career. Ultimately, I depend upon myself to move my career forward. Where my career is concerned, I am very much "my own person". In the past I have relied more on myself than others to find a new job when necessary.
Values-driven career management (Briscoe/Hall/ Frautschy DeMuth 2006)	I navigate my own career, based on my personal priorities. It doesn't matter much to me how other people evaluate the choices I make in my career. What's most important to me is how I feel about my career success, not how other people feel about it. I'll follow my own conscience if my company asks me to do something that goes against my values. What I think about what is right in my career is more important to me than what my company thinks. In the past I have sided with my own values when the company has asked me to do something I don't agree with.
Boundaryless mindset (Briscoe/Hall/ Frautschy DeMuth 2006)	I seek job assignments that allow me to learn something new. I would enjoy working on projects with people across many organizations. I enjoy job assignments that require me to work outside of the organization. I like tasks at work that require me to work beyond my own department. I enjoy working with people outside of my organization. I enjoy jobs that require me to interact with people in many different organizations. I have sought opportunities in the past that allow me to work outside the organization. I am energized in new experiences and situations.
Org. mobility preference (all rev. scored; Briscoe/Hall/ Frautschy DeMuth 2006)	I like the predictability that comes with working continuously for the same organization. I would feel very lost if I couldn't work for my current organization. I prefer to stay in a company I am familiar with rather than look for another employer. If my organization provided lifetime employment, I would never desire to seek work in other organizations. In my ideal career I would work for only one organization.
Innovativeness (Hurley/Hult 1998)	Technical innovation, based on research results, is readily accepted. Management actively seeks innovative ideas. Innovation is readily accepted in program/project management. People are penalized for new ideas that don't work. /R Innovation in XYZ is perceived as too risky and is resisted. /R
Power sharing (Hurley/Hult 1998)	People are willing to share their power - there is an atmosphere of working together. We talk about teamwork and sharing, but people quietly hold on to their power and authority. /R Authority is highly centralized; only a handful at the top have it. /R
Support and collaboration (Hurley/Hult 1998)	People throughout XYZ are supportive and helpful. There is a willingness to accept responsibility for failure. There is a willingness to collaborate across organizational units within XYZ.

Learning and development (Hurley/Hult 1998)	XYZ provides opportunities for individual development other than formal training (e.g. work assignments and job rotation). XYZ encourages managers to attend formal developmental activities such as training, professional seminars, symposia, etc. There are people at XYZ who provide guidance and counsel regarding one's career. Career management is a shared responsibility of both employee and the manager.
Managerial orientation (Kim/Cha 2000)	In my job, I want to advance up to a management position. In my job, I want to associate with top executives in the organization. In my job, I want to be evaluated on the basis of management skills.

Table 2-1: *Questionnaire items used in Chapter 3*

Main variables and items used in Chapter 4	
Intensity, diversity, and their combination of career management (new; based on calculations - see chapter 4)	To what extent is each activity on the list used in your organization?: Performance appraisal as a basis for career planning; Assessment centers; Peer appraisal; Upwards (subordinate) appraisal; Career counseling by direct supervisor; Career counseling by HR department; Formal mentoring; Career workshops; Succession planning; Common career paths; Dual ladder (parallel hierarchy for professional staff); Books and/or pamphlets on career issues; Written personal career planning (as done by the organization or jointly); Postings regarding internal job openings; Retirement preparation programs; Formal education as part of career development; Lateral moves to create cross-functional experience.
Perceived career management support (Sturges et al. 2002)	I have been given training to help develop my career. My boss has made sure I get the training I need for my career. I have been taught things I need to know to get on in this organization. I have been given a personal development plan. I have been given work which has developed my skills for the future. My boss has given me a clear feedback on my performance.
Match between individual and organisational career plans (Granrose/Portwood 1987)	Do your individual career goals match your company's career goals for your future? Does your career timetable match your company's timetable for you? Does your career strategy match your company's strategy for you? Can you meet your career goals inside your company? Can you meet your career timetable inside your company? Can you meet your career strategy inside your company? Can you meet your family and work career plans inside your company?

Table 2-2: *Questionnaire items used in Chapter 4*

Main variables and items used in Chapter 5	
Recognition of the dual ladder (new)	I think that in my company... ... the technical ladder is just as attractive as the managerial ladder. ... the reputation of the technical ladder is equal to that of the managerial ladder. ... it is attractive to advance in the technical ladder. ... the technical ladder is not a siding for failing managers.
Transparency of the dual ladder (new)	I think that in my company... ... the assignment of technical ladder positions in the hierarchy is transparent. ... the assignment of technical ladder positions in the hierarchy is comprehensible. ... it is easy to understand why some positions are higher than others in the hierarchy.
Organizational comittment (Cook/Wall 1980)	I am quite proud to be able to tell people who it is I work for. I sometimes feel like staying in this employment for good. I'm willing to put myself out just to help the organization. Even if the firm were not doing too well financially, I would be reluctant to change to another employer. I feel myself to be part of the organization. In my work I like to feel I am making some effort, not just for myself but for the organization as well. The offer of a bit more money with another employer would not seriously make me think of changing my job. I would recommend a close friend to join our staff. To know that my own work had made a contribution to the good of the organization would please me.
Career satisfaction (Martins/Eddelston/ Veiga 2002)	In general, I am satisfied with my career status. In general, I am satisfied with my present job. I feel that my progress toward promotion is satisfactory.
Self-directed career management (Briscoe/Hall/ Frautschy DeMuth 2006)	see above

Table 2-3: *Questionnaire items used in Chapter 5*

2.3 Sample

37 organizations from a variety of industries participated in the quantitative study. I used this broad sample of industries to bolster the generalizability of results. Figure 2-1 shows the distribution of organizations on the basis of industries.

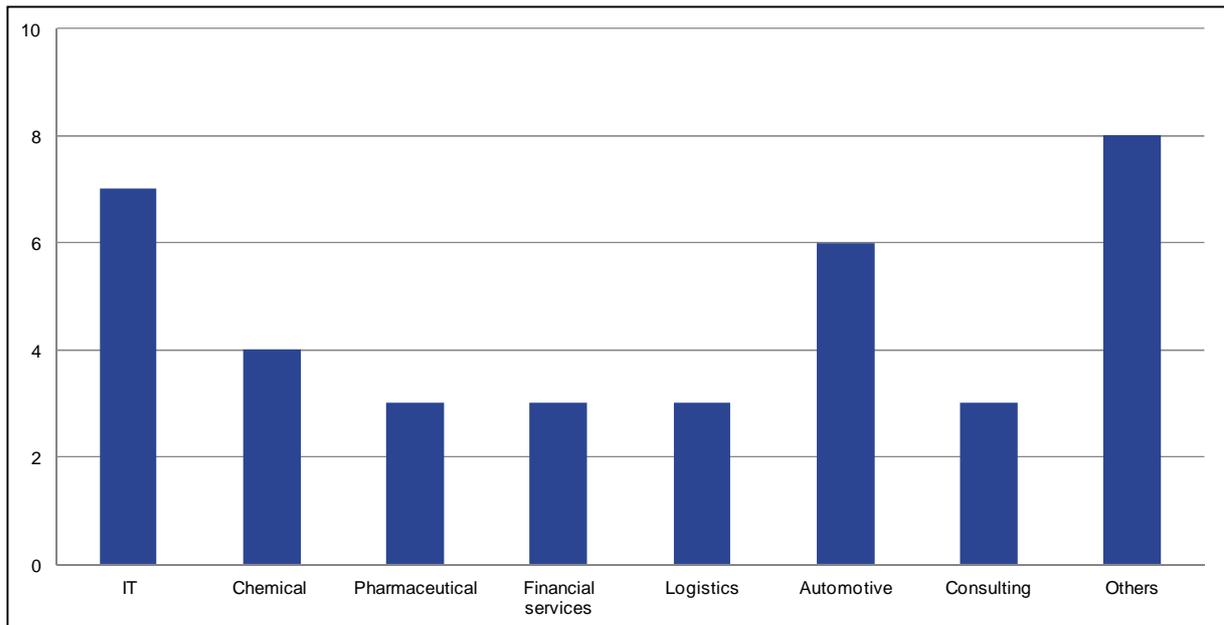


Figure 2-1: *Number of organizations per industry*

The average number of staff per organization was 13,238. The smallest organization had 24, whereas the largest had 100,000. Figure 2-2 categorizes the participating organizations in four different groups based on their number of staff.

Most of the participating organizations had increased their number of staff in the year before data collection. The average turnover was four billion euro, mean age of the organizations was 71 years, and 40% of the organizations were family-owned at the time of the study.

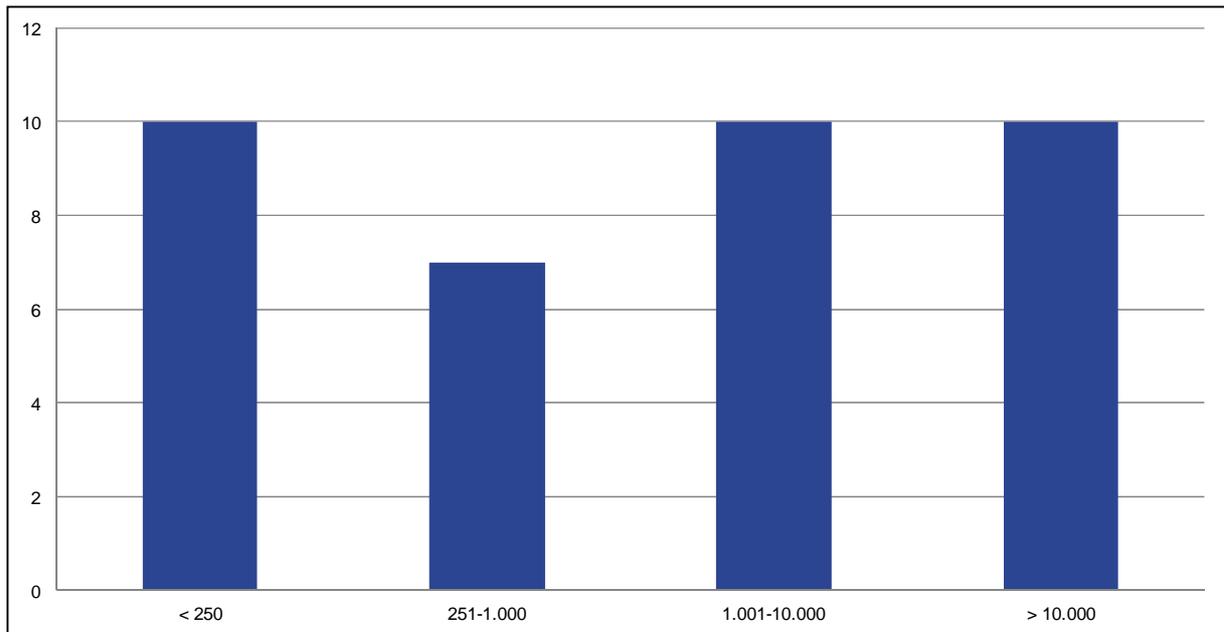


Figure 2-2: *Number of organizations per size class (based on headcount)*

The participants were comprised of 662 employees from 37 organizations. The final sample of key informants for the participating organizations consisted of 37 HR managers (17 men and 20 women), resulting in a response rate of 100%. Furthermore, 625 innovators (500 men and 125 women) completed my questionnaire, resulting in a response rate of 77%. The mean age of the innovators was 39.5 years, ranging from 18 to 65, of whom 61% were married, and 55% had at least one child. The majority had a master's degree. Figure 2-3 shows the innovators' highest level of education.

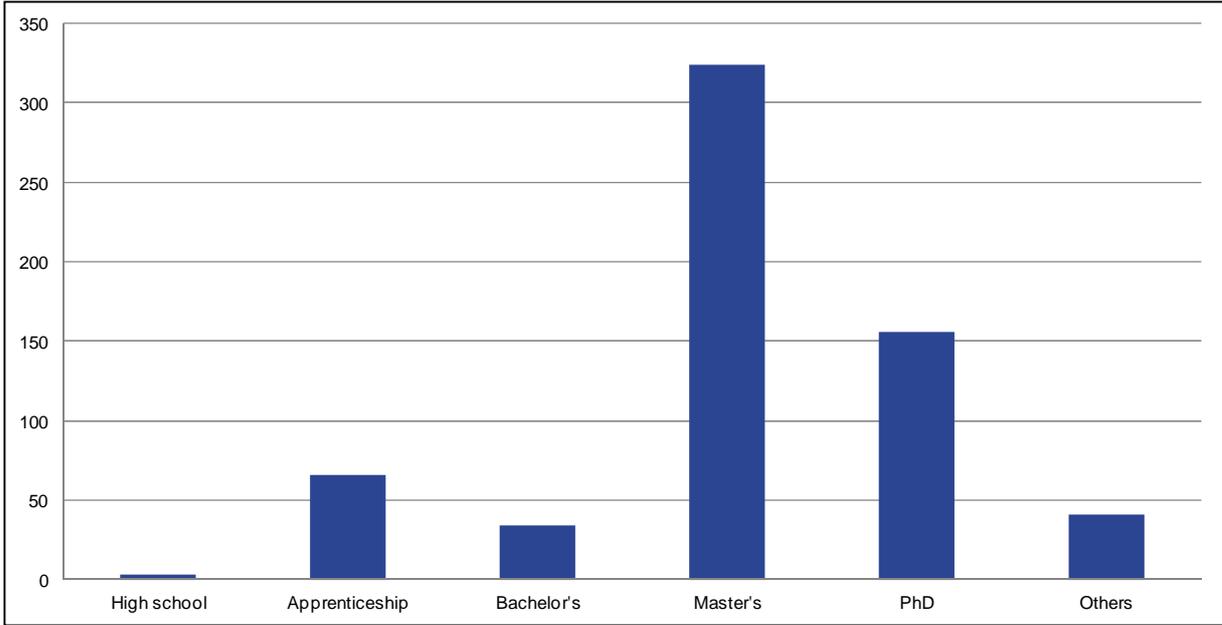


Figure 2-3: *Number of innovators per highest level of education group*

The innovators' mean working experience was 14 years, and the mean organizational tenure was 9.5 years. Figure 2-4 shows the innovators' organizational tenure. 30% said that their current position was part of a technical ladder. 50% worked in development, 20% in research and 10% in production. The other innovators worked in many different areas, such as IT, consulting, or marketing.

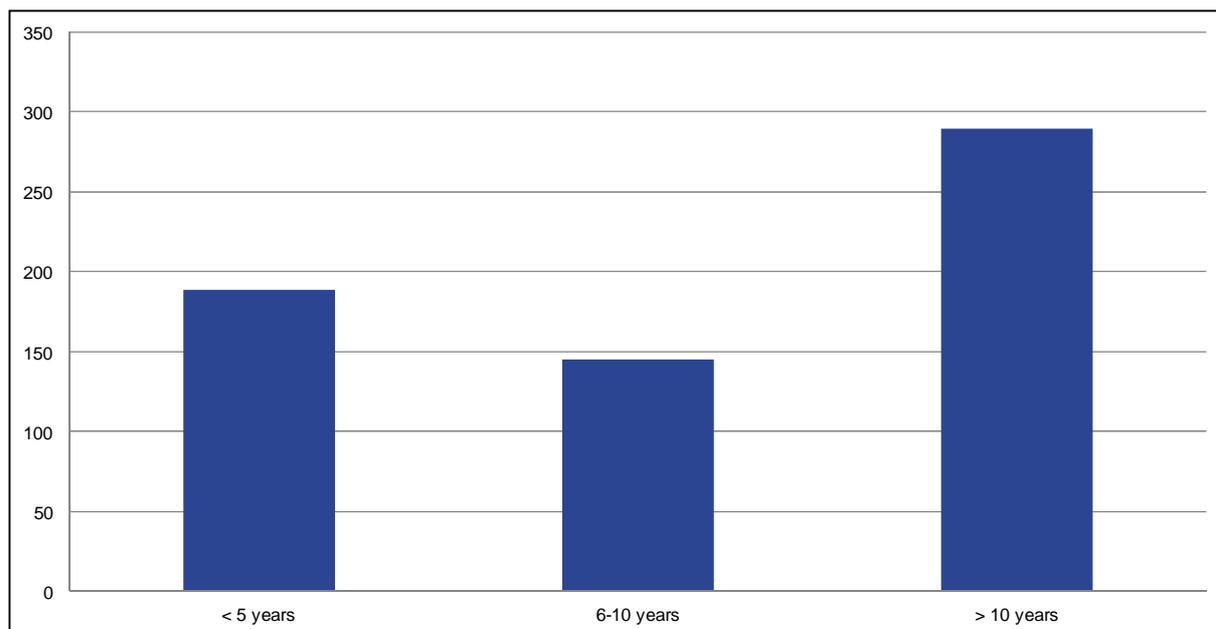


Figure 2-4: *Number of innovators per organizational tenure group*

The research described in Chapters 3 and 4 is based on the full dataset. In contrast, in Chapter 5 sample size is smaller. This is because I focus on individual level effects and do only take those 33 of our 37 organizations into account which applied a dual ladder system at the time of data collection.

3 What makes innovators turn into managers?¹

ABSTRACT

In recent years, increasing global competition has made innovativeness an ever more important factor for achieving sustainable competitive advantage. Innovators have therefore become more significant for organizations. Accordingly, career management research has focused on managerial career orientation to better understand innovators' reactions toward various career development opportunities. The objective of the present study is to contribute to that research by analyzing the influence of new career attitudes and organizational culture on innovators' managerial career orientation, within today's changing career environment. Drawing on a cross-level sample of 625 innovators and 37 HR managers from 37 organizations, the research results suggest that the innovators' managerial career orientation is negatively related to innovativeness, power sharing, and learning and development on the organizational level and to values-driven career management on the individual level. In addition, managerial career orientation is positively related to support and collaboration on the organizational level and self-directed career management, boundaryless mindset, and organizational mobility preference on the individual level. Finally, we discuss the implications of the results and highlight directions for future research.

¹ This unpublished working paper was written by Patrick Hoffmann based on conjoint work with Dr. Matthias Weiss and Prof. Dr. Martin Högl. Previous versions were presented at the Academy of Management Conference 2012 under the title "The influence of new career attitudes and organizational culture on managerial career orientation" and at the European Academy of Management Conference 2012 under the title "Predictors of managerial career orientation: A cross-level study."

3.1 Introduction

As a reaction to the outstanding and still growing importance of innovation (Anderson, de Dreu, & Nijstad, 2004; Damanpour & Evan, 1984; Froehlich & Hoegl, 2012), many organizations try to retain and promote valuable technical talents, such as scientists and engineers. Nevertheless, many of these innovators see an opportunity for career advancement in a move into a management position, whereby their technical talent is often partially, and sometimes completely, lost to the organization (Allen & Katz, 1986; Kim & Cha, 2000). Triggered by this observation, career management research has become more attentive to managerial career orientation, as it is the key to understanding individuals' reactions toward various career development opportunities (Aryee, 1992; Rynes, Tolbert, & Strausser, 1988; Schein, 1975).

Generally speaking, managerial career orientation, also labeled managerial career preference (e.g., Delbecq & Elfner, 1970; Hassard, Morris, & McCann, 2012; Morse & Gordon, 1974; Schein, 1975; Schein, 1993; Zikic, Bonache, & Cerdin, 2010), can be defined as a set of needs and values influencing an individual's career path (Gerpott et al., 1988; Igbaria et al., 1999; Kim & Cha, 2000). In particular, individuals with high managerial orientation intend to eventually move into a management position (Dalton & Thompson, 1985; Gerpott et al., 1988).

The work on managerial career orientation can be divided into two subcategories: The first focuses on how managerial career orientation influences different work-related outcomes, such as performance, career satisfaction, or reward preferences (e.g., Aryee, 1992; Bailyn, 1991; Gerpott et al., 1988; Igbaria et al., 1999; Kim & Cha, 2000), whereas the second, less-developed stream of research tries to explain different levels of managerial career orientation (e.g., Gerpott et al., 1988; Kim & Cha, 2000). The latter aspect has mostly

concentrated on individual career characteristics (e.g., education or organization tenure), types of current work, or national cultures as an explanation for different levels of managerial career orientation (Gerpott et al., 1988; Miller & Wager, 1971).

However, these research efforts have not taken into account how, on the individual level, career attitudes, such as self-directed career management or a preference for organizational mobility (Briscoe & Hall, 2006; Briscoe et al., 2006), might also affect managerial orientation; as postulated by the theory of reasoned action and the theory of planned behavior, respectively (Ajzen, 1988, 1991; Ajzen & Fishbein, 1980). Such considerations are important because career attitudes have shifted away from the traditional organizational career in which the organization could be considered the primary career driver (Arthur, 1994; Arthur & Rousseau, 1996a; Briscoe & Hall, 2006; Briscoe et al., 2006; Hall, 1976, 2004).

In addition, few studies have considered how organizational level constructs might explain different levels of managerial career orientation (Gerpott et al., 1988; Kim & Cha, 2000). More specifically, the influences of organizational culture dimensions (Hult, Hurley, & Knight, 2004; Hurley, 1995; Hurley & Hult, 1998) on managerial career orientation have neither been conceptualized nor empirically tested, even though existing research on organizational culture suggests that they might play a crucial role in determining the career aspirations of individuals within organizations (Derr & Laurent, 1989; Schein, 1985). This view is also supported by research on organizational socialization (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994; Jones, 1986; Miller & Wager, 1971) and on the person-environment fit (Edwards, 1996; Lewin, 1951; Pervin, 1989).

The present study redresses these research gaps by making three main contributions. First, we take into account the development described in new career theory and build on the

theories of reasoned action and planned behavior (Ajzen, 1985, 1988, 1991; Ajzen & Fishbein, 1980) to determine whether and how new career attitudes are related to managerial career orientation. This is an important step toward a more comprehensive understanding of how managerial career orientation is influenced by the changes and developments described in new career concepts. Moreover, it is necessary given the dramatic changes in employees' career attitudes that question the traditional assumptions about organizations' career management (Baruch & Peiperl, 2000; Briscoe & Hall, 2006; Briscoe et al., 2006). Building on the results of the conceptual and empirical analysis, we advance theory by integrating the relationships proposed by new career concepts with the research on managerial career orientation. Linking these two research streams on careers in organizations constitutes an important step forward to better capture the underlying complexity of innovators' managerial career orientations.

