

**Personality, values, or attitudes?
Individual-level antecedents to creative deviance**

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Abstract

Creative deviance, i.e. the violation of a managerial order to stop working on a new idea, is an emerging topic in innovation research. Whereas the outcomes of this nonconforming behavior are inherently ambiguous, its importance for corporations' innovative capability is undisputed. We complement prior research on the organizational-level determinants of creative deviance by studying its individual-level antecedents. We hypothesize that risk propensity as a personality trait is positively related, whereas allocentrism as a personal value orientation and organizational commitment as a personal attitude are negatively related to creative deviance. Risk propensity is considered the strongest predictor, as it affects creative deviance both directly and indirectly through allocentrism and commitment. Data from 457 employees in a German high-tech corporation support our hypotheses. Our findings contribute to research on innovation management and organizational behavior while yielding managerial recommendations for leadership and recruitment.

Keywords: Creative deviance; Risk propensity; Allocentrism; Organizational commitment

1 Introduction

As innovation has become “the industrial religion of the late 20th century” (Baer and Frese, 2003: 45), large corporations need to continuously conduct in-house basic research to improve their innovation performance (Higón, 2016). These research activities rely on initiatives from below, i.e. employees come up with and aim to implement pioneering and revolutionary ideas (Kuratko et al., 1990). However, managers cannot sponsor all ideas their subordinates generate (Mainemelis, 2010). To separate the wheat from the chaff, they must critically evaluate these proposals and select the most promising ones to be pursued further. This selective retention means that leaders “must tackle the dual challenge of encouraging employees to generate new ideas and of routinely rejecting most of those ideas” (Lin et al., 2016: 537). But what happens if employees propose a new idea, grow attached to it and want to further explore it, but are told by their superiors to abandon it? One reaction might be to just ignore the leader’s instructions (Lin et al., 2016). Mainemelis (2010: 558-559) refers to this individual nonconforming behavior, specifically “the violation of a managerial order to stop working on a new idea” as *creative deviance*.

Nonconforming innovative behavior is intensely debated in innovation research, as it is a double-edged sword (Mainemelis, 2010; Warren, 2003), which may help or harm the organization (Perry et al., 2016). On the downside, deviants pursue their ideas through illegitimate means (Lin et al., 2016) and take unauthorized risks (Warren, 2003), thus potentially wasting valuable resources (Mainemelis, 2010). Those scholars, who assume rules to be functional and consider noncompliant behavior as harmful, therefore speak of “organizational misbehavior” (Vardi and Weitz, 2004). On the upside, bold rule breaking may foster creative destruction (Brenkert, 2009) and enable breakthroughs in product development (Johnstone, 2015). Innovation scholars frequently recount anecdotes about the designer of Pontiac’s successful Fiero model, who was repeatedly ordered to stop working on the prototype, or about the creator of HP’s large and highly profitable electrostatic displays, who was instructed by David Packard himself to abort the project (Mainemelis, 2010). Those scholars considering rule breaking as “synonymous with innovation and creativeness” (Zhang and Arvey, 2009: 437) speak of “pro-social rule breaking” (Dahling et al., 2012), “constructive deviance” (Warren, 2003), “functional disobedience” (Brief et al., 2001), or “bootlegging” (Criscuolo et al., 2014). The

positive or negative effects of creative deviance ultimately depend on whether the managerial order to stop pursuing the respective idea was false or correct (Mainemelis, 2010). As this is difficult to determine beforehand, this type of nonconforming action is inherently ambiguous (Lin et al., 2016). What is certain, however, is its importance for corporations' innovative capability.

We argue that the construct is not yet sufficiently understood, because prior studies have captured the antecedents to this behavior only partially. With scholars asserting that deviance is influenced primarily by the overarching social structure (see e.g. Coleman and Ramos, 1998; Staw and Boettger, 1990), existing research has mostly studied the organizational conditions producing deviant behavior while neglecting that each employee individually decides whether or not to deviate from the supervisor's order. However, recent innovation research has been paying growing attention to the psychological underpinnings of innovative behavior (Marcati et al., 2008). Building on Mainemelis' (2010: 574) belief that "individual differences can explain why some people are more likely than others to engage in creative deviance under the same contextual conditions", our study takes creative deviance research to the individual level.

Individual personality traits, values, and attitudes are considered the most important psychological determinants of behavior (Goldberg, 1993; Bilsky and Schwartz, 1994; Ajzen, 2005). From each of these three categories, we select one exemplary construct and investigate its influence on creative deviance, thus opening a door to the future study of other individual-level predictors. We study risk propensity as an individual personality trait, allocentrism as a personal value orientation, and organizational commitment as an individual attitude. Based on a survey of 457 employees working in a German technology corporation, we hypothesize and demonstrate that risk propensity is positively related, whereas allocentrism and organizational commitment are negatively related to creative deviance. We also gauge the relative importance of these predictors, showing that risk propensity is the strongest of the three. This personality trait influences deviant behavior both directly and indirectly through values and attitudes. Figure 1 visualizes the hypothesized relationships, which we find confirmed in our data.

Our study advances innovation research with one of the first conceptualizations and empirical tests of the psychological foundations of creative deviance. It contributes to organizational behavior research by jointly considering personality, value orientations, and attitudes as bases for explaining creative deviance, by weighing their relative importance as behavioral predictors in

our research setting, and by showing how personality can indirectly affect behavior through values and attitudes. In terms of practical implications, our study indicates how human resource managers may increase person-job fit by screening candidates' personalities, values, and attitudes goals during recruitment. It also suggests that superiors need to differentiate their leadership measures depending on their employees' individual dispositions to create an enabling environment for innovation while maintaining corporate control.

--- Insert Figure 1 about here ---

2 Theory and hypotheses

2.1 Individual risk propensity as a predictor of creative deviance

Personality traits constitute “the most important individual differences in human transactions” (Goldberg, 1993: 26) and provide the starting point for our investigation. Stock et al. (2016) recently demonstrated that these traits influence individual innovators' success in realizing their project ideas. Lin et al. (2012a; 2012b; 2016) accordingly conjectured that employees' proclivity for creative deviance may vary depending on their personality structures. Building on their work, we empirically test this assumption. We select *risk propensity*, defined as “the extent to which a person is willing to knowingly take risks” (Zhang and Arvey, 2009: 437), as an exemplary personality trait to test for its influence on creative deviance.

Risk propensity constitutes a suitable point of departure for studying individual-level influences on creative deviance, as creative deviance entails substantial personal risk for the perpetrator (Mainemelis, 2010). Mishra and Lalumière (2011: 869) define risk as “outcome variance, where the riskier of two options with the same mean expected value is that with higher outcome variance”. Based on the assumption that risk seekers are drawn to outcome variance, we argue that risk propensity should encourage creative deviance in two ways: a) risk seekers are incentivized to generate radical new ideas, which can result in big successes or failures, and b) risk seekers are prone to violating managerial orders, which can provoke very different reactions by the supervisor.

Risk seekers are more likely to generate radical new ideas, as they are prone to sacrificing the secure rewards that come with routine work for an insecure chance to gain higher acclaim through innovations. They do so not only because they enjoy risk taking, but also because they often overestimate the likelihood of success in risky endeavors while downplaying the likelihood

of failure (Sitkin and Pablo, 1992; Weinstock and Sonsino, 2014). In contrast, those with lower risk propensity overestimate the possible negative outcomes associated with risky behavior and are therefore more likely to shrink back from it (Kogan and Wallach, 1964; Morrison, 2006). Consequently, risk-seeking individuals have a higher proclivity towards radical innovations, which may be penalized if it fails, but may be highly rewarded if it turns into a success.

The outcome variance of radical innovation is especially high, as disruptive new ideas are likely to be un(der)appreciated by superiors and may require deviance to pursue them. Disregarding managerial orders to stop working on a new idea is highly risky, as subordinates cannot predict how supervisors will ultimately react to their endeavors. Whereas conformist behavior limits outcome variance by preserving the status quo, creative deviance is “inherently uncertain” (Mainemelis, 2010: 562) with broad variance between possible outcomes. The innovation may result in a viable product or total failure, it may benefit or harm the organization and superiors may applaud the initiative while forgiving the deviance or reject it and punish the innovator for his insubordination. Illustrating just how much risk creative deviants may incur, the inventor of the LED lighting technology violated his superior’s orders to stop and experimented with the only substances available at his department, causing several explosions in his lab. He could have failed spectacularly, but ultimately laid the groundwork for a multibillion-dollar industry and even received the Nobel Prize for Physics in 2014 (Johnstone, 2015). Risk-seekers are drawn to such deviance, because they overestimate the likelihood of success and strive for the insecure, but possibly high rewards of transgressing the boundaries set by the supervisor.

