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Examining the relationship between task interdependence, relatedness, autonomy, competence and their effects on job satisfaction.

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Abstract

As a large percentage of organisations work together interdependently, it is beneficial for organisations to understand how the basic psychological needs of the self-determination theory, autonomy, relatedness, and competence might enhance or hinder job satisfaction when working with others. As there have been recent shifts in the workplace due to a worldwide pandemic as well as new developments in research of organisational psychology, this study may provide insight and encourage positive adjustments for organisations. This study aimed to examine the relationship between task interdependence and job satisfaction when the SDT needs were present. Two organisational psychology master's students conducted a cross-sectional study and gathered 132 participants of 18 years old and older from multiple countries and industries. Contrary to the expectations, there was no association between task interdependence and job satisfaction. There was also no interaction of task interdependence and autonomy on job satisfaction. However, when employee competence and relatedness were present, there was an interaction between high task interdependence and job satisfaction. Lack of power due to an insufficient number of participants may be seen as a critical factor in the results, although other limitations were explored. Future lines of research are discussed to fully understand why task interdependence may affect employees' job satisfaction when autonomy, relatedness, and competence are supported.

Introduction

More often than not, tasks at work require one or more colleagues to collaborate, share ideas, and essentially depend on one another to accomplish their goals. Working together on goals increases productivity and flexibility in the workplace, and so much as seventy-eight percent of work teams in the United States work together interdependently (Bishop & Mahijan, 2005). We have seen that interdependence at work increases individual performance, reduces turnover, and decreases work cycle times (Harris, 1992). The question is whether task interdependence is a beneficial aspect of the workplace and what individual factors play into its success. In the workplace, task interdependence is the degree to which individuals depend on their coworkers for material, information, and support (Tagger & Haines, 2006). It allows team effort and members to share information, materials, and expertise in work projects. Task interdependence can be seen often in teams that communicate daily via online platforms and meetings, and who depend on one another to advance in their work.

It has been shown that when employees are in a high task interdependent work environment, it may improve job satisfaction, team satisfaction, and performance (Tagger & Haines, 2006). It has also been recognised as an essential factor in several organisational theories, such as job design (Campion & Medsker, 1997) and team performance (Campion et al., 1993). However, although the benefits have been proven to link to job satisfaction, other studies show no significant relationship between task interdependence and job satisfaction (Van der Vegt et al., 2006). An explanation of this can be seen in the inconsistency of research in examining the relationship between the workgroup or the individual worker as a level of analysis. Factors such as group feedback on performance, cooperation, morale, and employee attitudes may also play a part (Van der Vegt et al., 2006). Another explanation for this inconsistency might be because, in some high task interdependent situations, problems might arise with the cooperation, coordination, timing, and the sequence of the group member's actions (Van der Vegt et al., 2006). Research also reveals that these factors may be associated with a mismatched task and goal

interdependence which may result in lower levels of job satisfaction (Van der Vegt, 2006). Furthermore, it might be informative to explore individual differences, such as orientations, aspirations, and goals for causation of inconsistency, as those factors might affect how employees perceive and react to task interdependence.

The self-determination theory is a theory worth examining as an underlying mechanism in the relationship between task interdependence and job satisfaction (Deci & Ryan, 1985). This theory explores human motivation and has addressed links between employee performance and well-being in organisations. The SDT explores how fostering workplace conditions where employees feel supported in their autonomy, competence, and relatedness can lead to employee satisfaction (Deci & Ryan, 2017). These needs have become a crucial concept to describe the conditions within work groups that influence motivation, wellbeing, and performance. Additionally, the SDT needs can be theorised to moderate the relationship of task interdependence and job satisfaction.

Contexts such as managerial styles and how they support the SDT needs correlate to job satisfaction (Deci & Ryan, 2017). Moreover, if autonomy is endorsed, competence and relatedness are often positively related to job satisfaction (Van den Broeck et al., 2010). This might be because managers who support autonomy are generally attuned to the other SDT needs. It can also be seen because employees with a sense of autonomy generally understand how to satisfy their other needs. In addition, individual differences in SDT need fulfilment may affect job satisfaction. This includes how the individual perceives their environment, such as challenges and feedback, and external events such as rewards, deadlines, and punishments (Hagger & Hamilton, 2020). There has also been an exploration of how these individual needs differ in various cultures. Still, no significant differences were found as the SDT needs were seen to support their job satisfaction regardless of cultural differences (Deci & Ryan, 2017). Nevertheless, if the SDT needs are not positively supported, it may result in a negative relationship between task interdependence and job satisfaction. Considering the above stated, the research question I will be examining is: Under what conditions of autonomy, relatedness, and competence does task interdependence predict higher job satisfaction among employees?

