



The Effect of Conscientiousness on the
Performance of IT-workers While Working from
Home: Investigating the Moderating Role of
Autonomy and Job Complexity.

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Abstract

The COVID-19 pandemic forced most IT employees in the Netherlands to spend the majority of their working hours from home. Despite the rise of working from home, there is a lack of research on who thrives within this context and under which working conditions these relationships can be explored. Moreover, limited research exists on the effects of personality on performance while working from home. Therefore, this study examined the relationship between conscientiousness and performance when working from home. The study also examined the moderating role of the work design variables of autonomy and job complexity in the relationship between conscientiousness and performance. Autonomy and job complexity may activate the trait of conscientiousness in the context of working from home. In this cross-sectional study, a total of 519 participants completed an online questionnaire. The results supported the hypothesis that conscientiousness is positively related to performance. Although autonomy was found to be associated with performance, the results did not support the moderating role of autonomy and job complexity in the relationship between conscientiousness and performance. The findings may help organizations make choices in designing the support, context, and amount of work from home for optimal performance.

Keywords: Working from home, Conscientiousness, Performance, Autonomy, Job Complexity

The Effect of Conscientiousness on the Performance of IT-workers While Working from Home: Investigating the Moderating Role of Autonomy and Job Complexity

“Some people are more productive working at home than people would have expected. Some people thought that everything was just going to fall apart, and it hasn’t” (Mark Zuckerberg, 2020).

For decades, job performance has captivated researchers from both practical and scientific perspectives. The working environment is a key factor that impacts employees’ performance. In today’s evolving world, work environments are continuously changing, and employees must constantly adapt to these changes. The COVID-19 pandemic has accelerated this development process and forced many employees to work outside of the office for a proportion of their work hours. Researchers believe that this new norm is here to stay. For example, it is expected that half of the Dutch working population will remain to work from home for more than 40% of their working hours (Josten & Merens, 2021). Furthermore, 92% of employees prefer hybrid working policies (Libosan, 2021). Although remote work is likely to continue, little is known about its advantages and disadvantages as well as who thrives within these circumstances and who does not (Hoffmann et al., 2021). It can be assumed that not all individuals can perform well when working from home (Evans et al., 2022; Mihalca et al., 2021). Companies and organizations should determine what a sustainable amount of working from home is for each individual, team, and occupation so that each person can perform to their best capabilities.

Working life has changed dramatically as a consequence of hybrid work. For example, colleagues are usually close by to discuss work-related issues and decisions; currently, they have to actively seek help through their devices. In working from home, no managers oversee how employees perform their tasks or when they arrive, making the schedule up to themselves. This new way of working may be easier for some people, who tend to score

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higher on certain personality traits (Kok & Helms, 2016). The level of conscientiousness is a key factor that affects employees' performance when working from home (Venkatesh et al., 2021). Conscientious people are reliable, well organized, self-disciplined, and strive for competence and success in their work (Dudley et al., 2006). One could imagine that these premises are essential for performance when working from home.

Venkatesh et al. (2021) found a stronger positive relationship between conscientiousness and performance after employees started working from home due to COVID-19. However, it remains unclear under which working conditions this relationship can be observed (Hoffmann et al., 2021). Within work design theory, autonomy is an important working condition that describes freedom in organizing, decision making, and work methods (Morgeson & Humphrey, 2006). Autonomy may influence the relationship between conscientiousness and performance (O'Neill et al., 2009). For example, conscientious employees are generally good at organizing; thus, in a high autonomy context, conscientious employees would be better at effectively choosing their schedule or how to do their assigned tasks.

Another important working condition is job complexity. Within work design theory, job complexity implies that work tasks require high-level skills that are cognitively demanding and challenging (Edwards et al., 2000). In line with this definition, it could be argued that being self-disciplined and striving for competence and success truly improve employees' performance in complex tasks. For example, an IT worker may benefit more from discipline when writing complex programming code than when having to monitor simple processes. Furthermore, supervisors who seek to improve their organizations may benefit more from striving for competence and success than someone who installs internet connections.

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In the current study, I will investigate to what extent autonomy and job complexity moderate the relationship between conscientiousness and performance among IT workers – a group of employees who are in high demand and have experience with tools needed when working from home. Based on the literature on the relationship between conscientiousness and performance, I argue that IT workers who score high on conscientiousness perform better when working from home than those with lower scores. Also, I argue that people with high autonomy or job complexity have a stronger relation between conscientiousness and performance than those who score low on either or both. The results of this study test whether the relationships between the person, their environment, and performance also hold in new contexts, such as working from home. The results provide insights that may benefit organizations, for instance, to help employees who score low on conscientiousness better deal with working from home, for example, by providing them with tools that help them with organization, self-control, and discipline or by decreasing the number of hours employees can work from home.

