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# Motivational antecedents to high-tech R&D employees' innovative work behavior: Self-determined motivation, person-organization fit, organization support of creativity, and pay justice



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## ABSTRACT

Employees' innovative work behavior (IWB) contributes to organizational innovativeness in the form of new processes, products, and services, and therefore it is worthwhile to examine motivational antecedents of employees' IWB. This study analyzes the relationship between motivation forms from self-determination theory and the concept of person-organization (PO) fit to provide insight into some of the factors that can influence high-tech R&D employees' IWB. Survey data from R&D employees in three high-tech organizations show that employees with higher levels of PO fit have higher levels of autonomous (identified and intrinsic) work motivation and that autonomously motivated employees engage in more frequent IWB. Autonomous motivation forms mediate PO fit's relationship with IWB. Furthermore, pay justice (i.e., distributive justice) and organization support of creativity are significantly associated with PO fit, indicating that these may be useful for managers to consider in relation to employee fit, motivation, and innovative work behavior. Ultimately, managers interested in fostering innovative behavior of R&D employees would be prudent to seek congruence between employee and organization values and support employees' autonomous motivation.

## 1. Introduction

In a fast-paced world, organizations – especially high-tech organizations – must innovate to remain competitive. Employee behavior that contributes to the generation and implementation of new ideas is desired because it leads to organization-level innovation, which is necessary for organizational effectiveness, competitive advantage, and long-term survival (Amabile, 1988; Janssen, 2000; Scott & Bruce, 1994; Shanker, Bhanugopan, van der Heijden, & Farrell, 2017; Van de Ven, 1986). Thus, it is important to identify factors that are associated with higher levels of innovative behavior among employees (N. Anderson, Carsten, & Bernard, 2004). This is especially true for R&D employees of high-tech organizations since they are expected to contribute to their firms' innovations.

Although an important component of innovative behavior is creativity, i.e., the generation of novel and useful ideas (Amabile, 1988), it requires more than just creative behavior. Innovative work behavior (IWB) is a multi-stage behavior that intends to improve processes, products, or procedures, and ultimately culminates in the implementation of a new idea in a work role, group, or organization (Farr & Ford, 1990; Janssen, 2000; Scott & Bruce, 1994). Specifically, IWB involves searching for problems and/or solutions, generating new ideas, championing (i.e., attempting to build support for) ideas, and implementing ideas (De Jong & Den Hartog,

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2010; Pieterse, Van Knippenberg, Schippers, & Stam, 2010).

Greater research attention is needed to increase understanding of individual antecedents of IWB (Anderson, Potočnik, & Zhou, 2014), including motivation since innovative behavior is highly dependent on it (Amabile, 1988) and few studies on the antecedents to IWB address individual motivation (Stock, 2015). Recent research has revealed that person-organization (PO) fit leads to individual employees' IWB (Afsar, Badir, & Khan, 2015). However, this research did not include employee motivation as a mediating factor despite a call for more research on PO fit and its relationships with motivation from self-determination theory (SDT) (Greguras, Diefendorff, Carpenter, & Tröster, 2014). Although it is not a given that fitting into an organization is always conducive to innovative behaviors since it could foster contentment and an unwillingness to instigate change, autonomous motivation could reconcile this paradox via its association with PO fit. If PO fit is indeed associated with employee IWB through autonomous motivation, it is also practically useful to understand how organizations might be able to improve perceptions of PO fit among R&D employees.

Consequently, this paper investigates the relationships between pay justice, creativity support, PO fit, two types of autonomous work motivation from SDT (i.e., intrinsic and identified motivation), and IWB among R&D employees in high-tech organizations. In doing so, this paper contributes to the literature by examining some previously unexplored relationships in a unique and useful context, and it provides both theoretical insights for academics and practical implications for managers. Ultimately, it offers insight into the following questions regarding R&D workers in high-tech organizations: What relationships do R&D employees' intrinsic and identified work motivation have with IWB; what relationships exist between R&D employees' perceptions of organization fit and their autonomous work motivation; and how do pay justice and organization support of creativity relate to R&D employees' perceptions of PO fit and ultimately, their innovative behavior?

## 2. Theory and hypotheses

### 2.1. SDT, autonomous motivation, and IWB

SDT is a theory of motivation that has been applied and refined for the last 40 years in multiple contexts, and it posits that individuals experience a variety of motivations ranging from controlled to autonomous (Deci, Olafsen, & Ryan, 2017). It differentiates types of motivation, primarily on their degree of autonomy; greater autonomy is associated with higher self-determination (Gagné & Deci, 2005). According to SDT, motivation can be distinguished by type and quality where the quality of motivation is more important than quantity (Gagné & Deci, 2005; Ryan & Deci, 2000b). For example, SDT posits that there is a difference between the relative autonomy of different motivation forms such as intrinsic motivation, identified motivation, and external motivation, and that autonomous types of motivation – e.g., intrinsic motivation and identified motivation – foster performance in complex or creative tasks and behaviors (Gagné & Deci, 2005). On the other hand, controlled forms of motivation, such as external motivation, are usually only beneficial for mundane tasks (Gagné & Deci, 2005).

In total there are three different types of autonomous motivation in SDT – intrinsic, identified, integrated (Ryan & Deci, 2000b). However, integrated motivation has proven extremely difficult to measure reliably (Gagné et al., 2015), and is therefore left out in most empirical studies. The two types of autonomous motivation included in this study – intrinsic and identified motivation – are described below, including their hypothesized relationships with IWB.