Consistent with this reasoning, prior studies found that risk seeking plays a role in both creative (Feist, 1999) and deviant (Morrison, 2006) behaviors. Howell and Higgins (1990) have shown that risk-taking propensity is positively associated with the tendency to behave in an unconventional and innovative fashion that may deviate from the organizational culture. Similarly, Morrison (2006) found that employees with high risk propensity are more likely to respond to pressing concerns by violating organizational rules, whereas more risk-averse colleagues would more likely “play it safe” by adhering to the regulations. Thus, we hypothesize:

Hypothesis 1. The higher an individual’s risk propensity, the more (s)he will engage in creative deviance.

2.2 Allocentrism as a predictor of creative deviance

Having hypothesized that creative deviance is influenced by risk propensity as an individual personality trait, we argue that it is also a function of personal values. Value orientations are similar to personality traits in that they are relatively stable over time (Lusk and Oliver, 1974; Rokeach, 1973). However, a recent meta-analysis has demonstrated that traits and values are distinct constructs describing core dimensions on which people differ (Parks-Leduc et al., 2015). Whereas personality traits refer to “what persons are like” regardless of their intentions, values express a person’s intentional life goals (Bilsky and Schwartz, 1994: 165), i.e. “what is important to them”. As values are known to guide individual behaviors (Bilsky and Schwartz, 1994), we study them as antecedents to creative deviance in organizations.

Considering that creative deviance, if gone wrong, may be socially harmful (Warren, 2003) and subject the deviant to punishment from the social group (Morrison, 2006; Zhang and Arvey, 2009), employees’ values regarding their involvement in the group are likely to influence deviant behavior. We therefore conjecture that *allocentrism*, a value indicating high group orientation (Triandis, 1989), influences proclivity towards creative deviance. Whereas the frequently invoked construct of “collectivism” represents a general attribute of a given culture (Hofstede, 2001), the term “allocentrism” refers to an individual’s value orientation independent of his or her society’s dominant culture (Chen et al., 2007; Triandis, 1989). Allocentrics see themselves as embedded in social contexts, are loyal to their in-group and concerned with interpersonal harmony (Chen et al., 2007). In cases of conflict, they tend to subordinate their personal goals to collective goals (Nahum-Shani and Somech, 2011). The self-centered opposite of this orientation is called *idiocentrism* (Triandis, 2002). Prior research has linked allocentrism both to lower creativity and higher conformity, suggesting that allocentrism should discourage creative deviance in two ways: a) allocentrics shy away from radical new ideas, which challenge group norms, and b) allocentrics are unlikely to violate managerial orders, as this would disrupt interpersonal harmony.

Allocentrics are less likely to generate radical new ideas, as disruptive innovations frequently challenge existing routines or norms and consequently disturb the group’s harmony. Since many groups are resisting change, new ideas are often ridiculed and rejected. Miron-Spektor et al. (2015) accordingly found that fear of being dismissed by others and losing face keeps many employees from engaging in creativity. This restraint may be particularly strong among

allocentrics, who are known to display a lower need for uniqueness (Yamaguchi et al., 1995). They would rather blend in and dismiss their own ideas than stand out in a possibly negative way.

Allocentrics are particularly unlikely to defy managerial orders, given that rule breaking is defined as the failure to comply with the group's normative expectations (Zhang and Arvey, 2009). Allocentrics are highly concerned with harmonious social relationships, sometimes even at the expense of task achievement (Kim et al., 1994). This concern discourages any nonconforming behavior (Chen et al., 2007), which would strain the supervisor-subordinate relationship. Allocentrics are particularly sensitive to rejection and punishments from in-group members (Yamaguchi et al., 1995), so they do not expose themselves to such treatment by defying managerial directives. With these findings of prior studies in mind, we hypothesize:

Hypothesis 2. The higher an individual's allocentrism, the less (s)he will engage in creative deviance.

2.3 Organizational commitment as a predictor of creative deviance

Besides personality traits and values, social psychologists also often draw on attitudes to explain human behavior (Ajzen, 2005). These psychological tendencies are “expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly and Chaiken, 2007: 582) and influence their holders' behaviors towards that entity (Ajzen, 2001; Mulki et al., 2006). In the context of our study, we consider employees' attitudes towards the organization as a potential antecedent to creative deviance. These attitudes are commonly captured in the concept of organizational commitment (Meyer and Allen, 1991, 1997; Allen and Meyer, 1990; Meyer et al., 2002). The literature suggests that organizational commitment influences creativity and deviant behavior in divergent ways. Whereas highly committed employees are motivated to generate new ideas to benefit their employer, they are very reluctant to antagonize their organization by violating managerial orders. Consequently, these individuals will stop pursuing their ideas as soon as the supervisor tells them so instead of resorting to deviant behavior.

Several studies have found a positive relationship between organizational commitment and new idea generation. According to Hage and Aiken (1970), employees who are committed to their organization are likely to search for ways to improve its conditions. This aligns with Thompson's (1965) view that organizational commitment leads to the initiation of innovative

ideas (also see Pierce & Delbecq, 1977). More recently, Ng et al. (2010) has demonstrated that those who are affectively committed to their employer exhibit more innovation-related behaviors.

Whereas these findings portray highly committed employees as very *creative*, there is ample evidence that they will *not* become creative *deviants*. According to Meyer et al.'s (2002) meta-analysis of commitment research, committed employees' emotional attachment to their organization, their strong identification with it and their wish to stay with this employer (Allen and Meyer, 1990) make them adhere to organizational policy. In Kim and Mauborgne's (1993) study, for example, employees with strong affective commitment to their organization reported higher levels of compliance with strategic decisions than did those with weaker commitment. Nouri (1994) discovered that affectively committed managers were more likely to adhere to corporate financial policy than their less committed peers were. Liao et al. (2004) also found that affective commitment correlated negatively with deviance at work. Tepper et al. (2008) replicated this result, reasoning that affective commitment leads employees to behave in their organization's best interests and to avoid potentially harmful deviant actions. These findings are intuitive for general deviance, which carries negative connotations. *Creative* deviance is different, as it might also result from employees' intention to benefit their corporation. However, we argue that emotionally committed individuals will be less likely to antagonize their superiors, whom they often perceive as surrogates for the organization (Mulki et al., 2006), by disregarding their directives.

Deviant behavior is also discouraged by organizational commitment, which arises from a rational assessment of the costs associated with changing one's employer (Meyer et al., 2002). These costs may be work-related (such as wasted effort acquiring non-transferable skills) or not related to work (such as relocation costs) (Erdheim et al., 2006). One may expect that employees, who calculate that remaining in their current organization will be the least costly option, will act in ways that maximize their chances of maintaining their positions. Disobeying their leaders' orders in order to pursue innovations would not be a rational choice in this context, as their superiors may punish them (Lin et al., 2016) or even discontinue their contracts.

Finally, deviant behavior is reduced by organizational commitment, which rests on employees' feeling of obligation that they ought to stay with their employer (Meyer and Allen, 1997). Such feelings develop if an organization invests in the employee and honors its part of the psychological contract, i.e. the mutual obligations between employer and employee (Meyer and

Allen, 1991). In these cases, the individual will feel indebted and motivated to behave appropriately and to do what is right for the organization (Erdheim et al., 2006). Although there is little empirical evidence on this relationship, it is plausible to assume that individuals wanting to reciprocate their organization's favors will be less likely to disregard directives from their superiors. Based on this reasoning, we hypothesize:

Hypothesis 3. The higher an individual's organizational commitment, the less (s)he will engage in creative deviance.

2.4 The relative strength of personality-based, value-based and attitudinal antecedents to creative deviance

Our separate investigation of risk propensity as a personality trait, allocentrism as a personal value, and organizational commitment as an attitude raises the question of which antecedent will influence creative deviance most profoundly. Personality traits differ from personal values in that the former are mostly innate (McCrae and Costa, 2008), whereas the latter are mostly produced by a person's environment (Rokeach, 1973). The interplay between "nature" and "nurture" (Rutter, 2006) is not yet fully understood, but the assumption that traits epitomize behavior, whereas values are deemed to express a person's motivations "that may or may not be reflected in behavior" (Parks-Leduc, 2015: 5) suggests a particularly strong link between employees' personality and their behavior towards the organization. Regarding the specific variables under study, Sitkin and Pablo (1992) propose that risk propensity dominates the perceived characteristics of situations and will therefore consistently influence risk behavior. More recently, Mishra and Lalumière (2011) confirmed that risk propensity as a stable personality trait can lead individuals to behave in consistently risk-seeking ways. The behavioral impact of allocentrism is portrayed as less systematic, as Chen et al. (2007) discovered that the relationship between allocentrism and cooperative behavior depends on situational circumstances. Synthesizing these findings, we might expect a stronger influence of risk propensity compared to allocentrism on creative deviance.