Conscientiousness as a Predictor of Performance

Personality is a concept that most people are familiar with and is often a target of organizational research (Tett et al., 2021). Personality traits can be defined as behaviors and thoughts that are rather stable and distinguish humans from each other (McCrae & Costa, 1995). These traits influence the behavior of humans within a broad range of situations (Tett et al., 2021). Researchers have proposed theories and models to categorize personality traits. Two of the most common theories are the Big Five theory and HEXACO. The Big Five theory describes five major traits: extraversion, agreeableness, openness, conscientiousness, and neuroticism. In addition to five traits similar to those of the Big Five theory, HEXACO considers the two traits of honesty-humility and emotionality instead of agreeableness. Both

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models have been shown to be good at classifying people on the basis of their major dimensions (Anglim & O'Connor, 2019).

Conscientiousness is one of the primary traits in both models and encompasses constructs that describe the differences in the tendencies of individuals to be self-controlled, orderly, responsible, hardworking, and rule-abiding. Studies have shown that conscientiousness can predict many positive outcomes such as health, human capital, and performance (Roberts et al., 2014). A recent synthesis of over 50 meta-analyses investigating the link between all Big Five personality traits and job performance shows that conscientiousness yields the most substantial effect in relation to performance ($\rho = 0.19$) (Zell & Lesick, 2021).

The meaning of work performance in psychology has changed over the last half-century. It now encompasses not only the outcomes of doing a specific job but also citizenship performance, contextual performance, and proactivity (Griffin et al., 2007). In this study, performance is conceptualized to consist of individual task proficiency, adaptivity, and proactivity while employees work from home. Task proficiency is the extent to which an employee meets their role requirements. Task adaptivity is the extent that an employee manages to adapt to changes such as new processes within the work environment. Proactivity is the extent to which an employee takes action toward finding better ways to perform core tasks (Griffin et al., 2007).

Performance is mainly predicted by the work environment and the person (Humphrey et al., 2007; Hertz & Donovan, 2000). People in work settings are frequently chosen for their traits, expecting them to perform better than others. A large body of research has identified conscientiousness to be the most potent non-cognitive predictor of work-related performance (Wilmot & Ones, 2019). Generally, people who score higher in conscientiousness generally perform better. This relationship has been supported in relation to typical work situations. To

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understand this relationship, it makes sense to look at the subfacets of conscientiousness, such as orderliness, industriousness, self-control, and responsibility. An employee who scores high on conscientiousness has the tendency to be “prepared” and neat instead of being disorganized and messy (orderliness), the tendency to work hard and have persistence when challenges arise (industriousness), the tendency to control impulses instead of being reckless (self-control), and the tendency to keep promises and follow the rules instead of being unreliable (responsibility; Roberts et al., 2014). Nevertheless, these subfacets have not exhibited higher validity in predicting performance than the broad trait (Dudley et al., 2006).

Hoffmann et al. (2021) conducted a meta-analysis to investigate the impact of personality traits on employees’ performance. They reported a significant but small positive effect size for conscientiousness and concluded that people with higher conscientiousness scores perform better while working away from the office. However, Hoffmann et al. (2021) shared that their analysis can only draw preliminary conclusions due to the small number of studies and moderate study quality. Furthermore, Allen et al. (2015) studied the effect of conscientiousness on performance in the context of telework (a type of work done remotely, typically from home, while using telecommunications or computers). They expected that only the most conscientious and high-performing individuals are those that get the opportunity to telework, which may influence pre-COVID-19 research on telework.

Enforced changes in work policies due to COVID-19 have offered a unique opportunity to investigate the characteristics of people and jobs in relation to their performance while working from home. Especially since regulations are lifted in many countries, employers are trying to find balance in hybrid working (Josten & Merens, 2021). Some studies have shed light on the negative effect of the forced transition to working from home during the pandemic on the relationship between performance and conscientiousness. For example, Evans et al. (2022) reported that due to the enforced transition to working from

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home, conscientious employees have become less productive and less engaged over time. However, Venkatesh et al. (2021) suggested that working from home may put conscientious employees at risk for burnout and lower job satisfaction, but not lower performance. These contrasting findings highlight a lack of and a need for more research into the link between conscientiousness and performance while working from home.

There are multiple reasons why conscientiousness is especially relevant for performance while working from home. For example, a conscientious employee may better meet role requirements while having no supervisors around. Furthermore, one of the difficulties that an employee who works from home may encounter is the lack of structure. When employees score higher in conscientiousness, they may create work schedules, better coordinate their tasks with others at a distance, and have systematic approaches to work activities (O'Neill et al., 2009). Besides, employees who score high on conscientiousness often have a strong work ethic. This diligence has been shown to be negatively related to cyberloafing (using the Internet for personal use while pretending to work; Jia et al., 2013). This leads to the following hypothesis:

Hypothesis 1. There is a positive relationship between conscientiousness and performance while working from home among IT workers.