Second, by connecting the research on employees' managerial career orientation with organizational culture dimensions, such as innovativeness and power sharing (Hurley & Hult, 1998), we contribute to current career management, socialization, and person-environment fit research. To this end, we address the questions of how managerial career orientation is influenced by organizational culture and why some innovators turn into managers in the course of their career. As a result, this theoretical contribution deepens the understanding of how organizational socialization and the person-environment fit influence managerial career orientation. Given the widely established effects of culture on many domains of employee behavior (Hoegl et al., 2012; Lichtenthaler, Hoegl, & Muethel, 2011; Van Maanen, 1978; Van Maanen & Schein, 1979), it is important to identify cultural aspects in organizations that may promote or diminish innovators' managerial career orientation.

Third, we make an empirical contribution by examining the career orientation of 625 innovators from 37 organizations, including cross-level effects in our analyses. This approach fills a void in the cross-level research on the meaning of organizational level constructs as an explanation for different levels of managerial career orientation. Evidently, this is long overdue, given the calls in the literature for cross-level analyses of organizational behavior (Anderson et al., 2004; Klein & Kozlowski, 2000; Rousseau, 1985), such as employees' choice of career path. Based on these results, we specify mechanisms by which managers may adjust their organizations to retain valuable technical talents in the positions where they are most valuable.

3.2 Conceptual background and hypotheses

3.2.1 Managerial career orientation

Research on managerial career orientation has been strongly influenced by Gouldner's (1957, 1958) local-cosmopolitan dichotomy (Aryee & Tan, 1992; Gerpott, Domsch, & Keller, 1986; Jauch, Glueck, & Osborn, 1978). According to social role theory, individuals' latent social identities can cause their behavior to differ in organizations (Biddle, 1986; Katz & Kahn, 1978; Turner, 1987). In this sense, Gouldner (1957, 1958) conceptualized two different identities, which he labeled "cosmopolitans" and "locals." Whereas cosmopolitans are highly committed to a specialized role skill (e.g., research or new product development), locals are highly loyal to the employing organization (Berger & Grimes, 1973; Delbecq & Elfner, 1970; Morse & Gordon, 1974).

Transferring Gouldner's distinction of cosmopolitan and local identities to career orientation, most studies in this area of research identify managerial and technical career

orientation as the main subcategories of career orientation (Aryee, 1992; Gerpott et al., 1988). In short, according to the different definitions of managerial career orientation in the literature (e.g., Kim & Cha, 2000; Schein, 1978), individuals with a strong managerial career orientation can be described as employees who want to become influential managers in their organizations. Their most important career aspirations are to attain a position that requires the application of managerial skills and to move into upper management (Aryee, 1992). Such employees are also willing to undertake subsequent decision-making and strive for leadership. However, there are few empirical studies on the determinants of different levels of managerial career orientation. There are two notable exceptions: Gerpott et al. (1988) found no significant cross-country differences in the levels of managerial career orientation, and Kim and Cha (2000) pointed out that the proportion of individuals with a managerial orientation was higher in the private than in the public sector, decreased with educational level, and increased with organization tenure.

3.2.2 New career attitudes and managerial career orientation

An examination of career attitudes as determinants of managerial career orientation cannot proceed without considering the ongoing changes in the professional world (Arthur, 1994; Hall, 1976). For several years now, the career management literature has emphasized how, in the course of organizational change, traditional careers have changed dramatically (Arthur, 1994; Arthur, Khapova, & Wilderom, 2005; Briscoe & Finkelstein, 2009; Briscoe et al., 2006). Whereas the traditional career model postulated the continuity of lifelong employment and linear career progression in one or two organizations (Baruch, 2006; Valcour & Tolbert, 2003; Whyte, 1956), contemporary careers reflect a “new deal,” in which the commitment between employer and employee has substantially diminished (Briscoe et

al., 2010; De Vos & Soens, 2008; Sullivan & Arthur, 2006). Consequently, new ways of viewing careers have come to the fore, which have in turn inflected individuals' career attitudes (Briscoe, Henagan, Burton, & Murphy, 2012; Valcour & Ladge, 2008). This development has been described, in terms of the new career theory, as the protean (Hall, 1976) and the boundaryless career (Arthur, 1994).

However, are these new career attitudes expected to influence innovators' managerial career orientations, and if so, in which ways? To address these questions, we draw on two prominent and closely related theories in social psychology, namely, the theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behavior (Ajzen, 1988). These theories postulate that the best predictor of a behavior is the intention to perform the behavior. This intention, in turn, is argued to be influenced by personal attitudes (Ajzen, 1985, 1991; Ajzen & Fishbein, 1980), which can be defined as an individual's positive or negative evaluation of performing a certain behavior (Ajzen & Fishbein, 1980). Both theories have been extensively used in studies of human behavior (e.g., Arnold et al., 2006; Cordano & Frieze, 2000; Flannery & May, 2000). Nevertheless, comparatively little research has applied these theories to the vocational realm (Arnold et al., 2006; Baruch & Peiperl, 2000).

The theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behavior (Ajzen, 1988) offer a highly suitable framework for the present study, as managerial career orientation can be described as an individual's intention to move into a management position. Therefore, according to the two theories, managerial orientation will be influenced by personal attitudes, particularly new career attitudes in the context of this study, of which the two most dominant concepts are the protean career (Hall, 1976) and the boundaryless career (Arthur, 1994).

Protean career attitudes. The protean career theory emphasizes the importance of psychological success resulting from a self-reliant career management (De Vos & Soens, 2008; Hall, 2002, 2004). Hall (1976) introduced the term “protean,” based on the Greek God Proteus who could change his shape at will (Hall, 2002, 2004). In the course of a protean career, the individual is in charge (not the organization) and decides what constitutes career success or failure (rather than relying on objective measures of success, such as salary increases). Although protean career theory has been discussed in the management literature for years (Hall, 2004), few studies have examined it empirically. To rectify this situation, Briscoe et al. (2006) constructed and validated scales to measure protean career attitudes.

The first protean career attitude, that is, self-directed career management, describes an individual’s independent role in managing her or his career (Briscoe & Finkelstein, 2009; Briscoe et al., 2006). As a result of the changing psychological contract between employer and employee, individuals no longer rely on the organization to provide opportunities for development and career advancement (Granrose & Baccili, 2006; Paula, Kerry, & Lisa, 2005; Volmer & Spurk, 2011). Moreover, they are willing to learn continuously and they are permanently in search of new challenges (Briscoe et al., 2006; Crowley-Henry & Weir, 2007; De Vos & Soens, 2008). Hence, this attitude values independence (Briscoe et al., 2006; Grimland, Vigoda-Gadot, & Baruch, 2012), and therefore resonates very well with a managerial career orientation in which an individual strives for the hierarchical advancement and enlarged power base (Aryee, 1992; Gerpott et al., 1988; Kim & Cha, 2000), which will enable such a higher degree of self-direction.

Consistent with the theory of reasoned action and the theory of planned behavior, in their quest for self-reliant career management, innovators possessing a more self-directed career attitude will try to proactively create opportunities for career advancement and self-

presentation, rather than just awaiting opportunities (Briscoe et al., 2006; De Vos & Soens, 2008). This appears to shape an innovator's normative beliefs to being mainly concerned with the organization's management as the most important reference group to approve or disapprove of her or his professional behavior (Ajzen, 1985, 1991). Again, the resulting intentions are very likely to concur with those of a managerial career orientation, because according to this viewpoint individuals also place more importance on the recognition in their organization than in the respective professional community (Aryee, 1992). Hence, we hypothesize:

Hypothesis 1. Self-directed career management is positively related to innovators' managerial career orientation.

In addition to a self-directed career management, individuals who hold protean career attitudes follow their own values (rather than organizational values) when managing their career. By engaging in such values-driven career management, they concentrate on their own needs and aspirations, instead of borrowing external standards, such as the organization's evaluations (Briscoe & Finkelstein, 2009; Briscoe et al., 2006). In this vein, research on employee turnover (Griffeth, Hom, & Gaertner, 2000) has shown that innovators ascribing more attention and importance to intrinsic work values are less attached to their organization (Chang et al., 2008). Conversely, individuals with a managerial orientation are supposed to be highly interested in seeking recognition from other members of the organization and are expected to be engaged in organization-directed strategies such as opinion conformity (Gerpott et al., 1988; Kim & Cha, 2000). This is because they need to demonstrate a strong sense of loyalty to the goals and values of the organization in order to succeed (Aryee, 1992).

Following the theory of reasoned action and the theory of planned behavior, this implies that the intentions of innovators possessing a values-driven career attitude are less related to their organizations and more connected to their profession, and that such innovators are less likely to see an organization's management as their focal reference group. Altogether, this reasoning consistently suggests that having a values-driven career management attitude disfavors a managerial career orientation of innovators. Hence, we hypothesize:

Hypothesis 2. Values-driven career management is negatively related to innovators' managerial career orientation.

Boundaryless career attitudes. The boundaryless career concept stresses the significance of psychological and physical boundarylessness (Arthur et al., 2005; Arthur & Rousseau, 1996b). In this respect, individuals become independent from traditional career arrangements and seek to create and sustain active working relationships beyond organizational boundaries (Lazarova & Taylor, 2009; Pringle & Mallon, 2003; Tams & Arthur, 2010). Parallel to the protean career attitudes, Briscoe et al. (2006) developed and defined two specific boundaryless career attitudes to enable empirical research on the implications of new career development.

The first boundaryless career attitude identified by Briscoe et al. (2006) is the boundaryless mindset, which describes individuals that are open-minded and actively looking for various work-related relationships across organizational boundaries (Briscoe & Finkelstein, 2009; Briscoe et al., 2006; Ituma & Simpson, 2009). In this context, relationships mean career-related networks and contacts with others (Jackson, 1996; Littleton, Arthur, & Rousseau, 2000; Masaru & Tatsuya, 2006; Sparrowe, Linden, Wayne, &

Kraimer, 2001). These do not only imply connections to people working in the individual's field of vocational specialization, but with many others, such as an organization's suppliers and customers, as well as with professional and social connections (Defillippi & Arthur, 1994; Hoegl et al., 2003; Morris & Wu, 2009). Hence, these relationships do not provide only expertise, reputation development, job opportunities, power, visibility, and new contacts, but also offer venues for career support and personal development by facilitating the exchange of information (Arthur, 1994; Granovetter, 1974; Katz et al., 1995; Wittig-Berman & Beutel, 2009).

These benefits can motivate individuals to pursue a career in management. As per the theory of reasoned action and the theory of planned behavior, we expect innovators to recognize these potential benefits. Staying in their technical profession where such a broad network might be less useful would thus constitute a missed opportunity, which individuals usually tend to avoid (Festinger, 1957; Gilbert, Morewedge, Risen, & Wilson, 2004; Gilovich & Medvec, 1995). Innovators are likely to take advantage of these positive preconditions for a managerial career, thereby stimulating their managerial career orientation. Hence, we hypothesize:

Hypothesis 3. A boundaryless mindset is positively related to innovators' managerial career orientation.

The second boundaryless career attitude, that is, mobility preference, refers to careers that go beyond one single employment relationship (Briscoe et al., 2006; Pang, 2003; Pia, 2011). This is closely related to Gouldner's cosmopolitan orientation (Gouldner, 1957, 1958). Individuals with a high organizational mobility preference favor working for multiple employers throughout their career, rather than the predictability that comes from working

continuously for the same organization (Briscoe & Finkelstein, 2009; Briscoe et al., 2006; Raider & Burt, 1996). Such an attitude thus comes with a low level of commitment to the organization (Sommerlund & Boutaiba, 2007; Stahl, Miller, & Tung, 2002; Suutari & Smale, 2008), and is likely to be positively related to the identification with the profession itself and its content. As such, innovators with a boundaryless career attitude prefer to seek recognition and success as a member of their professional or scientific community (Chang et al., 2008; Svejenova, 2005; Tremblay, Wils, & Proulx, 2002).

Consistent with the theory of reasoned action and the theory of planned behavior, this makes such innovators more predisposed to follow a technical career path, as opposed to a managerial career, which would afford higher levels of loyalty and orientation toward an organization and its management (Gerpott et al., 1988; Tremblay et al., 2002). Hence, we hypothesize:

Hypothesis 4. Organizational mobility preference is negatively related to innovators' managerial career orientation.

3.2.3 Organizational culture and managerial career orientation

Studies of organizational culture date back to the 1930s (Mayo, 1933). Nevertheless, systematic research began only in the 1980s (Hofstede, 1980; Schein, 1985). Although abundant research has led to many different definitions of this phenomenon (e.g., House, Javidan, Hanges, & Dorfman, 2002; Schwartz, 1994; Trompenaars, 1993), these conceptions have in common that organizational culture is described as shared values, norms, and practices in an organization.

According to research on organizational socialization, organizational culture affects many domains of vocational behavior (Chao et al., 1994; Muethel & Hoegl, 2010; Schein, 1990). Organizational socialization describes the learning process by which an individual assimilates and adjusts to a new or changed organizational role (Helena & Neil, 2006; Taormina, 2009). Research has argued that organizational socialization is multidimensional (Fisher, 1986; Helena & Neil, 2006). These independent dimensions refer to different aspects of an organization that pertain to an individual, such as her or his respective role in the organization, organizational policies, and shared values.

The notion that people socialize best when there is a good person-environment fit is widespread in research on organizational behavior (Edwards, 1996). Basically, the operating assumption is that intentions or behavior result from the relationship between the person and the environment (Lewin, 1951; Pervin, 1989). Therefore, the person-organization fit, or, in other words, the person-organizational culture fit, has been identified as a potentially important determinant of individual-level outcomes (Meyer & Allen, 1997; Verquer, Beehr, & Wagner, 2003).

The present study focuses on four cultural dimensions: innovativeness, power sharing, support and collaboration, and learning and development. Hurley and Hult (1998) specifically developed these dimensions to describe organizational cultures in innovative environments, as befitting the present study.

Innovativeness. This first dimension characterizes an organizational culture that readily accepts technical innovation, in which management searches for innovative ideas and accepts that innovation is risky and might lead to failure (Hult et al., 2004; Hurley, 1995; Hurley & Hult, 1998). Innovators are highly recognized in such cultures and their capacity to innovate is seen as one of the most important factors that affect business performance (Hult

et al., 2004; Hurley & Hult, 1998). This open recognition and appreciation of innovators that is present among the workforce because of cultural socialization makes innovators less dependent on hierarchical advancement to develop a feeling of achievement and of being valued (Liu, Liu, & Wu, 2010).

Thus, there is notably less of an incentive in such organizations for innovators to seek a managerial career. A management position is also less attractive to innovators in organizations that have an innovation-oriented culture, given comparatively higher monetary rewards for innovators (Aryee, 1992; Balliet, Mulder, & Van Lange, 2011; Gomez-Mejia et al., 1990). Furthermore, the theory of person-environment fit (Edwards, Cable, Williamson, Lambert, & Shipp, 2006) suggests that innovators with a technical career orientation perceive their goals and interest as more congruent with an organization that has an innovation-oriented culture, making them less likely to adapt their orientation toward a more managerial orientation. Hence, we hypothesize:

Hypothesis 5. Innovativeness in an organization is negatively related to innovators' managerial career orientation.

Power sharing. Hurley and Hult's (1998) second dimension describes whether people are willing to share their power, information, and resources. It also refers to the influence throughout an organization's different hierarchical levels (Hult et al., 2004; Hurley, 1995; Hurley & Hult, 1998). The rationale for power sharing in organizations is that individuals develop more commitment to action when they have a voice in the decision-making process (Aaron, 1992; George, 2003; Ilies, Morgeson, & Nahrgang, 2005). Therefore, managers and subordinates need to work together in a process of defining

problems and searching for solutions (Hofstede, 1983; Hurley, 1995; Walumbwa, Wang, Wang, Schaubroeck, & Avolio, 2010).

Once an organization has established a power sharing culture, this culture will be reflected through socialization in the attitudes and norms of employees, which are then likely to attach less importance to the personal possession of power and authority (Hurley & Hult, 1998; Thompson, 1965). It follows that such a culture is more likely to nurture distrust and refusal among the workforce toward an elevated concentration of power.

Consistent with the theory of organizational socialization and the theory of person-environment fit, we argue that one of the most important motivations for innovators to become a manager, and thus to develop a managerial career orientation, is enhancing power. As such, innovators might be less inclined toward a managerial career in organizations in which enhancing power is probably less likely and less valued. Furthermore, innovators with a high managerial career orientation aiming at managerial responsibility and power, and who do not want to share decision-making with their subordinates (Allen & Katz, 1986; Bailyn, 1991; Igarria et al., 1999) might also be more attracted by organizations in which power sharing is a less important cultural value. Hence, we hypothesize:

Hypothesis 6. Power sharing in an organization is negatively related to innovators' managerial career orientation.

Support and collaboration. The third dimension of organizational culture deals with the degree to which individuals in an organization are supportive and helpful (Hurley, 1995; Hurley & Hult, 1998). Studies have shown that a culture of collegial support and collaboration fosters organizational commitment, openness, citizenship, and cooperation

among employees (Moorman, Blakely, & Niehoff, 1998; Rhoades & Eisenberger, 2002; Settoon, Bennett, & Liden, 1996). Furthermore, it supports new ideas and their cross-fertilization and makes people feel valued (Aiken & Hage, 1971; Eisenberger et al., 1990). Through socialization, this cultural dimension may encourage people to collaborate across organizational units (Hult et al., 2004; Hurley, 1995; Hurley & Hult, 1998).

As a result, in a supportive and collaborative culture, managing relationships, teamwork, and processes is expected to be a highly interesting task for innovators, which probably makes a managerial career appear more attractive. Even more importantly, such a cultural environment is very likely to ease an innovator's entrance to a line management position, which will make the change of career path notably less difficult, and thus more likely compared to organizations without a supportive culture. Furthermore, research on organizational support has shown that individuals want to help the organization to achieve its objectives if they feel supported and valued (Chen, Aryee, & Lee, 2005; Rhoades & Eisenberger, 2002), which reflects commitment to the organization, rather than to the technical profession of an innovator.

Therefore, innovators are likely to be more willing to change to a management position, rather than focusing on technical innovations in their respective field of specialization. As outlined above, person-environment fit is expected to strengthen this increased inclination of innovators to develop a managerial orientation. Hence, we hypothesize:

Hypothesis 7. Support and collaboration in an organization is positively related to innovators' managerial career orientation.

Learning and development. The final dimension introduced by Hurley and Hult (1998) is learning and development. It describes whether an organization provides opportunities for individual career development through formal or informal training or educational programs (Hurley, 1995; Hurley & Hult, 1998). For innovators, ongoing training and education is of utmost importance to stay up-to-date in their technical field of interest. Therefore, organizations that stress an organizational culture in which learning and development is encouraged, and which provide employees with resources and opportunities to do so, are expected to appeal more to such innovators, who are not interested in pursuing a managerial career, but in further developing their professional skills in a technical career. In such a culture, innovators are provided with various opportunities for personal development to enhance their motivation to acquire and apply crucial new knowledge. Thus, the socialization in such an environment is likely to result in a nonmanagerial career orientation among innovators and will cause innovators with a managerial career orientation to perceive an inferior person-environment fit.

Therefore, the more an organization emphasizes and demands learning and development, the less attractive it might be for innovators to move into a management position, where the focus of work is much more on handling relationships. Hence, we hypothesize:

Hypothesis 8. Learning and development in an organization is negatively related to innovators' managerial career orientation.

3.3 Methods

3.3.1 Sample and data collection

The empirical analyses are based on data pertaining to 37 organizations from a variety of industries (including automotive, chemicals, pharmaceuticals, logistics, and IT). We used this broad sample of industries to bolster the generalizability of the results. After agreeing to participate in our study, the organizations provided the contact information of one HR manager and of employees whose job descriptions met the definition of innovators given at the beginning of this chapter. We invited them via e-mail to participate in a strictly voluntary and confidential web-based survey. The final sample consisted of 37 HR managers (17 men and 20 women) and 625 innovators (500 men and 125 women), resulting in response rates of 100% for HR managers, and 77% for innovators.

To ensure content validity and to avoid possible common source bias, we used data from different respondents to measure variables, where possible. We used data from innovators to measure the dependent variable, that is, managerial career orientation, and we used the responses of the HR managers to measure the independent variables for organizational culture. As this approach was not possible for the second set of independent variables, that is, new career attitudes, we used Harman's (1967) single-factor test as a common way to address the issue of common method variance (Harman, 1967; Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003). The test revealed that no single factor emerged from factor analysis, and that a general factor could not account for the majority of the covariance among the measures. We concluded that no substantial amount of common method variance was present (Podsakoff et al., 2003).

3.3.2 Measures

Dependent variable: Managerial orientation. We used a scale developed by Kim and Cha (2000) to measure the managerial career orientation. In their study, it was designed to determine the degree to which innovators seek to advance their career in management. The scale consists of three items, including “I want to advance up to a management position.” Cronbach’s alpha for this scale in the present study was calculated to be .84. As for all measures in the investigation, we used a five-point Likert scale ranging from “completely disagree” to “completely agree” for this dependent variable.

Independent variables: Individual level. We assessed new career attitudes with four scales recently developed by Briscoe et al. (2006). The first protean scale, self-directed career management, was measured using an eight-item scale including items such as “I am in charge of my own career.” Cronbach’s alpha for this scale was .76. It indicated the degree to which employees believed that they have a very independent career. The second protean scale, values-driven career management, was designed by Briscoe et al. (2006) to determine the degree to which individuals use their own values to define career goals. It consists of six items such as “It doesn’t matter much to me how other people evaluate the choices I make in my career.” This scale had a Cronbach’s alpha of .72 in the present study.