Comparing the impact of personality traits and attitudes, we find the influence of personal attitudes on employees' behavior to be less clear-cut, as attitudes are considered more malleable than personality traits (Parks-Leduc, 2015; Ajzen, 2005). This volatility is particularly evident for organizational commitment, the specific attitudinal variable selected for our study.

Organizational commitment is often characterized as a shifting psychological *state* (Eagly and Chaiken, 2007; Meyer and Allen, 1991) and has been found to change over an extended period of an employee's tenure in the organization (Beck and Wilson, 2000), particularly during the first year of employment (Meyer et al., 1991). Given its changeable nature, we expect organizational commitment to be a weaker predictor of creative deviance than risk propensity. Summarizing this argumentation, we hypothesize:

Hypothesis 4. Risk propensity, as a stable personality trait, is a stronger predictor of creative deviance than allocentric values and organizational commitment attitudes.

In addition to these direct effects, we assume that risk propensity also influences creative deviance indirectly through allocentric values and commitment attitudes. Studying these indirect effects not only provides a nuanced understanding of the psychological basis to deviant behavior, but also promotes broader theorizing on the understudied relationships between personality, values, and attitudes.

As personality traits and personal values are rarely investigated together, there is only limited understanding on how they are related (Parks and Guay, 2009). In line with self-perception theory (Bem, 1972), personality traits might affect values, as people are likely to value the goals their specific personality traits serve (Roccas et al., 2002) and may consequently decide to prioritize those values, which are consistent with their personalities (Parks and Guay, 2009). Some researchers therefore posit that personality traits influence values (McCrae and Costa, 2008). In the specific context of our study, this means that individuals with a high innate risk propensity are unlikely to develop allocentric values. Allocentric conformity to group norms fails to satisfy their dispositional drive towards high outcome variance, since it promises secure, but modest success. Similarly, placing collective goals over one's own is unattractive to risk seekers, because it yields a certain, yet limited payoff. Along these lines, Frost et al. (2010) expect a strong negative correlation between risk propensity and loyalty, an allocentric type of behavior. Conversely, Gurel et al. (2010) posit that group-oriented individuals view uncertainty in the external environment more pessimistically than more self-centered people do and are less likely to involve themselves in situations they perceive as being extremely risky. Based on this argumentation, we hypothesize:

Hypothesis 5. The higher an individual's risk propensity, the less (s)he will display allocentric values.

Individuals' risk propensity may also influence their proclivity for creative deviance through organizational commitment. Although personality-based and attitude-based predictors of behavior are typically investigated separately (see e.g. Ajzen, 2005), empirical studies from political psychology (Schoen and Schumann, 2007), environmental psychology (Taciano and Sibley, 2012), and health psychology (Seo et al., 2013) have given evidence of traits influencing attitudes. With particular regards to risk propensity, a study of risky driving among young license holders suggested that a risk-seeking personality influences risky behavior indirectly through affecting its attitudinal determinants (Ulleberg and Rundmo, 2003).

Our study specifically investigates the relationship between risk propensity and organizational commitment. Considering prior results that personal dispositions correlate modestly with organizational commitment (Meyer and Allen, 1991), an influence of dispositional risk propensity on this attitude towards the organization may be expected. Empirical evidence on this relationship is still scarce, but Allen et al. (2007) propose that individual risk propensity influences employees' inclination to quit their jobs. Put differently, risk-seekers will assess the costs of leaving their organization to be lower than risk-averse individuals do, thus displaying lower rational commitment to the organization. One may also expect risk propensity to decrease employees' emotional commitment, as risk-prone individuals will feel less security-driven desire to remain in their organization. Based on this reasoning, we hypothesize:

Hypothesis 6. The higher an individual's risk propensity, the less (s)he will be committed to the organization.

3 Methods

3.1 Data collection

The data used in this study was collected from one large German multinational engineering and electronics company. As the primary aim of the survey was to improve the understanding of innovation from within, a senior manager of the firm's innovation department was assigned to the research team. To recruit suitable respondents, this manager suggested approaching all 1.350 employees from the firm-owned "innovation and entrepreneurship" platform, who worked in eight different locations across Germany. All potential respondents were occupied with work

tasks related to innovation and employed at similar hierarchical levels. Prior to the survey, we conducted a focus group discussion with members of the innovation department. This discussion helped in the design of the survey, which was then pre-tested to make sure that all questions and response options were absolutely clear. The final survey was evaluated by the company's works council and implemented by the firm through an online system.

We were unable to obtain the predictor and criterion variable from separate sources, but minimized common method bias in several ways. First, we followed Govin et al.'s (2016) approach to formulate the questions as accurately, simply, specifically, and concisely as possible. Second, we applied proximal separation of the predictor and criterion variable, i.e. we deliberately placed the items far away from each other in the questionnaire (Podsakoff et al., 2003). We also benefited from the fact that the questionnaire included a large set of variables intended to address other issues, making it difficult for respondents to draw any conclusions regarding our research questions. Third, to decrease the likelihood of socially desirable responses as pointed out by Podsakoff et al. (2012), we strongly emphasized and communicated anonymity of the questionnaire.

Overall, the survey period lasted two weeks. Each of the targeted employees received a personal e-mail from the manager assigned to the research team, which highlighted the study's importance and guaranteed full confidentiality with anonymity being monitored by the works council. This e-mail helped to secure an adequate response rate and ensured the validity of answers. Within the survey period, 909 employees participated, which corresponds to a response rate of some 67%. The main reason for the inability to reach more respondents was the limited time frame in which numerous respondents did not find time to answer the survey. Others were unavailable due to business trips or vacation. Still, we generated a fair amount of responses within the short time frame, mainly due to the strong support of the company's management manager and the participants' interest in our study.

3.2 Sample

We made several restrictions to improve our analysis. Most importantly, we considered Mainemelis' (2010: 559) proposition that creative deviance occurs only under structural strain, i.e. a "condition where the resources the organization provides for the elaboration of new ideas do not suffice to support the elaboration of all proposed new ideas in the work context". To account

for this crucial context factor, we restricted our sample to resource-constrained employees and kept only those respondents who reported to regularly experience structural strain by the organization in pursuing new ideas. The corresponding binary question in the survey reads: “I often feel constrained by the organization in pursuing my ideas”. Keeping only those respondents, who often felt this constraint, reduced the original sample of 909 to some 595 observations. To rule out potential systematic bias, we compared the reduced sample to the sample without structural strain to find no significant difference in terms of any variables later used in the regressions. Notably, keeping only those employees who encounter structural strain increases the rate of creative deviance. By leaving aside employees with unlimited resources and situations in which managers could allow all new ideas to be pursued, we exclude several candidates who would not need to engage in creative deviance in the first place. However, this also sharpens our analysis as we measure creative deviance only for those facing the choice between conformity and deviance. The following regressions will then denote the average treatment effect of the treated.

We excluded all respondents with missing observations in either outcome or control variables. Also here, we tested whether this reduction created any bias without finding significant difference in terms of the variables used in the regressions. The final analytical sample consists of 457 respondents, who are on average 39 years old, 21% being female, 63% married, 86% holding a Masters degree, 37% in a management position, and 64% having worked in another firm prior to joining the focal company.

3.3 Measures

All measures used in this research can be found in Appendix A. The items in our questionnaires were rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). In case of multi-item constructs, we used an iterated principal factor analysis to predict the variables that were then standardized to a mean of zero and a standard deviation of one.

3.3.1 Dependent variable

We measure creative deviance with a single item approach. The item in the questionnaire reads: “Did you have to pursue innovative activities even against organizational resistance?” We chose this single item option to minimize the common method bias resulting from a strong

emphasis on the predictor and criterion variable in the same survey (Podsakoff et al., 2003). Instead of adding several items that could have sharpened respondents' awareness concerning the predictor variable, we included only one item in the questionnaire and used the information on structural strain to improve its precision. In contrast to a multi-item approach such as the scale by Lin et al. (2016; 2012a), which includes nine items, our measure is of binary form and not restricted to the last two months. Hence, it is more general and does not include all facets of the multi-item construct. However, an advantage of measuring creative deviance in this binary form is its unambiguous response. In contrast to larger scales, our variable is clearly one if creative deviance was carried out and zero otherwise.