*Intrinsic motivation* is a fully autonomous (most self-determined) type of motivation, and means that one is motivated by the task out of interest and enjoyment (Ryan & Deci, 2000a). Individuals are intrinsically motivated when they obtain benefits directly from the activity itself without receiving external benefits (Ryan & Deci, 2000a). Intrinsically motivated employees are likely to show persistence (Vallerand & Bissonnette, 1992), and exhibit higher work performance and affective commitment (Kuvaas, Buch, Weibel, Dysvik, & Nerstad, 2017).

Intrinsic motivation is particularly considered to be crucial for creativity (Amabile, 1996) since it is conducive to persistence (Oldham & Cummings, 1996), positive affect (Silvia, 2008), and novelty (Zhou, 1998). These qualities should also be beneficial for other aspects of IWB, such as implementation. There is also some empirical support for a positive relationship between employees' intrinsic innovation motivation and their innovative behavior (Yuan & Woodman, 2010), and intrinsic motivation is a stronger predictor of performance quality than external motivation (Cerasoli, Nicklin, & Ford, 2014). Although some research has not shown a significant positive relationship between intrinsic motivation and IWB for certain professions (Bammens, Notelaers, & Van Gils, 2015), it is expected that R&D employees who are intrinsically motivated by their work exhibit greater interest in, and effort and ability for working innovatively. Thus, relative to both identified motivation, it is likely that intrinsic work motivation expresses the strongest relationship with IWB among R&D workers.

*Identified motivation* is a relatively autonomous form of extrinsic motivation. Unlike intrinsic motivation, identified motivation does not require inherent satisfaction in an activity. Rather, it is expressed when an individual identifies and internalizes the perceived value and meaning of a behavior due to its instrumental value (Gagné et al., 2015; Ryan & Deci, 2000b). Identified motivation embodies a sense of volition for behaviors that are congruent with peoples' own personal goals and identities (Gagné & Deci, 2005). It is not as widely studied as intrinsic motivation, but it is also considered to lead to persistence, performance, and well-being (Deci & Ryan, 2008).

Identified motivation is also likely associated with IWB (Bammens, 2016; Bammens et al., 2015). Employees who find their work meaningful (e.g., those that express higher identified motivation in relation to their work) will be more likely to engage in IWB since meaning is an important element of creative behavior (Cohen-Meitar, Carmeli, & Waldman, 2009; Elsbach & Hargadon, 2006). Moreover, innovative behavior is composed not only of creative endeavors such as idea generation, but also of tasks like idea championing, which although complex may require less creativity and interest (Bammens, 2016). In this respect, maintaining high

levels of identified work motivation may also lead to IWB since it can help R&D employees persist in behaviors that are complicated, but not necessarily intrinsically motivating (Bammens, 2016; Burton, Lydon, D'Alessandro, & Koestner, 2006; Koestner & Losier, 2002).

**H1.** *Intrinsic work motivation is positively related to IWB and will have the strongest relationship with IWB of the two autonomous motivation types.*

**H2.** *Identified work motivation is positively related to IWB.*

## 2.2. SDT motivation and PO fit

Like SDT, person-environment fit concerns the correspondence between a person's characteristics and their environment. PO fit is specifically concerned with the relationship between an individual and their organization. An all-encompassing definition of PO fit is, "the compatibility between people and organizations that occurs when at least one entity provides what the other needs, they share similar fundamental characteristics, or both" (Kristof, 1996, pp. 4–5). This definition includes the perception of PO fit as personal need fulfillment based on the degree to which an individual perceives their organization's values to match with their own (Chatman, 1989; Greguras & Diefendorff, 2009; Kristof, 1996; Lauver & Kristof-Brown, 2001).

Underlying SDT and acting as a precursor to autonomous or self-determined motivation is the concept of psychological need-fulfilment (Deci et al., 2017; Gagné & Deci, 2005; Slemp, Kern, Patrick, & Ryan, 2018). Individual personalities and preferences may differ, but the basic psychological needs of competence (the need to affect one's own outcomes), relatedness (the need to connect with others), and autonomy (the need to control one's own actions) are important for all individuals (Gagné & Deci, 2005; Greguras & Diefendorff, 2009). Although the basic needs of SDT are proposed to be universal, the level of need fulfillment is affected by the degree of congruity between personal attributes and contextual factors (Deci et al., 2017). Someone is more likely to satisfy their basic psychological needs in an environment that provides them with the appropriate resources, and environments where employees experience better fit are more likely to offer greater opportunities to fulfill employees' basic needs (Greguras et al., 2014; Greguras & Diefendorff, 2009). Therefore, individuals who experience greater fit with their environment are also more likely to express higher levels of autonomous motivation.

Conversely, low perceptions of PO fit (or higher degrees of misfit) will likely contribute to controlled forms of motivation, or at worst, amotivation (i.e., lacking motivation entirely). This is because low PO fit results from low value congruence, implying that the underlying reasons for work are not valued (Greguras et al., 2014). In this scenario an employee would not be autonomously motivated by their work activities but would instead only be motivated by attaining external rewards (e.g., monetary incentives), or avoiding punishment, such as losing one's job or being disciplined.

Previous research has shown associations between person-environment fit, need fulfillment, and autonomous forms of motivation (Van den Broeck, Ferris, Chang, & Rosen, 2016), and that PO fit leads to satisfaction of the basic psychological needs of competence, relatedness, and autonomy (Greguras & Diefendorff, 2009). Moreover, PO fit helps individuals internalize external goals and therefore affects autonomous motivation due to value congruence (i.e., supplementary fit) (Greguras et al., 2014). Therefore, higher levels of perceived PO fit should relate to R&D employees' autonomous or self-determined forms of motivation, namely, intrinsic and identified motivation.