The first boundaryless career attitude scale, boundaryless mindset, assesses individual’s preferences for working with people outside their organization. The scale consists of eight items including “I enjoy jobs that require me to interact with people in many different organizations.” In our study, Cronbach’s alpha for this scale was .85. We measured organizational mobility preference, the second boundaryless scale, by using five items such as “In my ideal career I would work for only one organization” (reversed coded).

Cronbach's alpha was .78. This scale indicated the degree to which individuals want to work for several employers throughout their career.

Independent variables: Organizational level. We used four scales conceptualized by Hurley and Hult (1998) to assess the dimensions of organizational culture. We measured the first culture measure, innovativeness, with a five-item scale including items such as "Technical innovation, based on research results, is readily accepted." Cronbach's alpha for this scale was .77, which indicated the organization's ability to successfully adopt or implement new ideas, processes, and products.

Hurley and Hult (1998) conceptualized power sharing as the second dimension of organizational culture to determine the degree to which authority is decentralized. It consists of three items such as "People are willing to share power - there is an atmosphere of working together." Cronbach's alpha was .76 in our study.

The next culture measure, support and collaboration, indicated the degree to which people are willing to collaborate in the organization. We measured it with a three-item scale including items such as "People throughout my company are supportive and helpful." This dimension of organizational culture had a Cronbach's alpha of .79.

Learning and development, the fourth culture measure, was assessed with a four-item scale. It indicates the degree to which the organization is involved in the career management of its employees. In this study, Cronbach's alpha for this scale was .85. An example of scale items is "There are people at my company who provide guidance and counsel regarding one's career."

Control variables. As per many other contributions to studies of careers (e.g., Briscoe & Finkelstein, 2009; Granrose & Portwood, 1987; Sturges et al., 2005), we

controlled for a set of individual characteristics of the innovators at the individual level. We did this because individual characteristics could easily influence managerial career orientation. We used age (measured in years), gender (dummy-coded; 0 = “male,” 1 = “female”), marital status (dummy-coded; 0 = “single,” 1 = “married”), the number of children, and organizational tenure (in years).

To control for organizational level effects, we used company size (the logarithm (ln) of number of employees) and company age (the logarithm (ln) of number of years). The rationale was that the role of innovators in larger or older organizations might be different than in smaller or younger ones, for example, as innovators in small organizations are more likely to work on a broader task spectrum and thus become more involved in managerial tasks, in addition to their technical tasks. Moreover, “traditional” career paths for innovators are more likely to exist in older organizations, which could influence innovators’ managerial career orientation. Table 3-1 shows the descriptive statistics and correlations of the individual level and organizational level variables used in this study.

3.3.3 Analysis

The hypotheses of the present study required testing the effects of organizational level and individual level properties on individual level outcomes. This was because managerial career orientation, new career attitudes, and five controls were measured at the individual level, whereas organizational culture and two control variables were assessed at the organizational level. As regular OLS regression was unable to capture cross-level relationships in an appropriate way, we chose hierarchical linear modeling (HLM; Raudenbush & Bryk, 2001) as a more adequate technique for assessing these cross-level relationships (Hofmann, 1997; Klein et al., 2000).

One of HLM's advantages over OLS regression is that it solves the problem of aggregation and disaggregation bias (Bryk & Raudenbush, 2002). As a result, HLM has been recommended and extensively used for similar purposes as the present study (e.g., Hirst, Van Knippenberg, & Zhou, 2009; Hofmann & Stetzer, 1998; Muethel et al., 2011). Since this study involved assessing the impact of organization level factors on individuals, the HLM model consisted of two levels.

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Managerial career orientation	3.79	1.02	--														
2. Self-directed career management	3.99	0.50	.30**	--													
3. Values-driven career management	3.55	0.64	-.03	.25**	--												
4. Boundaryless mindset	3.84	0.64	.46**	.26**	.09*	--											
5. Organizational mobility preference	3.14	0.81	.21**	.20**	.18**	.32**	--										
6. Age	39.51	7.98	-.02	-.04	-.02	-.06	-.16**	--									
7. Gender	0.19	0.39	-.01	-.05	-.01	.02	.05	-.18**	--								
8. Marital status	0.61	0.49	.10*	.06	.02	-.01	-.09*	.44**	-.09*	--							
9. Number of children	0.97	1.12	.12**	.05	-.04	.03	-.11**	.48**	-.24**	.55**	--						
10. Organizational tenure	9.50	7.38	-.03	-.16**	-.05	-.08*	-.31**	.62**	-.14**	.25**	.26**	--					
11. Innovativeness	4.14	0.61	.14**	.09*	-.03	.02	.13**	.03	-.02	.05	.03	-.03	--				
12. Power sharing	3.89	0.61	.14**	.08*	-.02	.02	.12**	.00	-.01	.03	.01	-.03	.29	--			
13. Support and collaboration	3.93	0.65	.13**	.06	-.02	.02	.12**	.01	-.01	.04	.02	-.03	.49**	.67**	--		
14. Learning and development	3.91	0.88	.14**	.07	-.02	.02	.13**	.02	-.02	.04	.02	-.04	.26	.32	.43**	--	
15. Company size	7.35	2.44	.17**	.05	-.00	.09*	.12**	.09*	.00	.08*	.10*	.04	-.33*	-.14	-.22	.01	--
16. Company age	3.82	0.99	.18**	.06	-.04	.06	.10**	.10**	-.03	.10*	.10*	.06	-.33*	-.39*	-.53**	-.10	.47**

^a n = 625, level 1; n = 37, level 2. To compute cross-level correlations, we assigned organizational level variables to each individual in that organization. However, to weigh each organization equally, we counterweighted by sample size. With counterweighting, the organizational level correlations are equivalent to correlations based on the organizational level sample size.

^b * p < .05

** p < .01 (two-tailed)

Table 3-1: Descriptive statistics and correlations of variables^{a, b}

3.4 Results

Table 3-2 shows the results of the intercept-as-outcomes HLM model. It includes the unstandardized coefficients of the organizational level variables and of the individual level variables used to predict the managerial career orientation of innovators. Regarding the relationships between managerial career orientation and new career attitudes, we hypothesized that self-directed career management (Hypothesis 1) and a boundaryless mindset (Hypothesis 3) are positively related, whereas values-driven career management (Hypothesis 2) and organizational mobility preference (Hypothesis 4) are negatively related to innovators' managerial career orientation. The results shown in Table 3-2 provide support for Hypotheses 1, 2, and 3, but not for Hypothesis 4.

In addition, we hypothesized that the organizational culture measures, namely, innovativeness (Hypothesis 5), power sharing (Hypothesis 6), and learning and development (Hypothesis 8) are negatively related, whereas support and collaboration (Hypothesis 7) is positively related to innovators' managerial career orientation. The results supported each of these hypotheses.

As the correlation matrix in Table 3-1 shows several significant correlations, we estimated the variance inflation factors to check for potential multicollinearity. The variance inflation factors of the variables were below 2.4, indicating there was no distortion of results due to multicollinearity (Cohen, Cohen, West, & Aiken, 2003).

Variables	Model 1 Estimates		Model 2 Estimates	
	Coefficient	s. e.	Coefficient	s. e.
Individual level				
Controls				
Age	- 0.02*	0.01	- 0.01 ⁺	0.01
Gender	- 0.11	0.11	- 0.06	0.10
Marital status	0.16	0.11	0.13	0.09
Number of children	0.11*	0.05	0.08*	0.04
Organizational tenure	0.01	0.01	0.01 ⁺	0.01
New career attitudes				
Self-directed career management			0.36**	0.08
Values-driven career management			- 0.15*	0.06
Boundaryless mindset			0.59**	0.06
Organizational mobility preference			0.09 ⁺	0.05
Organizational level				
Controls				
Company size	- 0.07**	0.02	- 0.06**	0.02
Company age	0.15**	0.05	0.13*	0.05
Organizational culture				
Innovativeness			- 0.25**	0.07
Power sharing			- 0.23*	0.09
Support and collaboration			0.26**	0.09
Learning and development			- 0.13**	0.05

n = 625, level 1; n = 37, level 2. ⁺ p < .10; * p < .05; ** p < .01. Reported are unstandardized coefficients.

Table 3-2: *Results of hierarchical linear modeling for innovators' managerial career orientation*

3.5 Discussion

This research addresses why some innovators turn into managers in the course of their career. As expected, the results of our study revealed that this seems to be rooted not only in individuals' career attitudes but also in a response to organizational culture. In this vein, the results highlight the importance of an individual's protean and boundaryless career attitudes in shaping innovators' career orientation. Furthermore, it shows that individuals are socialized in their organization, so that their managerial career orientation is influenced by

organizational culture. In the following section, we discuss the theoretical and practical implications of this study's results before noting some limitations of the present research and considering the implications for future research.

3.5.1 Theoretical implications

This study makes an important contribution to the literature on managerial career orientation and offers a number of theoretical implications. By applying the theory of reasoned action and the theory of planned behavior to the context of career orientation, we respond to recent calls in the literature for more research on these theories in the vocational field (Arnold et al., 2006). As a result, we show that the theory of reasoned action and the theory of planned behavior indeed offer a very useful framework for career management research by providing an explanation of how attitudes and intentions shape career orientations.

By taking into account the development of new career attitudes, this study adds to the growing body of research on new careers (Briscoe & Finkelstein, 2009; Lips-Wiersma & Hall, 2007; Peiperl & Baruch, 1997). The results show that, in general, new career attitudes are related to managerial career orientation, thereby highlighting the importance of an individual's protean and boundaryless career attitudes in shaping innovators' career orientation. As expected, self-directed career management is positively related to managerial career orientation of innovators, whereas there is a negative relationship between values-driven career management and the dependent variable (De Vos & Soens, 2008; Hall, 2002, 2004).

In addition, we found out that the higher the boundaryless career attitudes of an innovator (Briscoe & Finkelstein, 2009; Briscoe et al., 2006), the stronger her or his managerial career orientation. However, it is quite surprising that organizational mobility preference is (marginally) positively related to managerial career orientation as opposed to the hypothesized negative association between those variables. We based Hypothesis 4 on the theory of reasoned action and the theory of planned behavior. However, the results indicate they were inappropriate in this context. A possible explanation could be that individuals with a high managerial career orientation have a strong ambition to advance to an upper management position (Aryee, 1992; Gerpott et al., 1988; Kim & Cha, 2000). Therefore, they might be willing to change employment to seize opportunities for hierarchical advancement in other organizations in order to reach their career objectives more quickly (Gerpott et al., 1988; Kim & Cha, 2000).

Overall, the results underscore how having new career attitudes does not necessarily lead to an enhanced managerial career orientation, although this appears intuitive at first glance because these new career attitudes suggest an easier change between the different career ladders. As such, the present study provides a more comprehensive understanding of how managerial career orientation is influenced by the developments described in new career concepts. Hence, it adds to the growing body of research on the implications of new career attitudes on vocational behavior (e.g., Briscoe & Finkelstein, 2009; Briscoe et al., 2010; De Vos & Soens, 2008; Segers et al., 2008). By linking new career attitudes to managerial career orientation, we provide a more detailed understanding of the determinants of managerial career orientation. We thus contribute to research on new career development by showing the numerous attitudinal effects on innovators' managerial career orientation.

Furthermore, connecting the research on employees' managerial career orientation with research on organizational culture dimensions contributes to the literature on career management. As expected, we show that the culture dimension of support and collaboration is positively related, whereas the dimensions of innovativeness, power sharing, and learning and development are negatively related to innovators' managerial career orientation. We thereby address the question of how managerial career orientation is influenced by organizational culture and thus contribute to research on the influences of organizational culture (e.g., Deshpandé & Farley, 2004; Glisson & James, 2002; Hartnell, Ou, & Kinicki, 2011). In addition, we deepen the understanding of how organizational socialization and the relationship between the person and the environment influences innovators' managerial career orientation.

By explaining the level of innovators' managerial career orientation through individual and organizational variables, this research is consistent with recent calls in the career literature for perspectives that combine the influences of the individual and organizational level (Anderson et al., 2004; Klein & Kozlowski, 2000; Rousseau, 1985). This is of utmost importance in order to provide a more holistic view of careers (Aryee, 1992; Gerpott et al., 1988; Kim & Cha, 2000). Furthermore, this study forms part of a growing body of cross-level management research that links individuals' vocational behaviors to cultural variables (Cullen et al., 2004; Glisson & James, 2002; Muethel et al., 2011). We provide an extended, cross-level basis for further work in the area of managerial career orientation by introducing organizational culture dimensions as antecedents. Such cross-level research allows for a more precise formulation of the influences of culture on career orientation.

3.5.2 Practical implications

As more and more organizations have to deal with the increasing significance of innovation, research such as this provides practical insights regarding the managerial career orientation of innovators and therefore fosters the understanding of innovators' reactions toward various career development opportunities. The suggestion here is that organizations try to influence innovators' managerial career orientation to attract and retain technical talent in the area of innovation in two ways.

First, organizations should create a work environment that is innovation-friendly, which is characterized by power sharing, and supports values-driven career management (Amabile, 1988; Woodman, Sawyer, & Griffin, 1993). According to the componential model of creativity and innovation in organizations (Amabile, 1983, 1985, 1988), this can be done by improving several environmental components. Organizations should encourage creativity by enabling open information flow and supporting new ideas at all levels of the organization (Thompson & Brajkovich, 2003; Woodman et al., 1993).

Furthermore, innovators appreciate autonomy and freedom (Abbasi & Hollman, 1994; Adler, 2003). Therefore, organizations should grant autonomy to innovators in their day-to-day work to foster a sense of individual ownership of and control over work (Agin & Gibson, 2010; Armson, 2008; Bainbridge, 2004). To foster autonomy, organizations have to overcome the unwillingness of those with power in the organization to share their power. Thus, granting autonomy should preferably start at the top of the hierarchy (Daniels, 2010; Fetscher, 2008; Kalyani, 2011).

In addition, the organization should balance its attitudes toward pressure by searching for a good match between positive challenges and negative workload pressure (Amabile, Hadley, & Kramer, 2002). Lastly, organizations should minimize organizational

impediments to creativity, for example, conservatism, bureaucracy, and internal strife (Hirst, Van Knippenberg, Chin-Hui, & Sacramento, 2011).

Second, we suggest that organizations should promote an innovative organization culture, for example, by establishing innovative mission and vision statements, democratic communication, flexible and adequate career management systems, collaboration, boundary-spanning, incentives, and leadership (Dombrowski et al., 2007; Kellermanns, Eddleston, Sarathy, & Murphy, 2012; Talke, Salomo, & Rost, 2010; Wang, Begley, Hui, & Lee, 2012). In addition, organizations should try to strengthen their cultural commitments to innovation, for example, through increased recognition of new technical developments and an increased number of technical employees (Knapp, 2012; Læg Reid, Roness, & Verhoest, 2011; Schein, 1994). They should refrain from actions that might be seen as unsuitable for an innovation-friendly organization, for example, cutbacks of intangible rewards such as conference and publication support and sabbaticals (Allen & Katz, 1986; Amabile, 1998; Balliet et al., 2011; Katz et al., 1995).

3.5.3 Study limitations and future research

Notwithstanding this study's contributions, its limitations should be noted. The research data were cross-sectional rather than longitudinal. Therefore, our study can demonstrate relationships between variables, but it cannot establish causality. A longitudinal research design would deepen our knowledge of the causality of relationships and the effects of new career attitudes and organizational culture on innovators' managerial career orientation.

Furthermore, the male dominance within our sample (81%) gives reason to think about the possible consequences of this pronounced gender imbalance (Burke, 2007; Hancock, 2012; Woolnough & Davidson, 2007). Although we are confident that our sample is representative of the population of innovators and despite the study attempting to control for innovator's gender, the literature points to a number of potential influences such male dominance may exert (Ackah & Heaton, 2004; Shapiro, Blake-Beard, & O'Neill, 2009). For example, Bergeron et al. (2006) reported that women are likely to perceive themselves as being less competent than men in managerial positions are, and Valcourt and Tolbert (2003) found in their research on gender differences regarding boundaryless career attitudes of employees that women experience more interorganizational mobility, whereas men experience more intraorganizational mobility. A closer examination of the effects of gender and gender diversity on the antecedents and outcomes of innovators' career orientations might thus offer new insights for fostering innovation in organizations, which is traditionally a male-dominated domain.

Moreover, we hope that this research stimulates further investigations on the role new career attitudes and organizational culture play in determining career orientation. As such, the examination of further variables appears worthwhile in order to deepen understanding of the mechanisms underlying the observations in this study.

Moving toward such a more comprehensive theory of antecedents of managerial career orientations may not only help to develop strategies to cope with varying career orientations of employees, but may also help to take advantage of them. In this regard, future research might also want to develop and test potential interventions that could directly influence innovators' career orientations. Such interventions have already proven effective in

other fields of research (e.g., Betz & Schifano, 2000; Oliver & Spokane, 1988; Rosenthal & Crisp, 2006), so they present a promising avenue of future research on career orientations.

4 Effects of organizational career management²

ABSTRACT

Due to the ever-increasing importance of innovation and the pivotal shifts under way in the labor market, organizations have a greater need to use their organizational career management system to retain their key innovators. The objective of the present study is to explicate how intensively organizations should apply their organizational career management practices and how diversified their bundle of career management instruments should be to increase innovators' perceived career management support. Furthermore, this study tests if organizational career management support increases the match between individual and organizational career plans. Drawing on a cross-level sample of 625 innovators and 37 HR managers pertaining to 37 organizations, the research results suggest that organizations should apply organizational career management practices intensively but should not simply use as many instruments as possible. Furthermore, the study reveals that it is not worth the effort to further diversify an already intensively applied organizational career management system. In addition, we show a positive relationship between innovators' perceived career management support and the match between individual and organizational career plans. Finally, we discuss the implications of our results and highlight directions for future research.

² This unpublished working paper was written by Patrick Hoffmann based on conjoint work with Prof. Dr. Martin Högl and Prof. Dr. Miriam Müthel.

4.1 Introduction

In today's world of strong international competition and dynamic markets, innovativeness is becoming an ever more important competitive advantage for organizations (Gemuenden & Hoegl, 1998; Hoegl & Parboteeah, 2007; Miron, Erez, & Naveh, 2004). A particular group of employees, the so-called innovators, forms the basis of an organization's successful innovativeness (Domsch & Gerpott, 1985; Ladwig & Domsch, 2011; Walter et al., 2011). This group is responsible for the innovation process in an organization and consists, for example, of scientists and engineers (Pfeffer, 1994; Rothwell & Poduch, 2004; Stewart, 1997). To secure the economic well-being of the organization, these innovation specialists should be retained (Ball, 1998; Gerpott, 1994; Higgins, 2001). Many organizations try to respond to this increasing importance of their key technical talents by applying their bundle of organizational career management practices in a way that fits the needs and preferences of their innovators (Ashton & Morton, 2005; Katz, 2004; Lepak & Snell, 1999). This organizational career management includes all the activities, practices, tools, and instruments used to manage and develop their employees' careers (Bowen & Hall, 1977; Dries, Vantilborgh, & Pepermans, 2012b; Sturges et al., 2002).

Unfortunately, finding the right way to use organizational career management to make sure that key innovators keep coming back is easier said than done (Aryee, 1992; Seema & Sujatha, 2012; Stumpf, 1988). One reason might be that careers have changed dramatically in recent years, resulting in the creation of new career attitudes such as strong self-directed and values-driven career management of individuals (Arthur, 1994; Arthur et al., 2005; Briscoe & Finkelstein, 2009). In other words, moving away from the traditional career also means moving away from the organization being the primary career driver (Arthur, 1994; Briscoe et al., 2006; Hall, 1996a, 1996b). Nevertheless, this does not

necessarily mean that organizations have no influence on their employees' careers (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007). For example, recent research has shown that offering career management help supports organizational competitiveness (London, 2002), increases the employability of staff (Baruch, 2001), and boosts organizational commitment (Sturges et al., 2002).

The ongoing changes in the relationship between employer and employee have put considerable pressure on organizational career management systems to become effective and to achieve the objectives of their application (e.g., Baruch & Peiperl, 2000; De Vos et al., 2009; Parboteeah, Hoegl, & Styborski, 2005; Verbruggen, 2008). As a result, finding adequate ways of using organizational career management to retain innovators at the organization is both increasingly necessary and more difficult (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007). Unfortunately, hitherto this question has not been adequately addressed. Despite the growing interest in organizational career management as an instrument to develop innovators' careers, there are few rigorous empirical examinations on how to adequately use organizational career management practices (De Vos et al., 2009; Lips-Wiersma & Hall, 2007). For instance, Baruch and Peiperl (2000) identified five groups of career management practices and linked them to certain organizational characteristics.

A reason for the scarcity of investigations in that research area is that the organizational aspect in career theory lacks a comprehensive framework, making it difficult to conduct empirical studies (Baruch & Peiperl, 2000). The problem of generating such a framework seems to be that the concept of a career is investigated from many different perspectives, such as psychology, sociology, economics, and business administration (Arthur et al., 1989), but none of these viewpoints has focused on careers in the organizational

context. Therefore, the conceptual background of organizational career management is rather thin.

However, research on organizational career management is urgently needed to address the growing importance of innovators for organizations. Although various studies attest to a positive role for organizational career management practices in general (Aryee, 1992; Baruch & Peiperl, 2000; Chang et al., 2008; Kim & Cha, 2000), it remains unclear how these instruments should be applied to support individuals' careers. The diversity of organizational career management practices, as well as the intensity of the use of the individual HR measures, are likely to affect individuals' perceptions of career management suitability because they symbolize the career management support provided by the HR department. Nevertheless, up to now, neither the right way of using an organizational career management system, nor the perceived suitability from the technical talents' perspective have been investigated.

In this paper, we address these research questions and aim to make three main contributions. First, by drawing on organizational support theory, we specify how organizations can use career management practices to increase innovators' perceived organizational career management support (Aselage & Eisenberger, 2003; Eisenberger et al., 1986). This will address the questions of how intensively organizations should apply their organizational career management practices and how diversified their bundle of career management instruments should be to increase innovators' perceived career management support.