The Moderating Role of Job Autonomy

Multiple researchers have proposed that moderators, such as work design characteristics, influence the extent to which conscientiousness is related to performance (e.g., Barrick & Mount, 1993; Byrne et al., 2005; Witt, 2002). This study, therefore, explores whether motivational and knowledge work design features help to better understand the relationship between conscientiousness and performance while working from home.

The relationship between conscientiousness and job performance while working from home can be influenced by contextual factors. Humphrey et al. (2007) performed a meta-

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analysis on work design, personality, and performance and found that the motivational characteristics of work design explained 25% of the variance in performance. These findings may be explained by trait activation theory (TAT) which is based on the idea that context activates traits. In this light, in order for conscientiousness to be expressed, there have to be situations that are relevant to the trait (Tett et al., 2013). Accordingly, a trait may not have predictive utility and is dormant if no situation stimulates it into action (Tett et al., 2021). Further, Tett and Christiansen (2007) reviewed Big-Five related meta-analyses and showed that the context of a situation plays a vital role in the relationships between traits and job performance.

Work design characteristics are shown to strongly predict the behavior and performance of people in their workplace (Humphrey et al., 2007). Autonomy, which falls within the motivational characteristics of work design, may help understand what affects the relationship between conscientiousness and performance while working from home. Further, conscientiousness may be a better predictor when one has higher levels of autonomy (Barreck & Mount., 1993; Shaffer & Postlethwaite, 2013). For example, there may be more need for self-control, responsibility, and the ability to organize well within a high autonomy job than within a highly structured job. An employee who has these traits would have a higher relative level of performance in high autonomy jobs compared to the relative performance of employees who have highly structured jobs (Wilmot & Ones, 2019). In line with these predictions, Gellatly and Irving's (2001) study on public-sector managers found a negative relationship between conscientiousness and performance in low autonomy jobs but not in high autonomy jobs. Furthermore, another study of managers found that the relation between conscientiousness and performance was stronger for managers in high autonomy jobs (Barrick & Mount, 1993).

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Previous research indicated that employees experience more autonomy in a flexible environment where they are able to work from home (Gajendran & Harrison 2007). However, the level of autonomy still differs between each IT job, with IT managers having more autonomy than service employees. Considering TAT, high autonomy when working at home may be an excellent context for activating the trait of conscientiousness. For example, when employees have high conscientiousness and autonomy, their discipline may help them focus on work instead of misusing their autonomy to take a long break. Besides, people with high conscientiousness may show relatively better effectiveness when they have higher autonomy within the context of working from home. For example, IT employees who work from home on a high autonomy task would benefit more from having the tendency of being “prepared,” responsible, and able to control themselves, compared with employees working on structured tasks and having constant meetings with supervisors. Thus, I propose that conscientiousness has a stronger effect on performance in the presence of high autonomy while working from home. This leads to the following hypothesis:

Hypothesis 2. Autonomy moderates the relationship between conscientiousness and performance such that conscientiousness relates more strongly to performance when autonomy is high.

The Moderating Role of Job Complexity

Another possible moderator that may influence the relationship between conscientiousness and performance while working from home is job complexity. Chen et al. (2001) found that the higher the job complexity is, the stronger the relationship between conscientiousness and performance becomes. The researchers concluded that job complexity can be considered as an important moderator of the relationship between conscientiousness and performance. Blicke et al. (2013) also argued that job complexity is a relevant contextual feature for conscientiousness as a predictor of performance. They included only complex jobs

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in their study in order to improve performance prediction. Complex tasks place greater behavioral and informational demands on employees compared with simple tasks. For example, a complex task generally consists of multiple subtasks, so a larger number of personal resources is needed to accomplish it (Chen et al., 2001). Considering TAT, the trait of conscientiousness may be activated in the context of a complex task. For example, proper organization and planning are needed when an employee has to perform a complex task from home. Besides, complex tasks may involve more continuous learning than simple tasks, which seems to make conscientiousness more predictive (Hogan & Holland, 2003).

Although job complexity is suggested to influence the relationship between conscientiousness and performance, the extent and direction of this effect remain unclear in the context of working from home. Based on the person-environment theory, the better an individual fits a work environment, the higher their productivity becomes (Kristof-Brown et al., 2005). It could be argued that the trait of conscientiousness fits job complexity. One's self-discipline, reliability, and organization are especially beneficial in performing a complex job while working from home. I argue that conscientiousness has a stronger effect on performance in the presence of high job complexity while working from home. This leads to the following hypothesis:

Hypothesis 3. Job complexity moderates the relationship between conscientiousness and performance, such that conscientiousness relates more strongly to performance in jobs high in complexity.

