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Effects of Psychological Need Satisfaction on Proactive Work Behaviors

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Abstract

The present study examined the drivers of proactive behavior in a workplace. Amazon Mechanical Turk workers ($N = 218$), currently employed in the US for either a full-time or part-time position, completed a questionnaire measuring four different types of proactive work behaviors, three basic psychological needs, task interdependence, task significance, and employee engagement. The most important predictor in the study was the satisfaction of the basic psychological needs: autonomy, competence, and relatedness. Participants who scored high on psychological need satisfaction were more likely to perform proactive work behaviors than those who scored low. Also, psychological need satisfaction moderated the relationship between task significance and proactive work behaviors, such that those who scored low on psychological need satisfaction tended to perform proactive work behaviors only when they perceived their job to have meaningful impacts on their surroundings. Employee engagement partially mediated the relationship between psychological need satisfaction and proactive work behaviors. The limitations of the present study and future directions are discussed.

Keywords: proactive work behavior, self-determination theory, task interdependence, task significance, employee engagement

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Introduction

Self-determination theory (SDT), a motivational theory developed by Deci and Ryan (1985, 1991), has been used to examine motivation in a variety of fields such as special education (Standage, Duda, & Ntoumanis, 2005; Chang, Hsu, & Lin, 2009; Ohtake & Wehmeyer, 2004), exercise (Sebire, Jago, Fox, Edwards, & Thompson, 2013; Wilson, Mack, & Grattan, 2008), coaching (Mallett, 2005), and work (Lin, Tsai, & Chiu, 2009; Kuvaas, 2009; Gagné & Deci, 2005). According to SDT, all human beings have three inherent, universal psychological needs: autonomy, competence, and relatedness. The need for autonomy refers to a desire to be causal agents, to experience a sense of volition, and to act in harmony with one's own interests or values (Deci & Vansteenkiste, 2004). Individuals feel autonomous when they have the control over their own actions or when their actions are self-initiated rather than in response to others' requests or demands.

The need for competence is concerned with an individual's desire to effectively deal with his/her own environment and to develop mastery over it (White, 1959). People have a need to become capable of effectively performing activities or tasks which individuals deem to be important. Finally, the need for relatedness refers to a universal inclination to feel connected to and to interact with others (Baumeister & Leary, 1995). People want to experience the feeling of belongingness, and therefore, interpersonal relationships are indispensable for optimal functioning of individuals.

Ryan and Deci (2000) explained that individuals experience three kinds of motivational states: amotivation, extrinsic motivation, and intrinsic motivation. When

individuals are amotivated, they either lack the intention to take actions or simply do not bother to act at all. Amotivation is caused when people do not perceive the activity that they carry out as important, when they do not feel competent to perform it, or when they do not expect it to result in desired outcomes. Intrinsic motivation is experienced by an individual when he or she finds joy or personal pleasure out of simply doing an activity for its own sake. Extrinsic motivation, in contrast, is the state in which individuals take actions because the actions yield desirable outcomes for the individuals.

Extrinsic motivation is subdivided into four categories: external regulation, introjected regulation, identified regulation, and integrated regulation. These forms of extrinsic motivation are on the same continuum but differ based on how autonomous individual's behaviors are. External regulation is least autonomous, and individuals perform behaviors for the sake of merely obtaining an external reward or satisfying demands. For instance, when a person does a job that she does not like in order to earn money for living expenses, she is driven by external regulation. Introjected regulation involves more internally driven behaviors than external regulation and it is concerned with performing a behavior to avoid guilt or anxiety. An individual performs introjected behavior not because he or she wants to but because he or she feels obligated to do so. An example of introjected behavior is a person who acts based on his religion, simply because he does not want to feel guilty or anxious about not following the religious beliefs. The third type of extrinsic motivation is identified regulation which involves the behavior that an individual recognizes as personally important and beneficial. In a work setting, an employee with identified regulation may want to learn how to do programming that is not necessarily required for his job, but does so because he thinks

programming skills will be beneficial for his career. Lastly, individuals with integrated regulation, the most autonomous form of extrinsic motivation, assimilate regulations or demands to the self and find them congruent with their own values. For example, a person might be driven by integrated regulation when working for a non-profit organization because he perceives the organizational values match his own.

Proactive work behavior

Proactive work behavior is defined as "taking initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions" (Crant, 2000, p. 436). As this definition suggests, there are three main characteristics of proactive work behaviors: self-initiation, future-focus, and change-orientation (Wu & Parker, 2013). Proactive employees do not just react to a situation, but they respond to needs or problems at work in an anticipatory manner, without being told or required to do so. Proactive behavior is future-focused, and proactive individuals are driven to take actions based on the foresight about future occurrences before they actually happen (Bindl & Parker, 2011; Frese & Fay, 2001; Grant & Ashford, 2008). Proactive employees are also change-oriented and they intend to make changes within themselves (e.g., gaining specific skills to deal with future demands) or make changes to the characteristics of their jobs or workplaces (e.g., removing inefficient practices in current workflow, implementing new work procedures) through their behavior or actions (Bindl & Parker, 2011). When individuals behave proactively, they aim to bring about changes in order to improve the situation or oneself (Wu & Parker, 2013).