3.3.2 Main explanatory variables

Risk propensity

Prior studies have operationalized risk propensity in a variety of ways. For instance, risk-taking scales have been formulated in general contexts including social, physical, monetary, and ethical risk-taking propensities (Jackson 1976), on the basis of financial risk taking (Schneider and Lopes, 1986) or with respect to harm avoidance (Zhang and Arvey, 2009). Following Hung and Tangpong's (2010) view that general risk propensity can be assessed across multifaceted business contexts, we use a 4-item scale to measure general risk propensity as a personality trait. An exemplary item reads "I take risks to achieve something in life".

Allocentrism

Allocentrics view the self as embedded in social contexts. They are concerned with interpersonal harmony, so they subordinate their personal goals to the collective goals in cases of conflict between individual and group goals (Chen et al., 2007). We measure this personal value orientation using two items that are based on Kim et al. (1994) and Triandis (1993). Following Kim et al. (1994), the harmony item reads: "I care about what others think of me." We complement this with the item "I feel uncomfortable if I don't know what my colleagues think of me."

Organizational commitment

We use three items to measure respondents' organizational commitment. Whereas our instrument is not as comprehensive as the scales suggested by Meyer et al. (1993), it resembles other studies that have empirically analyzed commitment in the context of creative deviance (e.g.

Mulki et al., 2006) in measuring a general type of commitment attitude that includes affective, rational, and obligation-based components. The item capturing the affective component of organizational commitment reads: “I praise this company as a particularly good employer in front of my friends.” Rational preferences to stay are measured by the item “I would like to spend the rest of my career in this organization”, whereas feelings of obligation are tested with the item “I might as well work in another company, as long as the tasks are similar.”

3.3.3 Control variables

We included a number of control variables in the analysis to hold constant the effect of biographical and occupational information in the regression. Our biographical variables consist of age, gender, marital status, and educational level (approximated by a master degree and zero otherwise). To account for occupational differences, we observe the hierarchical position (managerial position or not) and a dummy variable that is one if the respondent has spent time in another company prior joining the current one.

3.4 Analytical techniques

All explanatory variables were standardized with the mean of zero and a standard deviation of one to allow for better comparison of the effect sizes for risk propensity, allocentrism, and commitment. Considering the binary nature of our dependent variable, we used a probit model to test our hypotheses. For interpretation purposes, we estimated the marginal effects at the means for all explanatory variables and included the main explanatory variables stepwise to analyze the robustness of results. Our cross-sectional survey design does not allow many other estimation methods to better address causality. As described in the seminal paper by Antonakis et al. (2010), few methods allow causal inference from cross-sectional surveys. We assess the robustness of our results using mediation analysis and sub sample estimations.

To further test for common method bias as suggested by Podsakoff et al. (2003), we applied a Harman one-factor test, the most widespread way to address this issue. Using a principal component factor analysis that includes all dependent and independent variables of our subsequent regressions, only three factors exhibit an eigenvalue above one. The cumulated variance accounted for by all three factors is 48%. The factor with the highest eigenvalue only

explained 20% of the variance. As no single factor accounts for most variance, we assume that common method bias is unlikely.

4 Results

4.1 Preliminary analysis

The descriptive statistics are presented in Tables 1 and 2. The mean of creative deviance is relatively high at 0.73, however, as noted above, we have to consider the fact that we are only observing participants who often experience structural strain and work in the field of innovation. Also, we predominately observe middle-aged married men, the majority of whom is holding a Master's degree and one-third is in a management position. Given these preconditions, it is plausible to assume that many individuals from this specific sample have been involved in past creative deviance.

--- Insert Table 1 about here ---

Multicollinearity is unlikely as suggested by the correlation matrix. None of the correlation coefficients exceeds 0.3 except for the correlation between risk propensity and commitment that is -0.43. We tested the variance inflation factors to find none above the critical value of 10.

--- Insert Table 2 about here ---

4.2 Hypotheses tests

We tested our hypotheses on the same 457 observations with six different models. Each model holds constant the effect of the covariates. The first model estimates the relationship between risk propensity and creative deviance (H1), the second model between allocentrism and creative deviance (H2), the third model between organizational commitment and creative deviance (H3), and the fourth the relevance of all three in one model (H4). The fifth model tests the relationship between risk propensity and allocentrism (H5), the sixth between risk propensity and organizational commitment (H6). Table 3 reports the results. In the first model, we find that creative deviance is positively associated with risk propensity ($\beta=.11$, $p < .01$). The second and third model both yield negative correlations of allocentrism ($\beta=-.05$, $p < .05$) and commitment on creative deviance ($\beta=-.07$, $p < .01$). Hence, we find support for our first three hypotheses that all three tested antecedents significantly correlate with creative deviance when analyzed in isolation.

Regarding hypothesis 4, we observe the expected dominance of risk propensity over allocentrism and organizational commitment as a predictor of creative deviance. Interestingly, this dominance is so strong that we are unable to detect any significant relationship between allocentrism and creative deviance or between commitment and creative deviance, which prevails irrespective of risk. As soon as the personality trait, personal value orientation, and attitude are included in the same regression, only risk propensity remains significant and only slightly decreases in coefficient size ($\beta=.10$, $p < .01$). This dominance may be due to the fact that risk propensity not only relates to the probability for creative deviance directly, but also correlates with this behavior indirectly as suggested by the slight decrease of the risk coefficient in the fourth model. Model five and six further report a significantly negative relationship between risk propensity and allocentrism ($\beta=-.22$, $p < .01$) as well as risk propensity and commitment ($\beta=-.45$, $p < .01$).

--- Insert Table 3 about here ---

4.3 Alternative estimation methods

We apply three alternative estimation methods to improve the understanding of the previous results. First, we use mediation analysis to identify any mediating effect of allocentrism or commitment on the relationship between risk propensity and creative deviance. Table 4 reports the results from both mediation analyses conducted as suggested by Baron and Kenny (1986). Models 1-3 test the mediating effect of allocentrism and Models 4-6 refer to the mediation test with commitment as a mediator variable. We find tentative evidence for mediating effects of both, allocentrism and commitment, on the relationship between risk propensity and creative deviance. As reported by Table 4, the coefficient of risk propensity decreases more substantially when including commitment as a mediator. The Sobel-Goodman Test suggests that 2.3% of the total effect is mediated by allocentrism and 6% when using commitment as a mediator. However, both mediation effects are not statistically significant.

--- Insert Table 4 about here ---

Second, we have until now assumed that creative deviance represents the reaction to skepticism or opposition by supervisors. Given the general wording of the survey question that we used and the relevant share of respondents in managerial positions, the opposition that led to creative deviance could have also stemmed from other functional units or even subordinates from

the same unit. To clarify this issue, we separately conducted sub-sample regression analyses for different hierarchical levels, distinguishing between survey respondents from management positions, project heads, experts, and subordinates. Table 5 reports the results. Model 1 refers to marginal effects at the means from a probit model for the whole sample, Model 2 for all managers, Model 3 for all project heads, Model 4 for all experts, and Model 5 for all subordinates. Five respondents were both experts and subordinates and are thus excluded from this analysis. Table 5 clearly shows that the relationship between risk propensity and creative deviance is strongest for individuals from lower hierarchy levels. In fact, the correlation is the largest for subordinates.

--- Insert Table 5 about here ---

Third, considering that we drew the sample from various locations, our main results could either be driven by differences between individuals within the same locations or between individuals of different locations. To clarify the estimated effect, we conduct the main regression for the whole sample in Model 1 and then for sub-samples of the three largest locations in Models 2-4. In Model 5, we estimate location fixed effects regression. We find no systemic differences for the sub samples or the fixed effect estimates from the main regression. Hence, our results do not seem to be driven by differences between locations but rather denote individual differences.

--- Insert Table 6 about here ---

5 Discussion

5.1 Theoretical implications

Being at the intersection of research on innovation management and organizational behavior, our work makes theoretical contributions to both fields. In the realm of innovation management, it advances the emerging research on creative deviance with one of the first conceptualizations and empirical tests of individual antecedents to this behavioral phenomenon. Deviance scholars previously asserted that “its rate is primarily influenced by the overarching social structure” (Mainemelis, 2010: 559) and consequently focused on organizational framework conditions triggering creative deviance. Complementing this line of work, we elucidate the individual psychological basis for creative deviance while holding organizational context factors constant.

