

**The Interaction of the Five-Factor Personality Traits and Job Embeddedness in Explaining
Voluntary Turnover: A Necessary-Condition Perspective**

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Peltokorpi, V., & Sekiguchi, T. (2023). The interaction of the fivefactor personality traits and job embeddedness in explaining voluntary turnover: A necessary-condition perspective. *European Journal of Work and Organizational Psychology*.

<https://doi.org/10.1080/1359432X.2023.2246216>

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Abstract

Job embeddedness is theorized and found to be negatively related with voluntary turnover. To provide an alternative to the dominant correlational understanding of causality in the theory and research on job embeddedness and to improve its ability to predict voluntary turnover, we apply the necessary-condition perspective to propose that a low level of job embeddedness provides a *necessary* but not *sufficient* reason for employees to leave their organizations. Specifically, we use the perspective to theorize and examine through a necessary condition analysis whether a low level of job embeddedness is a necessary condition for voluntary turnover, and logistic regression analysis to examine the moderating role of the five-factor personality traits on the negative relationship between job embeddedness and voluntary turnover. To cover a range of job positions and industries, we collected a sample of 478 employees ranging from staff to managers in various organizations and industries in Japan to test our hypotheses. Our findings suggest that a low level of job embeddedness is a necessary condition for voluntary turnover, as well as that extraversion and openness to experience amplified and agreeableness mitigated the negative relationship between job embeddedness on voluntary turnover. This study contributes to the literature by clarifying the role of job embeddedness in predicting voluntary turnover by using the necessary sufficient logic and delineating the moderating effects of personality traits between job embeddedness and turnover.

Keywords: job embeddedness, personality traits, voluntary turnover

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Voluntary turnover—one’s decision to terminate the employment relationship (Dess & Shaw, 2001)—is costly for organizations because of associated recruitment and selection costs, decreased performance, disrupted operations, and damage to employee morale (Hom, Lee, Shaw, & Hausknecht, 2017). For instance, the cost of replacing a single employee can range from 93% to 200% of the budgeted salary for the vacated position (Allen, Bryant, & Vardaman, 2010). For employees as well, voluntary turnover can be costly and accompanied by various sacrifices such as breaking good ties with colleagues and potential relocation (Mitchell, Holtom, Lee, Sablinski, & Erez, 2001).

Marking a shift from “push” factors in traditional turnover theories that make employees leave their organizations, job embeddedness theory (Mitchell et al., 2001) – focusing on the web of forces that make individuals stay in their organizations – has received increasing attention in research (for reviews, see e.g., Hom et al., 2017; Jiang, Liu, McKay, Lee, & Mitchell, 2012; Lee, Burch, & Mitchell, 2014). The embeddedness construct consists of a net or web of forces from on-the-job (i.e., organization) and off-the-job (i.e., community) dimensions. Job embeddedness theory (Mitchell et al., 2001) and research (Jiang et al., 2012) suggest that the more forces that tie employees to their organizations and communities the less likely they are to leave. We focus here on on-the-job embeddedness (henceforth “job embeddedness”) because it has a larger role in voluntary turnover than off-the-job embeddedness and a range of related constructs (Crossley, Bennett, Jex, & Burnfield 2007; Jiang et al., 2012).

As an alternative to the dominant “correlational understanding of causality” (Fiss, 2011, p, 394) in research on organizational behavior, we apply the necessary-condition perspective

(Dul, 2016) to provide an alternative rationale for the relationship between job embeddedness and voluntary turnover. Arguably, prior studies are based largely on the sufficiency rather than necessary logic in which job embeddedness is a *sufficient condition* to change a given outcome, often voluntary turnover (Lee et al., 2014), which means that having a given condition (in our case, high job embeddedness) causes an outcome to occur (in our case, retention or employees staying in their organizations). In contrast, a *necessary condition* means that if a given condition (i.e., low job embeddedness) is not present, an outcome (i.e., voluntary turnover) will not occur (Dul, 2020). Based on this rationale, a high level of job embeddedness suggests that voluntary turnover will not occur because employees have strong reasons to stay, and a low level of job embeddedness is a necessary but not sufficient condition for turnover to occur. That is, despite their low job embeddedness, some employees may stay because they do not have a viable reason to leave (Hom, Mitchell, Lee, & Griffeth, 2012).

Although meta-analyses suggest that high job embeddedness is negatively related with voluntary turnover (Jiang et al., 2012; Rubenstein, Eberly, Lee, & Mitchell, 2018), obviously not all individuals with low job embeddedness decide to leave their organizations. Indeed, a meta-analysis suggests that job embeddedness explains 25% of the variance in voluntary turnover (Rubenstein et al., 2018).¹ This suggests the existence of possible moderators in the relationship between job embeddedness and voluntary turnover. A search for moderators is appropriate when a focal construct has a relatively weak predictive validity on the target outcome (Baron & Kenny, 1986). In this paper, we apply the necessary-condition perspective (Dul, 2016) to suggest that (1) job embeddedness is a necessary condition for voluntary turnover and that (2) personality traits as moderators can potentially improve the ability of the job embeddedness construct to predict voluntary turnover. We focus here on the five-factor personality traits that are argued to account

comprehensively for the variance in individuals and how they differ (Digman, 1990; Donnellan, Oswald, Baird, & Lucas, 2006; Zimmerman, 2008). Using the necessary-condition perspective, we propose that personality traits as stable and distal moderators influence whether employees are likely to leave or stay in their organizations when they have no viable reason to stay. The five-factor traits would thus strengthen or weaken the job embeddedness–voluntary turnover relationship.

This study contributes to the literature in three ways. First, it clarifies the role of job embeddedness in predicting voluntary turnover by applying the necessary condition logic (Dul, 2016), which has been implicitly assumed but not explicitly theorized and empirically examined in previous works (Jiang et al., 2012; Lee et al., 2014). Although being neglected in research on job embeddedness, the necessary condition logic has increasingly been used in various domains of social science such as organization behavior (Costa, Daher, Neves, & Velez, 2022) and human resource management (Hauff, Guerici, Dul, & van Rhee, 2021). Second, our findings demonstrate the importance of considering the moderating effects of five-factor personality traits in predicting employee voluntary turnover by using job embeddedness. While personality traits have a central role in turnover theories and research (Griffeth, Hom, & Gaertner, 2000; Hom et al., 2017), they have received scant attention in the theory and research on job embeddedness (Lee et al., 2014). More research is warranted because not all employees have similar evaluations and responses to the same level of embeddedness. Moderators also help to present boundary conditions in which predicted effects do and do not hold (Cortina, 2003). Third, using personality traits as moderators on the embeddedness–turnover relationship addresses the modest and inconsistent findings on a direct relationship between personality traits and voluntary turnover (Griffeth et al., 2000) and shifts the focus from moderating effects of personality traits on the turnover intention-turnover

relationship (Allen, Weeks, & Moffitt, 2005) to a net of forces that embed workers in their organizations.