Theoretical Framework

Self-Determination Theory (SDT)

Before examining the interdependence of tasks for teams, it's crucial to explore what intrinsically is occurring at work among individuals who have to work together. Task interdependence can be dysfunctional without team members who are competent (i.e. feel that they have the skills to do tasks and that their work adds value), autonomous (i.e. feel that they are supported to explore, take the initiative, and develop solutions to their problems), and able to relate to each other. In other words, it's important for the individual to be thriving in their work environment. Employee thriving, in terms of motivation to work and wellness, is linked to long-term organisational health, job satisfaction and loyalty (Deci et al, 2017). Conversely, when thriving is not present, employees may experience a lack of organisational citizenship and motivation, which can negatively affect the organisation due to lower productivity and performance (Guan & Frenkel, 2020).

The self-determination theory is known to conceptualise basic psychological needs for autonomy, competence, and relatedness as essential factors for the psychological growth of individuals (Van den Broeck et al., 2016). For decades, the SDT has been linked to employee wellbeing and satisfaction and has focused on what leads to high-quality, sustainable motivation and employee engagement. The SDT suggests that encouraging workplace conditions where individuals feel supported in their SDT needs will lead to higher job satisfaction and overall benefits for the company itself. Furthermore, the support for employees' autonomy, competence, and relatedness at work provides a framework for allowing them to be more engaged with their peers (Deci et al, 2017), which in turn may lead to mutual dependencies, cooperation, and accommodation, which are all activities characterised by task interdependence (Kuuvas, 2009). The SDT frames this by highlighting the interaction between growth-striving employees and their social environment where these three factors, relatedness, autonomy, and competence, are either enhanced or hampered (Deci et al., 2012). When these three needs are supported in social environments, it is

believed that optimal growth and positive development are expected (Deci et al., 2012). In the subsequent sessions, I will disentangle how the three SDT needs relate to task interdependence in the workplace.

Autonomy

Researchers have pointed out that team performance and job satisfaction are associated with team and individual autonomy and may contribute to task interdependence (Langfred, 2005). Individual autonomy means the amount of freedom and discretion an individual has in carrying out their assigned task, and team autonomy means the combination of individual and group independence (Langfred, 2005). For clarification purposes, I will only focus on individual autonomy throughout my research, as opposed to team autonomy as the SDT focuses on individual autonomy. Additionally, team autonomy concentrates solely on the group, and this research aims to understand the individual attributes that might contribute to the relationship between task interdependence and job satisfaction. Individual autonomy is seen to be related to one's responsibility for one's own work. Therefore, it can be experienced as an enhanced responsibility for the team and personal outcomes that come from initiated task interdependence (Kiggundu, 1981). However, it has been shown when one rates too high on individual autonomy, it can hinder task interdependence (Langfred, 2005). This may indicate that moderate autonomy, compared to high autonomy, and task interdependence may enhance job satisfaction.

Relatedness

It is essential for an individual to feel a sense of self and belonging in the workplace to be satisfied with their job (Kumar & Jauhair, 2016). Relatedness refers to one's belongingness with colleagues and the organisation and how they can positively relate to their social environment. A good sense of relatedness in the workplace might be seen as social activities outside the workplace with colleagues and sharing success or failures (Kumar & Jauhair, 2016) and proves to be an effective cohesion of interdependence (Arthur et al., 2012). These positive results might be due to the united aspects of teams understanding and relating to each other, allowing them to feel more open to sharing work information. Individuals who feel deprived of a sense of belonging and relatedness, in general, become

lonely, depressed, and anxious (Arthur et al., 2012). In an organisational context, low relatedness can hinder the elaboration of vital information between colleagues and cause them to withdraw from social meetings. If relatedness is not met in task interdependence, employees can isolate themselves from their work group, which can severely hinder the overall performance and job satisfaction of not only the individual but the group as well.

Competence

Competence in the workplace is a valuable resource in individuals, organisations, and societies (Paloneimi, 2006). The need for competence in the workplace is the ability of individuals to see work as meaningful, leading to significant results, and their reflections about their abilities such as skill, efficacy, knowledge, and capability. Competence may include having personal resources, willingness to do challenging tasks, objectives, and openness to feedback (Paloneimi, 2006). It aids task interdependence because it allows for valuable collaboration on work tasks and enhances the individual to feel that they have made a helpful contribution in the workplace. One can therefore theorise that task interdependence strengthens competence as well. When employees do not have a sense of competence at work, they might feel as if they are outsiders and have doubts about their abilities and achievements, which may lead to lower job satisfaction. Although it is believed that competence is a moderator between task interdependence and job satisfaction, there is limited research on the relationship.

In sum, this research aims to examine whether the needs of the self-determination theory (autonomy, competence, relatedness) may help understand how task interdependence can increase employee job satisfaction. The insights of this study may benefit employers to understand how to improve task interdependence and to relish the benefits of a cohesive working team. Moreover, there is still much research to be done on the topic as extensive research does not yet exist on the moderating effect of autonomy, relatedness, and competence for task interdependence and job satisfaction.

H1. Task interdependence has a positive main effect on job satisfaction.

H2. Task interdependence has a positive effect on job satisfaction when high relatedness, moderate autonomy, and high competence with regard to their team members.