Researchers have demonstrated that proactive work behavior can take a variety of forms. Parker and Collins (2010) identified a higher order structure of proactive behavior through a factor analysis, and categorized taking-charge behavior (Morrison & Phelps, 1999; Beck, Cha, Kim, & Knutson, 2014), expressing voice (LePine & Van Dyne, 1998; Thomas, Whitman, & Viswesvaran, 2010), individual innovation (Scott & Bruce, 1994), and problem prevention (Frese & Fay, 2001) as proactive work behaviors. Taking charge is defined as the behaviors that are intended to make changes in the procedures or execution of how work is done in a workplace (Morrison & Phelps, 1999; Parker & Collins, 2010). Voice behavior or expressing voice is conceptualized as bringing up issues in a constructive way to aim for the improvement in procedures or execution of work in one's group (LePine & Van Dyne, 1998; Van Dyne & LePine, 1998). Individual innovation refers to the behaviors concerning creation and implementation of ideas (Scott & Bruce, 1994). Lastly, problem prevention pertains to prevention of reoccurrences of issues or challenges at work (Parker & Collins, 2010).

Parker and Collins (2010) also identified two other categories of proactive behavior: proactive strategic behavior and proactive person-environment (P-E) fit behavior. Proactive strategic behavior includes strategic scanning and behaviors regarding issue selling (Dutton & Ashford, 1993) such as issue selling credibility and issue selling willingness. Issue selling is "a voluntary, discretionary set of behaviors by which organizational members attempt to influence the organizational agenda by getting those above them to pay attention to issues of particular importance to them" (Ashford, Rothbard, Piderit, & Dutton, 1998, p. 24). Proactive P-E fit behavior is represented by such behaviors as job change negotiation, career initiative, feedback monitoring, and

feedback inquiry (Parker & Collins, 2010). Aside from the three aforementioned categories of behaviors, other researchers also identified personal initiative (Frese & Fay, 2001; Frese, 2006; Thomas et al., 2010) and proactive idea implementation (Parker, Williams, & Turner, 2006) as different types of proactive behavior. It is also noteworthy that although proactive work behavior is frequently thought to be extra-role behavior, there is no clear demarcation between extra-role and in-role activities and the classifications of these activities are often contingent on employees' own construal (Morrison, 1994). Thus, proactive behavior is not necessarily restricted to extra-role behaviors, and one can still engage in proactive behavior in his or her prescribed role (Parker & Collins, 2010).

Researchers have shown that proactive work behavior is valued by organizations and companies, because it yields various benefits for both employees and organizations. Proactive behavior is associated with positive outcomes, including improvement in overall job performance (Parker & Liao, 2016) and career success (Yang & Chau, 2016). Binnewies, Ohly, and Sonnentag (2007) showed that personal initiative, one of the proactive work behaviors, would predict generation of creative ideas. A longitudinal study examining proactivity and career success demonstrated that individual innovation and career initiative were positively associated with career satisfaction, salary growth and the number of promotions (Seibert, Kraimer, & Crant, 2001). A meta-analysis, composed of 103 samples with participants from a variety of academic and applied settings, also revealed that proactive personality and two types of proactive behavior (personal initiative and taking charge) are related to satisfaction, affective organizational commitment, and social networking (Thomas et al., 2010). In sum, proactivity is

recognized as a critical driver for fostering company's success, employee's productivity, and employee well-being. Understanding the key predictors of proactive behavior and the circumstances where employees become motivated to work proactively is beneficial for organizations. The following sections present what the main drivers of proactive behavior are and how proactive behavior can be related to the satisfaction of the needs for autonomy, competence, and relatedness.

Antecedents to proactive behavior at work

Researchers have examined a variety of variables that promote employees' proactive work behaviors. One of the variables that predicts proactive work behavior is ambiguity, which is defined as the state of uncertainty or vague expectations (Grant & Ashford, 2008; Grant & Parker, 2009). Under ambiguous situations, employees, motivated to reduce equivocality, would take more proactive actions to prevent potential problems and to improve the current state. Other predictors of proactive behavior are job control and job complexity, and these work characteristics have been shown to be important drivers for individuals to engage in personal initiative (Fay & Frese, 2001). A high level of complexity in a job stimulates an individual to take active and self-initiated approach to obtain control over his job through effectively performing tasks and activities.

Some researchers have examined how personality or dispositional traits could either directly or indirectly affect proactive behavior at work. Several studies demonstrated that proactive personality could predict proactive behavior (Parker et al., 2006; Bindl & Parker, 2011; Wu, Deng, & Li, 2018). Proactive personality is

characterized as individuals' disposition to engage in influencing and changing their environments (Kim, Hon, & Crant, 2009), and proactive individuals are active in showing initiative and identifying opportunities (Crant, 2000). In addition, aside from proactive personality, Grant and Ashford (2008) argued that several personality traits could moderate the effects of some antecedents on proactive work behavior. For example, they proposed the moderator effect of conscientiousness on the relationship between accountability at work and proactive behavior, such that highly conscientious individuals engage in proactive behavior irrespective of whether they are held accountable, while less conscientious individuals may be more likely to engage in proactive behavior only when they are held accountable. Grant and Ashford (2008) also proposed a hypothesis concerning openness to experience and they suggested that openness could moderate the effect of ambiguity on proactive behavior. Individuals who are open to new experiences may be more likely to engage in proactive behavior when they face ambiguity compared to those who are not. Although personality traits may not always determine individual's willingness to behave proactively, individual disposition plays a significant role in association with some of the antecedents to proactive behavior.