Conceptual Framework and Hypotheses

Job embeddedness theory (Mitchell et al., 2001) describes why individuals choose to stay in their organizations. In contrast to the rationale provided in traditional turnover models, job embeddedness theory states that most of these reasons for staying are only remotely related to negative work-related attitudes (e.g., low organizational commitment) but to the idiosyncratic attachments of people to their organizations and communities (Allen, Peltokorpi, & Rubenstein, 2016). Highlighting the complex interrelations of personal and situational predictors on turnover, the embeddedness theory is grounded in field theory (Lewin, 1951) and research on embedded figures (Mitchell & Lee, 2001). More specifically, job embeddedness consists of interrelated on-the-job (i.e., organization) and off-the-job (i.e., community) links, fit, and sacrifice dimensions. Links refer to an individual's perceived formal and informal work and community-related ties. Fit refers to compatibility with work and community, and sacrifice refers to the psychological, material, and social cost of leaving the organization and community. The more an individual experiences higher levels of these dimensions, the more he or she becomes over time embedded in his or her organization and community, and thereby the stronger the set of forces that restrain turnover (Mitchell et al., 2001). As stated, we focus on on-the-job embeddedness given its role in redefining turnover theory and research (Lee et al., 2014), and because it predicts outcomes over and above various related constructs (Mitchell et al., 2001) and has a stronger relationship with turnover than community embeddedness (Jiang et al., 2012).

Job embeddedness has been distinguished from various related constructs such as job satisfaction, organizational commitment, and organizational identity (e.g., Crossley et al., 2007;

Mitchell et al., 2001). In contrast to organizational commitment suggesting that employees stay in organizations partly due to emotional attachment (i.e., the degree to which one experiences loyalty to the organization and desires to stay), job embeddedness including also non-affective aspects suggests that employees may stay to use their specific skills that fit an organization. In contrast to job satisfaction (i.e., the degree to which one likes his or her job), job embeddedness theory suggests that employees even with low job satisfaction might stay due to leaving-related sacrifices such as seniority-related perks. Job embeddedness also differs from job security and work engagement because employees can be embedded in organizations even perceiving job insecurity and because embedded employees with low work engagement by being “stuck” in organizations (Allen et al., 2016). Previous research also suggests that job embeddedness is moderately correlated with explains more variance in voluntary turnover than various related constructs such as job satisfaction and organizational commitment (e.g., Crossley et al., 2007; Mitchell et al., 2001).

The novel aspect of the job embeddedness theory is that it describes why employees stay rather than leave their organizations (Hom et al., 2017). Traditional turnover theories suggest that employees have myriad reasons to leave (quit), and low variance in research based on traditional turnover theories suggests that the turnover process is a complex phenomenon (Hom, Mitchell, Lee, & Griffeth, 2012; Hom et al., 2017). Focusing on push factors, Maertz and Griffeth (2004), for example, suggested that workers have eight motivational reasons to leave their organizations. The unfolding model in turn describes turnover paths initiated by “shocks” – jarring events that develop turnover cognitions (Lee & Mitchell, 1994). In contrast to traditional turnover models, job embeddedness theory maintains that the reasons to stay are more relevant than the “push” factors (e.g., job satisfaction) and “pull” factors (e.g., unsolicited job offers) causing people to

leave (Lee et al., 2014).

The theory and research suggest that high job embeddedness causes employee retention in organizations (i.e., low voluntary turnover) and scholars predominately use a correlational understanding of causality (Fiss, 2011) to extend this rationale to infer that a low level of job embeddedness causes employee turnover. For example, Mitchell et al. (2001, p. 1106) stated: “People who are embedded in their jobs have less intent to leave and do not leave as readily as those who are not embedded.” More recently, Smith et al. (2022, p. 15) noted: “Individuals that possess fewer positive links and more negative links, especially with prominent others at work, such as supervisors, are less apprehensive to break those links by leaving their organizations.” Implicitly assuming a symmetric correlational relationship between job embeddedness and retention/turnover, these statements were followed by the prediction that job embeddedness is negatively related to voluntary turnover. From the necessary-sufficient perspective (Dul, 2016), however, the statements that embeddedness and the probability of turnover have correlational associations have limitations.

By considering the conceptual differences between *necessary conditions* and *sufficient conditions* of causality from the necessary-sufficient perspective (Dul, 2016, 2020), the typical argument in research is that a high level of job embeddedness serves as a *sufficient condition* for people to stay in their organization while a low level of job embeddedness serves as a necessary condition to leave their organization. Because highly embedded people are “stuck” or choose to stay in their organizations because of a net of link, tie, and sacrifice-related forces (Allen et al., 2016), this situation is sufficient to predict individuals will stay in their organizations. At the same time, it is also feasible to suggest that a high level of job embeddedness is not a necessary condition for people to stay in their organizations because they can and often do stay without

having any viable reasons to do so (Hom et al., 2012). People can stay out of habit even if they do not have strong links to the organization or leave even if they have strong links by having a tendency for hobo syndrome (Ghiselli, 1974).

Job embeddedness and voluntary turnover

We use the necessary-condition perspective (Dul, 2016) to provide an alternative to the dominant correlational understanding of causality in the theory and research on embeddedness. We suggest that a low level of job embeddedness provides a *necessary* but not *sufficient* reason for people to leave their organizations. Because a high level of embeddedness can be considered a bottleneck/constraint that prevents people from leaving, such a bottleneck/constraint needs to be alleviated for voluntary turnover to occur. Therefore, a low level of job embeddedness—the situation in which people are not tied by a web of forces in their organization—is necessary for turnover to occur. This suggests that a low level of embeddedness does not ensure turnover will occur; it only becomes possible. A low level of embeddedness is not a sufficient condition for people to leave their organization since the ones who are less embedded can also choose to stay. Indeed, Hom et al. (2012) proposed that desires to stay and desires to leave are not necessarily opposite ends of the same continuum; low desires to stay do not necessarily mean high desires to leave. Some people may have neither preference (i.e., the desires to stay or leave are low). Given the existence of status quo bias (Hom et al., 2012), which many employees want to keep, even the ones with a low level of job embeddedness might prefer to stay because they do not want to change the course of their careers (Verbruggen & De Vos, 2020). Furthermore, it is possible that employees stay for a certain amount of time and then quit, for example after getting a retention bonus without other necessary jobs in place (Lee & Mitchell, 1994).

In sum, job embeddedness theory and research suggest that people having high levels of

embeddedness are more likely to remain in their organizations due to a web of job/organization-related forces (Lee et al., 2014) but have focused less on predicting the existence of a reason for people to leave their organizations, suggesting that a low level of embeddedness is a necessary but not sufficient condition for voluntary turnover. While providing precision to theoretical and empirical works, explicitly formulated and empirically examined necessary statements are still rare in the literature (Dul, 2020). We apply the necessary-condition perspective to the theory of embeddedness to offer the following base hypothesis.

***Hypothesis 1:** A low level of job embeddedness is a necessary condition for voluntary turnover.*

Moderating effects of the Big Five personality traits

The above argument suggests that individual-level differences can influence whether the low level of job embeddedness increases the likelihood of voluntary turnover—some people are more likely to leave when their embeddedness is low and others stay even having a low level of embeddedness. Moderating constructs help to explain the relationship between predictors and outcomes (Baron & Kenny, 1986) and provide boundary conditions in which predicted effects do and do not hold (Cortina, 2003). Interactionist psychology rooted in Lewin's (1951) field theory also maintains that human behavior is a product of people and situations (i.e., the interaction of the person and the situation). From this perspective, individuals can have different interpretations of the same situation. This assumption has implicitly and explicitly guided research highlighting moderating effects of personality traits between predictor and outcome variables (e.g., Mawritz, Dust, & Resick, 2014; Taylor & Kluepfer, 2012).