Method

Participants and Design

To reach a power of 80%, a power calculation to estimate the R2 increased with three moderators showed that I needed 232 participants (Faul et al., 2007). To estimate this sample size, a statistical power analysis was done based on the assumption that there will be a small to medium effect size (R2 increased of 5%). In total, 260 participants started the survey. However, due to missing data, 124 neglected to fill out all the items of relevance for this research and were removed. I also removed four participants as they filled out the survey with improbable answers, such as an unlikely age (above 105) or unreasonable working hours (over 90 per week). Eventually, 132 participants were included in the analysis in total. Therefore, there were not enough participants to reach enough power for the analysis. Participants were only allowed to fill out the survey if they met the criteria of working at least 20 hours per week (part-time) for six months, were working with others, such as colleagues or a supervisor and were at least 18 years of age. Of the included participants, 49 were male (37.1%) and 82 were female (62.1%), with one participant who answered to the other/third gender (.8%) with an average age of 31 years old (*SD* = 8.65). Overall, 79% of participants worked in the Netherlands, 13.7% in the United States, 2.3% in Iceland, 1.5% in Germany, and .8% in Canada, Denmark, and Greece. On average, participants had been at their role in their organisation for 32 months and worked an average of 35 hours per week. Data was collected for three months meaning this has a cross sectional design.

Procedure

Two master's students in the study of work and organisational psychology conducted data researching job satisfaction. To find participants for this study, convenience sampling was conducted.

Participants were recruited from the researcher's inner circles using platforms such as Facebook, LinkedIn, and Instagram. Additionally, participants were recruited through personal messages on applications such as Facebook and Whatsapp. The questionnaire was made through Qualtrics and then shared through the Qualtrics link. The participants were first given informed consent and asked to fill out the survey if they met the criteria, and briefed with a quick introduction page explaining the background information of the study. I also informed them that the questionnaire should only take about ten minutes.

The criteria mentioned above, as well as a brief explanation of the study, were clearly stated in the informed consent and participants were required to accept it before beginning the questionnaire (see Appendix A). First, the participants were given questions regarding their age, gender, duration in role, and hours worked weekly. Then, they were given statements regarding task interdependence, autonomy, relatedness, competence, and job satisfaction where they were informed to answer in what applies best to them. After completing the questionnaire, participants were debriefed and given the option to fill in their email to receive information regarding the results later on.

Ethical Approval

This research was registered at the Utrecht University Student Ethics Review & Registration Site (UU-SER). The Faculty Ethics Review Board has approved this study.

Measures

In this study, five variables were measured from three different scales (see Appendix B for the complete script of the survey):

Task Interdependence

Three questions were asked to measure task interdependence. These questions rated from low to high, with low meaning that each group member performs similar tasks independently, and high being that all group members cooperate simultaneously in the completion of tasks. The items included statements such as "Low interdependence: Each group member performs similar tasks independently; the

final result of the group is due to the sum of the individual results" and "High interdependence: All group members cooperate simultaneously in the completion of the tasks; the final result of the group depends on the team member's reflection and cooperation" (Lazaro et al., 2019). The three questions rated on a 7-point Likert scale with options ranging from 1 (*Completely Disagree*) to 7 (*Completely Agree*). All three questions were treated as individual items: high, medium, and low task interdependence to better understand how the SDT associates with each level.

Self Determination Theory

To measure the SDT needs, I used the basic psychological needs scale (BPNT), which is a twenty-four-item measure (Sheldon et al., 2009) that explores satisfaction of autonomy, relatedness, and competence at work. This scale mentions items in subgroups of the variables, for example: "I feel my choices on my job express who I really am" fitting into the relatedness subgroup ($\alpha = .80$), "In my job I feel I can successfully complete tasks" into the autonomy subgroup ($\alpha = .87$), and "I feel confident that I can do things well on my job" into the competence subgroup ($\alpha = .88$). These items are rated on a 7-point Likert scale ranging from 1 (*Completely Disagree)* to 7 (*Completely Agree)*. Cronbach's Alpha was sufficient for autonomy, competence, and relatedness, confirming the scale's reliability.

Job Satisfaction

The Michigan Assessment Questionnaire was used to measure job satisfaction (Lawler et al., 1975). It is a three item scale but for the sake of time, I included only one question in the survey. It states "Overall, I am satisfied with my job" and rated on a 7-point Likert scale ranging from 1 (*Completely Disagree)* to 7 (*Completely Agree).*

Demographics

Participants were asked about their gender (options male, female, other/third gender, or prefer not to say), age, the country they work in, duration in their role, whether or not they worked with others, and hours worked per week.

Statistical Analysis

The statistical analysis was conducted using *IBM SPSS Statistics v.28.* Hypotheses were tested using hierarchical linear regression and the moderation model (i.e. Model 1) of the PROCESS macro SPSS package (Hayes, 2017).