Autonomy, competence, and proactive behavior. In addition to the antecedents of proactive behavior mentioned above, two of the basic psychological needs, autonomy and competence, have also been investigated as important drivers of proactive behavior. Researchers argued that autonomy can stimulate proactivity such that employees are likely to engage in proactive behaviors when given autonomy (Grant & Ashford, 2008). Parker, Wall, and Jackson (1997) mentioned how autonomy is associated with flexible role orientation, which is concerned with how flexibly individuals define their work roles

and take on responsibilities more broadly than narrowly (Parker, 2007). Flexible role orientation is an important aspect of proactive behavior at work (Parker, 2000); however, lacking autonomy potentially limits employees' views of their roles and prevents them from defining their roles flexibly. Individuals whose jobs involve a low level of autonomy tend to be restricted with regard to their views towards job tasks and role orientations and end up being not proactive. It may be difficult for an assembly line worker to proactively change the way his job is performed, due to the limited freedom he has over the workflow. Contrarily, a sales person may have more autonomy to work proactively than an assembly line worker, because the way the sales job is done is typically not very strictly defined. Thus, autonomy is an essential predictor of proactive behavior and it enables employees to have a broad scope of their roles at work and to take actions that are beyond their requirements.

Researchers have also pointed out the importance of competence in explaining proactive behavior. The employees who experience role-breadth self-efficacy (RBSE) are predicted to engage in proactive idea implementation and problem-solving (Parker et al., 2006). RBSE is a construct related to competence and is concerned with "a judgment capability across a particular set of tasks" (Parker, 1998, p. 836). Bindl and Parker (2011) stressed the significance of competence in predicting proactive behavior. They presented two different types of antecedents to proactive behavior: individual differences (e.g., knowledge, abilities, demographics and personality) and situational differences (e.g., job design, leadership, and climate related constructs). Bindl and Parker underlined that simply having skills/knowledge or receiving support from supervisors is not sufficient for one to take proactive actions. They argued that one's self-efficacy and RBSE play an

important role to predict proactive behavior in combination with individual and situational differences. Individuals would be driven to be proactive when they have belief or confidence in their capability of performing proactive behavior.

Grant and Parker (2009) presented a model for work design and proactive work behavior. The model captured the relationship between some work characteristics (e.g., job complexity, time pressure and constraints, and routinization) and proactive work behaviors, which was moderated by individual characteristics such as proactive personality, cognitive ability, as well as core self-evaluation which is defined as "the fundamental assessments that people make about their worthiness, competence, and capabilities" (Judge, Bono, Erez, & Locke, 2005, p. 257). In their model, Grant and Parker demonstrated the pathways through which work characteristics can affect proactive work behavior and they indicated that self-efficacy and role-orientation can individually cause proactive work behaviors. Thus, feeling a sense of competence not only directly predicts proactive behavior but also plays an important role to explain how proactive behavior is caused by other antecedents.

Relatedness and proactive behavior. Researchers have also demonstrated that some of the social characteristics of work can lead employees to engage in proactive behavior. For example, leadership is one of the important social characteristics of work in relation to proactivity, and especially, transformational leadership has been shown to be effective to promote proactive behaviors via RBSE and work engagement (Strauss, Griffin & Rafferty, 2009; Schmitt, Den Hartog, & Belschak, 2016). Other researchers investigated how other leadership styles could influence proactive work behaviors, and Smithikrai and Suwannadet (2018) conducted research on the relationship between

authentic leadership and proactivity. Authentic leaders promote positive psychological experiences and climate as well as intrinsic motivation of their employees by providing support for the employees' self-determination. Their studies revealed that authentic leadership, partially through fostering organizational commitment among the employees, could promote proactive work behaviors, especially when the employees are highly conscientious.

Other social aspects of work have been explored, such as supportive supervision (Parker et al., 2006), social support, task interdependence (Grant & Parker, 2009), perceived organizational support (Shin & Kim, 2015), and supportive organizational climate (Wu & Parker, 2013). The findings from these studies suggest that social aspects of work are significantly related to proactive behavior, and employees are likely to engage in proactive behavior when their managers or workplaces are supportive of proactivity. Crant (2000) also indicated that management support and supportive organizational climate and norms are essential factors to promote proactive behavior at work.

As explained above, the needs for autonomy, competence, and relatedness are all related to proactive behaviors at work to a certain extent, and it is reasonable to state that the three basic psychological needs would individually and/or compositely lead individuals to take proactive actions at work. Despite a number of studies that have examined proactive behavior, there have not been so many researchers who specifically explore proactive behavior from the perspectives of SDT. According to SDT, when the basic psychological needs are satisfied, individuals experience intrinsic motivation or autonomous forms of extrinsic motivation such as identified regulation or integrated

regulation. Although it is not specifically suggested by SDT whether these individuals will behave more proactively in a work setting, researchers found that employees who are intrinsically motivated are more likely to engage in proactive behavior (Bande, Fernández-Ferrín, Varela-Neira, and Otero-Neira, 2016). Based on the past studies about proactive work behavior and the research on SDT, it is plausible that the basic psychological need satisfaction would propel individuals to work and behave proactively. With this in mind, I examined whether the satisfaction of each of the psychological needs would cause proactive behavior at work. Stated as hypotheses,

Hypothesis 1a: Individuals who are self-determined through having satisfied the needs of autonomy, competence, and relatedness are more likely to engage in proactive work behavior than those who are not.

Hypothesis 1b: Individuals who feel autonomous at work are more likely to engage in proactive work behavior than those who do not.

Hypothesis 1c: Individuals who feel competent at work are more likely to engage in proactive work behavior than those who do not.

Hypothesis 1d: Individuals who feel related to people at work are more likely to engage in proactive work behavior than those who do not.

Moderation and mediation on proactive behavior

The first set of hypotheses focus more on individual perceptions towards their jobs based on SDT, rather than specific antecedents of proactive behavior. However, as shown by previous research studies, a variety of factors influence proactive behavior, and therefore, it is noteworthy to see how other work-related constructs can affect the

relationship between the basic psychological needs and proactive work behavior. In the present study, psychological need satisfaction was examined to see whether it would moderate the relationships of proactive behavior with each of task interdependence and task significance. Concerning a mediator, I looked at how employee engagement would mediate the relationship between the basic psychological needs and proactive behavior.