To explain the moderating effects of individual-level differences on the embeddedness-turnover relationship, we focus on the five-factor personality traits. The five-factor model (Costa

& McCrae, 1992), consisting of extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience, is widely regarded as the most comprehensive account for the variance in what individuals are and how they differ (e.g., Donnellan et al., 2006; Griffeth et al., 2000; Zimmerman, 2008). Each five-factor trait pertains to a specific aspect of human behavior, each relatively independent of the others. The five-factor theory (McCrae & Costa, 2008) holds that personality consists of relatively stable patterns of actions, feelings, and thoughts, as well as that personality traits present basic psychological tendencies of these patterns. Research also suggests the stability of attitudes over time (Staw & Ross, 1985) and that identical twins raised apart have matching attitudes and preferences (Arvey, Bouchard, Segal, & Abraham, 1989).

While not considering job embeddedness, a stream of research has linked the five-factor personality traits to voluntary turnover. For example, a meta-analysis (Salgado, 2002) suggests that voluntary turnover was more likely among employees lower in emotional stability ($\rho = .35$), conscientiousness ($\rho = .31$), extraversion ($\rho = .20$), openness to experience ($\rho = .14$), and agreeableness ($\rho = .22$). Another meta-analysis (Zimmerman, 2008) suggests that voluntary turnover has negative relationships with emotional stability ($\rho = -.20$), agreeableness ($\rho = -.27$), conscientiousness ($\rho = -.22$), and positive relationships with openness to experience ($\rho = .10$). A more recent meta-analysis (Rubenstein et al. (2018) suggests voluntary turnover to have negative relationships with agreeableness ($\rho = -.20$), emotional stability ($\rho = -.19$), and conscientiousness ($\rho = -.16$) and positive relationships with openness to experience ($\rho = .14$). Extraversion was not significantly related to turnover. While linking the big five personality traits to turnover, research findings have been inconsistent. This suggests that it might not be practical to examine the direct effects of personality traits on turnover. Rather, it is better to theorize their moderating effects on the embeddedness-turnover relationship.

In contrast to research on the direct effects of the five-factor traits, considerably less is known about their moderating effects on the predictor-turnover relationship. In particular, there is a paucity of research on the moderating effects of personality traits on the job embeddedness—turnover relationship. To date, the research is limited to three studies on the direct effects and one study on the moderating effects of personality traits on embeddedness. First, a study on 122 workers in Romania suggests that agreeableness, conscientiousness, and extraversion among the five-factor traits were positively correlated with job embeddedness (Giosan, Holtom, & Watson, 2005). Second, in a study on 115 teachers, Lev and Koslowsky (2012) found job embeddedness to partially mediate a positive relation between conscientiousness and contextual performance. Third, in a study on 401 employees in Trinidad, Singh (2019) suggests that conscientiousness, emotional stability, and extraversion are positively associated with job embeddedness. Singh included no other five-factor personality traits in this study. Finally, a study on 277 academic staff in Malaysia suggests that job embeddedness is negatively related with turnover intentions and that the big five traits do not moderate the embeddedness-turnover intention relationship (Yusoff, Yusliza, & Saputra, 2022). It is important to note that while turnover intention is a strong predictor of turnover, meta-analyses suggest that turnover intentions explain only 15%-20% of variance in actual turnover (Griffeth et al., 2000; Hom & Griffeth, 1995). This is why turnover intention is not an appropriate proxy for actual turnover (Allen et al., 2005; Rubenstein et al., 2018).

We suggest that the five-factor traits can increase the job embeddedness construct's ability to predict voluntary turnover for two reasons. First, the five-factor theory (McCrae & Costa, 2008) suggests that people express personality traits through characteristic adaptations—patterns of thoughts, feelings, and action tendencies that influence their cognitive and affective

environmental reactions. That is, personality traits affect how people perceive and engage with their environments. Importantly, not all traits are associated with the same reactions because the underlying basis of each trait is unique. Traits can thus affect the likelihood of having or finding reasons to resign when people are free from the bottleneck (constraint) to leave the organization (i.e., they are less embedded in their organization). Second, related research has shown that some people exhibit more systematic consistency in their attitudes, beliefs, and behaviors than others (Kraus, 1995). Thus, we expect that the five-factor traits moderate the embeddedness–voluntary turnover relationship, which makes not only proximal but also distal predictions of whether a person is likely to resign. The big five traits can also explain why some people perceive higher fit, links, and sacrifices lost when leaving their organizations. Specifically, we hypothesize that the five-factor traits—extraversion, agreeableness, conscientiousness, neuroticism, and openness of experience—act as facilitators or inhibitors that influence turnover when a necessary condition (i.e., a low level of job embeddedness) increases.

Extraversion

Individuals who have high levels of extraversion (i.e., extroverts) are generally active, assertive, outgoing, and value positive social interactions (Barrick & Mount, 1991). Positive workplace relationships are important to extroverts because they satisfy their needs for smooth social interactions (Belsky, 1996). Extroverts also tend to display more commitment to social groups and activities; they are more talkative, active, and assertive than their counterparts with lower levels of extraversion (i.e., introverts; Judge, Martocchio, & Thoresen, 1997). Moreover, extroverts have positive emotions more often than introverts do; they regard themselves and their surroundings more favorably and recall more positive instead of negative information about their work environments (Watson & Clark, 1992). Extraversion is thus considered the main source of

positive affect, which stems primarily from links with others in terms of both the quantity and quality of social relationships (DeNeve & Cooper, 1998). Research also suggests that extroverts, partly because of their sociability, are more likely to form and maintain networks with other employees in the workplace (Wanberg, Kanfer, & Banas, 2000) and find more alternative employment opportunities than introverts (Zimmerman, 2008).

The above evidence from the job embeddedness perspective suggests that extroverts in general might also have more links with people outside their organizations than introverts have, which in turn can increase the propensity of voluntary turnover, for example, by job alternatives. Furthermore, extroverts' affective characteristics suggest that they might be more likely to have commitments with external parties and evaluate job alternatives positively and perceive them as more attractive than introverts. Applying the necessary-condition logic, we suggest that when job embeddedness is low for extroverts (i.e., they do not have a good reason to stay), extroverts who tend to have more external links and job opportunities than introverts are more attracted to these opportunities and more likely to quit their organizations than introverts. Thus, we expect that the level of extraversion changes the negative embeddedness-turnover relationship in a way that a high level of extraversion strengthens the likelihood that the ones with low job embeddedness will voluntarily leave the organization.