Moreover, we respond to recent calls in the career management literature for investigations of how careers should be shaped and influenced by organizations (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007; Sturges et al., 2005).

Furthermore, we take an important step toward a more comprehensive understanding of the role organizational career management plays for the employer-employee exchange relationships.

Second, we apply a cross-level approach to investigate the role of organizational career management practices for technical talents' perceptions of organizational support. Our procedure takes into account the different levels of analysis, that is, organizational level organizational career management practices and individual level perceptions of organizational career management support. This meets current requests for cross-level research in the field of human resource management (Anderson et al., 2004; Klein & Kozlowski, 2000; Rousseau, 1985).

Third, we determine if perceived organizational career management support increases innovators' perception of career fit; that is, the match between individual and organizational career plans. Therefore, we discuss whether a higher degree of perceived organizational career management support will lead to a stronger match between individual and organizational career plans. In so doing, we support the social exchange theory, the norm of reciprocity, and career management research that postulates the importance of organizational career management. We also address the question of why organizations should use organizational career management practices to increase innovators' perceived career management support.

In the following sections, we describe our research study and results. In the first step, we explain our conceptual background and hypotheses development, before we introduce our research method. After that, we present the results of our cross-level investigation of data from 625 innovators and 37 HR managers from 37 organizations. The paper closes with a

discussion of the study's main implications, along with the limitations and outlook for future research.

4.2 Conceptual background and hypotheses

4.2.1 Organizational career management

Organizational career management can be defined as the efforts of an organization to manage and develop its employees' careers (Baruch & Peiperl, 2000; Forster, 1993; Stumpf, 1988). In particular, it often includes career counseling, mentoring, training, and written career planing (Baruch & Peiperl, 2000; Granrose & Portwood, 1987; Latack, 1990). The objective of organizational career management is to increase employees' perceived career management support (London & Stumpf, 1982; Parboteeah et al., 2005; Sturges et al., 2002). Furthermore, it aims at helping individuals to stay up-to-date in their technical field of specialization and to expand capabilities into new working areas (Granrose & Portwood, 1987; Orpen, 1994; Sturges et al., 2005). In so doing, career management help by the employer is supposed to increase individuals' feeling of self-worth as well as their ability to learn how to learn. It qualifies individuals for career progression in the organization (Parboteeah et al., 2005; Sadler-Smith & Badger, 1988; Stumpf, 1988).

Research on organizational career management mostly starts with the implicit assumption that providing organizational career management always benefits the organization (e.g., Carter, 2002; De Vos et al., 2009; De Vos & Soens, 2008; Lips-Wiersma & Hall, 2007; London & Stumpf, 1982; Parboteeah et al., 2005; Stumpf, 1988). The rationale behind this is that career management help by the employer is supposed to improve employees' abilities and competencies, which, in turn, increases their contribution to the

success of the organization (Cordero, DiTomaso, & Farris, 1994b; Debackere & Buyens, 1997; Desimone et al., 2002). As a result, this view has led to formulation of the organizational support theory (Aselage & Eisenberger, 2003; Eisenberger et al., 1986; Zagenczyk, Scott, Gibney, Murrell, & Thatcher, 2010).

4.2.2 Organizational career management and perceived support

According to organizational support theory, employees constantly evaluate how they are treated by the organization (Aselage & Eisenberger, 2003; Eisenberger et al., 1986; Eisenberger et al., 1990). This is because the treatment signals to them how much the organization values their contributions and how favorable the organizations' orientation toward them is (Çakmak-Otluoğlu, 2012; Moorman et al., 1998; Rhoades & Eisenberger, 2002). For example, research based on organizational support theory has shown that organizational justice increases employees' trust in the organization which reduces concerns about inadequate compensation and job loss (Wayne, Shore, Bommer, & Tetrick, 2002; Wayne, Shore, & Liden 1997; Zagenczyk et al., 2010). As a result, organizational career management is supposed to symbolize to individuals that they are respected by the employing organization because offering organizational career management is an effort for the organization (Allen, Shore, & Griffeth, 2003; Stumpf, 1988).

Based on organizational support theory, many research studies have been conducted on the effects of specific practices of organizational career management on individual outcomes, such as organizational commitment (e.g., Allen, Shore, & Griffeth, 2003; Schlichting, 2011; Steffen, 2011; Wayne et al., 2002). However, research on how organizations should apply their organizational career management system as a whole has been scarce (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007).

Therefore, in our paper, we would like to focus on the influence that the way how organizations apply their organizational career management has on innovators' perceived career management support.

In this respect, organizations have three related but distinct possibilities (Granrose & Portwood, 1987; London & Stumpf, 1982; Stumpf, 1988). First, they can use their organizational career management intensively (Lambert-Pandraud & Laurent, 2010; O'Cass & Liem Viet, 2007). For example, this means that an HR department or the management of an organization spread information on the organizational career management of the organization and that career management practices are consistently applied (Aryee & Chong Chee, 1991; Debackere & Buyens, 1997; Thobani, 2012). Second, organizations can diversify their organizational career management by adding additional career management practices to their organizational career management system (Chang et al., 2008; Cordero, 1999; Portwood & Granrose, 1986). Third, they can do both, increasing the intensity as well the diversity of organizational career management (Gerpott & Domsch, 1986; Manolopoulos, 2006).

In line with the organizational support theory, we assume that organizational career management increases innovators' perceived career management support (Panaccio & Vandenberghe, 2009; Seema & Sujatha, 2012; Settoon et al., 1996). When innovators receive career management help by their employer, they might feel supported by the organization because organizational career management signals to the innovators that their contributions are recognized and worth the effort to offer such career management help. For example, innovators might appreciate when an organization shows interest in their long-term development by offering the possibility and the time to participate in career management practices, such as formal training or career counseling by the supervisor or the HR

department. In addition, providing a huge range of career management practices to innovators might be understood as an indicator that the organization cares about the career development of its key employees. Hence, we hypothesize:

Hypothesis 1. Intensity of organizational career management is positively related to innovators' perceived career management support.

Hypothesis 2. Diversity of organizational career management is positively related to innovators' perceived career management support.

Hypothesis 3. The combination of the intensity and the diversity of organizational career management is positively related to innovators' perceived career management support.

4.2.3 Perceived support and career fit

Social exchange theory (Blau, 1964; Homans, 1958) and the norm of reciprocity (Gouldner, 1960) postulate that social change and stability are the result of an ongoing exchange between parties (DeConinck, 2010; Riggle, Edmondson, & Hansen, 2009; Zagenczyk et al., 2010). In these negotiations, individuals will return benefits for benefits (Baranik, Roling, & Eby, 2010; Hochwarter, Kacmar, Perrewé, & Johnson, 2003; Sluss, Klimchak, & Holmes, 2008). In line with that, research on perceived organizational support proposes that employees who feel supported by the employing organization will respond with a more favorable approach toward their employer (Chen et al., 2005; Panaccio & Vandenberghe, 2009; Zacher & Winter, 2011). Many studies have underlined this relationship, for example, by showing that perceived organizational support is positively related to affective commitment to the organization (Shore & Wayne, 1993), work

attendance (Eisenberger et al., 1986), job performance (Eisenberger et al., 1990), citizenship behavior (Shore & Wayne, 1993), and job satisfaction (Eisenberger et al., 1997).

However, up to now, the positive influence of perceived organizational support has not been tested in the context of careers (Kiewitz, Restubog, Zagenczyk, & Hochwarter 2009; Kilduff, 1990). Drawing on social exchange theory and the norm of reciprocity, we, therefore, assume that organizations which increase their innovators' perceived career management support have a competitive advantage over organizations that do not. This is because offering career management help might, in return, increase the match between the career plans of the individual and the career plans of the company for her or him. The rationale behind this is that innovators will appreciate receiving career management support by their employer and will respond with a more favorable approach toward the organization. In other words, innovators might care more about the organization when they have the feeling that the organization cares about them. As the social exchange theory and the norm of reciprocity suggest, innovators might return benefits when they feel supported by the employing organization. Hence, we hypothesize:

Hypothesis 4. Perceived organizational career management support is positively related to the match between individual and organizational career plans.

4.3 Methods

4.3.1 Sample and data collection

The study draws on data pertaining to 37 organizations from a variety of industries (including automotive, chemicals, pharmaceuticals, logistics, and IT). We deemed this broad

sample of industries necessary to bolster the generalizability of the results. After agreeing to participate in our study, the organizations provided the contact information of one HR manager and of employees whose job descriptions complied with our understanding of innovators described at the beginning of this paper. These individuals then received e-mail invitations to participate in a strictly voluntary and confidential web-based survey. The final sample consisted of 37 HR managers (20 women and 17 men) and 625 innovators (125 women and 500 men), resulting in response rates of 100% for HR managers and 77% for innovators.

4.3.2 Measures

Variables on the organizational level: Intensity and diversity of career management as well as their combination. In the first step, HR managers were asked questions regarding the use of career management practices at the organizational level. To assess the diversity of the organizational career management practices of the participating organizations and how intensively they are applied, we provided HR managers with a list of 17 HR instruments developed by Baruch and Peiperl (2000). The list is depicted in Table 4-1.

Whereas many other investigations have focused on a small set of career management practices, we have chosen this list because it provides a comprehensive range of the career management instruments currently in use. Admittedly, other studies have provided lists of career management practices (e.g., Fowler, 1996; Gutteridge, Leibowitz, & Shore, 1993; London & Stumpf, 1982; Mumford, 1997; Parboteeah et al., 2005; Thomson et al., 1997; Walker & Gutteridge, 1979). However, the research design, purpose, and target

group of the present study appeared to best fit to Baruch and Peiperl's (2000) list because they constructed it for a research purpose close to ours.

According to their study, the first four activities on the list relate to performance appraisal and build the foundation for career decisions taken by the organization. Organizations use the following six instruments to plan their employees' careers. The next three are formal in nature, whereas the last four are general. We asked HR managers to indicate on a five-point Likert scale ranging from "not applied at all" to "applied extensively" to what extent each activity on the list is used in their organization.

1. Performance appraisal as a basis for career planning
2. Assessment centers
3. Peer appraisal
4. Upwards (subordinate) appraisal
5. Career counseling by direct supervisor
6. Career counseling by HR department
7. Formal mentoring
8. Career workshops
9. Succession planning
10. Common career paths
11. Dual ladder (parallel hierarchy for professional staff)
12. Books and/or pamphlets on career issues
13. Written personal career planning (as done by the organization or jointly)
14. Postings regarding internal job openings
15. Retirement preparation programs
16. Formal education as part of career development
17. Lateral moves to create cross-functional experience

Table 4-1: *Organizational career management practices used in this research (developed by Baruch & Peiperl, 2000)*

In the next step, we measured the diversity of the organizational career management of an organization by summing up the number of career management practices used in that organization. After that, we divided the result by the number of items on the list.

Furthermore, we calculated the intensity of the application of organizational career management practices by summing up the respective scores chosen by the HR managers for each item on the career management practices list. We again divided the result by the number of items on the list.

In addition, we multiplied an organization's score for diversity with the respective score for intensity to calculate a factor indicating how intensively and diversified an organization uses organizational career management practices.

Variables on the individual level: Perceived career management support and the match between individual and organizational career plans. On the individual level, we first asked the participating innovators to indicate to what extent they had experienced organizational career management support. Therefore, we used a six-item scale developed by Sturges et al. (2002) including items such as "My boss has made sure I get the training I need for my career" and "I have been given training to help to develop my career." Cronbach's alpha for this scale was .87.

In the second step, we asked innovators about the degree of the perceived match between individual and organizational career plans. To do this, we used a seven-item scale developed by Granrose and Portwood (1987) including items such as "Do your individual career goals match your company's goals for your future?" and "Does your individual career strategy match your company's career strategy for you?" This scale had a Cronbach's alpha of .91.

Control variables. To control for organizational level effects, we used company size (the logarithm (ln) of number of employees) and company age (the logarithm (ln) of number of years). The rationale behind this is that the role of innovators in larger or older organizations might be different from their role in smaller or younger ones.

In line with many other studies of careers (e.g., Briscoe & Finkelstein, 2009; Granrose & Portwood, 1987; Sturges et al., 2005), we controlled for a set of individual characteristics of the innovators at the individual level. We did this because individual characteristics could easily influence perceived career management support as well as the match between individual and organizational career plans. We used age (measured in years), gender (dummy-coded; 0 = “male,” 1 = “female”), marital status (dummy-coded; 0 = “single,” 1 = “married”), the number of children, and organizational tenure (in years). Table 4-2 shows descriptive statistics and correlations of the individual level and the organizational level variables used in this study.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Intensity of career management	3.19	0.40	--								
2. Diversity of career management	0.73	0.22	.40*	--							
3. Combined intensity and diversity of organizational career management	2.37	0.85	.28	-.26	--						
4. Company size (ln)	7.35	2.44	.12	.44**	-.22	--					
5. Company age (ln)	3.82	0.99	.00	.31	-.24	.47**	--				
6. Perceived career management support	3.27	0.91	.14**	.12**	.04	.02	.00	--			
7. Match between individual and organizational career plans	3.16	0.82	.43	.04	-.01	-.03	-.01	.65**	--		
8. Age	39.51	7.98	-.09*	.05	-.14**	.10*	.11*	-.03	.03	--	
9. Gender	0.19	0.39	-.00	-.01	.05	.01	-.03	.08	-.02	-.18**	--
10. Marital status	0.61	0.49	-.01	.03	-.08	.08*	.10*	.03	.07	.44**	-.09*
11. Number of children	0.97	1.12	-.08*	.01	-.06	.10*	.10*	.03	.06	.48**	-.24**
12. Organizational tenure	9.50	7.38	-.05	.11**	-.13**	.04	.06	.01	.04	.62**	-.14**

a n = 625, level 1; n = 37, level 2. To compute cross-level correlations, we assigned organizational level variables to each individual in that organization. However, to weigh each organization equally, we counterweighted by sample size. With counterweighting, the organizational level correlations are equivalent to correlations based on the organizational level sample size.

b * p < .05

** p < .01 (two-tailed)

Table 4-2: Descriptive statistics and correlations of variables^{a, b}

4.3.3 Analysis

As already mentioned above, our research questions required testing of the effects of organizational level properties on individual level outcomes, as well as an analysis of the effects of individual level properties on individual level outcomes. This is because we measured perceived organizational career management support, the match of individual and organizational plans, and five controls at the individual level, but we assessed the intensity and diversity of career management as well as their combination plus two control variables at the organizational level. As a result, we chose hierarchical linear modeling (HLM; Raudenbush & Bryk, 2001) as an adequate technique to assess these cross-level relationships (Hofmann & Gavin, 1998; Morgeson & Hofmann, 1999). Research comparable to ours has recommended and extensively used HLM (e.g., Hirst et al., 2009; Hofmann & Stetzer, 1998; Muethel et al., 2011). Given that this study involved an assessment of the impact of organization level factors on individuals, the HLM model consisted of two levels.

We used data from different respondents to measure variables, where possible, to ensure content validity and to avoid possible common source bias. As this approach was not feasible for testing the relationship between perceived career management support and the match between individual and organizational career plans, we used Harman's (1967) single-factor test as a widely accepted means of addressing the issue of common method variance (Harman, 1967; Podsakoff et al., 2003). The test revealed that no single factor emerged from factor analysis and that no general factor accounts for most of the covariance among the measures.

Furthermore, we applied the technique recommended by Lindell and Whitney (2001) to check for a potential common method bias. Therefore, we identified technical career orientation, a set of needs and values influencing an individual's choice of career route

(Gerpott et al., 1988; Igbaria et al., 1999; Kim & Cha, 2000), as a marker variable because it should not be theoretically relevant to the individual outcome variable in our model (Lindell & Brandt, 1999). Individuals with a high degree of technical orientation want to experience a career in their technical area of interest (Dalton & Thompson, 1985; Gerpott et al., 1988). The scale consisted of four items including “I want to be evaluated on the basis of technical contribution” and “I want to contribute to a body of science and technology.” Cronbach’s alpha for this scale was .76. Evidently, the nonsignificant and low correlation of this variable with the outcome variable in our model (0.04) was indicative of little, if any, common method bias in our data (Podsakoff et al., 2003). We concluded that no substantial amount of common method variance was present (Podsakoff et al., 2003).

4.4 Results

4.4.1 Intensity and diversity of organizational career management

Table 4-3 shows the results of our multiple regression analysis concerning the relationships between intensity, diversity, and their combination as well as innovators’ perceived career management support. Our analysis revealed that the intensity of organizational career management practices is positively related to innovators’ perceived career management support, which supports Hypothesis 1. However, there was no significant relationship between the diversity of organizational career management practices and perceived career management support. Therefore, Hypothesis 2 was not supported.

Variables	Model 1		Model 2		Model 3		Model 4	
	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.
Individual level								
Controls								
Age	- 0.01	0.01	- 0.01	0.01	- 0.01	0.01	- 0.01	0.01
Gender	0.20*	0.10	0.20*	0.10	0.20*	0.10	0.20*	0.10
Marital status	0.03	0.10	0.03	0.10	0.03	0.10	0.03	0.09
Number of children	0.06	0.04	0.06	0.04	0.06	0.04	0.06	0.04
Organizational tenure	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Organizational level								
Controls								
Company size	- 0.00	0.02	- 0.01	0.02	- 0.01	0.02	- 0.01	0.02
Company age	0.01	0.05	0.00	0.05	0.00	0.04	0.01	0.04
Career management practices								
Diversity			0.27	0.23			- 0.16	0.25
Intensity					0.35**	0.10	0.59**	0.12
Diversity*Intensity							- 3.29**	0.70

n = 625, level 1; n = 37, level 2. * p < .05; ** p < .01. Reported are unstandardized coefficients.

Table 4-3: *Results of hierarchical linear modeling for innovators' perceived career management support*

Furthermore, the results of our analysis showed that our combined term of diversity and intensity was negatively related to innovators' perceived career management support. This goes against the assumption of Hypothesis 3. To further interpret the interaction effect, we assessed the simple slopes of the relationship between the intensity of the use of organizational career management practices and innovators' perceived career management support contingent upon the level of the diversity of an organizations' bundle of career management instruments and calculated their levels of significance (Aiken & West, 1991). We analyzed the simple slopes one standard deviation above and below the mean level of the intensity of organizational career management and we plotted the graph shown in Figure 4-1 to depict the interaction.

As the correlation matrix depicted in Table 4-2 shows several significant correlations, we estimated the variance inflation factors to check for potential multicollinearity. The variance inflation factors of the variables were below 2.1, which indicated no distortion of results due to multicollinearity (Cohen et al., 2003).

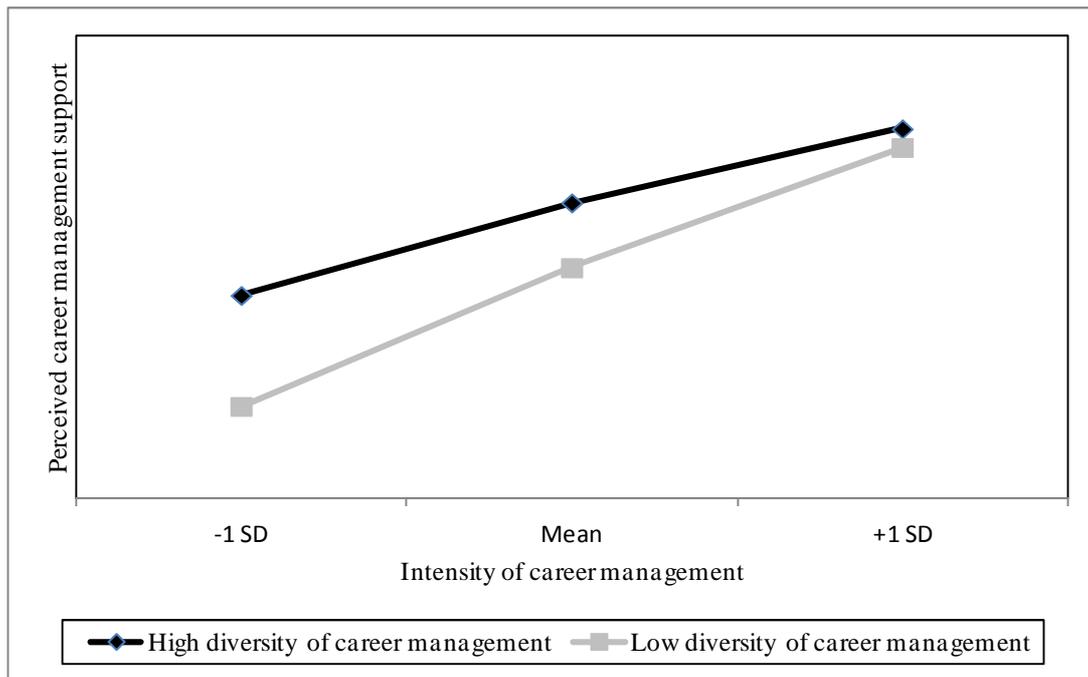


Figure 4-1: *Interaction of intensity and diversity on perceived support*

4.4.2 Effects of perceived organizational career management support

Table 4-4 shows the results concerning the relationships between innovators' perceived career management support and the match between individual and organizational career plans. Our analysis revealed a positive relationship between the two variables, thereby supporting Hypothesis 4.

Variables	Model 1		Model 2	
	Coefficient	s. e.	Coefficient	s. e.
Individual level				
Controls				
Age	- 0.00	0.01	0.00	0.01
Gender	- 0.01	0.09	- 0.13	0.07
Marital status	0.12	0.09	0.10	0.07
Number of children	0.02	0.04	- 0.02	0.03
Organizational tenure	0.01	0.01	0.00	0.01
Perceived career management support			0.61**	0.03
Organizational level				
Controls				
Company size	- 0.03*	0.01	- 0.03**	0.01
Company age	0.01	0.04	0.01	0.03

n = 625, level 1; n = 37, level 2. * p < .05; ** p < .01. Reported are unstandardized coefficients.