**H3.** *PO fit is positively related to intrinsic work motivation.*

**H4.** *PO fit is positively related to identified work motivation.*

## 2.3. Potential determinants of PO fit

As a component of person-environment fit that has been associated with desired employee outcomes such as increased job satisfaction, organizational commitment, and contextual performance (i.e., contributing above and beyond one's job requirements) (Kristof-Brown, Zimmerman, & Johnson, 2005; Verquer, Beehr, & Wagner, 2003), it is useful to consider how managers may be able to improve employees' perception of PO fit. Even though people differ, there are probably some factors that high-tech firms can adjust to help improve their R&D employees' perceptions of fit in the organization.

Although both PO fit and SDT concern need fulfillment/satisfaction, the needs that each refer to are conceptualized differently. In SDT, the basic psychological needs of relatedness, competence, and autonomy are universal, whereas PO fit and other forms of person-environment fit have generally taken the perspective that needs are akin to a person's desires and are therefore dependent on the individual (Baard, Deci, & Ryan, 2004; Greguras et al., 2014). For example, higher PO fit will be expressed when an employee's desires (e.g., salary, promotion, responsibility, etc.) are met by their organization as it will contribute to need (desire) fulfillment and signal a congruence in values. On the other hand, misfit occurs when a person's needs are not met, signaling value incongruence and resulting in lower PO fit.

People perceive fit with their organization when the organization satisfies their needs (desires) and the organization's values match their values (Chatman, 1989; Kristof, 1996). Moreover, as an element of distributive justice, pay justice should have positive implications for PO fit due to its relationship with need satisfaction and autonomous motivation. Work is generally the primary means by which people make money to live on, and this includes R&D employees. Pay is an important individual outcome provided by organizations, which helps to communicate what organizations value (Wiley, 1997), and employees who perceive their pay to be fair

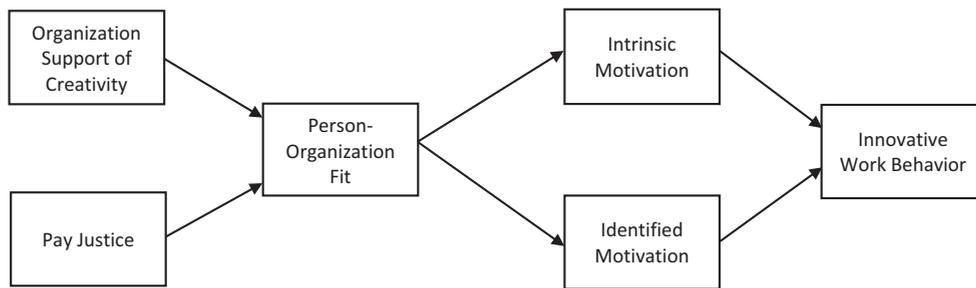


Fig. 1. Conceptual model.

will experience that their values are congruent with their organizations' values, thereby resulting in higher perceived PO fit (Cable & Edwards, 2004; Ohana & Meyer, 2016). Previous research has shown that employees perform better when given equitable rewards (Garbers & Konradt, 2014), and that distributive justice indirectly leads to autonomous motivation and performance through its positive effect on need satisfaction (Thibault Landry et al., 2017). Ultimately, R&D employees that perceive their work to be fairly compensated for will also perceive that their skills and abilities are valued by their organization, and this will be reflected by higher levels of PO fit.

In addition to pay justice, another potential determinant of PO fit for R&D employees is their perception of their organization's support of creativity. Contextual conditions that support creativity may be valued by most employees, but they will be particularly valued by employees that have creative personalities (Madjar, Oldham, & Pratt, 2002; Oldham & Cummings, 1996). Since R&D employees are expected to contribute to creativity and innovation, then the type of person that works in an organization's R&D department should be typically one that is comfortable in environments that support creativity and are open to change. Creativity supportive work climates are likely desired by employees in many functions, but since R&D employees tend to value creativity (Glassman, 1986) – and employees' perceived value congruence with their organizations leads to PO fit (Cable & Judge, 1996) – then it is logical to posit that perceived organization support of creativity will be significantly associated with their perceptions of PO fit.

**H5.** Pay justice will positively relate to PO fit.

**H6.** Organization support of creativity will positively relate to PO fit.

The relationships of interest as outlined by the hypotheses can be seen in the conceptual model in Fig. 1.

### 3. Method

#### 3.1. Sample and procedure

The sample for this study included R&D employees in three multinational firms with R&D departments and headquarters in Norway. Two of the companies develop electronic components and the third company develops and manufactures chemical products. According to their NACE (European Nomenclature of Economic Activities) codes, the electronic firms develop high-technology products, while the chemical firm is a medium-high technology manufacturer (Eurostat, 2017).

Employees from the three organizations were included in the study because the organizations that they work in are Norwegian-based multinational firms utilizing high technology with R&D departments in Norway. Each organization employs between 100 and 200 employees in their R&D departments. Employee data was collected from more than one organization to increase statistical power and provide a broader understanding of the relationships between the study's variables. The organizations were initially recruited via convenience sampling and ultimately selected after discussions with R&D departments and approval by each organization's management. Discussions with management in each of the organizations indicated that employees were relatively homogeneous across organizations. Additionally, managers affirmed the importance of R&D employees' work to innovation in their organizations.

An electronic questionnaire was sent via email to a total of 422 R&D employees in the three organizations. The email informed all potential participants that their responses to the questionnaire were voluntary. Participants in the survey and managers were guaranteed anonymity, and some details of the sample are omitted to protect anonymity.