Task interdependence. Task interdependence is part of social characteristics of work (Grant & Parker, 2009; Morgeson & Humphrey, 2006) and refers to the degrees to which completion of a job depends on others (Kiggundu, 1981). A study revealed that task interdependence is positively related to organizational citizenship behavior and extra-role behaviors in organizations (Ganesh & Gupta, 2010). Researchers have shown that task interdependence also has moderating effects on the relationships of group performance with trust (Langfred, 2004), helping behaviors (Bachrach, Powell, Collins, & Richey, 2006), as well as autonomy (Grant & Parker, 2009). Regarding autonomy, some research indicated that under high task interdependence, individual autonomy is negatively related to performance, and vice versa (Langfred, 2005; Langfred & Moye, 2004). Though task interdependence can predict extra-role behaviors at work, it could also deter individuals from engaging in proactive behavior under the conditions of high autonomy, because their behaviors are restricted due to reliance of their work on others. Thus, psychological need satisfaction would moderate the relationship between task interdependence and proactive work behavior, in a way that individuals whose basic psychological needs are satisfied would become less likely to work proactively when their jobs involve a high level of task interdependence.

Hypothesis 2: For those who are low on psychological need satisfaction, they are more likely to engage in proactive behavior when task interdependence is high than when it is low. In contrast, those who are high on psychological need satisfaction are less likely to engage in proactive behavior when task interdependence is high than when it is low.

Task significance. Task significance is one of the five components in the Job Characteristic Model (JCM) developed by Hackman and Oldham (1975), and it is defined as the perceived "degree to which the job has a substantial impact on the lives or work of other people – whether in the immediate organization or in the external environment" (p. 161). Task significance is an individual's perception regarding how much impact they think they give by performing their jobs. Hackman and Oldham (1975) stated that task significance would enhance individuals' intrinsic motivation, work performance, satisfaction, and also decrease absenteeism. Other researchers have supported this point and found that task significance could improve job performance of a variety of workers such as sales employees (Evans et al., 2002), call center employees for fundraising and lifeguards at a recreation center (Grant, 2008), as well as those working for public services (Johari & Khulida, 2016). However, it is not fully examined yet whether employees' perception of task significance in their jobs influences their proactive behavior, depending on one's level of psychological need satisfaction. As proposed by the JCM, task significance provides employees with meaningfulness in their work, which results in an increased level of intrinsic motivation of employees. Individuals can be intrinsically motivated when perceiving task significance in their jobs, and therefore, task significance can potentially complement lack of the basic psychological needs and

promote proactive behavior even when individual psychological need satisfaction is not particularly high.

Hypothesis 3: Those who are low on psychological need satisfaction are more likely to behave proactively when they perceive task significance in their jobs than when they do not. However, those who are high on psychological need satisfaction act proactively regardless of identifying task significance in their jobs.

Employee engagement as a partial mediator. Schaufeli, Salanova, González-romá, and Bakker (2002) defined employee engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p.74). Vigor refers to high levels of energy and resilience individuals show at work, even in the midst of difficulties. Dedication is concerned with a sense of significance, enthusiasm, inspiration, pride, and challenge, and one is strongly involved in his or her work. Absorption is a state in which an individual is so highly focused and engrossed in his or her work that he or she feels the time quickly passes by. Some of the effects of high employee engagement are improved employee performance and job satisfaction, higher levels of organizational commitment and organizational citizenship behavior, as well as a decreased level of intention to quit (Anitha, 2014; Saks, 2006). Employee engagement is also positively related to proactive behavior (Bakker, 2011) and mediates the relationship of proactive behavior with autonomy and task variety (Maden-Eyiusta, 2016). Schmitt et al. (2016) argued that individuals who are highly engaged in their work become proactive mainly for three reasons: 1) work engagement activates vigor, energy, and alertness and these factors contribute to proactive behavior, 2) individuals with work engagement experience positive emotions, which expand their scope of cognition and behaviors and

enable them to be more future- and change-oriented, and 3) individuals who are highly engaged tend to value their work and become motivated to improve their work through behaving proactively.

Furthermore, employee engagement has been shown to be closely related to SDT (Macey & Schneider, 2008; Meyer & Gagné, 2008; Deci et al., 2001), and Shuck, Ziagrmi, and Owen (2015) demonstrated that the needs for autonomy, competence, and relatedness shared a positive relation with employee engagement. Macey and Schneider (2008) stated that individuals whose values were consistent with their organization's goals would experience a higher level of engagement and they were driven to engage in more extra-role behaviors. As past studies suggest that positive relationships of employee engagement with both psychological need satisfaction and proactive behavior exist, it was hypothesized that employee engagement could partially mediate the relationship between psychological need satisfaction and proactive behavior at work.

Hypothesis 4a: Employee engagement is positively related to proactive behavior at work.

Hypothesis 4b: Employee engagement partially mediates the relationship between the basic psychological needs and proactive behavior.

Method

Participants

Data was collected from a total of 218 people in various organizations or companies in the US. Data collection was conducted through the use of Amazon Mechanical Turk (AMT). AMT is an online crowdsourcing website where researchers post surveys or tasks and workers engage in them to receive compensation. The worker population is diverse in age (but at least 18 or older than 18-year old), background, ethnicity, socioeconomic status, language, and country of origin. I employed AMT, because the present study was not restricted to a specific population of workers, but rather can be generalizable across diverse worker populations. The AMT workers who completed the survey for the present study were compensated for one U.S. dollar.