***Hypothesis 2:** Extraversion moderates the relationship between job embeddedness and voluntary turnover such that the relationship is stronger when extraversion is higher.*

Agreeableness

Individuals who have a high level of agreeableness (i.e., agreeable people) tend to be more cooperative, flexible, forgiving, and trusting than their counterparts with a low level of agreeableness (Costa & McCrae, 1992). Agreeable individuals, due to their desire to get along,

tend to develop satisfying and high-quality relationships with others in the workplace (Organ & Lingl, 1995). These relationships are noted to strengthen the affective forces (Maertz & Griffeth, 2004) that motivate agreeable people to understand their work context's negative aspects, think more positively of their work settings, and be more likely to stay in their organizations (Meyer & Allen, 1991). While the unfolding model (Lee & Mitchell, 1994) holds that some employees are more prone to leave their organization spontaneously and that some employees develop habits of quitting their jobs easily, agreeable employees are less likely to display these types of impulsive and spontaneous reactions due to strong sense of obligation, persistence, and purpose. In some support, impulsivity is shown to be negatively related to agreeableness and conscientiousness (Clark & Watson, 1999).

The above evidence suggests that agreeable individuals can be more reluctant to leave the organization even if their level of embeddedness is low (i.e., they do not have strong reasons to stay in their organizations). Compared to disagreeable individuals, who tend to be uncooperative and unfriendly because of their skepticism about others' motives, agreeable individuals are more trusting and make more efforts to get along with others (Organ & Lingl, 1995). Thus, agreeable employees are less likely to show withdrawal behaviors (Meyer & Allen, 1991) and more likely to understand their work environment's negative aspects (Zimmerman, 2008). People who have higher levels of agreeableness are likely to experience contractual obligations to remain in their organizations even if they do not have a strong reason to stay (Maertz & Griffeth, 2004). Thus, we propose that the negative embeddedness-turnover relation is weaker for agreeable employees because they are less likely than ones low in agreeableness to leave even if their embeddedness is low (i.e., they do not have a strong desire to stay).

Hypothesis 3: Agreeableness moderates the relationship between job embeddedness and

voluntary turnover such that the relationship is stronger when agreeableness is lower.

Conscientiousness

Individuals with a high level of conscientiousness in general are more diligent, organized, hardworking, and devoted to the efficient completion of their tasks at work than individuals with a low level of conscientiousness (Costa & McCrae, 1992). This tendency of work involvement leads to a higher likelihood of receiving satisfying formal (e.g., promotions) and informal (e.g., recognition) rewards at work (Organ & Lingl, 1995). Conscientiousness is also a factor in the motivational forces that influence turnover decisions – individuals having a high level of conscientiousness tend to have a lower propensity for turnover (Maertz & Campion, 2004). Further, individuals high in conscientiousness are noted to perceive a greater obligation to be dependable and remain with an organization (Raja, Johns, & Ntalianis, 2004). In some support, research suggests that conscientiousness taps traits that are vital to the accomplishment of work tasks in all jobs—individuals with traits associated with a strong sense of obligation, persistence, and purpose perform better than those without them (Barrick & Mount, 1991).

The above evidence from the job embeddedness perspective suggests that individuals with higher levels of conscientiousness are more inclined to consider having moral reasons to stay even if they are not strongly embedded in their jobs and organizations. Highly conscientious individuals are also less likely than others to display impulsive quitting or job-hopping behaviors because they are likely to have a strong sense of dedication and purpose (Clark & Watson, 1999). Applying the necessary condition logic (Fiss, 2011), we suggest that the negative embeddedness-turnover relationship is stronger for less conscientious individuals because their counterparts high in conscientiousness are less likely to resign even if their job embeddedness is low (i.e., there is no strong reason to stay).

Hypothesis 4: Conscientiousness moderates the relationship between job embeddedness and voluntary turnover such that the relationship is stronger when conscientiousness is lower.

Neuroticism

In contrast to individuals with high levels of emotional stability (i.e., low neuroticism) who in general are calm, resilient, and secure (Costa & McCrae, 1992), their counterparts with high levels of neuroticism are more vulnerable to experiencing emotional instability, facing and engendering negative experiences in their lives (Watson & Clark, 1984), and seeing their work environment through negative lenses (Maertz & Griffeth, 2004). This may occur partly because individuals high in neuroticism tend to focus more on the avoidance of loss than on the pursuit of gain (Carver & White, 1994). They are also more likely to have negative feelings such as anxiety and depression (McCrae & Costa, 1987) and have conflicts with their coworkers (Organ, 1994), which can make them voluntarily leave their organizations. McCrae and Costa (1991) also noted that individuals high in neuroticism lack self-confidence and esteem; thus, they are more likely to overestimate difficulties and regard themselves as incompetent for the assigned tasks, and less likely to believe their future circumstances will improve (Zimmerman, Boswell, Shipp, Dunford, & Boudreau, 2012).

Based on the above evidence, we expect people with high levels of neuroticism to be more likely to have work-related stress and to withdraw from the perceived source of the stress (Zimmerman et al., 2012) when they have low degrees of job embeddedness. Singh (2017) also argued that employees with low emotional stability, due to low fit and links, are less embedded in their organizations than other employees. We also predict that employees with high levels of neuroticism are more likely to be impulsive quitters (Hom et al., 2012) when they lack a strong

reason to stay in the organization (i.e., low levels of embeddedness) than people with low levels of neuroticism. Thus, when people with high neuroticism have low levels of job embeddedness, they are more likely than emotionally stable people with the same levels of job embeddedness to quit due to negative experiences they perceive or other reasons, such as impulsiveness. That is, the level of neuroticism changes the negative relationship between embeddedness and turnover in a way that a high level of neuroticism strengthens the likelihood of individuals low in job embeddedness leaving their organizations.

Hypothesis 5: Neuroticism moderates the relationship between job embeddedness and voluntary turnover such that the relationship is stronger when neuroticism is higher.

Openness to experience

Individuals with higher levels of openness to experience, in general, are more artistic, curious, autonomous, imaginative, open-minded, and intelligent than their counterparts with lower levels of openness to experience (Barrick & Mount, 1991; Boudreau, Boswell, Judge, & Bretz, 2001). Openness to experience, like extraversion, relates to status striving – the desire for hierarchical advancement, prestige, and influence (Barrick & Mount, 1991). Further, Maertz and Griffeth (2004) argued that individuals high in openness to experience tend to value changing jobs and are more inclined to quit their organizations. In some support, Zimmerman et al. (2012) found that compared to individuals with low openness to experience, those with high levels of openness to experience are more likely to hold positive perceptions of job mobility and change jobs more frequently.

The above evidence from the job embeddedness perspective suggests that employees higher in openness to experience are more prone to search for jobs and to pay attention to the benefits of new job opportunities (Boudreau et al., 2001; Zimmerman et al., 2012), and leave

their organizations when they have low embeddedness (i.e., not having a strong reason to stay). Compared to those with low openness to experience, these people can also be more interested in new job opportunities and place less value on on-the-job links, fit, and sacrifices lost by leaving their organizations. Therefore, we expect that one's level of openness to experience changes the negative job embeddedness–turnover relationship so that a high level of openness to experience strengthens the likelihood that individuals with low embeddedness will voluntarily leave their organizations.

Hypothesis 6: Openness to experience moderates the relationship between job embeddedness and voluntary turnover, such that the relationship is stronger when openness to experience is higher.

Method

We used a research company to gather online data from individuals 18 years or older working full-time in various privately-owned organizations in Japan. Participation in this study was voluntary: the research company gave respondents small incentives (online shopping) points for participation. The research company provided data with a realistic average time for survey completion, and without missing values.