Two hundred thirty-five of the employees returned the questionnaire constituting a response rate of 56%. All three organizations have a male majority in their R&D departments. Due to a request from one of the organizations, and to further ensure anonymity, participant gender and age were not included on the questionnaire. Eighty two percent of the respondents had a master's degree or PhD, while the remaining 18% of respondents had a bachelor's degree. Sixty seven percent of respondents had a job tenure of at least two years, and 72% had an organization tenure of at least two years. English is the working language in all three R&D departments due to their multinational workforces and global reach.

#### 3.2. Measures

The scale items with factor loadings for the endogenous and exogenous variables, along with their respective reliability and

validity values can be found in the Appendix.

### 3.3. Exogenous variables

#### 3.3.1. Organization support of creativity

Three items adapted from (Scott & Bruce, 1994) and originally developed by (Siegel & Kaemmerer, 1978) were used to measure to what extent employees perceive their organization to support creativity and be open to change on a 7-point bipolar Likert-type response scale ranging from 1 (strongly disagree) to 7 (strongly agree).

#### 3.3.2. Pay justice

Employee perceptions of pay justice were measured by four items adapted from Colquitt's (2001) distributive justice scale on a 7-point bipolar Likert-type response scale ranging from 1 (strongly disagree) to 7 (strongly agree).

### 3.4. Endogenous variables

#### 3.4.1. PO fit

Employee perceptions of PO fit were measured by Lauver and Kristof-Brown's (2001) three-item scale on a 7-point bipolar Likert-type response scale ranging from 1 (strongly disagree) to 7 (strongly agree).

#### 3.4.2. IWB

R&D employees' IWB was measured by nine items adapted from De Jong and Den Hartog's (2010) IWB scale on a 7-point unipolar Likert-type response scale ranging from 1 (never) to 7 (always). The IWB scale is a unidimensional measure that incorporates items to reflect four stages of IWB, i.e., exploration, generation, championing, and implementation of ideas. One item from the original scale, "...pay attention to issues that are not part of your daily work," was left out because of its dubious representation of exploration within IWB and its potential to confuse respondents.

Despite the potential for bias, self-report measures of creativity and innovative behavior have been used in multiple studies (e.g. Dewett, 2007; Janssen, 2000; Shalley, Gilson, & Blum, 2009), and they have been found to correlate with supervisor ratings (Axtell et al., 2000; Dewett, 2007; Janssen, 2000). Additionally, Janssen (2000) argued that self-reports may be most appropriate for measuring employees' innovative behavior since individuals are likely most aware of their own subtle activities comprising IWB.

#### 3.4.3. Work motivation

Intrinsic motivation and identified motivation were measured with three items each from the Multidimensional Work Motivation Scale (Gagné et al., 2015) on a 7-point unipolar Likert-type response scale ranging from 1 (not at all) to 7 (completely).

### 3.5. Control variables

Two variables were included as controls. First, socially desirable response set (SDRS) was included since all measures were self-reported and respondents could tend to represent themselves in a favorable manner. A single SDRS score for each participant was determined by the sum of their dichotomized extreme responses to the SDRS-5 scale developed by Hays, Hayashi, and Stewart (1989). Respondents' SDRS scores had no impact on the tests of hypotheses, suggesting that socially desirable responding did not bias the results. Second, organization tenure was also included as a control since tenure could potentially affect perceptions of PO fit and motivation. However, like SDRS scores, organization tenure had no effect on the results of hypothesis testing.

### 3.6. Common method bias

Since self-report measures were used, common method bias could have potentially been an issue (Podsakoff, MacKenzie, & Podsakoff, 2012). Following advice from Podsakoff, MacKenzie, Lee, and Podsakoff (2003), and Podsakoff et al. (2012), the potential for common method bias was reduced by guaranteeing respondent anonymity, using previously validated scales with different endpoints, and eliminating ambiguity by labelling all response scale points. I also tested for socially desirable responses since participants may have artificially presented themselves in a favorable light (Crowne & Marlowe, 1960), but, as aforementioned, respondents' SDRS scores had no impact on the tests of hypotheses, so socially desirable responding did not appear problematic. Finally, confirmatory factor analysis (CFA) revealed that the theoretically derived factor model demonstrated sufficiently good fit to the data, and a  $\chi^2$  difference test with a one factor model suggested that common method variance was not a major concern (Podsakoff et al., 2003).

## 4. Analysis and results

### 4.1. Missing cases

Missing cases (0.004% of responses) were handled by using maximum likelihood with missing values (MLMV) estimation. Before doing so, Little's (1988) missing completely at random (MCAR) test ( $\chi^2 = 835.926$ ,  $df = 792$ ,  $p = .136$ ) showed that data was missing

**Table 1**  
Composite reliabilities, means, standard deviations, and correlations.

	Mean	SD	1	2	3	4	5	6	7	8
1. SDRS	0.82	1.17								
2. Org. tenure	2.41	1.13	-0.09							
3. Pay justice	4.19	1.41	-0.04	-0.09	(0.97)					
4. Org. support of creativity	5.36	0.96	0.14*	-0.19**	0.34**	(0.83)				
5. PO fit	5.75	0.93	0.14*	-0.12	0.36**	0.54**	(0.84)			
6. Intrinsic motivation	5.49	0.91	0.20**	-0.18**	0.10	0.36**	0.39**	(0.91)		
7. Identified motivation	5.70	0.91	0.26**	-0.15*	0.11	0.23**	0.30**	0.43**	(0.89)	
8. IWB	4.53	0.78	0.08	-0.02	0.02	0.16*	0.17**	0.50**	0.35**	(0.88)

Pairwise,  $n = 235$ . Composite reliabilities (CR) are given on the diagonal for the latent variables in parentheses. SDRS = social desirability response scale; PO fit = person-organization fit; IWB = innovative work behavior.

\*\*  $p < .01$ .