Results

Preliminary Analyses

First, I conducted a correlational analysis to check whether the background variables affected any independent, moderator, or dependent variables and whether or not they should be included as covariates in the final model. After inspection, I found no significance of background variables and variables of interest (see Table 1). Then, I inspected in the same correlational analysis whether any of the variables of interest showed anticipated associations. This was not the case, as no associations show a value of $p > .05$. However, I found a high correlation between autonomy and low task interdependence as well as competence and high task interdependence (see Table 1).

Table 1

Correlations Between Background Variables, Independent, Moderator, and Dependent Variable

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Age	-.00									
3. Duration at Role	-.05	.57**								
4. Hours worked per week	-.09	.20*	.23**							
5. Low Interdependence	.09	.06	.01	.05						
6. Medium Interdependence	-.06	.05	-.06	.06	-.18*					
7. High Interdependence	-.11	.05	.01	-.15	-.20*	.35**				
8. Autonomy	.06	-.09	.00	.14	.46**	.02	-.01			
9. Relatedness	.09	-.15	-.09	.02	.11	.06	.12	.32**		
10. Competence	-.10	-.12	-.06	-.00	-.00	.11	.51**	.15	.46**	
11. Job Satisfaction	-.12	.02	.11	.06	-.03	-.05	.07	-.01	.00	.07

Note. **Correlation is significant at the 0.01 level (2-tailed).

Note. *Correlation is significant at the 0.05 level (2-tailed)

Assumption checks

The model of this study was tested by the PROCESS macro SPSS package (Hayes, 2017). PROCESS runs regression models. Therefore, I used this to check for the assumptions of linear regression. Outliers were found for competence, autonomy, and relatedness but were maintained in the data because they were believed to capture important information. After visual inspection to examine whether assumptions were satisfied, the assumption of normality was not met as a normal distribution. Therefore, due to violation of normality assumptions, results need to be interpreted with caution.

To check for multicollinearity, I calculated the variables' variance inflation factor (VIF) scores. All scores were below 2, indicating that multicollinearity was not an issue in the analysis, and the assumption was satisfied. Durbin Watson was tested and resulted in a score of 2.0 indicating no autocorrelation. The mean of competence was 3.96 (*SD* = *.67*), the mean of relatedness was 3.81 (*SD* = *.49*), and the mean of autonomy was 3.96 (*SD* = *.82*). This shows that most participants felt indifferent (neither agree nor disagree) when asked about autonomy, relatedness, and competence at work.

H1: Was there a Positive Association Between Task Interdependence and Job Satisfaction?

Contrary to Hypothesis 1, I did not find an association between levels of task interdependence and job satisfaction. As shown in Table 2, there was no association between low, medium, and high task interdependence and job satisfaction. When testing the observed power, β= .57 with an observed power of = 48%. Meaning, although the null hypothesis has failed to be accepted, there is a 48% chance of detecting an effect if occurring.

Table 2

Coefficients of Independent Variables and Dependent Variable

	b	SE	*t*	*p*
Low Task Interdependence	-.32	.07	-.43	.666
Medium Task Interdependence	-.05	.08	-.60	.548
High Task Interdependence	.06	.07	.83	.406

Note. Dependent Variable: Job Satisfaction

H2. Was there a Positive Effect on Job Satisfaction and Task Interdependence When High Relatedness, Moderate Autonomy, and High Competence Were Associated?

Contrary to Hypothesis 2, autonomy did not qualify the association between all levels of task interdependence (low, medium, or high) and overall job satisfaction. When conducting the moderation analysis, autonomy was positively associated with the relationship on low, $b = .17$, $p > .05$, and medium, $b = .02$, $p > .05$, task interdependence on job satisfaction (see Table 3). Relatedness showed a negative association with low, $b = -.07$, $p > .05$, task interdependence on job satisfaction. However, supporting Hypothesis 2, it showed a significant association with high task interdependence on job satisfaction, $b = .30$, $p < .05$, providing evidence for a moderation (see Table 4). Competence showed a negative association with low task interdependence, $b = -.07$, $p > .05$, on job satisfaction. However, competence showed a positive association with medium task interdependence, $b = .28$, $p > .05$, on job satisfaction and a significant association with high task interdependence, $b = .26$, $p = .048$, on job satisfaction, providing evidence for a moderation (see Table 5). Since all three needs did not qualify the association between task interdependence and job satisfaction, Hypothesis 2 can only partially be accepted.

Table 3

Regression Coefficients on Independent Variables, Autonomy, and the Dependent Variable

Low Task Interdependence				
	b	SE	t	p
(Constant)	8.27	2.13	3.88	.000
Low Task Interdependence	-.70	.45	-1.53	.126
Autonomy	-.79	.56	-1.40	.163
Low Task Interdependence X Autonomy	.17	.11	1.49	.137
Medium Task Interdependence				
(Constant)	6.04	2.22	2.71	.007
Medium Task Interdependence	-.15	.43	-.35	.722
Autonomy	-.16	.55	-.29	.766
Medium Task Interdependence X Autonomy	.02	.10	.24	.805
High Task Interdependence				
(Constant)	4.7	2.28	2.07	.040
High Task Interdependence	.11	.43	.27	.786
Autonomy	.03	.55	.06	.951
High Task Interdependence X Autonomy	-.01	.10	-.13	.894