We collected data with three online surveys at three different points in time; all variables were measured once (i.e., time-lagged design). At Time 1, we measured control variables and job embeddedness (724 respondents, 72% response rate). At Time 2, three months after Time 1, we measured the Big Five traits (592 respondents, 82% response rate). At Time 3, 12 months after Time 1, we measured voluntary turnover (497 respondents, 84% response rate). We then linked these surveys by using identification numbers assigned by the research company and excluded the ones who did not reply to all surveys or who left their organizations for involuntary reasons

such as dismissals. The final sample was 478 respondents. Our sample size is in line with other studies on job embeddedness (e.g., Allen et al., 2016; Fasbender, Van der Heijden, & Grimshaw, 2019; Sekiguchi, Burton, & Sablynski, 2008). Our posthoc power analysis with the G*Power version 3.1.9.7 (Faul, Erdfelder, Lang, & Buchner, 2007) showed that our sample size ($N = 478$) yielded 87% to 100% power to detect the effects found in our study. In terms of age, gender, and tenure, we did not find any significant differences between the employees who participated in all surveys and those who did not.

In our final sample, the respondents' average age was 32 years; 73% were male, 76% were married, 60% had children, 68% were staff-level employees (38% were managerial-level employees), and 82% of them had at least a four-year bachelor's degree. The average size of the respondents' employing organizations was 301 people. The respondents worked in organizations from various industries, including manufacturing (51.2%), banking and finance (13.7%), services (11.9%), and transportation and communication (6.1%).

Measures

We used the established back-translation method (Brislin, 1980) to translate survey items from English to Japanese. We measured all items using Likert-type scales that range from (1 = *strongly disagree*) to (7 = *strongly agree*) unless otherwise stated.

Job Embeddedness. We measured this using a seven-item scale from Crossley et al., (2007). A sample item is "I feel attached to this organization" ($\alpha = .77$).

Five-Factor Personality Traits. We measured these personality traits using a 20-item MINI-IPIP scale created by Donnellan et al. (2006). The MINI-IPIP scales are found to have consistent and acceptable internal consistencies in various studies (e.g., Donnellan et al. 2006; Perry, Hoerger, Molix, & Duberstein, 2020). The MINI-IPIP comprises five different four-item

scales, one for each of the Big Five traits. Sample items for the scales include “I am the life of the party” (extraversion, $\alpha = .73$), “I sympathize with others’ feelings” (agreeableness, $\alpha = .70$), “I get chores done right away” (conscientiousness, $\alpha = .70$), “I get upset easily” (neuroticism, $\alpha = .55$), and “I am not interested in abstract ideas” (openness to experience, reverse coded; $\alpha = .70$). It should be noted that Cronbach alphas, especially for MINI-IPIP neuroticism, have also been low in previous studies (e.g., Baldasaro, Shanahan, & Bauer, 2013 [$\alpha = .62$]; Jones, 2014 [$\alpha = .67$]).

Voluntary Turnover. Following prior studies (e.g., Allen et al., 2016; Rubenstein et al., 2018), we requested all participants at Time 3 to report if they were still employed in the same organization. Specifically, we asked all participants to answer the four statements: (1) “I am still employed in the same organization”, (2) “I left the organization because I was formally asked to leave”, (3) “I left the organization to work for another organization”, (4) “I left the organization for other reasons (please explain)”. We then checked the seven specific reasons provided by the participants for Statement 4 and categorized them either as involuntary or voluntary turnover and retained only respondents who voluntarily resigned. For example, we categorized the following reason as voluntary turnover: “I quit because I got married”. We used the information from the above four statements to code “0” for stayers and “1” for leavers.

Control Variables. We controlled for six variables related to voluntary turnover. We controlled for employee age because older people have a lower likelihood of turnover (Griffeth et al., 2000; Rubenstein et al., 2018). We controlled for employee gender because women have a higher propensity for voluntary turnover (Feng, Allen, & Seibert, 2022). We also controlled for employee tenure in the current organization because people with longer tenure are more likely to quit and for employee marital status because married people quit less often than single people

(Rubenstein et al., 2018). We controlled for employee education level because more educated people have a higher likelihood of turnover (Griffeth et al., 2000). Finally, we controlled for employee off-the-job (community) embeddedness because of its negative relationship with voluntary turnover (Jiang et al., 2013) and measured it using a five-item scale from Ng and Feldman (2012). A sample item is “I feel attached to this community” ($\alpha = .82$).

Analytical approach

We used AMOS Version 23 to conduct our confirmatory factor analysis. We examined Hypothesis 1 by using a necessary condition analysis (NCA) package (Dul, 2018) for R Version 4.2.1 with 10,000 permutations. The purpose of NCA is to identify whether there is a necessary but not sufficient condition for an outcome to occur. As described in the following section, we used several inference statistics to test Hypothesis 1. To test Hypotheses 2-6, we used logistic regression analyses with SPSS Version 23. More specifically, we used the maximum likelihood method to estimate the parameters. The maximum likelihood method finds a set of values, called the maximum likelihood estimates, at which the log-likelihood function attains its local maximum. We conducted our analyses using mean-centered variables.

Results

In our confirmatory factor analysis, the seven-factor model—job embeddedness, community embeddedness, extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience—provided an acceptable fit to the data after we deleted Item 3 (“I get upset easily”) from neuroticism scale: $\chi^2(413) = 1433.61, p < .001$; Comparative Fit Index [CFI] = .91; Root Mean Square Error of Approximation [RMSEA] = .07, 95% confidence interval [CI] .067, .075. CFI ranges between 0 and 1; values higher than .90 indicate an acceptable fit. An RMSEA ranges between 0 and 1; values lower than .08 indicate an acceptable fit (Hu & Bentler,

1999; Kline, 1999). After we removed Item 3, Cronbach's alpha for the neuroticism scale was .66, which is less than the cut-off point of .7 (Kline, 1999; Nunnally, 1978) but can be acceptable because it is in line with previous research that used the scale with similar alpha values (e.g., Baldasaro et al., 2013; Jones, 2014). Our comparisons with alternative models with a range of combinations of the variables revealed that these models had worse fits with the data than our seven-factor model. Descriptive statistics and correlations are provided in Table 1.

 Insert Table 1 about here

Hypothesis 1 predicted that a low level of job embeddedness is a necessary condition for voluntary turnover. To confirm a necessary condition hypothesis, NCA results need to show at least a small and significant effect size and indicate practical relevance in terms of realizing the required levels of the necessary condition. Regarding the first aspect, Dul (2020) offered the following benchmarks to interpret effect sizes: if $0 < d < 0.1$, the effect is small; if $0.1 \leq d < 0.3$, the effect is medium; if $0.3 \leq d < 0.5$, the effect is large; and if $d \geq 0.5$, the effect is very large. The value of $d = 0.1$ is a threshold for the necessary condition (Dul, 2016). Furthermore, a p -value for the NCA effect size must be calculated to avoid a false positive effect size randomly resulting from two unrelated variables (Dul, 2020). Our NCA results showed that low job embeddedness has a medium-sized effect on voluntary turnover ($d = .270$; $p = .006$).