We thereby answer Mainemelis' (2010) call, who suggested studying when and how personality traits influence creative deviance in work contexts. Our study sheds light on the differential effects of three individual dispositions or tendencies on creative deviance, thus establishing previously unrecognized antecedents to this nonconforming behavior. Risk propensity as a personality trait, allocentrism as a personal value orientation, and organizational commitment as a relevant attitude all appeared to be significant predictors of creative deviance when studied in isolation, suggesting that future research could fruitfully investigate a still broader set of individual antecedents. Given the striking dominance of risk propensity among these three factors, we particularly encourage future studies relating the Big Five personality dimensions (John and Srivastava, 1999) to creative deviance in order to elucidate the impact of personality on deviant behavior in more detail. Stock et al. (2016) recently demonstrated the importance of the Big Five for idea generation, elaboration, and diffusion, so a significant relationship with creative deviance is also highly plausible. In addition, it would be insightful to study the interaction between the organizational framework conditions covered by previous work and the psychological basis we added to creative deviance research. Overall, we believe that our study contributes to a more complex understanding of this important, yet so far only partially understood phenomenon and hope that it will open up new research avenues for the field.

Our findings also have implications for innovation management beyond the specific construct of creative deviance. By studying individual dispositions to innovate against a supervisor's or the organization's resistance, we contribute to an active research stream, which investigates the basis of entrepreneurial behavior in corporations (see e.g. Kuratko et al., 1990; 2005; 2014). Existing studies on personality traits as antecedents to entrepreneurship constructs such as entrepreneurial alertness or business planning (for meta-analyses see Brandstätter, 2011; Frese and Gielnik, 2014) related mostly to start-up founders, who are less constrained by supervisor directives and organizational rules. Targeting employees of large corporations as bottom-up innovators, we contribute to a better understanding of what drives *intrapreneurs* (Subramanian, 2005) to pursue innovation. Overall, our empirical findings support Frese and Gielnik's (2014: 416) view that "entrepreneurship concepts can be improved using a psychological perspective".

We contribute to organizational behavior research by jointly considering an exemplary personality trait, a personal value orientation, and an attitudinal state as bases for explaining creative deviance. This is a novelty of the current study, as researchers have only recently started

to explore the combined effects of traits and values on various outcomes (Parks-Leduc, 2015). Adding attitudes as somewhat more volatile individual tendencies, we offer a uniquely broad view on the psychological bases for creative deviance. This combined analysis yielded that all three independent variables significantly predicted creative deviance as long as we analyzed them in isolation. However, only risk propensity remained a significant predictor of our focal construct as soon as all three individual antecedents entered the equation. We had expected the coefficient of allocentrism and commitment to shrink in the presence of a strong personality influence, but did not foresee their significance levels to disappear completely once risk propensity was controlled for. We find tentative evidence that risk propensity did not only influence creative deviance directly, but that part of this effect is also mediated by allocentrism and organizational commitment. Furthermore, our results for various sub-sample regressions indicate that our estimates refer mainly to subordinates' responses to leader's opposition and are not influenced by respondent's location. Indicating significant influences of personality traits on personal values and attitudes, our study serves as a springboard for future research on the interplay between personality, values, and attitudes. Connecting the so far largely separated streams on these behavioral predictors might yield a series of unexpected and insightful interaction effects.

5.2 Managerial implications

Our study has important practical implications for companies striving to gain competitive advantage through radical innovation. Evidence on the incidence of creative deviance is still missing, but a study by Morrison (2006) found pro-social rule breaking, a closely connected form of nonconforming behavior, to be surprisingly common in today's organizations. Our work therefore addresses a widespread, yet surprisingly neglected phenomenon.

The present study informs recruitment decisions in innovation-oriented environments. As modern corporations increasingly depend on employees' initiatives, they are often seeking innovators "who will put extraordinary thought and effort into achieving things previously not done in the organization" (Kuratko and Goldsby, 2004: 19). In that sense, risk-seeking personalities are valuable employees, as they will be more proactive regarding business opportunities and more prone to changing situations or procedures instead of waiting for changes to occur (Kuratko and Goldsby, 2004). However, we have shown that these individuals are also more likely to pursue ideas against their superiors' directives, thus putting not only themselves,

but also their corporations at risk. For some organizations, risk-seeing employees' innovative potential will outweigh the drawbacks of their deviance, whereas others will require stricter conformity. To increase person-organization fit (Morley, 2007), i.e. the fit of an applicant's personality, values, and attitudes with the organization's culture, values, and priorities, recruiters are well advised to include personality assessments into their decision-making process and to weigh the drive for innovation against the need for conformity in their respective work environments.

The dilemma of large organizations trying to nurture an atmosphere for entrepreneurial activity while maintaining corporate control was already recognized by Sathe (1985). Leaders can strike this balance by creating an enabling climate for initiative, but simultaneously setting standards for how employees should behave. Extending a recent study of leaders' responses to their subordinates' creative deviance (Lin et al., 2016), our findings indicated that superiors need to differentiate their leadership measures depending on their employees' individual dispositions and tendencies. Risk-averse, allocentric, and highly committed employees may need encouragement to propose new ideas, but will gravitate towards rule conformity. In contrast, more risk-prone, idiocentric, and less committed individuals will need little incentive to innovate, but require more active interventions reining them in.

5.3 Limitations and further research

Like every empirical study, ours is also subject to several limitations. First, we collected our data in a single German technology corporation. Given that Hofstede (2001) characterized the German culture as rather individualistic, this setting may have influenced the proportion of respondents displaying allocentric values. However, Oyserman et al. (2002: 40) counter that between-culture differences in collectivism are "neither as large nor as systematic as often perceived". More importantly, Triandis and Suh (2002) argued that only around 60% of individuals in an individualistic culture will be idiocentric and only 60% of individuals in collectivistic cultures will be allocentric. Considering this, our single-country study can give valuable indications of the general relationship between individual value orientations and creative deviance. Nevertheless, it would be worthwhile to replicate our study in cultures, which are commonly classified as highly collectivistic.

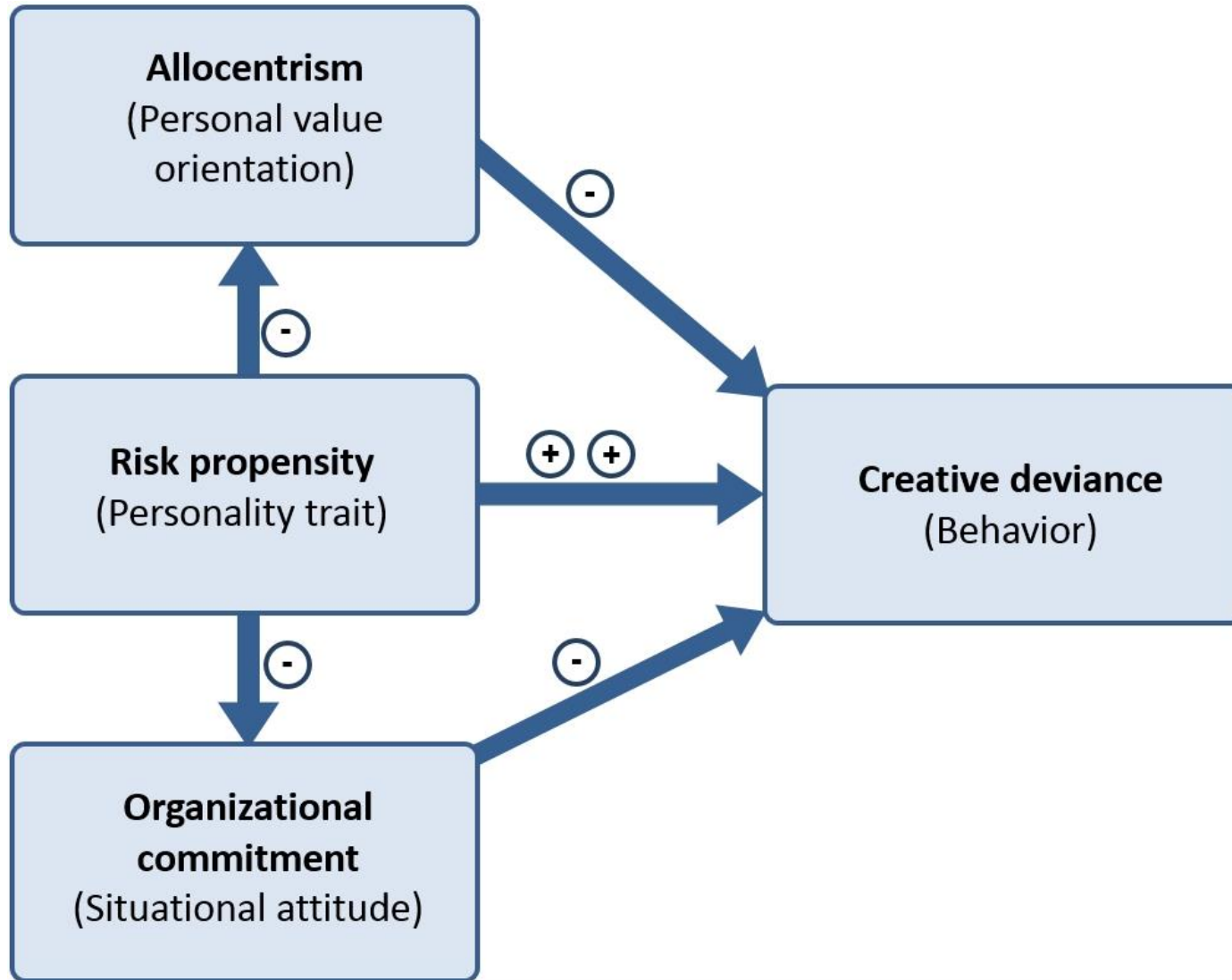
Second, we only studied one exemplary personality trait, one particular element of personal value orientations, and one attitudinal state as predictors of creative deviance. Whereas we carefully selected relevant constructs based on a detailed literature search, future research covering a broader range of variables could shed further light on the emergence of creative deviance. Dahling et al. (2012) indicates connections between the Big Five Personality dimensions and pro-social rule breaking and Liao et al. (2004) connects those dimensions to negative forms of deviance, but an investigation of their relationship with *creative* deviance is still missing. Similarly, Schwartz' (1992) comprehensive set of individual values and other major job attitudes such as satisfaction and engagement could be tested as predictors of creative deviance. Creative self-efficacy (Tierney and Farmer, 2002), thrill seeking (Self et al., 2006), status seeking (Bowers et al., 2017), intrinsic motivation (Cerasoli et al., 2014), curiosity (Grossnickle, 2016), or attitudes towards rules, the products, and the supervisor could also be studied as individual-level predictors of deviant behaviors in organizations. Whereas it was impossible to cover all those variables within the space constraints of the present study, we hope that our work can stimulate future research along these promising lines.