Note. Dependent Variable: Job Satisfaction

Table 4

Regression Coefficients on Independent Variables, Relatedness, and Dependent Variable

	b	SE	*t*	*p*
Low Task Interdependence				
(Constant)	3.92	2.95	1.32	.187
Interdependence	.24	.59	.41	.678
Relatedness	.36	.77	.46	.642
Low Task Interdependence X Relatedness	-.07	.15	-.47	.636
Medium Task Interdependence				
(Constant)	11.37	3.51	3.23	.001
Interdependence	-1.23	.65	-1.87	.063
Relatedness	-1.56	.91	-1.70	.090
Medium Task Interdependence X Relatedness	.30	.17	1.81	.072
High Task Interdependence				
(Constant)	10.47	2.68	3.90	.000
Interdependence	-1.08	.51	-2.10	.037
Relatedness	-1.48	.70	-2.09	.038
High Task Interdependence X Relatedness	.30	.13	2.24	.026

Note. Dependent Variable: Job Satisfaction

Table 5

Regression Coefficients of Independent Variables, Competence, and Dependent Variable

	b	SE	*t*	*p*
Low Task Interdependence				
(Constant)	3.67	2.88	1.27	.204
Interdependence	.14	.56	.25	.802
Competence	.40	.72	.56	.57
Low Task Interdependence X Competence	-.04	.14	-.30	.758
Medium Task Interdependence				
(Constant)	10.26	3.23	3.17	.001
Interdependence	-1.17	.60	-1.96	.053
Competence	-1.24	.83	-1.50	.135
Medium Task Interdependence X Competence	.28	.15	1.86	.064
High Task Interdependence				
(Constant)	9.48	2.71	3.49	.000
Interdependence	-.96	.51	-1.88	.061
Competence	-1.23	.74	-1.67	.097
High Task Interdependence X Competence	.26	.13	1.99	.048

Note. Dependent Variable: Job Satisfaction

Additional Analyses

I conducted additional analyses to better understand the significant associations in competence and relatedness for high task interdependence and job satisfaction. I wanted to explore if the SDT needs affected high task interdependence and to understand which one explains the most variance in high task interdependence. I conducted a regressional analysis, and I found that competence explained most of the

association, $b = .60$, $p < .001$. Relatedness, $b = -.10$, $p > .05$, and autonomy, $b = -.16$, $p > .05$, showed a negative association on high task interdependence. R2 = .30, explaining that 30% variance for high task interdependence is explained by autonomy, relatedness, and competence.

Although seemingly unrelated, I wanted to explore if the SDT needs predict one another. When I found that competence was highly associated with high task interdependence, but the other SDT needs were not, I explored to see if competence might predict relatedness and autonomy. Running a linear regression analysis with competence as the dependent variable and relatedness and autonomy as the predictors, I found that relatedness was highly associated with competence $b = .41$, $p <.001$, and autonomy was associated with competence as well but to a lower degree, $b = .16$, $p = .049$. R2 of the model explained that 23% of the variance for competence is explained by relatedness and competence.

Discussion

Task interdependence is a large part of any working culture to collaborate, share ideas, and help one another in daily tasks. The purpose of this study was to better understand the influence of task interdependence on job satisfaction and to test if autonomy, relatedness, and competence play a part in increasing the overall job satisfaction when task interdependence is present. After diving into various research of all variables, I predicted that there would be significant positive relationships between task interdependence and job satisfaction, and a moderation effect of the self-determination theory needs and job satisfaction. However, my findings do not fully support these expectations.

Task interdependence and job satisfaction

Unexpectedly, my study showed that task interdependence did not predict significant rates of job satisfaction. These results imply that when colleagues collaborate on shared goals, it shows no difference in their overall job satisfaction. As discussed, the study's small sample size and low power may have played a role in this. Although there is little research on this specific relationship, some research points to

positive associations between the two. For example, according to a study done in 24 engineering teams, group-level interdependence was positively related to group members' job and team satisfaction (Van Der Vegt et al., 2006). However, plenty of empirical literature contains inconsistent findings of the relationship, with negative or no relation at all (Van der Vegt et al., 2006), which agrees with the results of this study and is believed to be equally as important.

In my research, the highest average score for all levels of task interdependence was in medium task interdependence, which was slightly above average. This might imply that there may not have been a high enough level of task interdependence to begin with. Therefore, exploring work environments with high task interdependence might be interesting. Additionally, and on average, most participants in my study agreed that they are satisfied with their job. These results may imply that factors outside task interdependence might have contributed to job satisfaction, such as personal resources or a good work-life balance.