\*  $p < .05$  (2-tailed).

completely at random and that MLMV estimation could be applied (Graham, 2009).

4.2. Measurement model

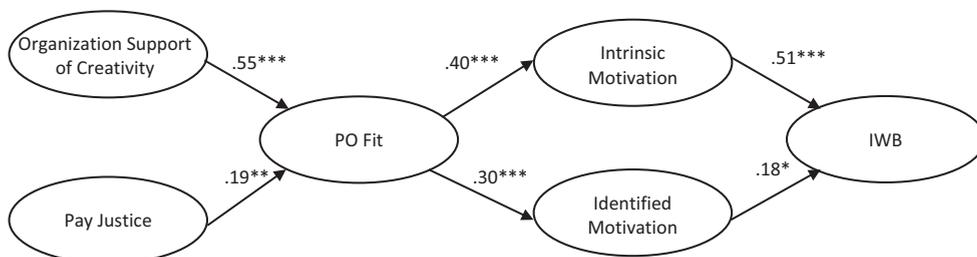
Table 1 reports the means, standard variations, and correlations for all variables. As suggested by Anderson and Gerbing (1988), a two-step modelling approach was used by initially validating the measures and testing the measurement model with confirmatory factor analysis (CFA) before proceeding with a structural equation model (SEM) in Stata 14.2. The CFA included the hypothesized model with exogenous and endogenous variables. Four pairs of IWB item error terms with high modification indices were allowed to correlate, reflecting innovative behavior as an overlapping multistage process in which individuals can be involved in multiple stages at one time (Scott & Bruce, 1994).

Regarding construct validity, all items loaded significantly on their respective latent constructs and the standardized factor loadings were above the recommended minimum threshold of 0.4 (Mehmetoglu & Jakobsen, 2017). Additionally, composite reliability (CR) – measured by Raykov’s (1997) reliability coefficient – was above the threshold of 0.7 for all factors as recommended by Mehmetoglu and Jakobsen (2017). Discriminant validity of the latent variables was tested with the average variance extracted (AVE) measure.<sup>1</sup> All of the AVE values were larger than the squared correlations between the latent variables, and the AVE values were above 0.5.

Fit indices revealed adequate fit for the measurement model (RMSEA = 0.050, CFI = 0.959, TLI = 0.951), with sufficient fit indices as recommended by Hu and Bentler (1998). Furthermore, a  $\chi^2$  difference test with a one factor measurement model (RMSEA = 0.160, CFI = 0.590, TLI = 0.531) indicated that the hypothesized measurement model fit the data significantly better, ( $\chi^2$  difference (10) = 1022.62,  $p < .001$ ).

4.3. Structural model

Since the measurement model was acceptable, then the structural model could be evaluated. When analyzing the structural model, the intrinsic and identified motivation latent constructs were allowed to covary since they are both forms of autonomous motivation. The structural model (see Fig. 2) showed acceptable fit with the data (RMSEA = 0.048, CFI = 0.962, TLI = 0.956). After



Standardized path coefficients.  
\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

**Fig. 2.** Standardized path coefficients.  
\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .  
Hypothesized model results.

**Table 2**  
Summary of fit statistics.

Model	X2	df	X2/df	RMSEA	CFI	TLI	SRMR <sup>a</sup>
Measurement model	469.70	294	1.60	0.050	0.959	0.951	0.054
Hypothesized model	460.48	300	1.53	0.048	0.962	0.956	0.058
Model (a)	460.09	299	1.54	0.048	0.962	0.956	0.058
Model (b)	458.99	298	1.54	0.048	0.962	0.955	0.055
Model (c)	458.99	297	1.55	0.048	0.962	0.955	0.055
Model (d)	515.75	297	1.74	0.056	0.949	0.939	0.104

Note.  $N = 235$ . RMSEA = root-mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized-mean-square residual.

<sup>a</sup> SRMR is calculated using listwise deletion ( $N = 212$ ), since it cannot be calculated when using maximum likelihood with missing values estimation.

determining that the hypothesized structural model adequately fit the data, competing models were examined.

The hypothesized model was compared with four alternative models. First, since previous research has provided evidence of direct links between PO fit and IWB (Afsar et al., 2015) and between support for innovation and IWB (Scott & Bruce, 1994), model (a) added a direct path between PO fit and IWB, ( $\chi^2$  difference (1) = 0.39, *ns*); model (b) added direct paths between creativity support and pay justice to IWB, ( $\chi^2$  difference (2) = 1.49, *ns*); and model (c) added direct paths between PO fit, pay justice, and creativity support to IWB, ( $\chi^2$  difference (3) = 1.49, *ns*). Additionally, since motivation could be directly affected by perceptions of organizational support and justice, model (d) added direct paths from creativity support and pay justice to the autonomous motivation types, ( $\chi^2$  difference (3) = -55.27, *ns*). Since the addition of paths in models (a), (b), (c), and (d) did not significantly improve the fit of the models when compared to the hypothesized model, the results provide support for the more parsimonious hypothesized model.

Based on  $R^2$  values, the hypothesized model accounted for 43% of the variance in PO fit, 26% of the variance in intrinsic motivation, 20% of the variance in identified motivation, and 34% of the variance in IWB. Consequently, the statistical significance, direction, and size of the path estimates in the hypothesized model were examined when assessing support for the hypotheses. Table 2 provides a summary of fit statistics for the structural models.