Furthermore, we used a bottleneck technique to create the necessary conditions for job embeddedness to reach a certain level of voluntary turnover: 0% = not necessary; 10% = 2.7; 20% = 5.4; 30% = 8.1; 40% = 10.8; 50% = 13.5; 60% = 16.2; 70% = 18.9; 80% = 21.6; 90% = 24.3; and 100% = 27. For the medium level of voluntary turnover (50%), at least 13.5% of low

job embeddedness is the minimum requirement; for the top level of voluntary turnover (100%), at least 27% of low job embeddedness is required. The results provide support for Hypothesis 1 by suggesting that a low level of job embeddedness is a necessary condition for voluntary turnover.

 Insert Table 2 about here

Hypothesis 2 predicted that extraversion moderates the negative relationship between job embeddedness and voluntary turnover; this relationship is stronger when extraversion is higher. Table 2 shows that the hypothesized interaction term was significant ($b = -.54$; $p = .027$; 95% CI [.35, .94]). We conducted simple slope analyses. As shown in Figure 2, when extraversion was 1 standard deviation (SD) higher, job embeddedness was more negatively related to voluntary turnover ($b = -1.81$; $p = .000$; 95% CI [.07, .38]) than when extraversion was 1 SD lower ($b = -.63$; $p = .117$; 95% CI [.87, 3.53]). These findings support Hypothesis 2.

Hypothesis 3 predicted that agreeableness moderates the negative relationship between job embeddedness and voluntary turnover; this relationship is stronger when agreeableness is lower. The hypothesized interaction term was significant ($b = .64$; $p = .015$; 95% CI = 1.13; 3.20). As displayed in Figure 3, when agreeableness was 1 SD higher, job embeddedness was less negatively related to voluntary turnover ($b = -.62$; $p = .066$; 95% CI [.28, 1.04]) than when agreeableness was 1 SD lower ($b = -1.82$; $p = .000$; 95% CI [.07, .39]). These findings supported Hypothesis 3.

Hypothesis 4 predicted that conscientiousness moderates the negative relationship between job embeddedness and voluntary turnover; this relationship is weaker when

conscientiousness is higher. Hypothesis 4 was not supported ($b = .36$; $p = .177$; 95% CI [.84, 2.43]).

Hypothesis 5 predicted that neuroticism moderates the negative relationship between job embeddedness and voluntary turnover; this relationship is stronger when neuroticism is higher. Hypothesis 5 was not supported ($b = -.11$; $p = .640$; 95% CI [.55, 1.44]).

Hypothesis 6 predicted that openness to experience moderates the negative relationship between job embeddedness and voluntary turnover; this relationship is stronger when openness to experience is lower. The hypothesized interaction term was significant ($b = -.72$; $p = .015$; 95% CI [.27, .86]). As displayed in Figure 4, when openness to experience was 1 SD higher, job embeddedness was more negatively related to voluntary turnover ($b = -1.85$; $p = .000$; 95% CI [.07, .39]) than when it was 1 SD lower ($b = -.59$; $p = .000$; 95% CI [.26, 1.17]). These findings support Hypothesis 6.

 Insert Figures 1–3 about here

Discussion

In this paper, we applied the necessary-condition perspective to theorize and examine whether a low level of job embeddedness is a necessary condition for voluntary turnover and the moderating effects of the five-factor personality traits on the negative relationship between job embeddedness and voluntary turnover. Our findings provided general support for our hypotheses by suggesting that a low level of job embeddedness is a necessary condition for turnover and that extraversion and openness to experience amplified and agreeableness mitigated the negative relationship between job embeddedness and turnover.

Theoretical contributions

First, our study adds to the literature by using the necessary condition logic (Dul, 2016) increasingly used in a range of domains in social science to demonstrate that job embeddedness can predict voluntary turnover better for some individuals than for others and what theoretical perspectives explain the boundary conditions of job embeddedness theory in terms of predicting turnover. Because the voluntary turnover process is a complex phenomenon (Hom et al., 2017) and various predictors are shown to account for low amounts of variance in turnover (Griffeth et al., 2000; Hom & Griffeth, 1995; Rubenstein et al., 2018), scholars have stressed the importance of considering causal complexity in theory and research on turnover (Hom et al., 2017). In this study, we applied the necessary-condition perspective (Dul, 2016) to theorize and empirically demonstrate that low levels of job embeddedness, meaning that employees lack a strong reason to remain in their organizations, is a necessary but insufficient condition for voluntary turnover to occur. Our study also contributes to the literature by applying the necessary condition logic to conceptualize the moderating effects of the big five personality traits between embeddedness and turnover. To date, the conditional necessary rationale is used mainly to explain the direct effects between predictor and outcome variables (Dul, 2020). We believe that the necessary-condition logic helps to provide more precise theoretical rationale and hypotheses in empirical research than the prevailing dominant linear and correlation-based explanations (Hom et al., 2017). Our conceptualization and findings further suggest the theoretical importance of understanding the bottlenecks or constraints that prevent employees from voluntarily leaving and other factors that promote turnover when bottlenecks are absent.

Second, our study contributes to the literature by examining the moderating effects of the five-factor personality traits on the association between job embeddedness and turnover. Despite

having a key role in turnover theories (Hom et al., 2017), personality traits have been overlooked in theory and research on job embeddedness (Jiang et al., 2012; Lee et al., 2014). To date, four studies have linked personality traits to job embeddedness, and most of them have been limited to correlations (Giosan et al., 2005) and direct or mediated effects of a few personality traits (Lev & Koslowsky, 2012; Singh, 2019). While the focus in job embeddedness theory and research has been on voluntary turnover (e.g., Lee et al., 2014), we are not aware of any previous studies that have linked personality traits to job embeddedness and voluntary turnover. As already noted, one prior study has examined moderating effects of the big five traits between job embeddedness and turnover intentions (Yusoff et al., 2022). However, because meta-analyses suggest that turnover intentions explain only up to 20% of variance in actual turnover (Griffeth et al., 2000; Hom & Griffeth, 1995), turnover intention is not an adequate proxy for actual voluntary turnover (Allen et al., 2015; Rubenstein et al., 2018). Perhaps more importantly, our arguments of the moderating effects of five-factor personality traits are based on the necessary-sufficient logic. That is, we did not conceptualize how personality traits would strengthen or weaken the effect of high levels of job embeddedness on retention. Instead, we conceptualized how they strengthen the effect of low levels of job embeddedness, which is necessary but not sufficient for turnover to occur. In other words, our argument regards whether certain personality traits change low job embeddedness's effect on the likelihood of turnover by it from possible to likely, resulting in job embeddedness's increased ability to predict turnover.

Furthermore, the interactive effects in our study delineate possible boundary conditions of job embeddedness theory. To date, researchers have implicitly or explicitly assumed people are uniformly embedded in their organizations (Lee et al., 2014). Our findings demonstrated that the five-factor personality traits explain systematic variation in the job embeddedness-voluntary

turnover relationship. By doing so, our theorization and findings suggest that future research and theoretical developments related to job embeddedness benefit from consideration of personality traits' role as moderating factors that determine how likely embedded individuals are to leave or remain in their organizations.