Although research on COVID-19 is very new, it is worth considering how it might have impacted task interdependence and job satisfaction. The pandemic impacted employee wellbeing, and shifted the nature of work, forcing employees to work from home away from colleagues. Studies show that during the pandemic, employees felt that they were not engaging with other colleagues as much as before; however, researchers did not find a noticeable effect on job satisfaction (Nuangjamnong, 2022). As the impact of COVID-19 on the workplace only began to be explored recently, there is reason to inspect to a greater extent. All considered, a small sample size, different levels of both task interdependence and job satisfaction, and the impact of COVID-19 may have played a part in the results of my data. Additionally, future research can determine the extent to which job characteristics, such as performance, might impact the perspective of task interdependence on job satisfaction.

The moderating effect of autonomy

The relationship between autonomy and job satisfaction was carefully paid attention to as research on this has various conclusions. Contrary to my expectation, autonomy was not seen as a

significant moderator for job satisfaction when task interdependence was present. In my research, the mean of autonomy scored slightly below average and had some outstanding outliers that might have impacted the reliability. A possible explanation for these results might be due to the variety of industries, tenure, and levels of task interdependence, resulting in different levels of autonomy in their roles. For example, an employee who has been in their role for ten years will assumingly have a higher level of autonomy than an employee who has worked in their role for one month. My research's variance is visible as the shortest duration in a role is one month, and the longest is 432 months, showing there is reason for speculation. There was also no requirement nor insight of industry in this study, which may have affected the results as managerial positions usually have higher levels of autonomy than of employees in entry-level positions. Further research might suggest requirements for tenure and duration in the role to better understand the association between task interdependence and job satisfaction when autonomy is positively present.

When conducting additional analyses, I saw that autonomy did not predict high task interdependence, which partially aligns with existing research as mixed findings on the association. For example, a study done on 108 work teams shows that autonomy has a negative effect on task interdependence but goes on to explain that this does not imply that autonomy can not be effective in task interdependence (Langfred, 2005). This relates to my findings, as I found a negative association between autonomy and high task interdependence. The environmental factors that might affect this relationship should be explored, such as organisational environments where low autonomy individuals might be ideal for the level of task interdependence in the workplace. After examining existing research as well as my own, future researchers might pay additional attention to how job satisfaction might depend on both levels of task interdependence and autonomy and the background factors that might affect the study, such as tenure or role.

The moderating effect of relatedness

I found that relatedness moderated the association between high task interdependence and job satisfaction. However, there was no indication that relatedness moderated the association between low and medium task interdependence and job satisfaction. This suggests that employees who feel a sense of relatedness have higher job satisfaction when there are higher levels of task interdependence. Employees who feel deprived of a sense of relatedness might experience lower job satisfaction, which agrees with existing research (Arthur et al., 2012).

When doing additional analysis to explore the effects of the SDT needs on high task interdependence, I found that relatedness alone did not predict high task interdependence. Although the correlational analysis showed that competence had a correlation with relatedness, I wanted to understand whether competence might indicate relatedness and found that there was a positive association between the two. This suggests that the two needs complement each other and that as the level of competence increases, the level of relatedness also goes up. I might also suggest that since competence was quite significant with high task interdependence, it might have had positive effects on relatedness.

Feeling related to at work could be beneficial for employers to recognise, especially if there is low relatedness between colleagues in high task interdependent work environments. Research shows that high relatedness increases job satisfaction but may also decrease the chances of burnout and increase work engagement (Trepanier et al., 2013). A suggestion to researchers might be to examine low relatedness amongst employees and measure whether job satisfaction increases as higher task interdependent teams assemble within the workplace.

The moderating effect of competence

Lastly, there was a significant moderation of competence between high task interdependence and job satisfaction, but was not the case for low and medium task interdependence. This finding aligns with existing research, as studies show that competence significantly affects job satisfaction due to employees feeling that they have sufficient competence to carry out their roles (Hallin et al., 2009). When doing

additional analyses, I found that competence showed the most association with high task interdependence compared to the other needs (autonomy and relatedness), implying that individuals who feel competent at work engage in high task interdependence. Additionally, I speculate that when individuals feel competent they might reach out for more task interdependent work environments. However, when the individual does not feel confident enough to carry out roles, it can hinder job satisfaction significantly (Jusmin et al., 2016). Although there were average levels of competence in my study, I believe that when high task interdependence is present (even with moderate levels of competence), it may increase their overall job satisfaction. Further, I did not find a significant association when examining the correlation between competence and job satisfaction. I speculate that if competence scored higher in my research, there could be a possibility of a higher correlation between the two. As there is a lack of empirically-based research on competence in organisational settings (Ellstrom & Kock, 2008), I conclude that it might be an area of interest for future researchers to examine further.

Furthermore, competence is an area for employers to pay attention to as competence in the workplace generally exhibits positive outcomes for both the employer and the employee. If competence is lacking in the workplace, it may benefit organisations to invest in personal and intellectual development training on both individual and team levels as it is proven to be associated between high task interdependence and job satisfaction.

Implications

As my expectations were not fully met, it is challenging to state the practical implications of this research. Although, there is still reason to continue investigating the associations as research implies their benefit. Understanding how the basic psychological needs influence job satisfaction whilst working interdependently might allow a greater understanding in upper-level positions. For example, individual autonomy can be seen as both beneficial and not, depending on the amount of task interdependence granted in the workplace, which might help employers to understand the best work environment for highly autonomous individuals.