Among 218 individuals who completed the survey, 8 people who were not qualified to take part in the study (e.g., currently unemployed or working in a different country other than the US) or whose responses were deemed to be insufficient were excluded from the study. Regarding gender, 51.4% were male, 48.0% were female, and one person did not prefer to specify his or her gender. The mean age of the sample was 39.05 years (*SD* = 10.36 years). Considering employment status, 90% of the participants were working for a full-time position and 10% of them were working for a part-time position. In terms of tenure, 2.4% were working for less than 1 year, 13.1% were working for 1 to 2 years, 22.3% were working for 3 to 4 years, 36.9% were working for 5 to 9 years, 17.5% were working for 10 to 15 years, 4.9% were working for 16 to 20 years, and 2.9% were working for 21 years or longer. Concerning the hours of work per week, 1.0% were working for 11 to 20 hours, 5.2% were working for 21 to 30 hours, 51.0% were working for 31 to 40 hours, 37.1% were working for 41 to 50 hours, and 5.7% were working for 51 hours or longer. Regarding an employee position, about 56.2% indicated

that they were employees or staff, 15.2% were supervisor, 24.3% were manager, 1.0% were executive, and 7 people chose "other."

Measures

Psychological need satisfaction. I measured the basic psychological needs of autonomy, competence, and relatedness through Basic Psychological Need Satisfaction at Work Scale (Deci et al., 2001; Ilardi, Leone, Kasser, & Ryan, 1993; Kasser, Davey, & Ryan, 1992). The measure consists of 21 items that are rated on a 7-point Likert scale (1 = not at all true and 7 = very true). The items are categorized into three subsets, such that 7 items measure autonomy, 6 items measure competence, and 8 items measure relatedness. The internal reliability for the overall measure, assessed by Cronbach's alpha, was .89, and the subscales for autonomy, competence, and relatedness had the internal reliabilities of .79, 73, and .84, respectively (Deci et al., 2001). Example items include "I feel like I can make a lot of inputs to deciding how my job gets done" for autonomy, "Most days I feel a sense of accomplishment from working" for competence, and "I consider the people I work with to be my friends" for relatedness.

Proactive work behavior. In the present study, four types of behaviors classified as the proactive work behavior by Parker and Collins (2010) were measured. The items were selected from the ones used in the study conducted by Parker and Collins (2010). The measure consists of 12 items, and the measures of taking charge developed by Morrison and Phelps (1999), voice developed by Van Dyne and LePine (1998), individual innovation developed by Scott and Bruce (1994), and problem prevention developed by Parker and Collins (2010) were employed. Each subset of the measure had

the evidence of satisfactory internal reliability, as assessed by Cronbach's alpha, of .83 for taking charge, .75 for voice, .76 for individual innovation, and .75 for problem prevention. Example items include "How frequently do you try to bring about improved procedures in your workplace?" for taking charge, "How frequently do you speak up with new ideas or changes in procedures?" for voice, "How frequently do you generate creative ideas?" for individual innovation, and "How frequently do you try to find the root causes of things that go wrong?" for problem prevention. All the items were on a 5-point Likert scale (1 = very infrequently and 5 = very frequently).

Task interdependence. Task interdependence was measured by six items selected from Work Design Questionnaire (WDQ; Morgeson & Humphrey, 2006). In WDQ, two kinds of task interdependence are measured: initiated interdependence and received interdependence. Initiated interdependence concerns the extent to which one's job affects the completion of other's jobs at work, and example items for initiated interdependence are "The job requires me to accomplish my job before others complete their job" and "Other jobs depend directly on my job." Received interdependence refers to the degree to which completion of one's job depends on others, and example items include "The job activities are greatly affected by the work of other people" and "My job cannot be done unless others do their work." Both of the initiated interdependence and received interdependence items had satisfactory internal consistency reliabilities of .80 and .84, respectively, as indicated by Cronbach's alpha. The items were rated on a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree).

Task significance. Task significance was measured by three items from Job Diagnostic Survey (JDS) developed by Hackman and Oldham (1975). JDS has been widely used and has consistently shown satisfactory internal consistency reliabilities that normally range from .56 to .88. The items that were used in the present study are "In general, how significant is your job?," "This job is one where a lot of people can be affected by how well the work gets done," and "The job itself is not very significant or important in the broader scheme of things." These items were assessed on a 7-point Likert scale (1 = not very significant and 7 = highly significant for the first item, and 1 = very inaccurate and 7 = very accurate for the other two items).

Employee engagement. I used Utrecht Work Engagement Scale (UWES) developed by Schaufeli and Bakker (2006) to measure employee engagement. UWES consists of a total of 17 items and is one of the most commonly employed measures for employee engagement. The measure is comprised of three subsets: vigor, absorption, and dedication. All the three subsets have shown satisfactory internal reliabilities, and Cronbach's alpha is .82 for vigor, .89 for dedication, .83 for absorption, and .93 for the overall measure. Example items are "At my work, I feel bursting with energy" (vigor), "I feel happy when I am working intensely" (absorption), and "I am enthusiastic about my job" (dedication). Individuals respond to the items based on how frequently they experience the way the items are written at work. The items were rated on a 7-point Likert scale (1 = Never and 7 = Always).

Results

Firstly, the scale reliabilities were examined. All the scales showed satisfactory reliabilities of .70 or above. The lowest reliability was .75 for the need of competence, which was still higher than .73 indicated in the past literature. Please refer to Table 1 for the detailed reliabilities.