6 Conclusion

“Every day, employees face choices that pit obedience to formal organizational rules against responsiveness [and] innovation” (Morrison, 2006: 6). How they decide on these dilemmas was previously seen as a function of organizational framework conditions. We demonstrated that individual dispositions and tendencies also inform employees' proclivity towards creative deviance, thus opening a conceptual door to investigate the psychological bases of deviant innovative behaviors.

Figures and Tables

Fig. 1. Model of the individual-level antecedents to creative deviance



Tab. 1: Summary statistics

N=457	Mean	Std. D.	Min	Max
Creative Deviance	0.73	0.44	0	1
Risk propensity	0	1	-3.52	1.88
Allocentrism	0	1	-3.35	2.04
Commitment	0	1	-2.47	2.75
Age	39.36	8.57	22	63
Female	0.21	0.40	0	1
Married	0.63	0.48	0	1
Master	0.86	0.34	0	1
Manager	0.37	0.48	0	1
Past experience else	0.64	0.47	0	1

Tab. 2: Correlation matrix

N=457	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Creative Deviance	1									
2. Risk propensity	0.30*	1								
3. Allocentrism	-0.08	-0.20*	1							
4. Commitment	-0.17*	-0.43*	0.26	1						
5. Age	0.20*	0.05	0.06	-0.11	1					
6. Female	-0.10	-0.03	-0.06	-0.01	-0.11	1				
7. Married	0.10	0.02	0.13*	-0.02	0.38*	-0.20*	1			
8. Master	0.07	-0.02	-0.07	-0.05	0.14*	-0.12	0.18*	1		
9. Manager	0.19*	0.21*	0.07	-0.00	0.17*	-0.07	0.16*	0.16*	1	
10. Past experience else	0.07	0.13	-0.18	-0.13	0.21*	0.06	0.02	0.08	0.10	1

Tab. 3: Main results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Creative Deviance	Creative Deviance	Creative Deviance	Creative Deviance	Allocentrism	Commitment
Risk propensity	0.113*** (0.018)			0.100*** (0.020)	-0.222*** (0.050)	-0.445*** (0.043)
Allocentrism		-0.050** (0.021)		-0.020 (0.020)		
Commitment			-0.069*** (0.020)	-0.019 (0.022)		
Control variables						
Age	0.008*** (0.002)	0.008*** (0.003)	0.007*** (0.003)	0.008*** (0.002)	0.006 (0.006)	-0.011** (0.005)
Female	-0.058 (0.045)	-0.070 (0.047)	-0.070 (0.046)	-0.060 (0.045)	-0.081 (0.118)	-0.074 (0.105)
Married	0.003 (0.041)	0.011 (0.044)	0.001 (0.043)	0.008 (0.042)	0.223** (0.104)	0.023 (0.095)
Manager	0.045 (0.052)	0.007 (0.056)	0.013 (0.055)	0.036 (0.053)	-0.317** (0.139)	-0.198 (0.124)
Past experience else	0.084** (0.042)	0.144*** (0.042)	0.143*** (0.042)	0.094** (0.042)	0.251*** (0.097)	0.244*** (0.093)
Hypothesis	H1	H2	H3	H4	H5	H6
Observations	457	457	457	457	457	457
Pseudo R-squared	0.124	0.071	0.082	0.129	0.111	0.212

This table reports marginal effects of standardized regressions coefficients from a probit model (with creative deviance as the dependent variable) and OLS coefficients (allocentrism and commitment as dependent variables). Estimates marginal effects of the probit models are predicted at the mean. The corresponding hypothesis is noted below. Risk ($\alpha=0.68$), commitment ($\alpha=0.63$), and allocentrism ($\alpha=0.70$) were constructed using an iterated principal factor analysis using a promax rotation. Alternative ways of constructing the variables from the items were used (summing up the items; other rotations) without significant changes for the coefficients. Each regression holds constant a basket of control variables that includes biographical information (e.g. gender, age, and marital status), educational level (e.g. master degree), hierarchical levels, and past experiences. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Tab. 4: Mediation analyses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Allocentrism	Creative Deviance	Creative Deviance	Commitment	Creative Deviance	Creative Deviance
Risk propensity	-0.141*** (0.052)	0.103*** (0.020)	0.100*** (0.020)	-0.409*** (0.043)	0.108*** (0.019)	0.100*** (0.020)
Allocentrism			-0.020 (0.020)			
Commitment						-0.019 (0.022)
Observations	457	457	457	457	457	457
Pseudo R-squared	0.137	0.127	0.129	0.235	0.127	0.129
Sobel- Mediation Test		0.023			0.060	

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Tab. 5: Sub-sample estimations by hierarchical position

DV= Creative deviance	Model 1	Model 2	Model 3	Model 4	Model 5
	All	Management	Project Head	Expert	Subordinate
Risk propensity	0.100*** (0.020)	0.054 (0.066)	0.087** (0.037)	0.073** (0.036)	0.130*** (0.035)
Allocentrism	-0.020 (0.020)	0.026 (0.030)	-0.075* (0.040)	-0.024 (0.035)	-0.008 (0.036)
Commitment	-0.019 (0.022)	-0.051 (0.044)	0.020 (0.039)	-0.034 (0.041)	-0.001 (0.043)
Observations	457	75	93	123	161
Pseudo R-squared	0.129	0.258	0.166	0.121	0.132

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Tab. 6: Sub sample estimations and FE regression by location

DV= Creative deviance	Model 1	Model 2	Model 3	Model 4	Model 5
	All	Location 1	Location 2	Location 3	FE
Risk propensity	0.100*** (0.020)	0.111*** (0.039)	0.099*** (0.027)	0.110** (0.048)	0.095*** (0.020)
Allocentrism	-0.020 (0.020)	-0.068* (0.038)	-0.007 (0.028)	-0.031 (0.045)	-0.018 (0.020)
Commitment	-0.019 (0.022)	0.013 (0.042)	-0.019 (0.035)	-0.032 (0.052)	-0.021 (0.022)
Observations	457	152	192	59	457
Pseudo R-squared	0.129	0.159	0.130	0.352	0.135