Although more research is required to substantiate these results, I do not believe it discredits the SDT or the importance of task interdependence for employees. It merely calls for a different interpretation and sample size to fully understand the impact and correlation of each factor. Although some results were insignificant, I believe the seed of thought for these relationships might help understand how task interdependence can increase employee job satisfaction. As competence and relatedness showed to moderate the association between high task interdependence and job satisfaction, there is reason to believe that the self-determination theory holds true to an organisational setting. Taking into account the complexity of autonomy in the workplace and the importance of competence and relatedness might assist employers in improving task interdependence and optimising the benefits of a cohesive working team if further research is conducted.

As competence was a moderator between high task interdependence and job satisfaction, organisations might place importance on supporting this need. A suggestion aforementioned, training might be implemented in the work environments to enhance competence. Training might include organisational interventions that encourage on-job learning, which is learning that is encouraged by the nature of the workplace tasks (Ellstrom & Kock, 2008). Interventions should also pay attention to factors of the workplace, such as an organisational culture that might encourage on-job learning and cultivating a work environment where task interdependent teams stimulate the development of competence.

Understanding that relatedness was a moderator for high task interdependence and job satisfaction, employers and organisations might implement outside work activities such as social events and team building exercises among task interdependent teams to improve individual relatedness for the sake of increasing job satisfaction. In addition, as relatedness and competence showed association, organisations might implement activities in the workplace that might satisfy both of these needs simultaneously, such as exercises that encourage employees to have common goals in educational activities, such as on-job learning.

Strengths, limitations, and further research

This study, of course, has some implications that are crucial to discuss. As the power analysis for a medium to small effect aimed for 232 participants, having only 132 participants affected the strength of the research significantly, with a 48% of power after conducting an observed power analysis. With such a small sample size, it can be hard to find significant results in the current study as it has a low statistical power. Establishing a large sample size could provide substantial insight and is highly recommended for future research, particularly given the lack in this study. Furthermore, as seen in the scoring of means for autonomy, relatedness, and competence, most participants opted in the "neither agree nor disagree" selection. Studies show that when this occurs, the respondent has central tendency bias (caused by speeding through the survey) and may be easily selected when participants do not want to form an opinion or are not passionate regarding the statement (Baka & Figgou, 2012). One could speculate that this might question the reliability of the scales or simply due to the lack of time the participants allowed themselves to complete the questionnaire.

A limitation worth mentioning is the constraints that student projects pertain to. Research projects by university students are often on a limited schedule and monetary resources, making it more difficult to collect a large enough data set. Although this limitation was present, I believe that the focus of the study remains credible and informative for future research. A suggestion might be for a more formed researcher with a more extensive network of resources, as this research felt hindered due to constraints of participants that match the criteria.

Another limitation is that this study took place in several different countries such as Iceland, Netherlands, Canada, Greece and more. Although research shows that support for relatedness, competence, and autonomy have universal importance for achieving desired work outcomes (Deci, Olafsen, & Ryan, 2017), it is difficult to grasp how cultural aspects might play into task interdependence, and how different working styles may have affected the results. Another study shows that although there may be great cultural differences in the needs satisfaction of the self-determination theory, it remains

unclear how these are affected because studies have mixed results (Church et al., 2013). As I did not find a cultural explanation, it may be interesting to investigate deeper. Future research might focus on a specific country and then compare with others to explore how culture might affect the relationship between task interdependence and job satisfaction, as well as how the factors autonomy, relatedness, and competence might be perceived differently.

Although organisational psychology has been around for over a hundred years (Dunnette, 1998), there is still so much research to be done in the field, and in this case, specifically the factors that might affect job satisfaction. Furthermore, personality types fall into the category of workplace autonomy and job satisfaction, as seen in the job characteristics model. This model proposes that the degree to which workers' jobs possess core characteristics (such as autonomy) affects various psychological states, including how responsible one feels for work outcomes. This leads to personal and job outcomes that ultimately affect job satisfaction. Research by Deci & Ryan (2017) shows that factors such as workplace context and individual differences contribute to the success of the SDT on job satisfaction. I believe future research might study personality types alongside the social determination theory and task interdependence to explore the relationship on job satisfaction. I mention this due to the relation that may affect autonomy, competence, and relatedness and personality. For example, an introverted individual might need different resources to become an ideal level of autonomy compared to an extroverted individual. It is nonetheless a complex model but could benefit employers and managers greatly and hopefully lead to each employee to be 'thriving'.