Method

Participants

IT workers in the Netherlands were recruited to participate in this study. The recruitment process was performed through managers, newsletters, or the employer's site. Participants were informed that their participation in this study was voluntary. As an incentive

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to participate, Participants had the possibility to join a raffle for IT-related books with a win chance of one in 12.5. Of the 621 participants who initially participated in the study, there remained an effective sample of 519 IT workers; of which 82.1% were male, and 17.9% were female. The age of the participants was, on average, 46.53 years ($SD = 10.37$), ranging from 22 to 66 years. Regarding the educational level, most participants were higher educated, holding a bachelor's degree (53.9%) or a master's degree or higher (26.4%). While others finished vocational school or post-secondary vocational education (17.5%), and a few did not finish vocational school (2.1%). All participants were IT workers at the time of the study, either the Dutch government (81.7%) or other organizations (18.3%). The participants worked, on average, 36.54 hours per week ($SD = 3.91$), ranging from 16 to 50 hours. The participants worked, on average, 27.37 hours a week from home ($SD = 8.55$), which is 75% of their total working hours, while they would prefer to work 65% of their total work hours from home. A total of 200 participants had children below 16 living at home (39%). About 19.3% of the participants had a job where they had to lead people, of which 15.4% had to lead more than five people. Participants currently worked an average of 9.57 years for their employer ($SD = 8.55$), in a range of 1 to 43 years.

Procedure and Design

The study had a cross-sectional design and used an online survey programmed in Qualtrics for data collection. The study was conducted by two master's students of Work, Organizational and Personnel Psychology. Ethics approval was obtained from the Ethical Committee of Psychology of the University of Groningen (code: PSY-2122-S-0252).

The participants accessed the study via a link to participate. In order to participate, the participants had to work in an IT job, which was assessed directly after the informed consent. Answering "no" on the consent or IT question resulted in redirection to the end of the survey. The variables were assessed through self-rated rating, and participants were asked only to

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answer the dependent variables if they did work from home during the last year. Of the 621 participants who gave consent, 519 remained. 102 participants were excluded due to the following rationale: 15 participants were not doing IT work, 84 had more than 50% of their answers missing on one of the independent or dependent variables, and 3 spent less than 300 seconds on the survey, resulting in a final sample of 519 participants.

Measures

The complete survey, including the measures, was presented in Dutch. The official translation was used for the measures of conscientiousness and work design. The back-translation method was used for the performance measure, partnering with a professional translator.

Conscientiousness

To measure the participants' level of conscientiousness, an 18-item conscientiousness-specific scale of the HEXACO-100 (Ashton & Lee, 2009) was used. The participants indicated to what extent they agreed with statements about situations they could encounter in their lives, using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). An example item is: "People often say that I am a perfectionist." Cronbach's alpha for this measurement was $\alpha = .77$.

Performance

Performance was measured by the three subscales of the work role questionnaire (Griffin et al., 2007). The original instructions were slightly altered; they stated, "On days that I worked from home". The participants indicated to what extent they agreed with statements about their performance during their work using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). An example item is: "I came up with ideas to improve the way in which my core tasks are done. The three subdimensions are treated as one dimension called individual performance. The Cronbach's alpha for all the items of this measurement was $\alpha = .87$.

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Work Characteristics

In order to measure work characteristics, scales from the Dutch work design questionnaire (Gorgievski et al., 2016) were used, which was based on the Work Design Questionnaire created by Morgeson and Humphrey (2006). The participants were asked to indicate to what extent they agreed with statements about their current job using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

Autonomy. Nine questions were used to measure autonomy, divided into three different aspects of autonomy: work scheduling, decision-making, and work methods autonomy. An example item is: “The job allows me to make my own decisions about how to schedule my work.” Cronbach’s alpha for this measurement was $\alpha = .85$.

Job Complexity. Four questions were used to measure job complexity: An example item is: “The job involves performing relatively simple tasks (reverse scored)”. Cronbach’s alpha for this measurement was $\alpha = .73$.

Control Variables

The demographic variable of age was used as a control variable. It was important to control for age since people tend to become more conscientious as they age (Jackson et al., 2009), and older workers tend to perform better under high autonomy (Ng & Feldman, 2015). Furthermore, the second control variable concerns the need for adequate conditions while working from home, namely having a distraction-free workplace, which is considered an important predictor of employee performance while working from home (Mihalca et al., 2021).