Table 4-4: *Results of hierarchical linear modeling for match between individual and organizational career plans*

4.5 Discussion

This research addresses the question of how organizations should use and apply their bundle of organizational career management practices. Surprisingly, the results of our study reveal that the application of career management instruments as intensive and diversified as possible is not the best solution for organizations to handle and support the careers of their innovators. This goes against the implicit viewpoint in HR literature that career management efforts will always benefit organizations (Baruch, 2006; London & Stumpf, 1982; Stumpf, 1988). In this vein, our results highlight the importance of using organizational career management in the right way to ensure the retention of key innovators.

In the following sections, we discuss the theoretical implications of this study's results and offer guidelines on how to handle organizational career management in the best

possible way. After that, we point to some limitations of the present research and consider some future research possibilities.

4.5.1 Theoretical implications

This study makes an important contribution to the literature on organizational career management and offers a number of implications. First, by drawing on organizational support theory, we add fundamental information to the ongoing discussion on how organizations can use career management practices to increase innovators' perceived organizational career management support in protean and boundaryless times (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007). Our results provide answers to the questions of how intensively firms should apply their organizational career management practices and how diversified their bundle of career management instruments should be. We thereby add to the recent career management literature discussing the meaning of organizational career management in the era of the new career (e.g., Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007; Sturges et al., 2005). In short, we provide a comprehensive framework for research on organizational career management, for example, by showing that offering more organizational career management does not always benefit the organization. This questions the implicit, contrary assumption of many career management researchers (Baruch & Peiperl, 2000; London & Stumpf, 1982; Stumpf, 1988).

Furthermore, by connecting organizational career management on the organizational level and innovators' perceptions of organizational career management support on the individual level, we respond to current calls for cross-level research in the field of human resource management (Anderson et al., 2004; Klein & Kozlowski, 2000). We provide an extended, cross-level basis for further work in the area of organizational career management.

Such cross-level research allows for a more precise formulation of the determinants and antecedents of perceived organizational career management. This cross-level basis and research is of utmost importance in order to provide a more holistic view of careers (Aryee, 1992).

In addition, in line with social exchange theory and the norm of reciprocity (Aselage & Eisenberger, 2003; Eisenberger et al., 1986), we show that perceived organizational career management support increases innovators' perception of career fit, that is, the match between individual and organizational career plans. This is of particular importance as it shows the necessity of applying career management practices in the right way to increase perceived career management support. Therefore, our analysis supports the career management research that has underscored the importance of organizational career management in the employer-employee exchange relationships, even in the era of the new career (Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007).

4.5.2 Practical implications

With regard to organizational career management practices, organizations are confronted with a huge variety of ways of using and applying them (Parboteeah et al., 2005; Younger & Sandholtz, 1997; Zheng & Froese, 2010). However, what should an organization do to use its organizational career management system as a whole in such a way that its key innovators keep returning? Building on the results of our analysis, we propose to follow four simple guidelines and we offer advice on how to implement them. These guidelines may help organizations to set up and run their respective organizational career management system.

1. Apply your career management practices intensively.

Our study shows that the intensity of career management practices is positively related to innovators' perceived career management support. The results clearly indicate that the more intensively organizational career management practices are applied in an organization, the more effective their use is. The rationale behind this might be that innovators feel valued by the employing organization when they are offered useful career management instruments (Eisenberger et al., 1990; Moorman et al., 1998; Panaccio & Vandenberghe, 2009).

In addition, innovators might understand intensively applied organizational career management practices as an indicator that their contributions to the success of the organizations are highly appreciated and that, in turn, they are provided with good opportunities for career advancement (Allen et al., 2003; Eisenberger et al., 1986; Rhoades & Eisenberger, 2002; Settoon et al., 1996). As a result, organizations simply need to apply their organizational career management practices intensively to increase innovators' perceived career management support (Lambert-Pandraud & Laurent, 2010; Lambert, 1972; Normann, 1971; O'Cass & Liem Viet, 2007).

An easy way of increasing the intensity of the use of an organization's organizational career management might be to disseminate information on HR instruments and opportunities, to offer career counseling, and to provide career-related information to supervisors (Aryee & Chong Chee, 1991; Debackere & Buyens, 1997; Gerpott & Domsch, 1986; Thobani, 2012). Furthermore, organizations might support the application of their organizational career management by promoting an innovative organization culture to show that the organization acknowledges the long-term benefits of innovation and its creators

(Dombrowski et al., 2007; Pick & Kleinaltenkamp, 2012; Semercioz, Hassan, & Aldemir, 2011; Shields & Young, 1994).

2. More is not always more: There is no need to apply as many career management practices as you can.

Our study does not lend credence to the claim that career management efforts will always benefit organizations (Baruch & Peiperl, 2000; Sullivan & Baruch, 2009). Instead, the results show no significant relationship between the number of organizational career management practices that an organization uses and its innovators' perceived career management support.

At first, the result of our analysis seems surprising. One possible reason for a nonexistent relationship might be that instituting more career management practices does not necessarily increase the number of opportunities for career advancement in an organization and may actually increase competition among individuals (Granrose & Portwood, 1987; Portwood & Granrose, 1986). Furthermore, with more career management instruments in place, innovators' career aspirations may rise, but there may be relatively fewer opportunities that will satisfy them (Chang et al., 2008; Cordero, 1999; Cordero et al., 1994b). In other words, organizations may put in place an organizational career management system that raises aspirations to much higher levels but does not necessarily provide more opportunities for career advancement in the organization.

Building on our analysis, we therefore suggest that organizations should not simply apply as many career management practices as they can. Rather, we propose that organizations should apply a well-selected bundle of organizational career management

practices. Studies such as Baruch and Peiperl (2000) can help organizations choose practices that fit the organization best.

3. Do not just further diversify an intensively applied bundle of career management practices.

Another conclusion of our analysis is that it is not always worth the effort to further diversify an already intensively applied bundle of organizational career management instruments (Montesino, 2002). Rather, our study reveals that the combination of the intensification and the diversification of organizational career management practices might lead to “organizational career management overkill”; that is, innovators do not value more career management instruments when the existing ones are already intensively applied. Indeed, too much career management appears to decrease innovators’ perceived career management support.

This relationship again initially seems surprising. A possible explanation might be that greater certainty about career opportunities and plans may backfire if innovators recognize that their career plans and interests may not match the available organizational opportunities (Gerpott & Domsch, 1986; Manolopoulos, 2006). As our study reveals, this even leads to lower levels of innovators’ perceived career management support because individuals can more easily compare their aspirations for career development and the career management support provided by the organization.

4. Promote your innovators' perceived career management and you will increase the career fit.

Another implication of our study is that it pays off to support innovators' perceived career management. When an organization increases the perceived career management support of its innovators, the match between the career plans of the individual and the organization will also increase. Thus, our study underscores how links between the organization and the individual exist, even in the era of the new career.

Even though the evolution of the traditional career to the new career has changed the dynamic of employer-employee exchange relationships, many individuals continue to anticipate some career management assistance from their employers (Cianni & Wnuck, 1997; Sturges et al., 2005). Offering this kind of support might benefit organizations in times of an increasingly competitive labor market, where the caliber of employees that an organization can retain will determine the future innovativeness of that organization (Bommer & Jalajas, 1999; Chien, Lawler, & Jin-Feng, 2010; Debackere & Buyens, 1997).

4.5.3 Study limitations and future research

Some limitations need to be acknowledged. First, this study's data are cross-sectional, meaning they demonstrate relationships between variables but cannot fully establish causality as would be possible in a longitudinal study. A future longitudinal study could therefore enrich our understanding of the causality of relationships.

Second, the male dominance within our sample (81%) obliges consideration of the consequences of gender imbalance (Linehan & Walsh, 2000; Parboteeah, Hoegl, & Cullen, 2008). Notwithstanding our confidence that the sample is representative of the population of

innovators and that our analyses controlled for innovator's gender, the literature points to a number of potential influences such male dominance may have. For example, Pazy (1987) underlined how women's responsiveness to organizational career management is higher than men's, and Valcourt and Tolbert (2003) found women to experience more interorganizational mobility and men to show more intraorganizational mobility. A closer look at the effects of gender and gender diversity on innovators' reaction to organizational career management might thus offer new insights for fostering innovation in organizations, which is traditionally a male-dominated domain.

Moreover, we hope that this research stimulates further investigations of the role organizational career management practices play in supporting innovators' careers. As such, the examination of the use of further sets of career management instruments appears worthwhile to deepen our understanding of the mechanisms underlying the observations made in our study. Moving toward such a more comprehensive theory may help to handle the challenges of the "new deal" of contemporary careers.

5 The dual ladder: How to get from managerial delusion to motivational solution³

ABSTRACT

In response to the increasing pressure to innovate, many organizations search for career management practices to promote and retain valuable technical talent. In light of this challenge, management research suggests the implementation of dual ladder career systems. However, although many organizations have adopted dual ladders, it remains unclear whether dual ladders actually meet their objectives and if they do, under which conditions. We contribute to this research area by pointing to two factors integral to the successful application of dual ladders, perceived recognition and transparency, which we relate to innovators' organizational commitment and career satisfaction. Taking innovators' career attitudes into account, we further analyze how self-directedness influences these relationships. Drawing on a sample of 382 innovators pertaining to 33 organizations, we find support for the positive relationship between these success factors and innovators' commitment and satisfaction. However, we also note how self-directed career management weakens these effects. We discuss the implications of our results and highlight some directions for future research.

³ This unpublished working paper was written by Patrick Hoffmann based on conjoint work with Prof. Dr. Martin Högl, Prof. Dr. Miriam Müthel, and Dr. Matthias Weiss. Previous versions were presented at the Academy of Management Conference 2012 under the title "Success factors of dual ladders and their effects on commitment and career satisfaction" and at the European Academy of Management Conference 2012 under the title "Effects of recognition and transparency of dual ladders."

5.1 Introduction

In recent years, increasing international competition and shortened product life cycles have made innovativeness an ever more important factor for achieving a sustainable competitive advantage (Armstrong-Stassen & Schlosser, 2008; Hauschildt & Kirchmann, 2001; Hoegl & Weinkauff, 2005). Innovators, such as engineers and scientists, have therefore become highly significant for organizations. Thus, in theory and practice, there has been an intensive search for career management systems that could increase the organizational commitment and the career satisfaction of these technical professionals (Allen & Katz, 1986; Gerpott et al., 1988; Schein, 1978).

However, this is easier said than done: Most existing reward options and incentive schemes of formal managerial hierarchies do not seem to adequately reflect innovators' career aspirations and expectations (Katz & Tushman, 1990; Katz et al., 1995; Kim & Cha, 2000). One of the major reasons is that many technical professionals are not attracted by managerial responsibility because they want to focus instead on their technical interests (Allen & Katz, 1986; Dalton & Thompson, 1985; Gerpott et al., 1988; Gouldner, 1957, 1958; Katz & Tushman, 1990).

Enabling innovators to advance their careers without being assigned managerial functions and responsibilities is thus currently a dilemma for HR managers. A potential solution to this problem is the so-called dual ladder career and promotional systems, also known as individual contributor or technical ladders (Kieser & Walgenbach, 2003; Katz et al., 1995; Spear & Souder, 1986). These systems have been especially developed for technical staff and received increasing attention in the management literature of the 1980s and 1990s (e.g., Allen & Katz, 1986; Bailyn, 1991; Katz & Tushman, 1990; Spear & Souder, 1986). Dual ladder systems establish a second hierarchy in the organization. In addition to

the path for managerial career progression, the technical ladder provides a parallel opportunity for nonmanagerial professional advancement. Furthermore, dual ladders promise equal pay and status at equivalent levels in both hierarchies (Katz et al., 1995; Smith & Szabo, 1977).

Although the career management literature has proclaimed the effectiveness of the dual ladder (e.g., Allen & Katz, 1986, 1992; Bailyn, 1991; Cantrall et al., 1977; Gunz, 1980; Igbaria et al., 1999), rigorous empirical examinations of the success factors of the design of this career management practice are rare. This is because there has been such an ongoing and intense debate on the usefulness of dual ladders that research has never really taken the next step of empirically investigating the concept. Consequently, despite their huge popularity in practice in the last decades, interest waned in the research literature after the 1990s. This trend continues today, insofar as there is a lack of empirically based understanding of the factors integral to the successful application of dual ladders. There is also no operational definition or appropriate measures of these success factors.

Nevertheless, research on dual ladders is urgently needed to accompany the ongoing implementation of this concept in practice, as well as to enhance the effectiveness of the dual ladder systems already in place (Levine, Albright, & Fiester, 2010). The need for research has further increased because career attitudes have changed strongly since the era of the traditional career in which the organization was the primary driver (Arthur et al., 2005; Arthur & Rousseau, 1996b, 1996a; Briscoe & Finkelstein, 2009; Hall, 1976). This development has resulted in an increase in the self-directed career management of individuals, which has put high pressure on organizational career management systems, such as the dual ladder, to achieve objectives (e.g., Baruch & Peiperl, 2000; De Vos et al., 2009; Verbruggen, 2008).

The present study addresses these research gaps and aims to make two main contributions. First, we offer a more fine-grained conceptualization of the dual ladder career system. Drawing on procedural justice theory (Folger & Greenberg, 1985; Folger & Konovsky, 1989; Kim & Mauborgne, 1993; Thibaut & Walker, 1975), we suggest two specific characteristics of the design of dual ladders, namely, perceived recognition and transparency, which are likely to increase innovators' organizational commitment and career satisfaction.

According to Katz and colleagues (Allen & Katz, 1986; Katz & Tushman, 1990; Katz et al., 1995), it is the lack of recognition of the technical career path in comparison to the managerial ladder on the one hand, and the missing transparency of the intent and the design of the technical hierarchy on the other hand, which have impeded the success of the dual ladder career systems thus far. Whereas the importance of the recognition of dual ladders seems to be widely accepted, transparency might be equally significant, as current research on procedural justice has demonstrated that perceptions of justice are directly related to career satisfaction (Colquitt, Conlon, Wesson, Porter, & Ng, 2001).

First, we contribute to the conceptualization of dual ladders by specifying and empirically validating important characteristics as success factors of these career management systems. In addition to our conceptualization, we develop two scales to measure the recognition and transparency of dual ladders in organizations. In so doing, we redress the lack of appropriate measurement instruments in the literature.

Second, we take into account the change in career attitudes described in new career theory (Briscoe et al., 2006; Briscoe et al., 2010; Hall, 1996b) and investigate its influence on the relationships between the proposed characteristics of dual ladders and the objectives of applying these systems. Following contemporary career research, the responsibility for

managing careers has largely shifted from the organization to the individual. The result is a new self-directed career management that implies independence from external career influences such as career management systems (Briscoe & Finkelstein, 2009; Briscoe & Hall, 2006; Briscoe et al., 2006). Therefore, we scrutinize whether the relationships between the characteristics of dual ladders and organizational commitment on the one hand, as well as career satisfaction on the other hand, are contingent on innovators' self-directed career management. Building on the results of these analyzes, we advance theory by integrating relationships proposed by new career theory with the concepts of dual ladder systems.

In the following section, we review existing research on dual ladder career and promotional systems. Building on this theoretical foundation, we then develop hypotheses relating important characteristics of dual ladders to innovators' organizational commitment and career satisfaction. In the next step, we conceptualize the moderating effects of innovators' self-directed career management on the relationships between recognition of the dual ladder and innovators' organizational commitment, as well as career satisfaction. We then test our hypotheses based on a sample of 382 innovators pertaining to 33 organizations. The paper closes with a discussion of the study's main theoretical and practical implications, along with its limitations and future prospects.

5.2 Conceptual background and hypotheses

5.2.1 Dual ladders

To attract and maintain technical talent, many organizations have integrated dual ladder career and promotional systems into their bundle of career management practices (Cantrall et al., 1977; Gunz, 1980; Smith & Szabo, 1977). The basic principle behind this

concept is to establish a second hierarchy in the organization. Whereas career advancement in the managerial ladder comes with increased personnel responsibility and administrative tasks (Burke, 2007; Moment & Fisher, 1973), in the technical ladder the focus is on permanently creating technical innovation (Allen & Katz, 1986, 1992; Shepard, 1958; Van Wees & Jansen, 1994).

The dual ladder has been especially designed to promote and reward technical personnel without removing them from their professional work and to provide them with the opportunity to remain in their technical field of interest (Domsch, 1993; Gerpott, 1994; Shepard, 1958). For example, in the technical ladder, innovators might get higher salaries and higher amounts of autonomy as a reward for good work in their specialized research areas (Katz & Tushman, 1990; Katz et al., 1995).

The management literature has discussed dual ladder career and promotional systems since the 1950s (McMarlin, 1957; Shepard, 1958). A high proportion of the contributions have been published in practitioners' journals (e.g., Levine et al., 2010; Mainiero & Upham, 1986; Rubenstein, 1999). This suggests that the dual ladder may be a useful and valuable approach to tackle the problem of losing innovators in R&D to other organizations or because of them moving into management positions.

In contrast to the wide presence in the practitioner literature, scholarly work on this topic, in particular empirical research is rather scarce. For instance, Allen and Katz (1986) underline that a substantial proportion of innovators prefer career advancement in a technical ladder to a move into a management position. Furthermore, they highlight that young technical employees, especially the highly educated, are more interested in a technical career than their older and less educated colleagues (Allen & Katz, 1986, 1992). Finally, these studies note that the success of employees in a dual ladder system depends on supervisory

promotion and network location (Katz et al., 1995). In contrast, other contributions question whether dual ladders can achieve their objectives (e.g., Bailyn, 1991; Gunz, 1980; Igbaria et al., 1999). For instance, Cantrall et al. (1977) point out that the application of dual ladders is unsuccessful when the technical ladder is misused as a reward for organizational loyalty, as is often the case in practice.

However, analyzing the drawbacks of dual ladders described in the literature reveals that most studies actually do not question the effectiveness of the system itself, but rather its design and sustainability (Allen & Katz, 1986; Shepard, 1958; Spear & Souder, 1986; Van Wees & Jansen, 1994). For example, Bailyn (1991) does not argue that the dual ladder concept is not working at all, but rather that it must be broadened to multiple ladders to take into account the various career orientations of innovators in the R&D lab. A crucial aspect that seems to undermine the effectiveness of the dual ladder is that innovators often evaluate it as unfair (Allen & Katz, 1986; Cantrall et al., 1977; Gunz, 1980; Katz & Tushman, 1990). This is highly problematic, as research on procedural justice has underlined the importance of perceived fairness for employee behavior (Akgün, Keskin, & Byrne, 2010; Colquitt et al., 2001).

Procedural justice theory highlights that employees value fair processes in an organization (Folger & Greenberg, 1985; Folger & Konovsky, 1989; Kim & Mauborgne, 1993; Thibaut & Walker, 1975). For instance, it has been shown that perceived fairness increases the commitment of an individual to an organization or team (Folger & Konovsky, 1989; Korsgaard, Schweiger, & Sapienza, 1995; Taylor, Tracy, Renard, Harrison, & Carroll, 1995), the effort employees invest in their respective tasks (Konovsky & Cropanzano, 1991; Lee, 1995), and the acceptance of organizational rules (Kim & Mauborgne, 1993; Sparks, Bottoms, & Hay, 1996). Therefore, the crucial question regarding dual ladders appears to be:

How can organizations design dual ladders to increase innovators' appreciation of these career management systems?

5.2.2 Recognition of dual ladders

Research on procedural justice stresses that employees evaluate the quality of interpersonal treatment received from the management and other authorities of the organization (Cohen-Charash & Spector, 2001; Colquitt et al., 2001; Folger, 1977). Drawing on this assumption, we suggest that an important characteristic of dual ladders is perceived recognition. In the context of our study, recognition means that innovators in the technical ladder are just as valued as employees with managerial tasks and responsibilities, and that this view is promoted throughout the whole organization.

The problems arising from a lack of recognition of the technical career path in comparison to the managerial ladder are mentioned in many contributions on the dual ladder concept (e.g., Aryee, 1992; Bailyn, 1991). These studies highlight how the lack of recognition originates from two directions: First, managerial career advancement is highly prestigious and valued in organizations and society (Allen & Katz, 1986). This becomes quite clear when comparing job titles. For instance, most people may think that the Vice President of an organization is more important than a Senior Research Fellow (Allen & Katz, 1986; Shepard, 1958). Second, managerial career advancement is usually accompanied by an increase of power, as expressed by the number of employees reporting to that manager (Allen & Katz, 1986; Shepard, 1958).

In contrast, career advancement in the technical ladder does not provide any visible increase in power and is therefore in many cases evaluated by its workforce as less central to

the organization. Consequently, many innovators may think about moving into a management position (Dalton & Thompson, 1985; Gerpott et al., 1988). Consistent with research on procedural justice, we argue that recognition is likely to affect innovators' evaluation of the dual ladder application.

On that score, we build on extant dual ladder research (Katz et al., 1995; Smith & Szabo, 1977; Spear & Souder, 1986) by focusing on the effect of dual ladders on two specific organizational objectives, the facilitation of which are a major reason for applying these systems and therefore represent suitable indicators of their effectiveness. First, dual ladders aim at increasing innovators' organizational commitment to retain a highly qualified pool of technical talent for the organization (Allen & Katz, 1986; Katz & Tushman, 1990). Research on organizational commitment has conceptualized and measured organizational commitment in many different ways (Allen & Meyer, 1990; Mowday, Steers, & Porter, 1979; Pierce & Dunham, 1987; Riketta & Van Dick, 2009). Extracting the core of the many definitions of organizational behavior, organizational commitment refers to the relationship between employees and the organization they work for (Angle & Perry, 1981; Blina, Duchon, & Meixner, 1991; Meyer & Allen, 1990, 1991). Employees with a strong commitment to the organization have been shown to possess a stronger intention to stay in an organization than those who are weakly committed (Meyer & Herscovitch, 2001; Riketta, 2002; Riketta & Van Dick, 2009).