Third, this study contributes to research that links personality traits to voluntary turnover. While personality traits have been included in most turnover theories and have a long history in turnover research (Hom et al., 2017), prior research has provided inconsistent findings regarding their effects on voluntary turnover (e.g., Zimmerman, 2008). These inconsistent findings can be partly attributed to the insufficient theoretical rationale and their moderating rather than direct effects. In this regard, the personality traits' moderating role based on the necessary condition logic and empirical findings suggest that using personality traits as moderators can be more appropriate than theorizing and examining their direct effects on turnover. This perspective is consistent with the conceptual rationale of personality traits as an individual difference that affects individuals' responses to specific situations (Mischel & Shoda, 1998). In the case of turnover, our findings suggest that personality traits determine employee behaviors when they are free from constraints (i.e., high levels of job embeddedness) to choose whether to stay in or leave their organizations.

Practical implications

The findings can be used to provide implications for practice. First, because personality traits moderated the relationship between job embeddedness and voluntary turnover, using personality tests in recruitment and selection processes is an actionable approach (Barrick & Zimmerman, 2005). Organizations can therefore periodically assess job embeddedness and combine the results with employees' personality trait data. Special attention can also be paid to

employees with particular personality traits such as extraversion, agreeableness, and openness to experience because they moderated the relationship between job embeddedness and voluntary turnover in our study.

Second, our findings suggest that a combination of job embeddedness and personality traits can be a more parsimonious way to predict voluntary turnover than surveys consisting of only proximal predictors. Surveys that consist of both distal and proximal predictors are useful because they might enhance the early prediction of employees likely to quit. This is important because using only proximal predictors such as turnover intention may allow the prediction of real turnover propensity too late. Employees who exhibit such proximal symptoms might quit before organizations are able to identify their symptoms and generate and implement effective interventions, resulting in the loss of valuable employees.

Third, our findings by clarifying that low levels of job embeddedness are a necessary but not sufficient condition for turnover facilitate the understanding that less embedded people might choose to stay in their organizations. The positive effect of job embeddedness on outcomes aside from turnover such as organizational citizenship behaviors and performance (Lev & Koslowsky, 2012) might not apply to those stayers. However, the “dark side” of job embeddedness, in which embeddedness has detrimental outcomes for employees and their employers (Allen et al., 2016; Burton, 2015; Sekiguchi et al., 2008) does not apply to these stayers either. Special attention may thus need to be paid to stayers with low embeddedness because such effects can be different for them than for the employees that organizations seek to retain.

Limitations and suggestions for future research

This study also has limitations that can be considered in future research. First, our data consist of self-reports, which arguably were appropriate because individuals can arguably assess

their own embeddedness more accurately than others can. To alleviate common method variance concerns, we collected data using three different surveys at three points in time. Research also suggests that interaction effects are not subject to common method variance (Siemens, Roth, & Oliveira, 2010). Nevertheless, future studies that use data collected from multiple sources are valuable. Because we measured all variables in our study once, a longitudinal approach in future studies is also recommended because it enables to make causal inferences. Second, our findings suggest that the five-factor personality traits are important in understanding the embeddedness-turnover relationship. However, other personality traits such as proactive personality (Bateman & Crant, 1993), can moderate the embeddedness-turnover relationship and can be examined in future research. Future research can also benefit from including related constructs such as work engagement and organizational commitment. Furthermore, we cannot accurately specify that job embeddedness is a predictor and that the big five traits are moderators in our study. We theorized the big five traits because one of the main purposes of our study was to improve the predictive ability of embeddedness. The underlying paradigm of our approach is interactionist psychology rooted in Lewin's (1951) field theory. The basic tenet of this paradigm is that human behavior is a product of people and situations – the interaction of the person and the situation. Because this paradigm suggests an interaction, it does not specify which is the independent and moderating variable. Logistic regression does not solve this issue because it, mathematically, only detects interactions. Finally, while we consistent with prior research did not differentiate “push” and “pull” factors of voluntary turnover (Rubenstein et al., 2018), future studies can make a such distinction to provide a more fine-grained perspective of voluntary turnover.

Endnote

¹In the same meta-analysis (Rubenstein et al., 2018), job security (i.e., the degree to which a person is confident about having stable present or future employment in his or her current job) and work engagement (i.e., the degree to which a person invests their entire self into their work role; their dedication, vigor, and devotion toward work) respectively explained 21% and 19% of the variance in turnover.

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Table 1. Descriptive statistics

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	32.17	7.39												
2. Gender	0.73	0.35	.22 **											
3. Marital status	0.76	0.42	.26 **	.15 **										
4. Education level	3.89	0.80	-.04	-.10 *	-.01									
5. Tenure (years)	10.43	5.40	.49 **	.17 **	.14 **	-.17 **								
6. Community embeddedness	3.67	1.26	.01	.10 *	.11 *	-.08	.04							
7. Job embeddedness	4.07	0.98	.11 *	.10 *	.09 *	-.08	.21 **	.34 **						
8. Extraversion	3.48	1.07	.01	.04	.07	.07	-.10 *	.07	.15 **					
9. Agreeableness	4.13	0.93	.04	.03	.07	.05	-.07	.07	.17 **	.46 **				
10. Conscientiousness	4.79	0.95	-.02	-.05	.01	.03	-.03	-.03	-.08	.05	.18 **			
11. Neuroticism	3.97	0.86	-.09	-.03	.00	-.06	.04	.02	-.06	-.04	.03	-.14 **		
12. Openness to experience	4.30	0.87	.12 **	.04	.06	.01	-.00	.10 *	.14 **	.32 **	.45 **	.20 **	-.13 **	
13. Voluntary turnover	0.11	0.23	.02	.05	.05	.09	-.06	-.02	-.18 **	.10 *	.10 *	.05	-.01	.10 *

Note. N = 478. Gender (female = 0, male = 1); Marital status (non-married = 0, married = 1); Education level (1 = middle school, 2 = high school, 3 = vocational school/two-year university, 4 = Bachelor's, 5 = Master's/Ph.D.)