Analytical Procedure

Data analysis and assumption checks were performed using SPSS. Missing values were computed to be the average of the other answers within a scale whenever a participant did not answer the minority of the questions within that scale. Before running the analysis, I

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tested whether the assumptions for the moderation analysis were met using Q-Q plots, scatterplots, and histograms. The test results indicated that none of the assumptions for the variables of conscientiousness and performance were violated. However, for job complexity and autonomy, the Q-Q plots and histograms showed that they were slightly positively skewed. Skewness indicated that people scored themselves as having high autonomy and complexity within their jobs. Although the data seemed to be a close-enough approximation to reasonably estimate the statistics, there were no unexplainable outliers in the data.

To test the hypotheses, I used Model 2 within the PROCESS Macro for SPSS created by Hayes (2013) to run the regression analysis with two moderators. The predictor and moderator variables were standardized within the PROCESS Macro add-on, as recommended by Hayes (2013). Conscientiousness was included as the independent variable, autonomy and job complexity as moderators, and performance as the dependent variable. First, the analysis was run without the control variables (Table 2). Second, the control variables of distraction-free workplace and age were included (Table 3).

For the exploratory analysis, Model 1 of the PROCESS macro add-on was used to run the regression analysis. Within this analysis, autonomy was used as the independent variable, preferred hours of working from home as the moderator, and performance as the dependent variable. This analysis was run without control variables.

Results

Table 1 displays intercorrelations and descriptives. Regarding the control variables (i.e., age and distraction-free workplace), age had a significant negative correlation with performance ($r = -.11, p < .05$). Distraction-free workplace was significantly and positively correlated with performance ($r = .25, p < .01$), conscientiousness ($r = .13, p < .01$), and job complexity ($r = .11, p < .05$).

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Hypothesis Testing

Table 3 presents the results of the hypotheses. The results showed a significant positive effect of conscientiousness on performance ($b = 0.45$, $SE = 0.08$, $p < .001$), which supports Hypothesis 1: There is a positive relationship between conscientiousness and performance while working from home among IT workers. Also, there was a significant positive main effect of autonomy on performance ($b = 0.14$, $SE = 0.04$, $p < .001$). However, the interaction effect of conscientiousness and autonomy on performance was not significant ($b = 0.06$, $SE = 0.10$, $p = .54$). Accordingly, Hypothesis 2 which expected autonomy to moderate the relationship between conscientiousness and performance was not supported. There was no significant main effect of job complexity on performance ($b = 0.19$, $SE = 0.04$, $p = .61$). The interaction effect of conscientiousness and job complexity on performance was also not significant ($b = -0.03$, $SE = 0.08$, $p = .75$). These findings do not support Hypothesis 3 that job complexity moderates the relationship between conscientiousness and performance. The model, including the three predictors and two interactions, explained 9.7% of the variance in performance. Including the control variables, it explained 15.6% of the variance. The control variables did not lead to a significant difference in the significance or direction of the effects of conscientiousness, autonomy, and job complexity on performance.

Exploratory Analysis

The exploratory analysis was conducted to investigate what explains the relationship between autonomy and performance while working from home. There was interest in examining if the preferences of IT workers regarding the number of hours they would want to work from home match their performance while working from home, and if people who prefer to work from home are better able to use their autonomy. The results of the exploratory analysis are presented in Table 4. The interaction effect of autonomy and the preferred number of hours working from home on performance was significant ($b = -0.01$, $SE = 0.00$, p

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= .02). This means that the number of hours employees prefer to work from home positively influences the relationship between autonomy and performance. The simple slopes for employees 1 SD Above, with, and 1 SD below the mean of preferred hours of work from home were respectively .11, .17, and .27 (Figure 2). This model explained 22.4% of the variance in performance.

Discussion

While there is great interest in what explains performance, limited research exists on the performance of employees who work from home. Since this trend is emerging as a more prevalent form of work, this study contributes to the performance literature by examining the relationship between conscientiousness and performance when working from home. Besides, it examined the possible moderating role of job autonomy and job complexity within that relationship. The results confirmed the first hypothesis that there is a positive relationship between conscientiousness and performance when working from home. These findings align with previous meta-analytic evidence about the relationship between conscientiousness and performance in the context of telework (Hoffman et al., 2021) and working from home (Venkatesh et al., 2021).

Furthermore, the second hypothesis that job autonomy moderates the relationship between conscientiousness and performance could not be confirmed. The findings did not confirm that the relationship between conscientiousness and performance was stronger when participants experienced high job autonomy. Previous research did suggest a moderating role of autonomy in the relationship between conscientiousness and performance (e.g., Barrick & Mount, 1993; Byrne et al., 2005; Witt, 2002). This study did reveal a significant positive main effect of autonomy on performance, which other studies have also found (Morgeson et al., 2005; Muecke & Iseke, 2019). IT workers with higher amounts of autonomy perform better within the context of working from home. This may be due to an increase in commitment

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(Sisodia & Das, 2013) or to the suggested positive effect on self-efficacy, satisfaction, and trust-building (Saragih, 2011). It could be argued that employees especially need commitment, self-efficacy, and trust to perform well while working from home because there are more possibilities to drift towards doing non-work-related activities, and there is less support and pressure from colleagues. For example, IT workers spend their whole day on the computer, and low commitment could lead them to cyberloafing. In addition, the exploratory analysis found that IT workers who prefer to work from home are better able to use the autonomy given to them. This finding indicates that employees may be aware of the positive impact that autonomy has on their performance and may act on this. Subsequently, the current study adds to the literature on the relationship between autonomy and performance.