In order to test the first set of hypotheses (Hypothesis 1a through 1d), ordinary least squares (OLS) regression analyses were conducted. First of all, the correlations among proactive work behaviors, psychological need satisfaction, autonomy, competence, and relatedness were examined. As Table 1 shows, all the variables were correlated at a significant level ($p < .01$). In order to see whether psychological need satisfaction would predict proactive work behavior, a simple linear regression was conducted. The overall model was significant, $F\ (1, 208) = 61.32$, $p < .001$, $R^2 = .23$, and the analysis showed that psychological need satisfaction significantly predicted one's proactive behavior ($\beta = .48$, $t(208) = 7.83$, $p < .001$).

Table 1

Correlations and Reliabilities between Study Variables

Variables	1	2	3	4	5	6	7	8
1. Proactive Work Behavior	(.94)							
2. Basic Psychological Need Satisfaction	.48**	(.92)						
3. Autonomy	.47**	.87**	(.78)					
4. Competence	.53**	.85**	.66**	(.75)				
5. Relatedness	.26**	.83**	.58**	.58**	(.90)			
6. Task Significance	.48**	.53**	.44**	.59**	.34**	(.89)		
7. Task Interdependence	.26**	0.12	0.004	.16*	.20**	.19**	(.90)	
8. Employee Engagement	.59**	.68**	.58**	.66**	.49**	.63**	.17*	(.96)

Note. ** $p < .01$ level (2-tailed). * $p < .05$ (2-tailed). $n = 210$; Reliabilities of scales are in parentheses along diagonals.

Secondly, autonomy, competence, and relatedness were assessed to know whether they would predict one's proactive work behavior. A multiple regression was performed, and it showed that the combination of these variables predicted proactive work behavior at a significant level, F (3, 206) = 31.89, $p < 001$, $R^2 = .32$. Among the three variables, autonomy and competence were significant predictors, and competence was a stronger predictor ($\beta = .43$, $t(206) = 5.28$, $p < .001$) than autonomy ($\beta = .27$, $t(206) = 3.39$, $p = .01$). Relatedness was not a significant predictor in this model ($\beta = -.14$, $t(206) = -1.90$, $p = .06$).

Though relatedness did not seem to predict proactive work behavior in the previous regression model, a simple linear regression revealed that it still explained some variances in proactive work behavior, F (1, 208) = 15.53, $p < .001$, $R^2 = .07$. Relatedness predicted proactive work behavior at a significant level as a sole predictor, $\beta = .26$, $t(208) = 3.94$, $p < .01$. Though relatedness does not explain variances in proactive work behavior any more than that the combination of autonomy and competence did, it can still individually predict one's proactive work behavior to some extent.

To test Hypothesis 2, I examined the interaction between task interdependence and psychological need satisfaction on proactive work behavior. Firstly, before running analyses, I excluded 20 individuals who indicated "self-employed" as an employment status. The reason why I did this is because those who work independently would have a small chance to work collaboratively with other people on an everyday basis. I then mean-centered the task interdependence and psychological need satisfaction variables and multiplied these two variables to create an interaction term. An OLS regression was performed, and it showed that though task interdependence and psychological need satisfaction predicted proactive work behavior significantly ($\beta = .22$, $t(186) = 3.33$, $p = .001$ and $\beta = .42$, $t(186) = 6.43$, $p < .001$, respectively), the interaction term was not a significant predictor, $\beta = .03$, $t(186) = .11$, $p = .64$. This indicates that task interdependence and psychological need satisfaction do not interact with each other to predict proactive work behavior.

Regarding Hypothesis 3, in the same way as the previous analysis, I conducted a moderator analysis to test the interaction between task significance and psychological need satisfaction on proactive work behavior. I firstly mean-centered the task significance

and psychological need satisfaction variables and created an interaction term for them. An OLS regression was then conducted, and the analysis showed that task significance (β = .31, $t(206) = 4.51$, $p < .01$), psychological need satisfaction (β = .27, $t(206) = 3.85$, $p < .01$), and the interaction term (β = -.12, $t(206) = -2.01$, $p = .046$) all predicted proactive work behavior significantly at the .05 level. A hierarchical regression showed that the addition of the interaction term increased the variances explained in proactive work behavior from $R^2 = .30$, $F(2, 207) = 43.69$, $p < .001$ to $R^2 = .31$, $F(3, 206) = 30.91$, $p < .001$. This result tells us that the addition of the interaction term explained approximately 1% more variances in proactive work behavior compared to when the interaction term was not included.

Figure 1 visualizes the slopes for the relationship between task significance and proactive work behavior at one standard deviation above and below the mean of psychological need satisfaction. Task significance is positively related to proactive work behavior for both high and low psychological need satisfaction. A simple slopes analysis was performed to see whether these two groups significantly differed on the two levels of task significance. The analysis showed that the slopes for the both groups were statistically significant, but beta values indicated that the relationship for the low need satisfaction group was stronger (See Table 2). As can be seen in the Figure 1, employees who were low on psychological need satisfaction were more likely to perform proactive work behavior when they perceived their job to be impactful on their surroundings than when they did not. Employees whose psychological needs were highly satisfied also performed more proactive work behaviors as task significance increased, but the

relationship was not as strong as the one for those who were low on psychological need satisfaction.