Drawing on procedural justice theory, we expect that a high recognition of the technical ladder in an organization will improve innovators' organizational commitment. This is because innovators will respond to high recognition of this career management practice by evaluating the technical ladder as comparable to the managerial ladder. Hence, they will feel supported and valued by the organization because they are offered a useful and

fair career management system as well as opportunities for future career advancement. As a result, their commitment to the employing organization will increase and the possibility to work for another employer will be less interesting. Hence, we hypothesize:

Hypothesis 1. Perceived recognition of the dual ladder is positively related to innovators' organizational commitment.

The second major objective of the application of dual ladders is to provide innovators with adequate career development opportunities in their field of interest and, as a result, to boost their career satisfaction (Allen & Katz, 1986; Katz & Tushman, 1990). Career satisfaction refers to the degree of satisfaction an individual derives from her or his career (Judge, Cable, Boudreau, & Bretz, 1995). It is often an indicator for subjective career success in the career management literature (Arthur et al., 2005; De Vos & Soens, 2008; Heslin, 2005; Ng, Eby, Sorensen, & Feldman, 2005). Research on this topic has shown a positive relationship between career satisfaction and various organizational outcomes, such as the intention to stay in the organization (Armstrong-Stassen & Ursel, 2009; Nauta, van Vianen, van der Heijden, van Dam, & Willemsen, 2009), or support for organizational change (Gaertner, 1989).

Building on procedural justice theory, we assume that when innovators evaluate career management systems such as the dual ladder as fair, they are likely to demonstrate increased career satisfaction because they feel supported and fairly treated by the organization. The dual ladder then promises to provide chances and opportunities for innovators' career development equivalent to those offered by the managerial ladder (Katz et al., 1995; Van Wees & Jansen, 1994). One aspect that signals if the dual ladder can actually turn promises into action is recognition. When a career management practice such as the

dual ladder is highly valued in an organization, this will be understood by innovators as an indicator that their contributions to the success of the organizations are highly appreciated and that, in turn, they are provided with opportunities for career advancement. As a result, we argue that the higher the recognition of a dual ladder system, the higher the career satisfaction of innovators will be. Hence, we hypothesize:

Hypothesis 2. Perceived recognition of the dual ladder is positively related to innovators' career satisfaction.

5.2.3 Transparency of dual ladders

As per the general definition of fairness used in justice theory (Lind & Tyler, 1988), we argue that the expression “fair” in the dual ladder context not only means that dual ladders are recognized in the organization, but that the procedures and criteria underlying personnel selection and promotion decisions are highly transparent to the innovators (Allen & Katz, 1986; Katz & Tushman, 1990). A lack of transparency is likely to arise from the notion that, over time, some organizations tend to diverge from the initial design of the dual ladder career and promotional system (Allen & Katz, 1986; Gunz, 1980). For instance, whereas in the first few years the criteria for selection and promotion are rather strict, some organizations ease their requirements and guidelines when needed to use the technical ladder for purposes other than those intended (Bailyn, 1991; Cantrall et al., 1977). The technical ladder then often becomes a destination for failing managers or a camouflaged reward for organizational loyalty and is thus not evaluated as fair (Allen & Katz, 1986; Gunz, 1980).

Therefore, drawing on procedural justice theory, we propose that transparency is a second characteristic of dual ladders that signals the fairness of the system. We argue that the

transparency of the dual ladder career and promotional systems plays a crucial role in the fairness perception of innovators, which determines how the innovative workforce values the application of dual ladders. With high transparency in place, we expect higher levels of organizational commitment among innovators. This is because transparency offers innovators the opportunity to evaluate and understand the incorporation of a post into the hierarchy. It signals to the innovators that the organization does not want to hide the rationale behind a staffing decision.

Promotions on this parallel career ladder are determined by an innovator's performance, thereby inducing a higher outcome expectancy regarding their perception of career advancement. This aspect not only facilitates the value innovators are likely to ascribe to the dual ladder career and promotional system, and the motivation they display in advancing on the technical career ladder, it is also expected to exert a positive influence on innovators' organizational commitment (Brockner et al., 2004; Latham, 2001). Hence, we hypothesize:

Hypothesis 3. Transparency of the dual ladder is positively related to innovators' organizational commitment.

In matters of career satisfaction, the second major objective for applying dual ladder career and promotional systems, we expect similar mechanisms. As per our preceding argument based on the theory of procedural fairness, we expect that a more transparent design of a dual ladder career and promotional system raises the fairness perception of innovators (Hack, 2011; Hack & Lammers, 2008). This also increases the value innovators are likely to ascribe to the application of these career management systems.

Therefore, we expect that, along with increased transparency, the career satisfaction of innovators is likely to rise. As mentioned in the previous section, an increased transparency of the dual ladder career and promotional system is likely to come along with a higher expectation of work outcomes and performance as being commensurate with one's advances on the technical career ladder. Regarding career satisfaction, innovators possessing such a higher outcome expectancy about their career should be more satisfied with their career, because this perception reflects the belief that they are able to master their external environment (Ng et al., 2005; Spector, 1982). This is likely to result in higher career satisfaction than the perception that one's career advancement is not directly connected to one's performance (Spector et al., 2002). Hence, we hypothesize:

Hypothesis 4. Transparency of the dual ladder is positively related to innovators' career satisfaction.

5.2.4 Moderating effects

When investigating career management practices such as the dual ladder, it is important to take into account the ongoing changes in career development as described in new career theory (Arthur, 1994; Briscoe & Finkelstein, 2009; Briscoe et al., 2006; Peiperl & Baruch, 1997). For several years now, career research has been emphasizing that traditional careers have changed dramatically, because of, for example, organizational change and the shortening of product life cycles (Appelbaum & Close, 1999; Appelbaum, Simpson, & Shapiro, 1987; Arthur et al., 2005; Briscoe & Finkelstein, 2009). Whereas in the past organizations offered long-time employment and linear career progression (Valcour & Tolbert, 2003; Whyte, 1956), the connections between employer and employee have

strongly faded over the last years (Briscoe et al., 2010; De Vos et al., 2009; De Vos & Soens, 2008; Sullivan & Arthur, 2006; Sullivan & Baruch, 2009).

As a result, managing the careers of their employees has become less important for organizations, and careers are regarded less as a joint task of employees and organizations (Arthur & Rousseau, 1996b; Aryee, 1992; Briscoe et al., 2006). New ways of viewing careers have come into existence, resulting in the creation of new career attitudes (Arthur, 1994; Briscoe & Finkelstein, 2009; Briscoe et al., 2006; Hall, 1976; Peiperl & Baruch, 1997).

One of the most dominant theories dealing with new career development is the protean career (Hall, 1976). In this type of career, the individual is in charge (not the organization) and decides on the degree of its own career success or failure (rather than relying on objective measures of success, such as salary increases). The protean career theory highlights the importance of the psychological success associated with a self-directed career management (De Vos & Soens, 2008; Hall, 1996a, 1996b, 2002). This career attitude of innovators is likely to influence the relationships of the recognition (but not the transparency) of the dual ladder and the objectives of applying these systems (Briscoe et al., 2006; Hall, 1996b, 2002). This is because innovators with a self-directed career attitude define for themselves what career success is. Thus, they are less dependent on recognition from others (Briscoe et al., 2006; Hall, 1996b, 2002).

Drawing on protean career theory, we therefore argue that the relationships between recognition of the dual ladder and organizational commitment, as well as career satisfaction, as hypothesized above, are influenced by a self-directed career attitude because the relationships are weaker when innovators' self-directed career management is high. Hence, we hypothesize:

Hypothesis 5. The positive relationship between perceived recognition of the dual ladder and organizational commitment will be moderated by self-directed career management in that the relationship between perceived recognition of the dual ladder and organizational commitment will be weaker when self-directed career management is high.

Hypothesis 6. The positive relationship between perceived recognition of the dual ladder and career satisfaction will be moderated by self-directed career management in that the relationship between perceived recognition of the dual ladder and career satisfaction will be weaker when self-directed career management is high.

5.3 Methods

5.3.1 Sample and data collection⁴

We based the empirical analyses on data from 33 organizations from a variety of industries (including automotive, chemicals, pharmaceuticals, logistics, and IT). We used this broad sample of industries to bolster the generalizability of the results. After agreeing to participate in our study, the organizations provided the contact information of employees whose job descriptions matched our definition of innovators. We then invited these persons via e-mail to participate in a strictly voluntary web-based survey, and assured them of the

⁴ In this paper, sample size is smaller than in the other two papers. This is because we focus on individual level effects and do only take those 33 of our 37 organizations into account which applied a dual ladder system at the time of data collection.

confidentiality and anonymity of their responses. The final sample consisted of 382 innovators (312 men and 70 women), resulting in a response rate of 77%.

5.3.2 Measures

Organizational commitment. We measured organizational commitment by using a scale developed by Cook and Wall (1980). Following their conceptualization, organizational commitment refers to an employee's feelings of attachment to the goals and values of the organization she or he works for and to the organization itself. The scale consisted of nine items including: "I am quite proud to tell people who it is I work for." Cronbach's alpha for this scale in the current study was .80. As for all measures in our investigation, we used a five-point Likert scale for this dependent variable.

Career satisfaction. We assessed career satisfaction with a three-item scale developed by Martins, Eddleston, and Veiga (2002), including items such as: "In general, I am satisfied with my current career status." Cronbach's alpha for this scale was .70. This dependent variable indicates the degree to which employees feel satisfied with their career status, progress, and their current job (Martins et al., 2002).

Recognition and transparency of the dual ladder. The independent variables were constructed using seven items including "I think that in my company the technical ladder is just as attractive as the managerial ladder," and "I think that in my company the assignment of technical ladder positions in the hierarchy is transparent." The items were specifically generated for the present study based on the discussion of these constructs in the literature on the dual ladder concept (see the description of the characteristics of the dual ladder above).

We used an exploratory factor analysis (maximum likelihood analysis with varimax rotation) to analyze the four items related to recognition and the three items related to the transparency of the dual ladder. The factor analysis supported our two-factor solution (Gorsuch, 1997). Table 5-1 shows the full list of items, factor loadings and their assignment to the two extracted factors (i.e., recognition and transparency).

We performed a confirmatory factor analysis on the two developed scales, which also yielded a satisfactory fit to the data for the two-factor solution (RMSEA = .07; CFI = .98; SRMR = .046; GFI = .97). Cronbach's alpha for recognition of the dual ladder was .83, and .93 for the transparency of the dual ladder.

Self-directed career management. We measured self-directed career management, that is, the degree to which employees believed they have a very independent career, with an eight-item scale developed by Briscoe and Hall (2006), including items such as "I am in charge of my own career." Cronbach's alpha for this scale was .76.

Control variables. As per many other contributions to career management (e.g., Briscoe & Finkelstein, 2009; Granrose & Portwood, 1987; Sturges et al., 2005), we controlled for a set of individual characteristics of the innovators. In our study, we used age (measured in years), gender (dummy-coded; 0 = "male," 1 = "female"), marital status (dummy-coded; 0 = "single," 1 = "married"), the number of children, organizational tenure (in years), and the level of education (we asked participant if they had a university degree; dummy-coded; 0 = "yes," 1 = "no").

Items	Factor 1: Recognition	Factor 2: Transparency
I think that in my company ...		
... the technical ladder is just as attractive as the managerial ladder.	.85	.22
... the reputation of the technical ladder equals that of the managerial ladder.	.76	.27
... it is attractive to advance in the technical ladder.	.64	.17
... the technical ladder is not a siding for failing managers.	.59	.21
... the assignment of technical ladder positions in the hierarchy is transparent.	.23	.92
... the assignment of technical ladder positions in the hierarchy is comprehensible.	.23	.95
... it is easy to understand why some positions are higher than others in the hierarchy.	.36	.72

Table 5-1: *Results of factor analysis*

5.3.3 Analysis

We used multiple regression analysis to test the hypotheses (Aiken & West, 1991; Cohen et al., 2003). The standardized values of the variables were used to compute the interaction term of self-directed career management and the perceived recognition of the dual ladder. After all control variables and main effects had been entered, the significance of the proposed interaction effects was assessed using the significance level of the interaction term as the key indicator for moderation (Aguinis, 1995). Table 5-2 shows the descriptive statistics and correlations.

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
1. Organizational commitment	3.95	0.55	--									
2. Career satisfaction	3.75	0.75	.42**	--								
3. Recognition of the dual ladder	3.24	0.90	.34**	.31**	--							
4. Transparency of the dual ladder	3.00	1.00	.38**	.35**	.47**	--						
5. Self-directed career management	3.99	0.49	.14**	.20**	.09	.13*	--					
6. Age	39.31	7.94	.17**	.05	.06	-.04	-.03	--				
7. Gender	0.18	0.39	-.01	.06	-.02	.07	-.06	-.17**	--			
8. Marital status	0.62	0.49	.17**	.05	-.02	-.02	.07	.48**	-.13*	--		
9. Number of children	0.93	1.08	.07	.06	-.00	-.05	.08	.44**	-.23**	.59**	--	
10. Organizational tenure	9.98	7.50	.19**	.09	.04	.02	-.10*	.68**	-.16**	.29**	.30**	--
11. Level of education	0.11	0.32	.17**	.10	.07	.20**	-.01	.12*	.15**	-.00	.02	.36**

^a n = 382

^b * p < .05

** p < .01 (two-tailed)

Table 5-2: Descriptive statistics and correlations of variables^{a, b}

To ensure content validity and to check for a possible common source bias, we used Harman's (1967) single-factor test as a commonly accepted means of addressing the issue of common method variance (Harman, 1967; Podsakoff et al., 2003). The test revealed that no single factor emerged from factor analysis, and that no general factor accounted for the vast majority of the covariance among the measures.

In addition, we applied the technique recommended by Lindell and Whitney (2001) to check for potential common method bias. Therefore, we identified the boundaryless mindset, a new career attitude developed by Briscoe et al. (2006) based on boundaryless career theory (Arthur et al., 2005; Sullivan & Arthur, 2006; Tams & Arthur, 2010), as a marker variable. It assesses individuals' preferences for working with people outside their organization and should not be theoretically relevant to the individual outcome variables in our models (Lindell & Brandt, 1999). The scale consisted of eight items including "I enjoy jobs that require me to interact with people in many different organizations" and Cronbach's alpha for this scale was .85. Nonsignificant and low correlations of this variable with the outcome variables in our models (-0.05 for organizational commitment, -0.01 for career satisfaction) were indicative of an absence, or a negligible amount, of common method bias in our data (Podsakoff et al., 2003).

Furthermore, since the correlation matrix depicted in Table 5-2 shows several significant correlations among independent variables, we estimated the variance inflation factors to check for potential multicollinearity. The variance inflation factors of the variables were clearly below 3, indicating no distortion of results due to multicollinearity (Cohen et al., 2003).

5.4 Results

Table 5-3 shows the results of our multiple regression analysis. To complement our analyses, we also checked for curvilinear relationships between the two characteristics of dual ladders and organizational commitment, as well as career satisfaction. However, we found no significant quadratic relationship among these variables, and the inclusion of the respective quadratic terms did not notably increase R^2 .

Regarding the relationships between recognition of the dual ladder and the objectives of applying these systems, we hypothesized that the perceived recognition of the dual ladder is positively related to innovators' organizational commitment (Hypothesis 1) and career satisfaction (Hypothesis 2). Furthermore, we proposed that there is a positive relationship between the transparency of the dual ladder and innovators' organizational commitment (Hypothesis 3), as well as innovators' career satisfaction (Hypothesis 4). The results in Table 5-3 support these four hypotheses.

In addition, we hypothesized that the relationship between recognition of the dual ladder and innovators' organizational commitment, as well as career satisfaction, is contingent on innovators' self-directed career management. The results of the interaction analyses documented in Table 5-3 support these hypotheses. In addition, we plotted graphs to depict these interactions. Figures 5-1 and 5-2 show a pattern consistent with the predictions of Hypotheses 5 and 6.

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.	Coefficient	s. e.
Controls												
Age	0.12	0.01	0.10	0.01	0.11	0.01	0.07	0.01	-0.01	0.01	0.01	0.01
Gender	-0.00	0.08	-0.01	0.07	-0.01	0.07	0.05	0.11	0.05	0.10	0.05	0.10
Marital status	0.16*	0.08	0.15*	0.07	0.15*	0.07	-0.02	0.11	-0.03	0.10	-0.02	0.10
Number of children	-0.07	0.03	-0.05	0.03	-0.07	0.03	0.07	0.05	0.09	0.04	0.06	0.04
Organizational tenure	0.00	0.01	0.02	0.01	0.04	0.01	0.02	0.01	0.05	0.01	0.07	0.01
Education	0.16**	0.10	0.08	0.09	0.08	0.09	0.08	0.14	0.00	0.13	0.00	0.13
Main effects												
Recognition of the dual ladder			0.20**	0.03	0.20**	0.03			0.21**	0.05	0.20**	0.05
Transparency of the dual ladder			0.27**	0.03	0.26**	0.03			0.27**	0.04	0.25**	0.04
Moderator												
Self-directed career management					0.12*	0.03					0.16**	0.04
Interaction term												
Self-directed career management *					-0.10*	0.03					-0.16**	0.04
Recognition of the dual ladder												
R ²	0.07		0.23		0.25		0.02		0.18		0.23	

n = 382. * p < .05, ** p < .01. Reported are unstandardized coefficients.

Table 5-3: Results of regression analysis

To further interpret the interaction effects, we assessed the simple slopes of the relationships between recognition of the dual ladder and innovators' organizational commitment, as well as the career satisfaction, contingent on the level of self-directed career management and calculated their levels of significance (Aiken & West, 1991). We analyzed the simple slopes one standard deviation above and below the mean level of the self-directed career management of innovators.

Analysis of the interaction between the perceived recognition of the dual ladder and self-directed career management revealed that the effect of recognition of the dual ladder on organizational commitment was significant and positive when self-directed career management was a standard deviation below the mean ($b = 0.18$, $t = 4.22$, $p < 0.01$) and was non-significant when self-directed career management was one standard deviation above the mean ($b = 0.06$, $t = 1.51$, $p = 0.13$).

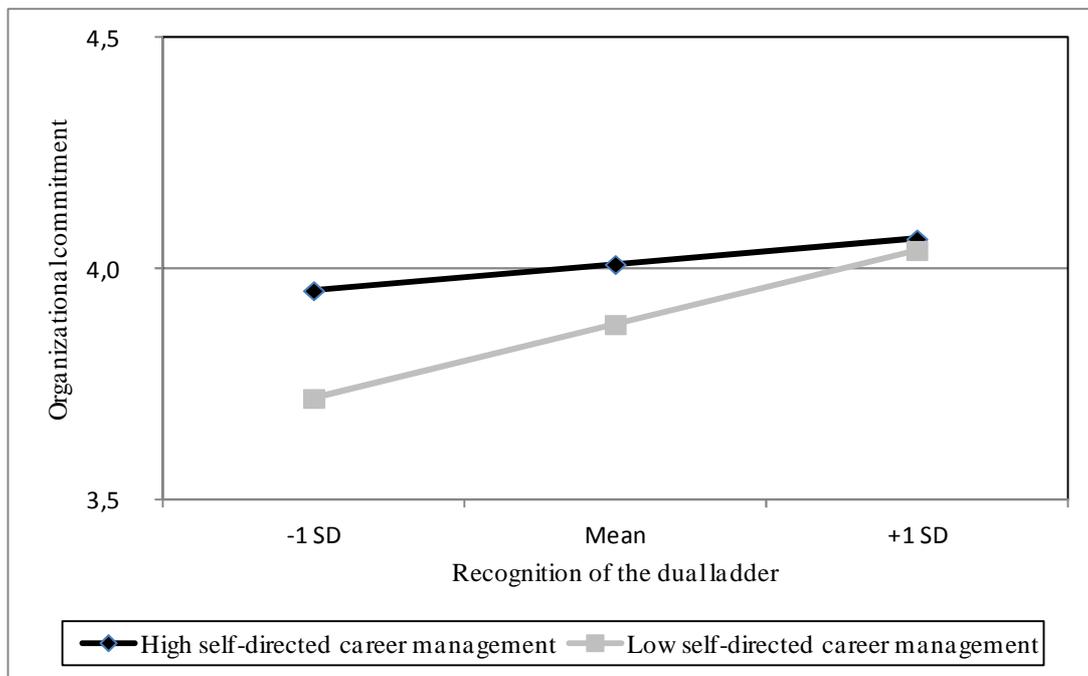


Figure 5-1: *Interaction of recognition and self-directedness on commitment*

The analysis of the interactions between recognition of the dual ladder and self-directed career management further revealed that the effect of recognition of the dual ladder on innovators' career satisfaction was significant and positive when self-directed career management was one standard deviation below the mean ($b = 0.29$, $t = 5.01$, $p < 0.01$) and was nonsignificant when self-directed career management was one standard deviation above the mean ($b = 0.05$, $t = 0.85$, $p = 0.40$). Simple slope analysis also supported the hypothesized pattern that given a low self-directed career management, the relationships between recognition of the dual ladder and organizational commitment, as well as career satisfaction are more positive.