The results also could not confirm the third hypothesis that job complexity moderates the relationship between conscientiousness and performance. In other words, the findings did not support that the relationship between conscientiousness and performance when working from home is stronger when people experience high job complexity. Previous research did, however, find job complexity to have a moderating role in similar situations (Chen et al., 2001). Nevertheless, conscientiousness might be as important for performance at different levels of job complexity. For example, O'Neil et al. (2009) found that people who were working from home tended to be more conscientious in less complex jobs. Consequently, they expected less complex jobs to be more suitable for working from home. Furthermore, the lack of effect could be because of complex jobs demanding higher levels of cognitive ability. One meta-analysis by Shaffer and Postlethwaite (2013) suggested that conscientiousness is a weaker predictor of performance in jobs that have cognitively demanding requirements, and a stronger predictor when the job is highly routinized. Lastly, the sample in the current study consisted of mostly higher educated IT workers, who, on average, scored themselves high on

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job complexity. This homogenous sample could explain why job complexity was not a relevant moderator in the current study.

Strengths, Limitations, and Directions for Future Research

The study had several strengths and limitations. First, the current study took place when COVID-19 measures were still mostly in place within the Netherlands. A large portion of the entire field of IT workers were working from home. Our participants spent 75% of their working hours from home; therefore, the study included IT workers in general, instead of only IT workers who chose to work from home. Besides, the large number of people working from home may have helped to obtain a relatively large sample size, which increased the power of our study. IT workers are probably a good group to study during this forced working from home since they know how to work with computers and spend most of their days behind the computer screen, which decreases the amount of actual change that they were forced to go through. This may be important since COVID-19 is shown to decrease situational strengths due to changes in work routine (Venkatesh, 2021), which may decrease the activation of conscientiousness.

Other COVID-19 consequences could be that results from participants who were forced to work from home may not generalize to people who *want* to work from home. Moreover, the longer conscientious employees are forced to perform remote work, the worse the relationship is between conscientiousness and performance, as conscientious employees become relatively worse in productivity and engagement over time (Evans et al., 2022). Another limitation that may have influenced the results is that all our variables were measured through self-rating. The fact that the performance scale was self-rated may not give the most valid results. For example, Gajendran and Harrison (2007) found a stronger association between remote working and self-report performance than between remote working and supervisor-reported performance. People may score themselves favorably because of social

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desirability (Ganster et al., 1983). Furthermore, people who score high on conscientiousness may, in particular, enjoy working from home, and they may be afraid they would lose this freedom when scoring themselves lower on performance. However, the current correlation of .28 is similar to the correlation of .27 found in a meta-analysis that analyzed the effect of conscientiousness on performance, which only included supervisor ratings (Wilmot & Ones, 2019).

Autonomy and job complexity were also self-rated and participants scored high in autonomy and job complexity. The average for autonomy and the average for job complexity may not be realistic. The context of working from home is high in autonomy in itself; therefore, participants might misjudge this for autonomy in their general work tasks. This may be because of common method bias effects, such as the tendency to maintain consistency in responses. Common method bias effects could be reduced by measuring at two different time points (Conway, 2004). At two different time points, the independent and dependent variables would be separate, which would have decreased the chance of socially desirable answers. Unfortunately, measuring at two-time points and having supervisor- or peer-rated scales were not possible due to the limits of the participating organizations.

This study proposes multiple directions for future research. First, the study did not explore any cause-and-effect relationships since it is correlational research. It would be valuable to conduct a long-term intervention study where groups get assigned different levels of autonomy or job complexity by their supervisors while assessing personality and performance in the context of working from home. Within this design, assessing the subscales of conscientiousness would be advisable to help explain possible effects.

Future research on the relationship between conscientiousness and performance while working from home should consider the adverse effects that conscientiousness may have within this context. Previous research has shown a risk of teleworkers over-investing in their

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work. For example, telework is linked to working more hours, putting in more voluntary effort, and increasing work intensity (Felstead & Henseke, 2017). Working harder may be perceived as performance, although it is questionable what the effects of working harder are on performance are in the long term. Venkatesh et al. (2021) found that more conscientious employees reported relatively higher strain and lower job satisfaction the longer they were forced to work from home. They argued that these conscientious employees might be at risk for burnout, dissatisfaction, and turnover. On the contrary, it may be a double-edged sword, as others argue that the possibility to work from home may have benefits for an employee such as less commuting time, greater autonomy, flexibility, work-life balance, and job satisfaction (Gajendran & Harrison, 2007; O'Neill et al., 2009). These contradictions raise the need for future research into the positive and negative effects of working from home.