#### 4.4. Support of hypotheses

As summarized in Table 3, all six hypotheses were supported. In the hypothesized model (see Fig. 2), the path between intrinsic motivation and IWB ( $\beta = 0.51$ ,  $p < .001$ ) was significant and had the strongest relationship with IWB of the two motivation types, supporting Hypothesis 1. Also, in support of Hypothesis 2, identified motivation had a significant and positive relationship with IWB ( $\beta = 0.18$ ,  $p < .05$ ). In support of Hypotheses 3 and 4, PO fit positively and significantly related to intrinsic motivation ( $\beta = 0.40$ ,  $p < .001$ ) and identified motivation ( $\beta = 0.30$ ,  $p < .001$ ). Finally, the paths between pay justice and PO fit ( $\beta = 0.18$ ,  $p < .01$ ), and between organization support of creativity and PO fit ( $\beta = 0.55$ ,  $p < .001$ ) were both positive and significant, providing support for Hypotheses 5 and 6.

Although indirect effects were not hypothesized for, it is useful to see how IWB and the motivation types were indirectly influenced by the preceding factors in the model. Table 4 provides a summary of the indirect effects of pay justice, organization support of creativity, and PO fit on the two types of autonomous motivation and on IWB. Organization support of creativity had significant indirect effects on intrinsic motivation ( $\beta = 0.19$ ,  $p < .001$ ), identified motivation ( $\beta = 0.14$ ,  $p < .001$ ), and IWB ( $\beta = 0.11$ ,  $p < .001$ ). Pay justice also had significant indirect effects on intrinsic motivation ( $\beta = 0.05$ ,  $p < .01$ ), identified motivation ( $\beta = 0.03$ ,  $p < .05$ ), and IWB ( $\beta = 0.03$ ,  $p < .05$ ), but pay justice's indirect relationships were clearly weaker when compared with organization support of creativity. Finally, as an example of how autonomous motivation types can mediate the effects of personal and contextual factors on creativity-related behaviors (Liu, et al. 2016), PO fit had a significant indirect effect on IWB ( $\beta = 0.23$ ,  $p < .001$ ) through the autonomous types of motivation. According to Zhao, Lynch, and Chen (2010), this is an instance of indirect-only mediation, which is equivalent to full mediation (Baron & Kenny, 1986).

**Table 3**  
Hypotheses tests.

Hypothesis (H)	Result
H1: Intrinsic work motivation is positively related to IWB and will have the strongest relationship with IWB of the two autonomous motivation types.	(Supported, 0.51, $p < .001$ )
H2: Identified motivation is positively related to IWB.	(Supported, 0.18, $p < .05$ )
H3: PO fit is positively related to intrinsic motivation.	(Supported, 0.40, $p < .001$ )
H4: PO fit is positively related to identified motivation.	(Supported, 0.30, $p < .001$ )
H5: Pay justice will positively relate to PO fit.	(Supported, 0.19, $p < .01$ )
H6: Organization support of creativity will positively relate to PO fit.	(Supported, 0.55, $p < .001$ )

Note. PO fit = person-organization fit; IWB = innovative work behavior.

**Table 4**

Indirect Effects of Pay Justification, Organization Support of Creativity, and PO Fit on Motivation and IWB.

		Intrinsic motivation	Identified motivation	IWB
Hypothesized model	Org. support of creativity	0.19**	0.14***	0.11***
	Pay justice	0.05*	0.03*	0.03*
	PO fit			0.23***

Note. PO fit = person-organization fit; IWB = innovative work behavior.

\*\*\*  $p < .001$ .

\*\*  $p < .01$ .

\*  $p < .05$ .

## 5. Discussion

The primary purpose of this study was to provide insight into the relationships between two forms of individual work motivation and IWB, the relationship between PO fit and autonomous motivation, and the relationships between perceptions of organizational support of creativity and pay justice with PO fit in a sample of R&D employees in high-tech companies. The results of this study were in line with the hypotheses and help to provide theoretical and practical implications.

First, this study responds to a call by Greguras et al. (2014) and is one of the first to examine the relationships of PO fit with autonomous motivation. The positive relationships between PO fit and the autonomous types of motivation complement previous research in which PO fit predicted satisfaction of the basic psychological needs of relatedness, competence, and autonomy (Greguras & Diefendorff, 2009), by showing that perceptions of PO fit are positively associated with intrinsic motivation and identified motivation. In multiple studies PO fit has been connected with positive outcomes such as increased job satisfaction and organizational commitment (Kristof-Brown et al., 2005; Verquer et al., 2003); this study opens the door to the potential for autonomous motivation behaving as a mediator in myriad relationships involving PO fit and desired individual outcomes in organizations.

Secondly, this study provides support for the positive relationship between R&D employees' autonomous work motivation and their innovative behavior. This is in line with previous research that showed a positive association between intrinsic motivation and employee creativity (Dewett, 2007; Shin & Zhou, 2003) and with innovative behavior (Yuan & Woodman, 2010). The results also supplement Bammens' (2016) proposition that associated identified motivation with IWB. Despite the magnitude of the relationship with IWB being much smaller for identified motivation than for intrinsic motivation, the findings point to the benefits of autonomous types of motivation for employees' innovative behavior. It also points to the utility of supporting identified motivation, which is of considerable importance since it may be more practical for organizations to promote identified motivation than intrinsic motivation – in other words, it is often easier to encourage employees to internalize the value of tasks instead of attempting to make them more fun (Gagné et al., 2015).

The findings are compatible with SDT that claim that autonomous forms of motivation are generally associated with high quality performance and behaviors that may be complex, creative, or problem-solving in nature (Gagné & Deci, 2005). IWB is a broad encompassing behavior that is largely composed of more complex problem-solving tasks but also includes simplistic aspects. In this respect, autonomous forms of motivation can be conducive to both simplistic and complex tasks.