*p < .05, **p < .01

Table 2. Logistic Regression Analyses Predicting Voluntary Turnover

Variable	Step 1: Control variables					Confidence interval 95%		Step 2: Predictors					Confidence interval 95%		Step 3: Interactions					Confidence interval 95%	
	<i>b</i>	SE	Wald	<i>p</i>	Exp(B)	LL	UL	<i>b</i>	SE	Wald	<i>p</i>	Exp(B)	LL	UL	<i>b</i>	SE	Wald	<i>p</i>	Exp(B)	LL	UL
Age	.01	.03	.21	.641	1.01	.95	1.08	.01	.03	.03	.849	1.01	.93	1.08	.02	.03	.19	.657	1.01	.94	1.09
Gender	.76	.76	.99	.318	2.15	.47	9.74	.71	.79	.79	.372	2.04	.42	9.75	.59	.80	.54	.459	1.81	.37	8.78
Marital status	.48	.57	.71	.398	1.62	.52	5.02	.46	.61	.57	.449	1.58	.48	5.26	.61	.63	.92	.336	1.84	.53	6.37
Education level	.60	.32	3.38	.066	1.82	.96	3.45	.68	.36	3.52	.061	1.98	.97	4.07	.68	.38	3.23	.072	1.98	.94	4.20
Tenure (years)	-.03	.02	1.65	.198	.97	.92	1.01	-.00	.02	.00	.960	.99	.94	1.05	-.00	.02	.07	.790	.99	.94	1.04
Community embeddedness	-.01	.16	.00	.929	.98	.70	1.37	.29	.18	2.46	.117	1.34	.93	1.93	.33	.20	2.57	.108	1.39	.93	2.08
Organizational embeddedness (OE)								-1.11	.25	18.97	.000	.32	.19	.54	-1.22	.30	15.66	.000	.29	.16	.53
Extraversion (EX)								.40	.21	3.65	.056	1.49	.99	2.27	.26	.26	.97	.324	1.30	.77	2.20
Agreeableness (AG)								.24	.27	.78	.375	1.27	.74	2.19	.56	.35	2.45	.117	1.75	.86	3.52
Conscientiousness (CO)								.01	.22	.00	.960	1.01	.64	1.57	.28	.30	.84	.360	1.32	.72	2.41
Neuroticism (NE)								-.12	.25	.21	.644	.88	.53	1.47	-.06	.30	.04	.826	.93	.51	1.69
Openness to experience (OE)								.30	.27	1.20	.273	1.35	.78	2.31	-.12	.36	.12	.726	.88	.43	1.79
OE_x_EX															-.54	.24	4.88	.027	.57	.35	.94
OE_x_AG															.64	.26	5.90	.015	1.90	1.13	3.20
OE_x_CO															.36	.26	1.82	.177	1.43	.84	2.43
OE_x_NE															-.11	.24	.21	.640	.89	.55	1.44
OE_x_OE															-.72	.29	5.974	.015	.48	.27	.86
Model $\chi^2_{(df)}$				8.20 ₍₆₎	.223						34.81 ₍₁₂₎	.001					47.31 ₍₁₇₎	.000			
-2Log likelihood				188.00							161.39						148.89				
Nagelkerke R ²				.05							.21						.28				

Note. *N* = 478. *b* = unstandardized coefficient; SE = standard error; Gender (female = 0, male = 1); Marital status (non-married = 0, married = 1); Education level (1 = middle school, 2 = high school, 3 = vocational school/two-year university, 4 = Bachelor's, 5 = Master's/PhD)

Figure 1. Extraversion as a moderator between job embeddedness and voluntary turnover

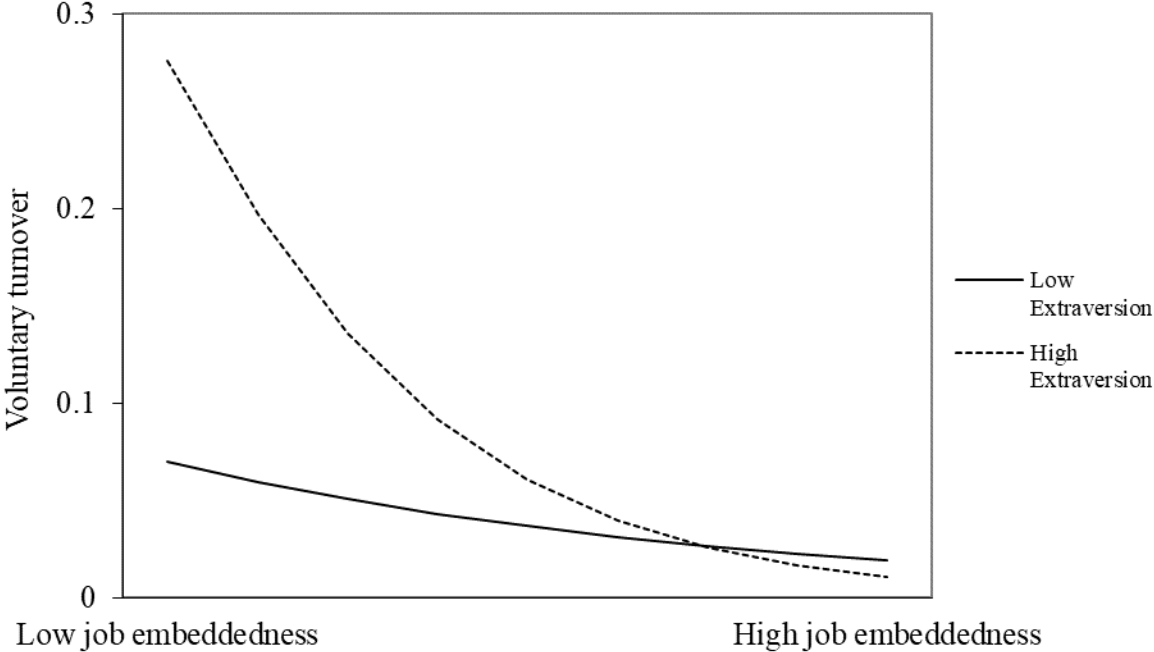


Figure 2. Agreeableness as a moderator between job embeddedness and voluntary turnover

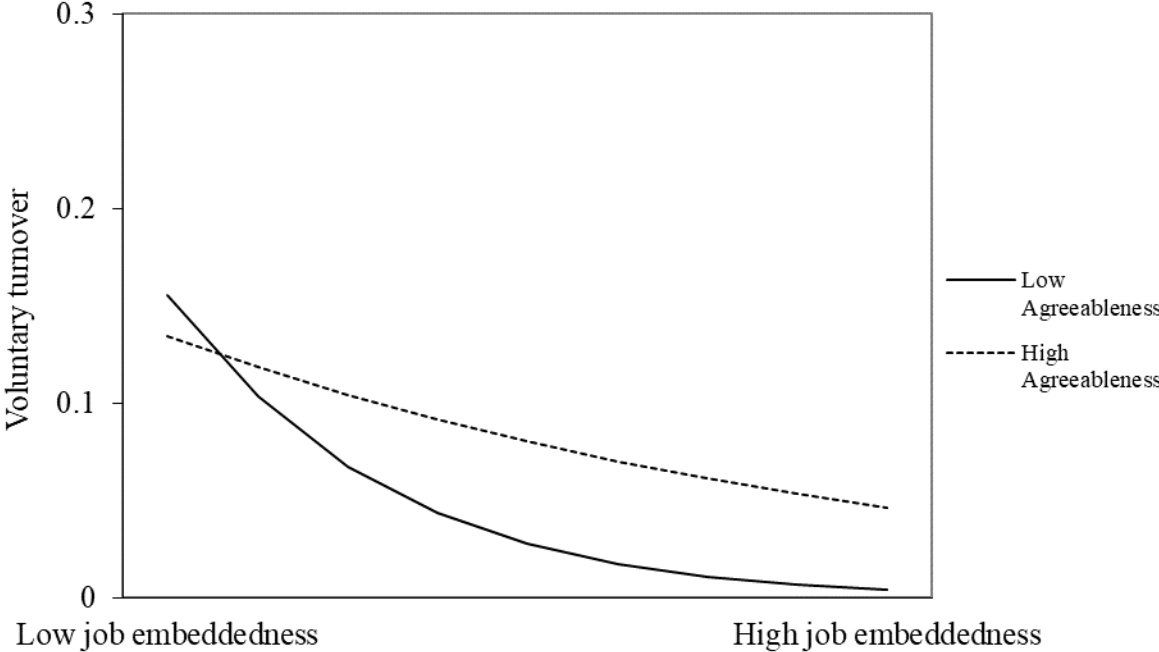


Figure 3. Openness to experience as a moderator between job embeddedness and voluntary turnover