The findings on the direct effect of autonomy and performance and the moderating role of the preferred hours of work from home indicate that more research into this direction is needed. For example, it would be interesting to explore whether the need for autonomy mediates the relationship between autonomy and performance. Besides, using the need for autonomy in a three-way interaction model could be interesting. It could be proposed that highly conscientious employees when given autonomy have better performance, especially when they have a high need for autonomy.

Practical Implications

The results of this study underline the importance of conscientiousness-related aspects in the working-from-home context since people are more dependent on themselves at home than at the office. Organizations may consider offering training for employees who score lower on conscientiousness. This training could focus on planning, at which people who score high in conscientiousness are generally better. They could help people with discipline when working from home, for example, by having groups of people meet online while working or

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other ways of holding them accountable (Cherame & Simmering, 2010). Training in self-directed leadership could be conducted to make them more self-directed while working from home (Stewart et al., 1996). There could be discussions between employees scoring lower in conscientiousness and a coach to determine what helps them strive for competence and success. Through these practices, organizations could create an environment where both people high and low in conscientiousness perform on par.

Furthermore, the findings of the positive main effect of autonomy on performance and the moderating role of preferred hours of work from home could encourage organizations to devise ways to increase the amount of autonomy for employees who prefer to work from home. Employees may be well aware of their level of performance while working from home. What remains for organizations is to give their employees a choice regarding whether they would like to work from home or not.

Conclusion

The results showed that conscientiousness positively predicted performance. Thus IT workers who score higher in conscientiousness score higher in performance within the context of working from home. Although autonomy was positively associated with performance, it seems to play a minor role in the relationship between conscientiousness and performance. Conscientious IT workers do not perform better in the presence of high autonomy when working from home. Furthermore, job complexity does not appear to influence performance or the relationship between conscientiousness and performance while working from home. IT workers appear to perform equally well at different levels of job complexity. The findings emphasize the positive effects of conscientiousness and autonomy on performance while working from home. They may help organizations make choices in designing the support, context, and amount of work from home in order to influence employees' performance.

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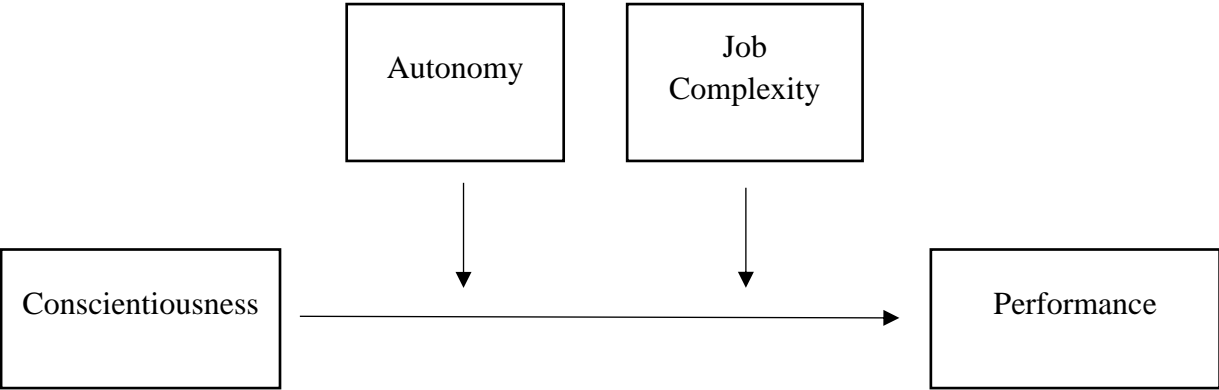
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Figure 1