As mentioned, I did find an association between low task interdependence and autonomy. Studies show that having too much autonomy at work may hinder the opportunity of task interdependence, leading to frustration at work. In a study done among 71 management teams, it showed that when individual autonomy was high, team performance tended to score lower than to when autonomy was low (Langfred, 2017). Further speculation might imply high task interdependence may hinder one's ability to have the preferred amount of autonomy in their work, resulting in lower job satisfaction due to their inability to perform as they wish. A study done by Langfeld (2005) shows that high individual autonomy

is often associated with low task interdependence and vice versa. This is because highly interdependent teams require high levels of interaction and close collaboration with other team members, which might result in the highly autonomous feeling frustrated. Further research might explore the difference between team and individual autonomy and interchange the two in this research. Although the SDT focuses on individual autonomy, it might be prevalent to explore how the combination of individual and group independence in the workplace (team autonomy) could lead to higher task interdependence and potentially reduce the preference for low task interdependence in highly autonomous individuals.

Conclusion

With the increase of prevalence in organisational psychology and its implementation in the workplace, understanding what factors allow for optimal employee wellbeing is crucial. The effects of task interdependence have proven to improve employees' ability to share information and work on goals in a way that can significantly increase job satisfaction. Furthermore, the self-determination theory explores individuals' needs for autonomy, relatedness, and competence which has been seen to apply well to wellbeing in the organisational context and continues to be explored as time goes on. In my research, exploring the associations of task interdependence on job satisfaction when the needs of the SDT are implemented allowed for a greater understanding in which factors may benefit or hinder the ability to have job satisfaction when working with others. Although I did not fully reach significant findings, the study allowed for new seeds of thought and hopefully inspired new and in depth research done on the topic. Recent factors are reasons to continue exploration, such as a worldwide pandemic creating a shift in workplace culture as well as how personality might affect one's willingness to work with others. Understanding of these factors might benefit not only employee's but entire organisations and allow for optimal employee well being and job satisfaction.

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Appendix A

Informed Consent

Dear participant,

You are being invited to participate in a research study of the Department of Social and Behavioral Sciences of Utrecht University. This study is part of the students' final thesis project of the 'Social, Health and Organisational Psychology' master's program. Hereby, we provide you with some further information with regards to the purposes of our study and the use of your data.

In the context of an organization, interpersonal relationships and teamwork are factors that have a great impact in both the quality of personal experiences within the workplace, as well as the quality of the output created by the individuals and teams within the organization. In this study we aim to investigate how individuals' attitudes about their relationship with their colleagues and teams' characteristics may have an influence on the levels of job satisfaction.

For the purposes of the current research, we are recruiting participants who work in the Netherlands, are 18 years old and above, and who work for at least 20 hours per week and for at least 6 months, together with other people (colleagues). If you agree to participate, you will be asked several questions regarding your experiences at work and how you handle different situations under certain circumstances. Also, a few attention checks are added in the survey. It is anticipated that the entire survey will take 10 minutes.

Participation in this study is voluntary. You may refuse to participate or answer any questions, or withdraw from the study at any time you like, without any repercussions. All data collected will remain confidential and accessible only to the investigators of this study. Even if results are published, no names

or personal data will be revealed. In case you choose to withdraw from this study, your data will be removed from the database.

If you require any further information regarding this research or your participation in this study you may contact one of the following student researchers: Dimitra Nousi (d.nousi@students.uu.nl), Eva Thorsdottir (e.l.thorsdottir@students.uu.nl).

Appendix B

Scales

Items for measuring "task interdependence" (Lazardo et al., 2019)

At my work, there is…

1. Low Interdependence: Each group member performs similar tasks independently; the final result of the group is due to the sum of the individual results.
2. Medium Interdependence: Each group member performs different tasks; one needs the result of the other to be able to complete his part of the work; the final result of the group is due to the contribution of each of the parties.
3. High Interdependence: All group members cooperate simultaneously in the completion of tasks; the final result of the group depends on team member's reflection and cooperation.

Items for measuring "Self Determination Theory" (Sheldon et al., 2001)

1. At work, I feel a sense of choice and freedom in the things I undertake.
2. I feel excluded from the group I want to belong to at work.
3. I feel confident that I can do things well on my job.
4. I feel that the people I care at work about also care about me.
5. Most of the things I do on my job feel like "I have to".
6. When I am at work, I have serious doubts about whether I can do things well.
8. I feel that people who are important to me at work are cold and distant towards me.
9. At work, I feel capable at what I do.
10. I feel forced to do many things on my job I wouldn't choose to do.
11. I feel disappointed with my performance in my job.
12. I feel connected with people who care for me at work, and for whom I care at work.
13. I feel my choices on my job express who I really am.

14. When I am at work, I feel competent to achieve my goals.
15. I feel pressured to do too many things on my job.
16. At work, I feel close and connected with other people who are important to me.
16. I feel insecure about my abilities on my job.
17. My daily activities at work feel like a chain of obligations.
18. I feel I have been doing what really interests me in my job.
19. I have the impression that people I spend time with at work dislike me.
20. In my job, I feel I can successfully complete difficult tasks.
21. I feel the relationships I have at work are just superficial.
22. When I am working I feel like a failure because of the mistakes I make.
23. I experience a warm feeling with the people I spend time with at work.

Item for measuring "Job Satisfaction" (Bowling & Hammond, 2007)

1. Overall, I am satisfied with my current job.