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

References

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52(1), 27-58.
- Ajzen, I. (2005). *Attitudes, personality, and behavior*. Berkshire: McGraw-Hill Education (UK).
- Allen, N. J., and Meyer, J. P. (1990). The measurement and antecedents of affective, continuance, and normative commitment to the organization. *Journal of Occupational Psychology*, 63, 1–18.
- Allen, D. G., Renn, R. W., Moffitt, K. R., and Vardaman, J. M. (2007). Risky business: The role of risk in voluntary turnover decisions. *Human Resource Management Review*, 17(3), 305-318.
- Antonakis, J., Bendahan, S., Jacquart, P., and Lalive, R. (2010). On making causal claims: A review and recommendations. *Leadership Quarterly*, 21, 1086-1120.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Baer, M., and Frese, M. (2003). Innovation is not enough: Climates for initiative and psychological safety, process innovations, and firm performance. *Journal of Organizational Behavior*, 24(1), 45-68.
- Beck, K., and Wilson, C. (2000). Development of affective organizational commitment: A cross-sequential examination of change with tenure. *Journal of Vocational Behavior*, 56(1), 114-136.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). New York: Academic Press.
- Bilsky, W., and Schwartz, S. H. (1994). Values and personality. *European Journal of Personality*, 8(3), 163-181.
- Bowers, A. H., Greve, H. R., and Mitsuhashi, H. (2017). Look at me: Overt status-seeking behavior and competitive emergence among securities analysts. In: Seidel, M.-D. L. and Greve, H. R. (Ed.) *Emergence (Research in the Sociology of Organizations, Volume 50)* (pp. 351-382). Emerald Publishing Limited.
- Brandstätter, H. (2011). Personality aspects of entrepreneurship: A look at five meta-analyses. *Personality and Individual Differences*, 51(3), 222-230.
- Brenkert, G. G. (2009). Innovation, rule breaking and the ethics of entrepreneurship. *Journal of Business Venturing*, 24(5), 448-464.
- Brief, A. P., Buttram, R. T., and Dukerich, J. M. (2001). Collective corruption in the corporate world: Toward a process model. In M. E. Turner (Ed.), *Groups at work: Theory and research* (pp. 471–499). Mahwah, NJ: Lawrence Erlbaum Associates.
- Cerasoli, C. P., Nicklin, J. M., and Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, 140(4), 980.

- Chen, X. P., Wasti, S. A., and Triandis, H. C. (2007). When does group norm or group identity predict cooperation in a public goods dilemma? The moderating effects of idiocentrism and allocentrism. *International Journal of Intercultural Relations*, 31(2), 259-276.
- Coleman, J. W., and Ramos, L. L. (1998). Subcultures and deviant behavior in the organizational context. In: P. A. Bamberger and W. J. Sonnenstuhl (Eds). *Research in the Sociology of Organizations* (Vol. 15, pp. 3-34). Stamford, CT: JAI Press.
- Criscuolo, P., Salter, A., and Ter Wal, A. L. (2013). Going underground: Bootlegging and individual innovative performance. *Organization Science*, 25(5), 1287-1305.
- Dahling, J. J., Chau, S. L., Mayer, D. M., and Gregory, J. B. (2012). Breaking rules for the right reasons? An investigation of pro-social rule breaking. *Journal of Organizational Behavior*, 33(1), 21-42.
- Eagly, A. H., and Chaiken, S. (2007). The advantages of an inclusive definition of attitude. *Social Cognition*, 25(5), 582-602.
- Erdheim, J., Wang, M., and Zickar, M. J. (2006). Linking the Big Five personality constructs to organizational commitment. *Personality and Individual Differences*, 41(5), 959-970.
- Feist, G. J. (1999). The influence of personality on artistic and scientific creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 273–296). New York: Cambridge University Press.
- Frese, M., and Gielnik, M. M. (2014). The psychology of entrepreneurship. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 413-438.
- Frese, M., Teng, E., and Wijnen, C. J. D. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior*, 20: 1139–1155.
- Frost, D., Goode, S., and Hart, D. (2010). Individualist and collectivist factors affecting online repurchase intentions. *Internet Research*, 20(1), 6-28.
- Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist*, 48(1), 26.
- Govin, J. G., Garrett, R.P., Kuratko, D. F., and Sheperd, D. A. (2015), Value proposition evolution and the performance of internal corporate ventures. *Journal of Business Venturing*, 30: 749-774.
- Grossnickle, E. M. (2016). Disentangling curiosity: Dimensionality, definitions, and distinctions from interest in educational contexts. *Educational Psychology Review*, 28(1), 23-60.
- Gurel, E., Altınay, L., and Daniele, R. (2010). Tourism students' entrepreneurial intentions. *Annals of Tourism Research*, 37(3), 646-669.
- Hage, J., & Aiken, M. (1970). *Social Change in Complex Organizations*. New York: Random House.
- Higón, D. A. (2016). In-house versus external basic research and first-to-market innovations. *Research Policy*, 45(4), 816-829.
- Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. 2nd Edition. Thousand Oaks, CA: Sage Publications.

- Howell, J. M., and Higgins, C. A. (1990). Champions of technological innovation. *Administrative Science Quarterly*, 35, 317-341.
- Hung, K. T., and Tangpong, C. (2010). General risk propensity in multifaceted business decisions: Scale development. *Journal of Managerial Issues*, 22(1), 88-106.
- Jackson, D. N. (1976). *Personality Inventory Manual*. Research Psychologists Press, Goshen, NY.
- John, O. P., and Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of Personality: Theory and research*, 2, 102-138.
- Johnstone, B. (2015). *Brilliant! Shuji Nakamura and the revolution of lighting technology (Updated edition)*. New York: Prometheus Books.
- Keltner, D., Gruenfeld, D. H., and Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review*, 110: 265–284.
- Kim, W. C., and Mauborgne, R. A. (1993). Procedural justice, attitudes, and subsidiary top management compliance with multinationals' corporate strategic decisions. *Academy of Management Journal*, 36(3), 502-526.
- Kim, U., Triandis, H.C., Kagitcibasi, C., Choi, S.C., and Yoon, G. (1994). *Individualism and collectivism: theory, method, and applications*. Sage: Thousand Oaks.
- Kogan, N., and Wallach, M. A. (1964). *Risk taking: A study in cognition and personality*. New York: Rinehart and Winston.
- Kuratko, D. F., and Goldsby, M. G. (2004). Corporate entrepreneurs or rogue middle managers? A framework for ethical corporate entrepreneurship. *Journal of Business Ethics*, 55(1), 13-30.
- Kuratko, D. F., Hornsby, J. S., and Covin, J. G. (2014). Diagnosing a firm's internal environment for corporate entrepreneurship. *Business Horizons*, 57(1), 37-47.
- Kuratko, D. F., Ireland, R. D., Covin, J. G., and Hornsby, J. S. (2005). A model of middle-level managers' entrepreneurial behavior. *Entrepreneurship Theory and Practice*, 29(6), 699-716.
- Kuratko, D. F., Montagno, R. V., and Hornsby, J. S. (1990). Developing an intrapreneurial assessment instrument for an effective corporate entrepreneurial environment. *Strategic Management Journal*, 11(5), 49-58.
- Liao, H., Joshi, A., and Chuang, A. (2004). Sticking out like a sore thumb: Employee dissimilarity and deviance at work. *Personnel Psychology*, 57(4), 969-1000.
- Lin, B., Law, K., and Chen, C. (2012a). "I love to do it" or "I can do it"? Competing mechanisms in explaining creative deviance. *Paper presented at Academy of Management Meeting*, Boston.
- Lin, B., Wong, Y.N., and Fu, P. (2012b). Consideration of future consequences and thriving in creative work context: A model of dual mechanism. *Paper presented at the 8th Asia Academy of Management Conference*, Seoul, South Korea.
- Lin, B., Mainemelis, C., and Kark, R. (2016). Leaders' responses to creative deviance: Differential effects on subsequent creative deviance and creative performance. *The Leadership Quarterly*, 27(4), 537-556.