The Proposed Conceptual Model of the Effects of Conscientiousness on Performance

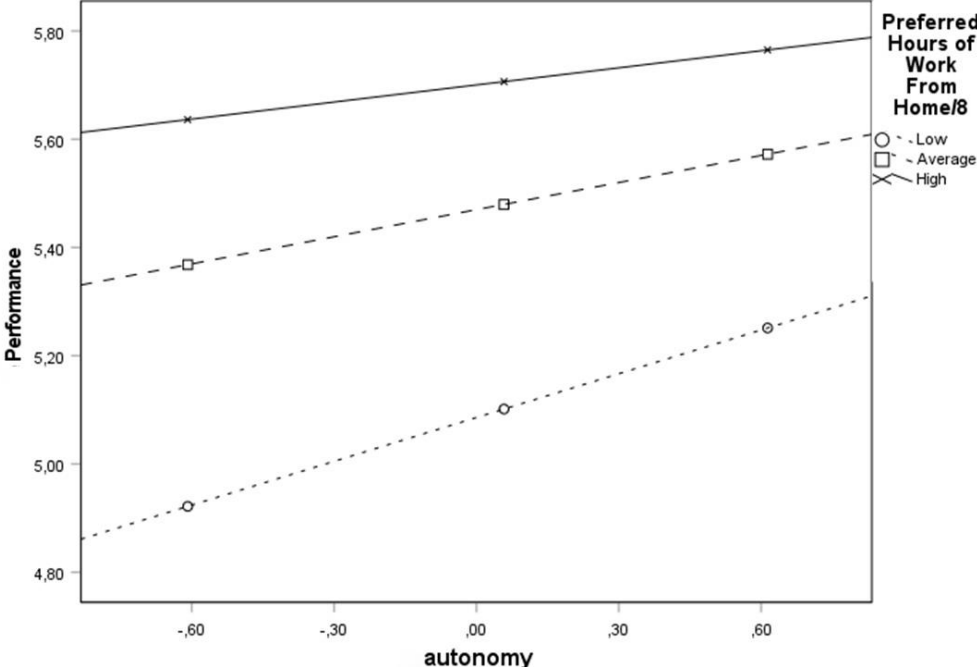
Moderated by Autonomy and Job Complexity



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Figure 2

Simple Slopes of Autonomy Predicting Performance for Different Levels of Preferred hours of work from home.



Note. Low = 1 SD below the mean of preferred hours of work from home, Average = the mean of preferred hours of work from home, and High = 1SD above the mean of preferred hours of work from home

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Table 1

Means, Standard Deviations, and Intercorrelations

Variables	Mean	SD	1	2	3	4	5	6	7
1. Conscientiousness	3.67	0.92	-						
2. Performance	5.42	0.81	0.28**	-					
3. Autonomy	5.72	0.79	0.08	0.17**	-				
4. Job Complexity	5.71	0.91	0.13**	0.08	0.19**	-			
5. Age	46.53	10.37	-0.05	-0.11*	0.03	0.14**	-		
6. Distraction-Free Workplace	4.28	1.04	0.11*	0.26**	-0.06	0.12**	0.01	-	
7. Preferred Hours of Work From Home	24.82	9.17	0.16**	0.43**	-0.01	-0.05	-0.02	0.33**	-

Note. $N = 519$. Intercorrelations are presented below the diagonal.

* $p < 0.05$

** $p < 0.01$

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Table 2

Model Estimation Results for Assessing moderation Where Conscientiousness, Autonomy, and Job Complexity Would Interact to Influence Performance.

Predictor	Dependent variable model (DV = Performance)				
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
Constant	5.43	0.03	<0.001	5.36	5.49
Conscientiousness	0.51	0.08	<0.001	0.35	0.68
Autonomy	0.14	0.04	<0.01	0.05	0.23
Job Complexity	0.02	0.04	0.61	-0.06	0.09
Conscientiousness x Autonomy	0.06	0.10	0.50	-0.13	0.26
Conscientiousness x Job Complexity	-0.06	0.08	0.46	-0.22	0.10

Note. *N* = 519.

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Table 3

Model Estimation Results for Assessing moderation Where Conscientiousness, Autonomy, and Job Complexity Would Interact to Influence Performance. Including the Control Variables.

Predictor	Dependent variable model (DV = Performance)				
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
Constant	5.07	0.21	<0.001	4.66	5.47
Conscientiousness	0.46	0.08	<0.001	0.29	0.62
Autonomy	0.14	0.04	<0.01	0.06	0.22
Job Complexity	0.01	0.04	0.71	-0.06	0.09
Conscientiousness x Autonomy	0.06	0.09	0.54	-0.13	0.25
Conscientiousness x Job Complexity	-0.02	0.08	0.75	-0.18	0.13
Age	-0.01	0.00	0.01	-0.02	-0.00
Distraction-Free Workplace	0.17	0.03	<0.001	0.11	0.24

Note. *N* = 519.

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Table 4

Model Estimation Results for Assessing the Moderation Effect of Preferred Hours of Work from Home on the Relationship Between Autonomy and Performance.

Predictor	Dependent variable model (DV = Performance)				
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
Constant	5.43	0.03	<0.001	5.36	5.49
Autonomy	0.18	0.40	<0.001	0.10	0.26
Preferred hours of working from home	0.04	0.00	<0.001	0.03	0.05
Preferred hours of WFH x Autonomy	-0.01	0.00	0.01	-0.02	-0.00

Note. *N* = 519.