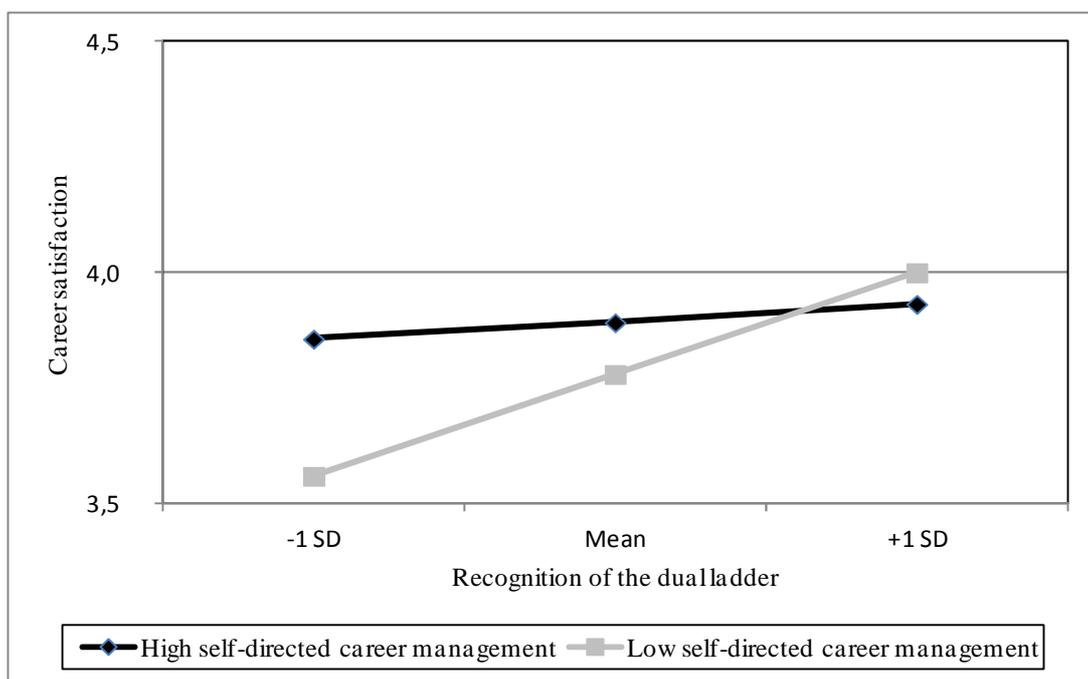


Figure 5-2: *Interaction of recognition and self-directedness on career satisfaction*

To complement our analysis, we checked if self-directed career management also moderates the relationships between transparency of the dual ladder and innovators'

organizational commitment, as well as career satisfaction. Regression analysis revealed that this was neither the case for the interaction term concerning the relationship between transparency of the dual ladder and organizational commitment ($p = 0.47$), nor for the interaction term concerning the relationship between the transparency of the dual ladder and career satisfaction ($p = 0.33$).

5.5 Discussion

As expected, we found that the recognition and the transparency of the dual ladder are positively related to the objectives of its application. In addition, as expected, the effects of the interaction of self-directed career management on the relationships between perceived recognition of the dual ladder and innovators' organizational commitment, as well as career satisfaction, were confirmed. This is because a self-directed career management negatively moderates the effects of the recognition of dual ladders on organizational commitment and career satisfaction. In the following section, we discuss the theoretical and practical implications of this study before noting some of its limitations and considering some possible avenues for future research.

5.5.1 Theoretical implications

This study supplements the literature on dual ladder career and promotional systems and offers a number of theoretical implications. First, we conceptualize the meaning of the recognition and the transparency of dual ladders by drawing on procedural justice theory and develop two scales to measure these characteristics (Folger & Greenberg, 1985; Folger & Konovsky, 1989; Kim & Mauborgne, 1993; Thibaut & Walker, 1975). This enables us to

demonstrate that procedural justice theory offers a very useful framework for dual ladder research because it explains how and why certain characteristics of the dual ladder influence individual outcomes, that is, innovators' organizational commitment and career satisfaction. In addition, we provide long-needed measurement instruments to advance the research on the design of dual ladder career and promotional systems. An appropriate design can help eliminate the problems of dual ladders described in career management literature, that is, the lack of recognition of the technical career path and the lack of transparency in the intent and design of the technical hierarchy (Allen & Katz, 1986; Katz & Tushman, 1990; Katz et al., 1995).

Moreover, the results highlight the importance of the recognition of the technical career path in an organization for the successful implementation and sustainability of dual ladder career and promotional systems. A strong recognition of the dual ladder in an organization can help reduce the disadvantages of the technical career path when compared to its managerial counterpart (Allen & Katz, 1986; Kieser & Walgenbach, 2003; Shepard, 1958).

In addition, the results show that the transparency of the dual ladder plays a very important role in determining innovators' organizational commitment and career satisfaction by signaling the fairness of the practice. However, misuse of the dual ladder (as with most other career systems) tends to limit the effectiveness of the application of this career management practice because it compromises the importance innovators attach to it, who no longer perceive the system as fair (Allen & Katz, 1986, 1992; Cantrall et al., 1977; Katz & Tushman, 1990).

As per current career management research (Arthur et al., 2005; Lips-Wiersma & Hall, 2007; Tams & Arthur, 2010), we considered the changing career attitudes of

employees (Briscoe & Finkelstein, 2009; Briscoe & Hall, 2006; Briscoe et al., 2006) and sought to ascertain whether self-directed career management influences the relationships between the proposed central characteristics of dual ladders and the objectives of applying these systems. We thereby responded to recent calls in new career research (Baruch, 2006; Baruch & Peiperl, 2000; Briscoe et al., 2010; Lips-Wiersma & Hall, 2007; Van Wees & Jansen, 1994) for the integration of relationships proposed by new career theory with career management concepts such as the dual ladder.

Based on our results, we argue that new career attitudes pose a great challenge to organizational career management practices, but do not fundamentally undermine their importance (Briscoe & Finkelstein, 2009; Briscoe & Hall, 2006; Briscoe et al., 2010; Van Wees & Jansen, 1994). It follows that the present study contributes to career management research by arguing that organizational career management remains relevant in today's changing business environment (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007).

5.5.2 Practical implications

From a managerial perspective, we highlight recognition and transparency as the factors integral to the successful implementation and use of dual ladders. Our study will provide organizations with the knowledge they need to build dual ladder career and promotional systems that achieve the objectives of their application (Allen & Katz, 1986; Shepard, 1958; Smith & Szabo, 1977).

In addition, the results indicate that organizations need to strengthen their cultural commitment to technical innovation (Conrad, 1999; Hoegl, Weinkauff, & Gemuenden, 2004;

Janiunaite, Cibulskas, & Petraite, 2011), and, as a result, improve the recognition of the technical ladder and the innovators working in this second, complementary hierarchy. This could be achievable, for example, through increased publicity, career counseling, and information dissemination (Dries, Pepermans, & De Kerpel, 2008; Guo, 2009; Hsiao, 1997; Verbruggen, 2010).

Furthermore, we suggest that organizations can improve the recognition of the dual ladder by promoting an innovative organization culture (Chang & Choi, 2007; Dombrowski et al., 2007; Kalyani, 2011). In this vein, organizations might establish innovative mission and vision statements, democratic communication, collaboration, boundary-spanning, adequate incentives, and innovation-friendly leadership (Bavec, 2009; Rubera & Kirca, 2012; Schein, 2003).

Moreover, organizations can underline the importance of the technical ladder and technical contributions for the success of the organization in their internal and external communication (Hourquet & Roger, 2005; Jin Feng & Shu Hwa, 2004; Kreiser & Davis, 2010). For instance, organizations could praise and present technical innovations on their intranet or highlight them in the annual organization statement (Lægheid et al., 2011; Nien-Chi & Min-Shi, 2011). In addition, organizations can foster their cultural commitments to innovation, for example, by increasing the recognition of new technical developments and the number of technical employees in the organization (Allen & Katz, 1986; Brockman, Jones, & Becherer, 2012; Chang & Choi, 2007; De Cleyn & Braet, 2012; Falkenreck & Wagner, 2011).

The results of our study furthermore reveal that organizations should be more attentive to the preservation of the transparency of the dual ladder, for example, by not using the system as a destination for failing managers or as a reward for organizational loyalty

(Allen & Katz, 1986; Cantrall et al., 1977; Gunz, 1980; Katz & Tushman, 1990). Consistent with other investigations of dual ladders, we argue that organizations need to have clear job descriptions, qualification requirements, demarcated areas of responsibilities, performance standards, and reporting relationships to maintain and promote the dual ladder in general and the transparency of the system in particular (Allen & Katz, 1986; Cantrall et al., 1977; Katz & Tushman, 1990).

5.5.3 Study limitations and future research

In addition to the results of our study, we wish to highlight a few limitations and some suggestions for future research. One possible limitation stems from the use of cross-sectional data, because only relationships between variables can be demonstrated and causalities cannot be fully established. Therefore, a longitudinal design would add to our understanding as this uncovers causalities.

Furthermore, the male dominance within our sample (82%) gives reason to think about the consequences of this pronounced gender imbalance (Hack & Lammers, 2008, 2009). Although this imbalance represents the common situation in innovative work areas, we nonetheless believe that a closer examination of the effects of gender and gender diversity is warranted in terms of the relationships between dual ladder characteristics and the objectives of the application of this organizational career management practice. Indeed, it could offer fresh insights on the fostering of innovation in organizations.

Such limitations could stimulate further analysis of the role that various success factors of dual ladders play in determining the results of the application of career systems.

As such, the examination of further characteristics appears worthwhile to deepen our understanding of the mechanisms underlying the observations in our study.

6 Concluding discussion

6.1 Summary of the results

The results of my doctoral thesis reveal that, despite the assumptions of many new career researchers to the contrary (Aselage & Eisenberger, 2003; Chen et al., 2008; Sturges et al., 2005), innovators' careers can still be influenced and developed by organizations. In Chapter 3, I examined the effects of new career attitudes and organizational culture on the managerial career orientation of innovators. My conceptual and empirical cross-level analyses show that innovators' managerial career orientation is negatively related to a culture characterized by innovativeness, power sharing, as well as learning and development on the organizational level, and values-driven career management on the individual level.

In addition, managerial career orientation is positively related to the cultural aspect of support and collaboration on the organizational level, as well as self-directed career management, a boundaryless mindset, and a preference for organizational mobility on the individual level. These results do not provide only a key to understanding why some innovators turn into managers in the course of their careers. More broadly, the results highlight the possibilities for managers to change their organization by retaining key technical talents in the position where they are most valuable for the innovation process.

In Chapter 4, I analyzed the conditions in which organizational career management increases innovators' perceived career management support. My results suggest that organizations should apply career management intensively but should not simply implement as many instruments as possible. Furthermore, the findings show that it is not worth the effort to further diversify an already intensively applied organizational career management.

In addition, the results underscore the positive relationship between innovators' perceived career management support and the match between individual and organizational career plans. These results foster our knowledge of how organizational career management must be applied to be effective. Furthermore, they hint at two ways in which managers can create a competitive advantage for their organization by retaining innovators.

In Chapter 5, I investigated the conditions in which dual ladders actually meet their objectives by increasing innovators' organizational commitment and career satisfaction. My results highlight that the recognition and transparency of the dual ladder system are crucial for the successful application of dual ladders and are positively related to innovators' organizational commitment and career satisfaction.

Moreover, my analyses show that a new career attitude (i.e., self-directedness) moderates the relationships between perceived recognition of the dual ladder and organizational commitment and career satisfaction. These results reveal how dual ladders need to be applied to be effective and how managers can create a competitive advantage for their organization by retaining innovators.

In summary, the results of my analysis provide a starting point for the development of a more balanced view of the traditional and contemporary careers of innovators than described in the contemporary career literature. Table 6.1 gives an overview of the hypotheses tested in Chapters 3-5.

Hypothesis	Result
Chapter 3 - What makes innovators turn into managers?	
Self-directed career management is positively related to innovators' managerial career orientation.	✓
Values-driven career management is negatively related to innovators' managerial career orientation.	✓
Boundaryless mindset is positively related to innovators' managerial career orientation.	✓
Organizational mobility preference is negatively related to innovators' managerial career orientation.	X
Innovativeness in an organization is negatively related to innovators' managerial career orientation.	✓
Power sharing in an organization is negatively related to innovators' managerial career orientation.	✓
Support and collaboration in an organization is positively related to innovators' managerial career orientation.	✓
Learning and development in an organization is negatively related to innovators' managerial career orientation.	✓
Chapter 4 - Effects of organizational career management	
Intensity of organizational career management is positively related to innovators' perceived career management support.	✓
Diversity of organizational career management is positively related to innovators' perceived career management support.	X
The combination of the intensity and the diversity of organizational career management is positively related to innovators' perceived career management support.	X
Perceived organizational career management support is positively related to the match between individual and organizational career plans.	✓
Chapter 5 - The dual ladder: How to get from managerial delusion to motivational solution	
Perceived recognition of the dual ladder is positively related to innovators' organizational commitment.	✓
Perceived recognition of the dual ladder is positively related to innovators' career satisfaction.	✓
Transparency of the dual ladder is positively related to innovators' organizational commitment.	✓
Transparency of the dual ladder is positively related to innovators' career satisfaction.	✓
The positive relationship between perceived recognition of the dual ladder and organizational commitment will be moderated by self-directed career management.	✓
The positive relationship between perceived recognition of the dual ladder and career satisfaction will be moderated by self-directed career management.	✓

Table 6-1: *Summary of hypotheses tested in the thesis*

6.2 Theoretical implications

6.2.1 Approaching contemporary careers of innovators

In my dissertation, I set out to provide a more balanced view on innovators' careers than offered in career management literature by integrating the answers to three central research questions. One of those is why some innovators turn into managers in the course of their career (see Section 1.4). In particular, I wanted to take a closer look at the role that new career attitudes and organizational culture play in this context. This is especially important because having a comprehensive understanding of the determinants of managerial career orientation might be crucial for the long-term success of an organization (Aryee, 1992; Cha et al., 2009; Gerpott et al., 1988).

If an innovator leaves the innovation process of an organization to become a manager, the lost and missing tacit knowledge will usually be detrimental to the innovativeness of the organization (Goffin & Koners, 2011). In addition, the replacement of the innovator might take some time and could prove very expensive (Kochanski & Ledford, 2001). This underlines the importance of increasing our knowledge of the antecedents of innovators' managerial career orientation (Aryee, 1992; Rynes, Tolbert, & Strausser, 1988; Schein, 1975). However, as pointed out in Chapter 3, little research has been conducted on this subject (Gerpott et al., 1988; Kim & Cha, 2000).

To address my research question and to add to the literature on managerial career orientation, I first applied the theory of reasoned action and the theory of planned behavior to the context of career orientation (Ajzen, 1985, 1988, 1991; Ajzen & Fishbein, 1980). My results contribute to the small body of research that has used these theories in the context of vocational behavior (Arnold & Cohen, 2008; Arnold et al., 2006). Furthermore, the results of my analyses show that the theory of reasoned action and the theory of planned behavior offer

a useful framework for career management research by explaining how career attitudes shape career orientation.

In the next step, I analyzed how new career attitudes influence innovators' managerial career orientation. The objective was to increase our knowledge of how the changing notion of careers affects career orientation. My results highlight the relationship between new career attitudes and innovators' managerial career orientation. These results add to the growing body of literature on new careers (see, e.g., Dries et al., 2012a; Gerber et al., 2012; Lips-Wiersma & Hall, 2007).

Nevertheless, my results reveal that the innovators who score highly on new career attitudes do not necessarily score highly on managerial career orientation. Thus, I offer new knowledge on how managerial career orientation is influenced by the changes described in new career theory and I add to the increasing number of research studies on the implications of new career attitudes on vocational behavior (Becker & Haunschild, 2003; Briscoe & Finkelstein, 2009; De Vos et al., 2008). By investigating the relationships between new career attitudes and managerial career orientation, my study provides detailed information on various antecedents of managerial career orientation. In addition, my results contribute to new career theory by showing that the changes of careers influence innovators' managerial career orientation.

Moreover, I extended research on organizational socialization and the person-environment fit (Fisher, 1986; Helena & Neil, 2006; Schein, 1968) to link managerial career orientation with dimensions of organizational culture (Hurley, 1995; Hurley & Hult, 1998). The results of my analysis indicate that organizational culture dimensions influence innovators' managerial career orientation. Therefore, my study adds to the burgeoning research on the impact of organizational culture and it provides new knowledge on how

organizational socialization and the person-environment fit influence innovators' managerial career orientation.

By analyzing the impact of individual and organizational level variables on innovators' managerial career orientation, I respond to recent calls in the career management literature for combining perspectives of individual and organizational level influences (Anderson et al., 2004; Klein & Kozlowski, 2000; Rousseau, 1985). Consequently, my results provide a more holistic view on careers than the current career management literature (Baruch, 2006).

A further contribution of my study is that it adds to the scarce but growing cross-level research that investigates the relationship between individuals' vocational behavior and cultural variables (Cullen et al., 2004; Muethel et al., 2011). This provides a starting point for future research on the impact of culture on career orientation.

In summary, my research reveals that there are many different reasons why some innovators turn into managers in the course of their career. In particular, my results show that new career attitudes and organizational culture are important factors.

Section 1.4, furthermore, raises the question of whether organizational career management can still influence innovators' careers. I wanted to analyze how organizations can improve their organizational career management to increase innovators' perceived career management support. Addressing this question is crucial because of the contrasting views in the current career management literature. Whereas some researchers argue that the need for adequate organizational career management has increased in recent years because of the growing importance of key talents in the innovation process (e.g., Ladwig & Domsch, 2011), others postulate that organizations have withdrawn from career management because individuals have assumed this responsibility (see, e.g., De Vos et al., 2009). Hence, there is a

strong need for research on that issue to deepen our understanding of the role that organizational career management plays in the employer-employee relationship, as shown in Chapter 4.

First, to address the research question, I analyzed how intensive and diversified organizational career management should be. Second, I examined whether organizational career management can increase the compatibility of individual and organizational career plans. My results provide fundamental information that adds to the ongoing discussion of how to make organizational career management effective (Parboteeah et al., 2005; Sturges et al., 2005; Zhou & Li, 2008). Furthermore, my study contributes to the current discourse in career management research on the importance of organizational career management in the era of the new career (Baruch, 2006; Baruch & Peiperl, 2000; Briscoe & Finkelstein, 2009).

In addition, I linked organizational career management on the organizational level to innovators' perceived career management support on the individual level. I thereby responded to the calls of many researchers in the HR field for more cross-level research by providing a cross-level basis for future research in that matter (Anderson et al., 2004; Klein et al., 2000; Klein & Kozlowski, 2000). This is of utmost importance in terms of fostering a more balanced approach to careers with a view to investigating the determinants of perceived career management support.

Furthermore, my study confirms that organizational career management remains important (Baruch & Peiperl, 2000; Ladwig & Domsch, 2011; Parboteeah et al., 2005). The results show that organizations can use career management to increase innovators' perceived career management support.

In summary, my analyses show that organizational career management can still influence innovators' careers. This means that the answer to my second central research

question is simply “yes.” Furthermore, the results of my study reveal that increasing innovators’ perceived career management support with the help of organizational career management might be beneficial for organizations because it increases the match between individual and organizational career objectives.

The remaining central research question of my thesis is how organizations can make dual ladders work to increase innovators’ career satisfaction and organizational commitment (see section 1.4). In this context, it seems to be especially important to identify crucial success factors for the application of this organizational career management practice. Research in that area is required to accompany the ongoing implementation of dual ladders in many innovative organizations (Kieser & Walgenbach, 2003; Ladwig & Domsch, 2011). However, as Chapter 5 argues, hitherto there have been few empirical or theoretical studies of dual ladder career and promotional systems.

To address the research question, I started analyzing how dual ladders can be appropriately used by taking into account the changing notion of careers (Gerber et al., 2012; Lips-Wiersma & Hall, 2007; Verbruggen, 2010). Therefore, I first drew on procedural justice theory to develop and conceptualize two scales to measure the perceived recognition and transparency of dual ladders (Chien et al., 2010; Thibaut & Walker, 1975). To this end, I offer a new measurement instrument as a starting point for further research on how to design dual ladders. This will help tackle the many problems of dual ladders described in the career management literature (Allen & Katz, 1986; Cantrall et al., 1977; Gunz, 1980; Van Wees & Jansen, 1994). Furthermore, my results show that procedural justice theory offers a useful framework for dual ladder research by explaining how certain characteristics of the dual ladder influence individual outcomes.

In the second step, my results show that the recognition of the dual ladder is crucial for the successful implementation of a dual ladder system because it minimizes some of the

drawbacks of the technical path when compared to the managerial ladder. Moreover, my results highlight how the transparency of the dual ladder is crucial, as it signals, for example, that the assignment of posts and the recruiting process are fairly conducted.

Furthermore, I studied if the relationships between recognition of the dual ladder and organizational commitment, as well as career satisfaction, are influenced by the change of career attitudes (Lips-Wiersma & Hall, 2007; Tams & Arthur, 2010). Therefore, I examined if self-directed career management moderates the relationships. By integrating new career attitudes and dual ladder research, I responded to recent calls in the new career literature for an analysis of the influence of new career attitudes on career management (Baruch, 2006; Van Wees & Jansen, 1994). Moreover, the outcomes of my analyses show that new career attitudes challenge the use of organizational career management, but do not have a decisive impact on its usefulness (Briscoe & Finkelstein, 2009; Briscoe et al., 2010). This confirms that organizational career management remains valuable, despite the changes of careers (Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007).

In summary, my analyses show that organizations can increase the effectiveness of dual ladders by increasing and sustaining the recognition and transparency of their respective dual ladder systems. My results, therefore, provide a starting point for further research of the factors that make dual ladders work.

6.2.2 Balancing traditional and contemporary views

According to contemporary career theory, in the past organizations had a rigid formal structure and hierarchy, and operated in stable environments (Baruch, 2006; Briscoe et al., 2006; Hall & Moss, 1998). Hence, their employees' career development was linear and

rather predictable (Tams & Arthur, 2010; Valcour & Tolbert, 2003; Whyte, 1956). In contrast, nowadays organizations are supposed to be embedded in highly dynamic markets, and careers are much more flexible (Briscoe et al., 2006; Hall, 1996b, 2002). This has made organizational career management even more difficult than before (Allen, Jimmieson, Bordia, & Irmer, 2007; Armstrong-Stassen, 1994, 2003; Tolbert, 1996).

In the new career literature, the changes of careers triggered by organizational change have been described as huge and fundamental (Arthur & Rousseau, 1996b; Bird, 1994; Evans & Gunz, 1996). However, in line with recent approaches of other career researchers (e.g., Baruch, 2006; Lips-Wiersma & Hall, 2007), the results of my study show that the changes have been rather moderate. Whereas the developments have influenced what it means to have a career, they have not changed careers completely. For example, organizational career management can still be effective and can help organization to increase innovators' perceived career management support, as shown in Chapter 4.