- Liu, W., Tangirala, S., Lee, C., and Parker, S. K. (2016) Exploring the consequences of proactive behaviors: New directions. Call for Papers in the *Journal of Organizational Behavior*.
- Lusk, E. J., and Oliver, B. L. (1974). Research notes. American manager's personal value systems-revisited. *Academy of Management Journal*, 17(3), 549–554.
- Mainemelis, C. (2010). Stealing fire: Creative deviance in the evolution of new ideas. *Academy of Management Review*, 35(4), 558-578.
- Marcati, A., Guido, G., & Peluso, A. M. (2008). The role of SME entrepreneurs' innovativeness and personality in the adoption of innovations. *Research Policy*, 37(9), 1579-1590.
- McCrae, R. R., and Costa, P. T., Jr. (2008). The Five-Factor theory of personality. In O. P. John, R. W. Robins, and L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159-180). New York, NY: Guilford Press.
- Meyer, J. P., and Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1, 61–89.
- Meyer, J. P., and Allen, N. J. (1997). *Commitment in the workplace: Theory, research and application*. California: Sage Publishers Inc.
- Meyer, J. P., Bobocel, D. R., and Allen, N. J. (1991). Development of organizational commitment during the first year of employment: A longitudinal study of pre-and post-entry influences. *Journal of Management*, 17(4), 717-733.
- Meyer, J. P., Stanley, D. J., Herscovitch, L., and Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, 61, 20–52.
- Miron-Spektor, E., Paletz, S. B., and Lin, C. C. (2015). To create without losing face: The effects of face cultural logic and social-image affirmation on creativity. *Journal of Organizational Behavior*, 36(7), 919-943.
- Mishra, S., and Lalumière, M. L. (2011). Individual differences in risk-propensity: Associations between personality and behavioral measures of risk. *Personality and Individual Differences*, 50(6), 869-873.
- Morley, M. J. (2007). Person-organization fit. *Journal of Managerial Psychology*, 22(2), 109-117.
- Morrison, E. W. (2006). Doing the job well: An investigation of pro-social rule breaking. *Journal of Management*, 32(1), 5-28.
- Mulki, J. P., Jaramillo, F., and Locander, W. B. (2006). Emotional exhaustion and organizational deviance: Can the right job and a leader's style make a difference? *Journal of Business Research*, 59(12), 1222-1230.
- Nahum-Shani, I., and Somech, A. (2011). Leadership, OCB and individual differences: Idiocentrism and allocentrism as moderators of the relationship between transformational and transactional leadership and OCB. *The Leadership Quarterly*, 22(2), 353-366.
- Ng, T. W., Feldman, D. C., & Lam, S. S. (2010). Psychological contract breaches, organizational commitment, and innovation-related behaviors: a latent growth modeling approach. *Journal of Applied Psychology*, 95(4), 744.

- Nouri, H. (1994). Using organizational commitment and job involvement to predict budgetary slack: A research note. *Accounting, Organizations and Society*, 19(3), 289-295.
- Oyserman, D., Coon, H. M., and Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128, 3-72.
- Parks, L., and Guay, R. P. (2009). Personality, values, and motivation. *Personality and Individual Differences*, 47(7), 675-684.
- Parks-Leduc, L., Feldman, G., and Bardi, A. (2015). Personality traits and personal values: A meta-analysis. *Personality and Social Psychology Review*, 19(1), 3-29.
- Paunonen, S.V., Jackson, D.N., 1996. The Jackson Personality Inventory and the Five-Factor Model of personality. *Journal of Research in Personality*, 30, 42-59.
- Perry, S. J., Hunter, E. M., and Currall, S. C. (2016). Managing the innovators: Organizational and professional commitment among scientists and engineers. *Research Policy*, 45(6), 1247-1262.
- Pierce, J. L., & Delbecq, A. L. (1977). Organization structure, individual attitudes and innovation. *Academy of Management Review*, 2(1), 27-37.
- Podsakoff, P. M., MacKenzie, S. B., and Podsakoff, N.P. (2012). Sources of Method Bias in Social Science Research and Recommendations on How to Control It. *Annual Review of Psychology*, 63, 539-569.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N.P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 870-903.
- Roccas, S., Sagiv, L., Schwartz, S. H., and Knafo, A. (2002). The big five personality factors and personal values. *Personality and Social Psychology Bulletin*, 28(6), 789-801.
- Rokeach, M. (1973). *The Nature of Human Values*. New York: Free Press.
- Rutter, M. (2006). *Genes and behavior: Nature-nurture interplay explained*. Malden: Blackwell Publishing.
- Sathe, V. (1985). Managing an entrepreneurial dilemma: Nurturing entrepreneurship and control in large corporations. *Frontiers of Entrepreneurship Research*, 37(2), 636-656.
- Schneider, S.L., and Lopes, L.L. (1986). Reflection in preferences under risk: who and when may suggest why. *Journal of Experimental Psychology: Human Perception and Performance*, 12(4), 535-548.
- Schoen, H., and Schumann, S. (2007). Personality traits, partisan attitudes, and voting behavior. Evidence from Germany. *Political Psychology*, 28(4), 471-498.
- Schwartz, S. H. (1992). Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In: Zanna, M. (Ed), *Advances in Experimental Social Psychology* (Vol. 25, pp. 1-65). Academic Press, New York.
- Self, D. R., De Vries, H. E., Findley, C. S., and Reilly, E. (2006). Thrill seeking: the type T personality and extreme sports. *International Journal of Sport Management and Marketing*, 2(1-2), 175-190.

- Seo, H. S., Lee, S., and Cho, S. (2013). Relationships between personality traits and attitudes toward the sense of smell. *Frontiers in Psychology*, 4, 901.
- Sitkin, S. B., and Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, 17: 9-38.
- Staw, B. M., and Boettger, R. D. (1990). Task revision: A neglected form of work performance. *Academy of Management Journal*, 33: 534–559.
- Stock, R. M., von Hippel, E., & Gillert, N. L. (2016). Impacts of personality traits on consumer innovation success. *Research Policy*, 45(4), 757-769.
- Subramanian, N. (2005). The economics of intrapreneurial innovation. *Journal of Economic Behavior & Organization*, 58(4), 487-510.
- Taciano L. M., and Sibley, C. G. (2012). The big five personality traits and environmental engagement: Associations at the individual and societal level. *Journal of Environmental Psychology*, 32(2), 187–195.
- Tepper, B. J., Henle, C. A., Lambert, L. S., Giacalone, R. A., and Duffy, M. K. (2008). Abusive supervision and subordinates' organization deviance. *Journal of Applied Psychology*, 93(4), 721.
- Thompson, V. A. (1965). Bureaucracy and innovation. *Administrative Science Quarterly*, 10, 1-20.
- Tierney, P., and Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6), 1137-1148.
- Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, 96, 506–520.
- Triandis, H. C. (1993). Collectivism and individualism as cultural syndromes. *Cross-Cultural Research*, 27, 155-180.
- Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality*, 69(6), 907-924.
- Triandis, H. C. (2002). Motivation to work in cross-cultural perspective. In J. M. Brett, and F. Drasgow (Eds.), *The psychology of work: Theoretically based empirical research* (pp. 101–117). Mahwah, NJ: Lawrence Erlbaum.
- Triandis, H. C., and Suh, E. M. (2002). Cultural influences on personality. *Annual Review of Psychology*, 53(1), 133-160.
- Ulleberg, P., and Rundmo, T. (2003). Personality, attitudes and risk perception as predictors of risky driving behaviour among young drivers. *Safety Science*, 41(5), 427-443.
- Vardi, Y., and Weitz, E. (2004). *Misbehavior in organizations: Theory, research and management*. Mahwah, NJ: Lawrence Erlbaum.
- Warren, D. E. (2003). Constructive and destructive deviance in organizations. *Academy of Management Review*, 28(4), 622-632.
- Weinstock, E., and Sonsino, D. (2014). Are risk-seekers more optimistic? Non-parametric approach. *Journal of Economic Behavior & Organization*, 108, 236-251.

Yamaguchi, S., Kuhlman, D. M., and Sugimori, S. (1995). Personality correlates of allocentric tendencies in individualist and collectivist cultures. *Journal of Cross-Cultural Psychology*, 26(6), 658-672.

Zhang, Z., and Arvey, R. D. (2009). Rule breaking in adolescence and entrepreneurial status: An empirical investigation. *Journal of Business Venturing*, 24(5), 436-447.

Appendix: Questionnaire items

Items were rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree).

Creative deviance:

- Did you have to pursue innovative activities even against organizational resistance?

Risk propensity:

- I take risks to achieve something in life.
- Even if there is leeway in the decision-making, I rather hedge my bets.
- I am willing to take risks if I am fully supporting a cause.
- I have always felt a need for security and calm.

Allocentrism

- I care about what others think of me.
- I feel uncomfortable if I don't know what my colleagues think of me.

Commitment:

- I would like to spend the rest of my career in this organization.
- I might as well work in another company, as long as the tasks are similar.
- I praise this company as a particularly good employer in front of my friends.