Complementing Afsar et al. (2015), this study's results showed that R&D employee perceptions of PO fit were indirectly related with IWB through identified and intrinsic motivation. The results also complement meta-analytic results showing positive correlations with various types of job performance (Kristof-Brown et al., 2005). It is plausible that a more substantial direct relationship between PO fit and innovative behavior exists for employees who are in functions where IWB is considered to be an extra-role behavior; this would be in line with Chatman (1989) who proposed a model with PO fit leading to extra-role behaviors.

This study also revealed two possible determinants of PO fit: perceptions of pay justice and organization support of creativity. These findings provide two specific means of which to potentially increase R&D employees' PO fit, and complement those from Slemp et al. (2018) showing that leader autonomy support is associated with employees' basic needs and positive work behaviors. Employees have a desire to get paid fairly for their work, so it is understandable that higher perceptions of pay justice are associated with higher PO fit – this is expected to be true of employees in all functions. Additionally, organizations' support of creativity had a much stronger association with PO fit. The stronger relationship between organization support of creativity and PO fit compared to pay justice and PO fit may be dependent on the nature of jobs sought and held by individuals – R&D employees perhaps feel more at home in organizations that are perceived to be supportive of creativity than employees in other functions, which have lower expectations or requirements for employee creativity and innovative behavior. Ultimately, it is possible to conclude that both pay justice and creativity support can play important roles in signaling value congruence between R&D employees and their organization.

Finally, previous conceptual and empirical research has been at odds about the relationship between distributive justice perceptions and autonomous motivation. Fall and Roussel (2014) suggested that justice perceptions regarding pay should impact autonomous motivation and behavior. On the other hand, two empirical studies found no significant direct relations between employees' perceptions of distributive justice in relation to pay and intrinsic motivation (Kuvaas, 2006; Olafsen, Halvari, Forest, & Deci, 2015). Like Thibault Landry et al. (2017), this study complements these findings by showing that distributive justice with respect to pay and autonomous motivation may be characterized by an indirect relationship rather than a direct one.

### 5.1. Managerial implications

The findings indicate that perceived organization support of creativity, pay justice, PO fit, and the autonomous (intrinsic and identified) forms of motivation are related to IWB, thus making it relevant for managers to consider them when trying to cultivate R&D employees' innovative behavior. Therefore, managers may want to consider PO fit of R&D workers both during the hiring process and throughout their tenure at the company. Managers may also be able to support employees' PO fit by stimulating their perceptions of pay justice and organization support of creativity.

When assessing prospective employees, it is likely useful to ascertain how candidates' values may fit with the organization's values (Cable & Judge, 1997). Moreover, it may behoove individuals to use their own perception of PO fit as an indication of whether they should join or stay in an organization. After all, this study shows that PO fit positively relates to autonomous motivation and indirectly to IWB, and numerous studies have shown that it relates to other favorable outcomes such as higher levels of job satisfaction and organization commitment (Kristof-Brown et al., 2005; Verquer et al., 2003).

It would be easy to assume that perceptions of pay justice can be improved by pay increases. However, pay justice, like pay satisfaction, is not necessarily strengthened by increases in salaries or bonuses (Judge, Piccolo, Podsakoff, Shaw, & Rich, 2010); instead, perceptions of pay justice can be influenced by comparisons with other employees in the same organization or employees in external organizations. Specifically, if employees see that others are making comparable amounts of money for similar types of work, then they might be more apt to view their own pay as just. Therefore, it could be prudent to maintain high degrees of intra- and inter-organizational fairness in the distribution of pay to employees based on their positions and work tasks.

For positions that demand some or all aspects of innovative behavior, organizations that support creativity and are open to change may help to attract and retain employees. Furthermore, other studies have shown that various leader and coworker actions can influence employees' beliefs that their organization is supportive of creativity. For example, leaders that voice support for employees' decisions, monitor their progress in a timely manner, and recognize good performance can help to strengthen employees' perceptions of leader support, potentially cultivating innovative behavior (Amabile, Schatzel, Moneta, & Kramer, 2004). Additionally, coworkers that show interest and support for new ideas may also help form employees' positive perceptions of an organization that is supportive of creativity (Madjar et al., 2002).

Also, managers may want to consider making direct efforts to support R&D employees' autonomous motivation, since it associates with IWB. For example, managers could provide constructive and positive feedback to their employees, give a meaningful rationale for tasks, and provide employees with choice in their jobs – in both what they do and how they do them – to potentially support autonomous motivation (Deci, Eghrari, Patrick, & Leone, 1994; Gagné & Deci, 2005). Ultimately, a work environment that is supportive of autonomous motivation will likely also promote psychological empowerment (Spreitzer, 1995; Thomas & Velthouse, 1990), resulting in positive employee outcomes such as innovative behavior (Pieterse et al., 2010; Spreitzer, 1995) and organizational citizenship behaviors (Güntert, 2015).

### 5.2. Limitations and suggestions for future research

This study has certain limitations that must be considered when interpreting the results; these limitations also provide possible directions for future research. A few limitations result from the type of data that were used in the study since they are based on self-report measures, which are cross-sectional (i.e., correlational) in nature. Due to the cross-sectional self-report data, causality cannot be determined. As Spector (1994) pointed out, cross-sectional self-report studies are useful in providing insight about phenomena of interest – especially those related to employees' perceptions – which should then be studied and tested with other methods in the future. This study used theory to infer causality, but future studies using lagged or longitudinal data could be used to establish the directionality and causal ordering of the relationships between the factors. Finally, although this study used single-source data to maximize sample size, future studies could further reduce the potential for common method bias by using different sources for the predictor and criterion variables.