However, the changing notion of careers has affected the way organizations should approach their innovators' careers (Gerber et al., 2012; Lips-Wiersma & Hall, 2007; Verbruggen, 2010). As highlighted in Chapters 3 and 5, attitudinal changes to careers might have an influence on innovators' career orientation and the way organizational career management practices should be used. For example, this impact is clearly reflected in my finding that organizations should not only increase the recognition of their dual ladder career and promotional system, but should care about its transparency as well.

In addition, my research supports new career theory, such as the protean and the boundaryless career, by arguing that careers have changed from the traditional conception (Arthur, 1994; Arthur, Khapova, & Wilderom, 2005; Briscoe & Finkelstein, 2009; Briscoe et al., 2006). Nevertheless, my results reveal that it can anyhow be effective for organizations

to use organizational career management, thereby supporting social exchange theory and organizational support theory (Aselage & Eisenberger, 2003; Balu, 1964). Whereas control over careers may not be solely with the organization, the changes described in the protean career theory and the boundaryless career theory do not mean that organizations have no say in managing their employees' careers anymore (Baruch, 2001; Baruch, 2006; Çakmak-Otluoğlu, 2012; King, 2003). One possible reason for this might be that nowadays organizations are less rigid, but not as fluid as postulated by new career theory (Baruch & Peiperl, 2000; Currie, Tempest, & Starkey, 2006; Sturges, Conway, Guest, & Liefoghe, 2005).

Furthermore, based on my research results I argue that there still is a need for organizational career management, although innovators' take more responsibility for their own careers (Cianni & Wnuck, 1997; Dalton & Thompson, 1985; Lips-Wiersma & Hall, 2007). Subjective career success and the feeling of personal achievement have become more important for individuals, but moving up the hierarchy, status, and power are still relevant (Briscoe et al., 2006; Hall, 1996b, 2002). This might be because these factors signal that an innovator's contributions to the success of the organization are valued by the management, as proposed by research on procedural justice (Folger & Greenberg, 1985; Folger & Konovsky, 1989; Kim & Mauborgne, 1993; Thibaut & Walker, 1975).

The changes described in new career theory influence the careers of many innovators, but new career theorists postulate that the shifts and transitions are more fundamental than they really seem to be (Baruch, 2006; Baruch & Peiperl, 2000; Sturges et al., 2002). For example, McDonald, Brown, and Bradley (2005) argue that, in the public sector, careers have not changed noticeably. This shows that organizational change has not led to a full transformation from traditional to protean and boundaryless careers, although there has been

downsizing, restructuring, and delayering (Appelbaum & Grigore, 1997; Briscoe, Hoobler, & Byle, 2010; Lips-Wiersma & Hall, 2007).

Traditional career theory describes careers as structured and organizationally focused (Hall, 1976; Lewin, 1951; Whyte, 1956). In contrast, new career theory argues that careers are protean and boundaryless, and are much more focused on the individual (Arthur, Hall, & Lawrence, 1989; Hall, 2002; Peiperl & Baruch, 1997). However, my research results suggest that neither the more traditional nor the contemporary views alone accurately describe what it means to have a career these days. For example, my findings in Chapter 4 show that organizations can still influence their innovators' careers with the help of the dual ladder, but they need to apply this career management practice in the right way to take into account the attitudinal changes to careers.

The concept of the organization man (Whyte, 1956) still seems to be valid to some extent, as organizations seem to have a core structure and a core group of staff, but is accompanied by protean and boundaryless careers and a new psychological contract between organizations and, at least, some of their employees (Baruch, 2006; De Vos & Soens, 2008; Handy, 1989). As a result, the traditional career is not invalid, but neither is it the norm (Arthur, 1994; Briscoe et al., 2006; Hall, 1996a, 1996b). However, this holds true for protean and boundaryless careers as well (Baruch & Peiperl, 2000; Briscoe, Hoobler, & Byle, 2010; Lips-Wiersma & Hall, 2007).

In line with that, a more balanced approach to contemporary careers of innovators needs to take into account the changing relationship between the innovator and the organization in managing careers (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007). Research on this new psychological contract has shown that individuals choose to work for an organization in which they see a match between their own needs for career

management and the possible contributions of the organization to this (Herriot & Pemberton, 1995, 1996), where they see their own career needs fulfilled (Wanous, 1992), and where they can build their career in line with their own values (Sullivan, Carden, & Martin, 1998). Organizations, however, search for employees that will help them to create a competitive advantage, thereby securing the organizations' long-term business success (Baruch, 2006; Walter et al., 2011). This clearly indicates that the organization's view on careers and, therefore, the role organizations play in career management have changed from the traditional conception (Aselage & Eisenberger, 2003; Lips-Wiersma & Hall, 2007; Turnley & Feldman, 1998).

As the results of my research show, contemporary careers of innovators should be managed by the individual and the organization (Chen et al., 2008; Rigotti, 2009; Rousseau, 1995). In other words, in a more balanced approach to careers, innovators' careers need to be understood as a mutual responsibility of the employer and the employee (Sturges et al. 2002; Sturges et al., 2005). According to this new role, organizations should redefine their tasks in career management.

Recent research studies have tried to establish what such a new role of organizations in career management could look like (Baruch, 2006; Baruch & Peiperl, 2000). In particular, Lips-Wiersma and Hall (2007) propose that new organizational career management is integrated in five core management practices. The first one is called developing capacity and employability. It highlights that organizations should consistently clarify consequences of career moves, provide opportunities for continuous learning, and offer training and networking possibilities. Strategic integration, the second management practice, includes that organizations should ensure that all employees receive strategic education. The reason for this is that employees can compare how their career plans fit the strategic direction of the

organization. The third responsibility, cultural integration, highlights the importance to build a culture in which employees are given responsibility and control to build career efficacy. In such a culture, the organization needs to ensure that career behavior fits in with the desired culture. The fourth management practice, diversity management, underlines that organizations should provide flexible structures for individuals to move up, down, or sideways. Communication, the last of the five management practices, reveals that organizations need to seek input on what employees need to manage their own careers. By offering these five core management practices, Lips-Wiersma and Hall (2007) provide a starting point for further discussion on the new role of the organization in career management.

In sum, the results of my study show that contemporary careers of innovators are quite different from traditional ones, but the changes are not as fundamental as new career theory postulates. Whereas careers have certainly changed from the life-long, traditional career with a single employer to more flexible arrangements, the results of my research show that the role of the organization in managing careers should not be underestimated. Therefore, I argue that the organization still has a significant role to play in career management, but that this role should be played in collaboration with individuals. Organizations need to become supportive and developmental, and should be seen as the enabler of successful careers by their innovators (Baruch, 2006; Baruch & Peiperl, 2000; Lips-Wiersma & Hall, 2007).

6.3 Practical implications

6.3.1 How to keep innovators in technical positions

With the increasing importance of innovation, innovators are becoming more and more significant for the development and success of organizations (Dombrowski et al., 2007; Parboteeah et al., 2005; Sagiv et al., 2010). However, when career development opportunities are missing, many innovators want to change into a management position (Aryee, 1992; Ball, 1998; Mainiero, 1986). As a consequence, organizations need to adapt to fit their innovators' expectations (Domsch & Gerpott, 1985; Ladwig & Domsch, 2011; Walter et al., 2011). This forms the basis for retaining these technical specialists in positions focused on innovative technical work (Allen & Katz, 1986; Domsch & Gerpott, 1985; Kieser & Walgenbach, 2003).

Based on the results of my research, I suggest that organizations should try to create an innovation-friendly culture. Innovation researchers point out that this can be achieved by encouraging creativity and stimulating open information flow (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile, Schatzl, Moneta, & Kramer, 2004; Kwasniewska & Necka, 2004). In addition, organizations should foster the autonomy and freedom of their innovators (Bailyn, 1985; Hoegl & Parboteeah, 2006a; Kalyani, 2011), look for a balance between challenges and pressure (Amabile et al., 2002), and should avoid conservatism, bureaucracy, and internal strife (Hirst et al., 2011; Hirst et al., 2009). Furthermore, organizations should support two-way communication, empower innovators, and they should actively seek input from all departments across all levels (Agin & Gibson, 2010; Kellermanns et al., 2012). Moreover, organization leaders need to set an example by recognizing and praising new technical developments in the organization (Balliet et al., 2011; Knapp, 2012).

My results add to this research by providing further advice and guidelines for organizations. First, they should help innovators to become respected researchers in their technical field of interest (Debackere & Buyens, 1997; Hourquet & Roger, 2005; Kim & Cha, 2000). Therefore, innovators need the time and resources to attend conferences and publish articles. As a result, innovators' values-driven career management is likely to increase. This is because they become more and more connected to their profession and do no longer see the management of their organization as their focal reference group (Briscoe et al., 2006; Çakmak-Otluoğlu, 2012).

Second, organizations should support a culture that readily accepts technical innovation, makes people search for innovative ideas, and knows that innovation might lead to failure (Bessant, 2008; Corbett, Neck, & DeTienne, 2007; McLaughlin, Bessant, & Smart, 2008; Moenkemeyer et al., 2012). Innovators working in such an organizational culture will feel highly valued and recognized (Hult et al., 2004; Hurley & Hult, 1998), and will depend less on hierarchical advancement to develop a feeling of personal achievement (Liu et al., 2010).

Third, organizations should promote the sharing of power, information, and resources throughout all hierarchical levels. In such an organizational culture, employees are likely to consider the personal possession of power and authority as less important (Hult et al., 2004; Hurley, 1995). Consequently, innovators might be less interested in managerial career advancement.

Fourth, organizations should offer opportunities for learning and development. Training and education is vitally important for facilitating the advancement of innovators in their technical field of specialization (Parboteeah et al., 2005; Schein, 1994; Silipo, 2008).

The innovators employed by organizations that offer better development opportunities are therefore less likely to seek a management position.

6.3.2 How to keep innovators in the organization

The extent of an organization's innovativeness is mainly determined by its innovators (Seriki, Hoegl, & Parboteeah, 2010; Välikangas, Hoegl, & Gibbert, 2009; Walter et al., 2011). When innovators are not satisfied with their career prospects, they might search for a new position outside the organization (Cordero et al., 1994a; Stumpf, 1988; Sturges et al., 2002). Thus, organizations have to invest in their innovators' career development and prospects to retain their key talents (Hurley & Hult, 1998; Schein, 1994; Silipo, 2008). However, as described above, this does not mean that organizations should control their employees' careers (Baruch, 2006; Coetzee et al., 2010; Hall, 1996a). Rather, organizations need to provide opportunities and resources to enable innovators to manage their own career (Pick & Kleinaltenkamp, 2012; Seema & Sujatha, 2012; Thobani, 2012).

This underlines the belief that the success of an organization is achieved through its people (Fowler, 1996; Parboteeah et al., 2005; Pfeffer, 1994). As a consequence, many organizations strongly focus on organizational career management to support the career development of innovators (Portwood & Granrose, 1986; Sadler-Smith & Badger, 1988; Stewart, 1997). My study could help improve the effectiveness of their organizational career management, which has proven difficult because of the strong change of careers described in new career theory (Arthur, 1994; Baruch & Peiperl, 2000; Granrose & Portwood, 1987; Hall, 1976).

However, as described in Chapter 4, recent research studies have shown that organizational career management support increases organizational competitiveness (London, 2002), employability of staff (Baruch, 2001), and organizational commitment (Sturges et al., 2002). My results contribute to these investigations by providing further advice for managers trying to increase the effectiveness of their organizational career management.

The analyses in this thesis show that organizations should apply their career management practices intensively, as the intensity of organizational career management is positively related to innovators' perceived career management support. The rationale behind this is that innovators feel valued and recognized when organizational career management is applied intensively because this signals that they have a high reputation in the organization and that the organization cares about them. Increasing the intensity of organizational career management can, for example, be achieved by informing employees about specific career management practices (Pick & Kleinaltenkamp, 2012; Thobani, 2012).

However, my results show that organizations should not diversify their organizational career management too much. I did not find a significant relationship between the number of organizational career management practices used by an organization and innovators' perceived career management support. This is in strong contrast to the implicit assumption of many career management researchers that additional or more organizational career management is always good for the organization (Baruch & Peiperl, 2000; London & Stumpf, 1982; Stumpf, 1988).

In line with that, the outcomes of my study, furthermore, reveal that organizations risk a "career management overkill" when they further diversify an already intensively applied organizational career management. There is a negative relationship between the combined measure of diversity and intensity of organizational career management and

innovators' perceived career management support. Organizations should refrain from this approach because innovators do not value it. Nevertheless, my results suggest that organizations should try to use their organizational career management in a way that raises innovators' perceived career management support. Organizations can thereby increase the match between individual and organizational career plans.

As shown in Chapter 5, many organizations use dual ladder career and promotional systems to support innovators' career development (Schlichting, 2011; Steffen, 2011; Stockhausen & Deuter, 2011). This is not easy because of the many problems associated with dual ladders (Bailyn, 1991; Cantrall et al., 1977; Gunz, 1980). Unfortunately, the implementation of dual ladders has not been examined by empirical studies (Ladwig & Domsch, 2011), and this has created a huge gap in the literature (Allen & Katz, 1986; Gerpott, 1994).

To fill this gap, my results offer assistance to organizations by describing the two factors that facilitate successful dual ladder systems, namely, perceived recognition and transparency. These are of vital importance for organizations implementing or using dual ladders. I have responded to recent calls in the career management literature for more research on dual ladders by suggesting that organizations should increase the recognition and transparency of their dual ladder systems (Cohrs, 2011; Ladwig & Domsch, 2011; Steffen, 2011).

My analyses show that there is a positive relationship between the recognition of the dual ladder and the extent of innovators' organizational commitment and career satisfaction. This means that if the recognition of the dual ladder is high, innovators in the technical ladder will feel just as valued as their counterparts in the managerial hierarchy. Moreover, they feel supported by the organization because they are offered fair and interesting career

development opportunities. Therefore, innovators appreciate working for such organizations and are satisfied with their career development opportunities.

One possible way of improving the recognition of a dual ladder is to promote the cultural commitment of the organization to technical innovation. This might be done, for example, through increased publicity of promotions of innovators in the technical ladder, offering career counseling to innovators, or by disseminating information about the equality between ranks, pay, and titles on the managerial and the technical career ladder (Allen & Katz, 1986; Cantrall et al., 1977; Katz & Tushman, 1990).

In addition, organizations can improve the recognition of the dual ladder by strengthening an innovative organizational culture. To do this, organizations can, for instance, introduce innovations to their employees in the internal employee magazine or on the intranet, promote boundary-spanning activities, introduce adequate incentive systems rewarding innovativeness, and foster innovation-supporting leadership (Dombrowski et al., 2007; Granrose & Portwood, 1987; Katz & Tushman, 1990). Furthermore, organizations should establish innovative mission and vision statements and foster democratic communication and collaboration throughout the hierarchy (Hoegl & Gemuenden, 2001; Hoegl et al., 2004; Rubera & Kirca, 2012).

My study also reveals that the transparency of the dual ladder and innovators' organizational commitment and career satisfaction are positively related. This underlines how the transparency of dual ladder career and promotional systems influence innovators' perceptions of fairness. Transparency signals that the organization is willing to communicate the reasons for the selection of personnel and that career advancement is based on performance. Such initiatives will enable innovators to feel satisfied with their career and will make them highly committed to the organization.

To increase the transparency of the dual ladder, organizations should not use the technical ladder as a destination for failing managers or as a reward for organizational loyalty (Allen & Katz, 1986; Cantrall et al., 1977; Gunz, 1980). Furthermore, organizations should have clear workplace and job specifications, requirement profiles, allocations of responsibilities, and reporting lines (Cohrs, 2011; Ladwig & Domsch, 2011; Schlichting, 2011). Organizations can thereby preserve the transparency of their dual ladder career and promotional systems.

Overall, my results reveal that organizations should not withdraw from organizational career management in the era of the new career. Although some responsibility for the career has shifted from the organization to the individual, many innovators still anticipate and value organizational career management support (Cianni & Wnuck, 1997; Dalton & Thompson, 1985). By providing this support, organizations can increase their attractiveness in a time when innovators have become integral to the success of the organization (Chien et al., 2010; Pfeffer, 1994; Pfeffer, 2005).

6.4 Future research

In my dissertation, I develop a more balanced view on contemporary careers of innovators than that currently offered in the career literature. However, the results, including their limitations, open doors to new and enriching research possibilities. In addition to the limitations and suggestions for future research mentioned in Chapters 3-5, the following possibilities should be acknowledged:

First, all of the organizations taking part in my study were in Germany and all of the participants were German speakers. This affects the generalizability of my results, insofar as

innovators from other national cultures, such as North America or Asia, might hold other beliefs and values that could influence their career orientation, as well as their reactions to organizational career management (Hofstede, 2001; House, Hanges, Mansour, Dorfman, & Gupta, 2004; Trompenaars, 1993). Therefore, studies in other cultures and cross-national research would be valuable. Indeed, there have been calls for such research in human resource management (Baruch & Budhwar, 2006; Budhwar & Sparrow, 1998, 2002a), as well as for more research on the influences of national culture on vocational behavior (Budhwar & Sparrow, 2002b; Cullen et al., 2004).

Moreover, future research might broaden the scope of analysis to additional variables on the organizational level. For example, I raise attention to the effects that the ethical work climate in an organization might have on the relationships found and the variables used in my study, such as innovators' managerial career orientation (Cullen, Parboteeah, & Victor, 2003; Victor & Cullen, 1988). According to Weaver and Trevino (1999), the ethical work climate influences employees' commitment above and beyond career and job satisfaction. Therefore, it is reasonable to assume that the ethical work climate might also influence managerial career orientation.

In this context, family influence might be another interesting organizational variable to look at. Previous research on family organizations found differences between family organizations and publicly held organizations regarding cultural aspects (e.g., Kellermanns, 2005; Kellermanns et al., 2012; Zahra, Hayton, Neubaum, Dibrell, & Craig, 2008). This could also influence the relationships and variables in my study, such as managerial career orientation.

Another possibility for future research would be to use other lists of organizational career management practices, rather than, as in Chapter 4, relying on Baruch and Peiperl

(2000). Several other research studies have provided such lists (e.g., Fowler, 1996; Gutteridge et al., 1993; London & Stumpf, 1982; Mumford, 1997; Parboteeah et al., 2005; Thomson et al., 1997; Walker & Gutteridge, 1979). This approach could increase our understanding of the effects of the intensity and diversity of organizational career management. In addition, a closer look at the influence of single career management practices on perceived career management support might help managers choose from the huge range of available organizational career management instruments.

Future research might also try to find additional organizational level success factors of dual ladders. For example, it would deepen our understanding of the success and failure of dual ladders if future research compares several characteristics of the technical and the managerial ladder, such as the equality of ranks, pay, and reward systems and their effects on variables such as organizational commitment and career satisfaction.

In addition, future research could analyze what influence team level variables have on career orientation and on the effects of career management. The basic idea behind this is that many innovators work together in innovation projects (Gemuenden & Hoegl, 2000; Hoegl, 2005; Hoegl & Parboteeah, 2003, 2006c). This might influence innovators' intentions, attitudes, and behaviors through socialization. For instance, past research has highlighted how teamwork is an important driver for the performance of teams with innovative tasks (Easley, Devaraj, & Crant, 2003; Hoegl, Ernst, & Proserpio, 2007; Hoegl & Gemuenden, 2001; Hoegl & Proserpio, 2004).

Therefore, it is reasonable to assume that good teamwork is negatively related to managerial orientation, as an innovator working in a project leading to successful results might be less interested in changing into a management position than an innovator

collaborating in a less successful project (Hoegl & Parboteeah, 2006b; Moenkemeyer et al., 2012).

An analysis of the antecedents and consequences of further individual level variables is another possibility for future research studies. For example, it would be interesting to see how the success factors of dual ladders in my study influence the search for external alternatives; that is, if an individual is already or will be looking for a job in another organization (Granrose & Portwood, 1987). To support my results, the relationship should be negative because the variable indicates an individual's reduced commitment to the current employer.

Another question is whether the relationships found and the variables used in this study are influenced by the so-called calling (Dik & Duffy, 2009; Elangovan, Pinder, & McLean, 2010; Palmer, 2007). This has been described in the literature as the ultimate form of subjective career success (Berg, Grant, & Johnson, 2010; Duffy, Allan, & Dik, 2011; Hirschi, 2011). Recent conceptualizations define it as the subjective experience of determination toward an individuals' work, or the kind of work a person defines as her or his purpose in life (Hagmaier & Abele, 2012; Hall & Chandler, 2005). The experience of a calling is an important promoter of career meta-competencies, such as identity, adaptability, and career decidedness (Dik, Sargent, & Steger, 2008; Dobrow & Tosti-Kharas, 2011).

Research studies have found relationships between the calling and life and work satisfaction (Peterson, Park, Hall, & Seligman, 2009; Wrzesniewski, McCauley, Rozin, & Schwartz, 1997), the understanding of one's work as moral obligation (Bunderson & Thompson, 2009), depression and stress (Oates, Hall, & Anderson, 2005; Treadgold, 1999), days of absence (Wrzesniewski, Rozin, & Bennett, 2003), sacrifices (Serow, 1994), and identification with one's work (Bunderson & Thompson, 2009). Hence, it can be assumed

that the experience of a calling could also influence, for instance, career orientation and perceived career management support.

In summary, future research should address these limitations and questions to provide managers with recommendations for handling innovators' careers in the era of the new career. The conceptual arguments and empirical results of my study may provide a starting point for such inquiries.

6.5 Conclusions

This dissertation set out to develop a more balanced view on the traditional and contemporary careers of innovators than that offered by the current career management literature. Some researchers emphasize the increasing importance of organizational career management because of the war for talent, whereas others postulate that organizations relinquish responsibility for career management to their individual employees. The key finding of my thesis regarding this contradiction is quite straightforward: Organizations can still influence and develop innovators' careers, even in protean and boundaryless times.

The results clearly show that innovators desire this kind of support. However, the developments described in new career theory do influence innovators' career intentions and decisions. Therefore, organizations need to analyze their innovators' managerial career orientation and have to appropriately use their organizational career management (practices) to retain innovators' in the innovation process of the organization.

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