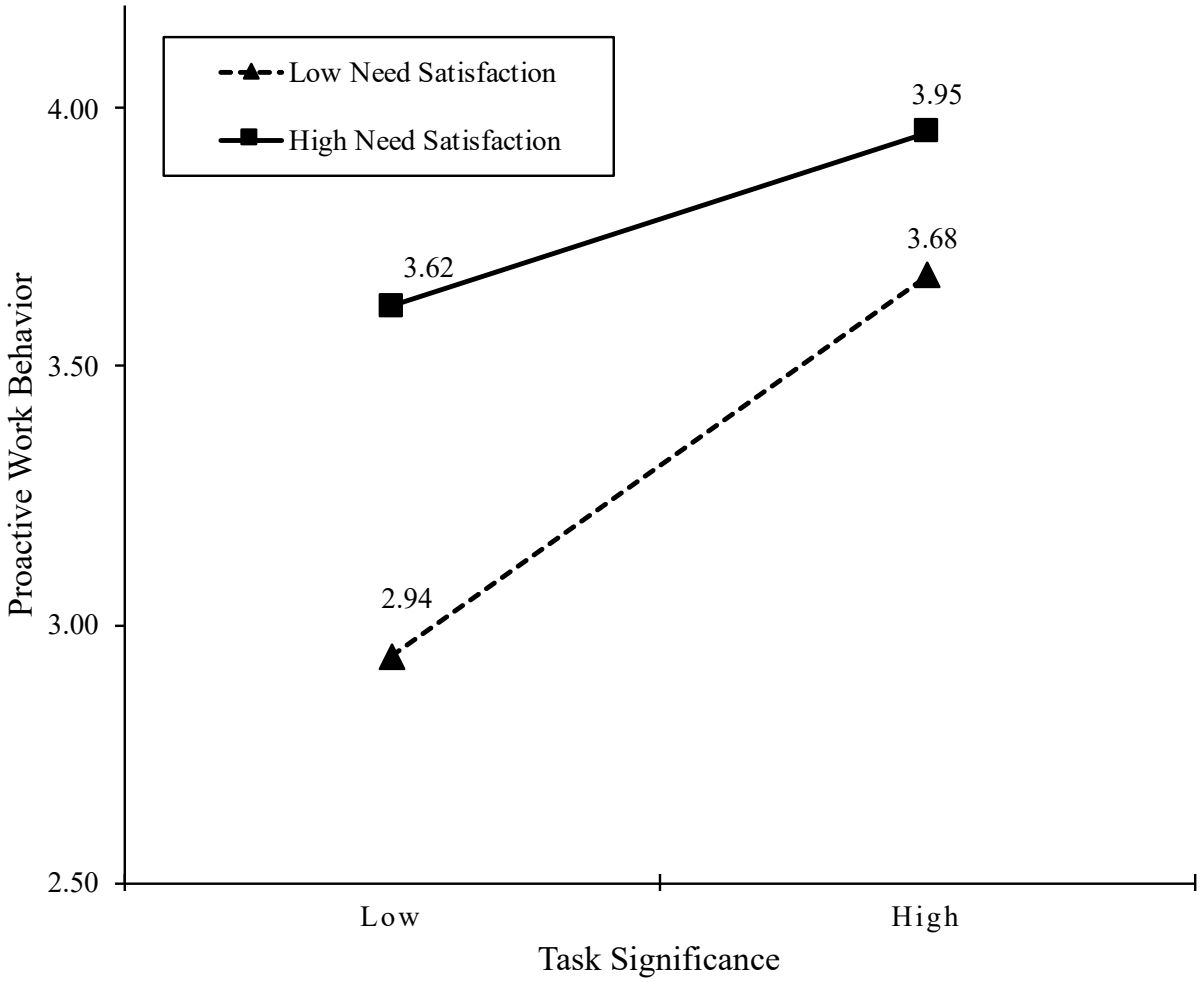

Figure 1. Regression slopes for task significance on proactive work behavior.

Table 2

Results of the Simple Slopes Analysis

Groups	*B*	*Standard Error*	β	*t*(206)
High Psychological Need Satisfaction	.11	.045	.19	2.39*
Low Psychological Need Satisfaction	.23	.044	.42	5.35**

Note. * $p < .05$. ** $p < .001$.

Finally, a mediator analysis was performed to test Hypothesis 4a and 4b. In order to assess whether employee engagement mediates the relationship between psychological need satisfaction and proactive work behavior, three different regressions were conducted. The first one examined the relationship between an independent variable (i.e., psychological need satisfaction) and dependent variable (i.e., proactive work behavior). The second regression concerned whether the independent variable is related to a mediator (i.e., employee engagement). The third regression was to see whether the combination of the independent variable and the mediator would predict the dependent variable.

The first regression was already performed above to test Hypothesis 1 and yielded the significant result showing that psychological need satisfaction predicted proactive work behavior ($\beta = .48$, $t(208) = 7.83$, $p < .001$, $F(1, 208) = 61.32$, $p < .001$, $R^2 = .23$, as shown above). The second regression indicated that psychological need satisfaction was a significant predictor of employee engagement ($\beta = .68$, $t(208) = 13.22$, $p < .001$), $F(1, 208) = 174.73$, $p < .001$, $R^2 = .46$. The third regression was then performed and it showed that psychological need satisfaction predicted proactive work behavior, $\beta = .15$, $t(207) =$

2.00, $p = .047$, as did employee engagement, $\beta = .48$, $t(207) = 6.37$, $p < .001$, and the combination of these variables explained the variances in proactive work behavior at a significant level, $F\ (2, 207) = 56.76$, $p < .001$, $R^2 = .35$. It showed that the relationship between psychological need satisfaction and proactive work behavior was reduced by the introduction of the employee engagement variable. I also conducted the Sobel test to ensure if there was a mediator effect at a significant level. The test indicated that the relationship between psychological need satisfaction and proactive work behavior was reduced significantly by employee engagement ($z = 5.71$, $p < .001$). As employee engagement and psychological need satisfaction both remained significant predictors in the third regression model, the data supported the occurrence of partial mediation.