The study's examination of the relationships between PO fit, the motivation forms, and IWB is limited because of an absence of the underlying mechanisms for PO fit's relationship with motivation. Consistent with (Deci et al., 2017; Slemp et al., 2018; Vallerand, 1997), the fulfillment of the basic needs of competence, relatedness, and autonomy are likely proximal to motivation, thus acting as a mediator between PO fit and autonomous motivation. However, as pointed out by Greguras et al. (2014), the causal ordering of the relationships between PO fit, motivation, and need satisfaction could be examined in future research. Notably, need satisfaction could behave as an antecedent to PO fit or as a mediator between PO fit and motivation, and autonomous motivation could even precede PO fit. Thus, future research on PO fit (and other types of person-environment fit) and motivation could also include need satisfaction in their models and examine competing models to better understand the relationships between them.

IWB is composed of multiple stages, but like other studies (e.g., Janssen, 2000; Scott & Bruce, 1994; Yuan & Woodman, 2010), this study used a one-dimensional measure, which potentially limits its impact. Measuring multiple stages of IWB separately, and comparing them with all forms of SDT motivation, could reveal more nuanced insight considering that different stages of innovation may require different motivation types (Amabile, 1993; Gagné, 2014). This provides an opportunity for future research to investigate the unique relationships between different types of motivation and innovation stages.

Lastly, this study specifically examined R&D employees in three high-tech organizations in Norway, so the results may not be generalizable to all types of employees, functions, organizations, or countries. However, the findings are consistent with the hypothesized relationships which were based on prior theory. Additionally, the organizations in the study employed workers of many different nationalities in their R&D departments, and the relationships between the variables were similar across the three

organizations. Finally, even employees outside of R&D have responsibilities related to IWB; it is common for employees in other functions to conduct unstructured problem solving and contribute to innovation (Scott & Bruce, 1994); therefore, it is possible to be cautiously optimistic about the generalizability of this study's results.

## 6. Conclusion

Since innovation is a vital organizational output for which R&D employees' IWB plays an important role, then further understanding of the antecedents to their innovative behavior is of great importance. The current study has provided useful insight into the motivational antecedents of IWB, with both theoretical and practical implications. It revealed that autonomous (intrinsic and identified) forms of motivation are associated with both PO fit and IWB. The study provides insight into the relationship between fit, motivation, and behavior. It also opens the possibility for autonomous motivation behaving as a mediating factor for other attitudinal and behavioral outcomes stemming from PO fit, and for identified motivation playing an important role in behavioral outcomes that have to this point only examined intrinsic motivation. Additionally, the study revealed that R&D employees' perceptions of pay justice and organization support of creativity – two factors at least indirectly under managers' control – can potentially benefit their perceptions of PO fit, autonomous motivation, and IWB. Future research may build on this study by examining the SDT types of motivation and their relationships with need satisfaction and person-environment fit, along with their impact on the separate stages of IWB in other contexts.

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## Appendix A

### Scale items with factor loadings

(The following items used a 7-point bipolar Likert-type response scale ranging from strongly disagree to strongly agree.)

**Organization support of creativity** adapted from Scott and Bruce (1994); items originally developed by Siegel and Kaemmerer (1978); ( $\alpha = 0.83$ ; CR = 0.83; AVE = 0.63)

1. Creativity is encouraged here. (0.86)
2. Our ability to function creatively is respected by the leadership. (0.82)
3. This organization is open and responsive to change. (0.69)

**Pay justice** adapted from Colquitt (2001); ( $\alpha = 0.96$ ; CR = 0.97; AVE = 0.88).

Stem: Including both salary and bonus pay, if provided...

1. ...my pay reflects the effort that I put into my work. (0.91)
2. ...my pay is appropriate for the work that I do. (0.93)
3. ...my pay reflects what I contribute to the organization. (0.96)
4. ...my pay is justified, given my performance. (0.94)

**Person-organization (PO) fit** (Lauver & Kristof-Brown, 2001); ( $\alpha = 0.83$ ; CR = 0.84; AVE = 0.65)

1. I am able to maintain my values at this company. (0.86)
2. My values match or fit the values of this organization. (0.86)
3. My values prevent me from fitting in at this company because they are different from the company's values. (0.67; reverse-coded)

**Innovative work behavior (IWB)** adapted from De Jong and Den Hartog (2010); ( $\alpha = 0.90$ ; CR = 0.88; AVE = 0.51) (The following items used a 7-point unipolar Likert-type response scale ranging from never to always.)

Stem: In relation to your job, how often do you...

1. ...wonder how things can be improved? (0.61)
2. ...find new working methods, techniques or instruments? (0.74)
3. ...generate original solutions for problems? (0.80)
4. ...find new approaches to execute tasks? (0.80)
5. ...make important organizational members enthusiastic for new ideas? (0.61)
6. ...attempt to convince people to support an original idea? (0.71)
7. ...introduce or use new ideas in work practices? (0.76)
8. ...contribute to the implementation of new ideas? (0.72)
9. ...put effort into the development of new things? (0.63)

**Motivation scales (Gagné et al., 2015)**

(The following items used a 7-point unipolar Likert-type response scale ranging from not at all to completely.)

Stem: Why do you put effort into your job?

**Intrinsic motivation** ( $\alpha = 0.91$ ; CR = 0.91; AVE = 0.78)

1. Because the work that I do is interesting. (0.89)
2. Because I have fun doing my job. (0.87)
3. Because what I do in my work is exciting. (0.88)

**Identified motivation** ( $\alpha = 0.89$ ; CR = 0.89; AVE = 0.74)

1. Because I personally consider it important to put effort into my job. (0.81)
2. Because putting effort into my job aligns with my personal values. (0.89)
3. Because putting effort into my job has personal significance for me. (0.87)

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