Discussion

The results above supported Hypothesis 1, 3, and 4. Employees whose psychological needs are met are generally more likely to engage in proactive work behavior than those who are not. The more self-determined one feels in his or her behavior, the more likely one engages in proactive behavior at work. The regression analysis further revealed which of the three needs would most contribute to one's likelihood of performing proactive behavior at work as well. Those who feel competent in their own job-related abilities or skills and who feel autonomous in their roles are motivated to work proactively. Interestingly, feeling related or connected to others at work did not predict one's proactive behavior any more than did the feelings of competence and autonomy. However, relatedness is still important as a sole predictor for proactive work behavior.

Psychological need satisfaction is shown to be a significant moderator in the relationship between task significance and proactive work behavior. As hypothesized, even when one's psychological needs are not satisfied, employees may become motivated in acting in a proactive manner as long as they perceive their jobs to be significant or impactful on their surroundings. In contrast, perception of task significance seemed not to substantially increase one's willingness to work proactively, when one already experienced the high level of psychological need satisfaction.

Furthermore, the analysis showed that employee engagement partly mediates the relationship between psychological need satisfaction and proactive work behavior. This means that employees who reported high psychological need satisfaction were more engaged in their work experiences than those who did not, which boosted one's motivation to work proactively. The analysis also showed that approximately 13% more variances explained in proactive work behavior by the combination of psychological need satisfaction and employee engagement than was explained solely by psychological need satisfaction. Thus, psychological need satisfaction and employee engagement each explain some unique variances in proactive work behavior.

In this study, Hypothesis 2, pertaining to the moderator effect of psychological need satisfaction with task interdependence on proactive work behavior, was not supported. The analysis did not suggest that one's likelihood of engaging in proactive work behavior would differ significantly between the high and low psychological need satisfaction groups depending on the level of task interdependence. The same pattern of the relationship between task interdependence and proactive work behavior appeared, regardless of the levels of psychological need satisfaction. Essentially, the result

suggested that as task interdependence increased, the individual would be more likely to work proactively.

Implications

Several implications can be made based on the results of the present study. First and foremost, it was demonstrated that one's psychological need satisfaction preceded proactive work behavior. In particular, as autonomy and competence significantly predicted one's willingness to work proactively in the study, managers and supervisors would be recommended to lean in such a way that they facilitate their subordinates' sense of autonomy and competence at work. For example, managers can help their subordinates build some job-related skills so that they can feel competent in their own capabilities. Managers can also put some efforts in allowing their subordinates to have discretion over their job tasks to enhance their sense of autonomy. One important note about autonomy, however, is that managers may want to understand that employees themselves need to be cognizant of having autonomy in performing their work. As this study focused on employees' subjective views on psychological need satisfaction, simply granting autonomy to employees may not be sufficient. In order to facilitate proactive work behavior, managers need to make it clear that employees are allowed to have some degrees of autonomy at a workplace.

Second, I found that satisfying one's psychological needs can help improve employee engagement as well, which also enhance one's willingness to act proactively. This suggests that trying to help employees engage in their work can be also effective to promote proactive work behavior. Researchers have identified several antecedents to

employee engagement, such as rewards and recognition (Iqbal, Shabbir, Zameer, Khan, & Sandhu, 2017), perceived organizational support, and procedural justice (Saks, 2006). Efforts can be expended on these areas of management to encourage employees to perform more proactive work behavior.

Furthermore, I found an interesting interaction between task significance and psychological need satisfaction to predict proactive work behavior. This study revealed that task significance could drive employees to take proactive actions at work, even when individuals did not feel particularly motivated at work. Having employees experience a sense of task significance would not require neither making enormous changes in work designs nor providing a long-term training to enhance one's sense of autonomy and competence. Management can simply focus on reframing employees' mindset in a way that employees can become aware of meaningful impacts that their jobs can give on their surroundings and society.

Limitations and Future Directions

Lastly, I would like to discuss some limitations in the present study and future directions of research in this field. Firstly, as the data was only collected through the self-report measures, the relationships among the variables might have been overestimated. In the future studies, it would be more ideal if researchers could collect some objective data. For some of the measures in the study such as psychological need satisfaction, task significance, and employee engagement, subjective measurements would be appropriate, because these variables are concerned with subjective views in nature and may not be accurately measured by other people except for oneself. However, proactive work

behavior, as being observable, may be appropriate to measure both subjectively and objectively, given that self-report may sometimes distort the perception of one's own behavior. Thus, obtaining data from peers and/or supervisors in the future studies would be important to address this limitation of the present study.

In addition, as I administered the survey to the workers on Amazon Mechanical Turk, the nature of the workers' jobs might have varied to a large extent. Some of the participants worked for a part-time job, and they might not be expected to work proactively as much as those working for a full-time position. In addition, depending on work design, the likelihood of one engaging in proactive behavior at work may be different. Those who work as an assembly line worker, cashier, or office worker may not be encouraged to work proactively but rather required to follow a certain set of procedures to complete their jobs. In contrast, job responsibilities for flight crews or consultants might not be completely set in stone, and these workers are often required to adapt or respond to frequent changes at work. Consequently, they are expected to perform tasks that are not explicitly asked in their job descriptions. It may be necessary to examine the level of role clarification in various kinds of occupation when we study proactive work behavior.

In future studies, researchers can further investigate more about contextual factors that might affect one's motivation to work proactively. Some of the examples might include organizational cultures, norms at a workplace, and recognition from managers or supervisors. The present study did not delve into one's perception about whether proactive behaviors are encouraged by the management of a company or peers and/or supervisors at work. Future research on such unspoken expectations of proactivity

in an organization can provide us with new insights into how employees can be best prompted to work beyond specified roles and responsibilities of their own volition.

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