

INVESTIGATING THE EFFECTS OF VARYING LEVELS OF AUTONOMY IN AN
ELANCING ENVIRONMENT

by

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ABSTRACT

INVESTIGATING THE EFFECTS OF VARYING LEVELS OF AUTONOMY IN AN
E-LEANCING ENVIRONMENT

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Whereas there is a plethora of research on the work outcomes of standard employees (i.e., individuals who work full-time at one organization and complete work specified by the employer at their established place of business under the assumption of long-term employment; Broschak & Davis-Blake, 2006), there is a scarce amount of research investigating factors impact the outcomes of nonstandard employees (i.e., individuals who conduct any type of work that differs from standard work; Ashford, George, & Blatt, 2007). As these work environments are highly discrepant, there is a need for research concentrating on nonstandard employees. This study built upon Job Characteristics Theory by investigating the effects of autonomy on online nonstandard employee (i.e., eLancer) outcomes (i.e., performance and satisfaction), as well as the mediating mechanisms of felt responsibility, meaningfulness, and effort. Although an experimental autonomy manipulation did not produce the expected effects, results indicated that perceptions of autonomy predicted felt responsibility for the task, but not reported task meaningfulness. In turn, both felt responsibility and meaningfulness predicted increased effort, which was positively related to task satisfaction and performance. Additionally, preference for autonomy moderated the relationship between perceptions of autonomy and felt responsibility, such that as preference for autonomy increased, the relationship between perceived autonomy and felt responsibility

weakened, which was contrary to expectations. These results suggest that perceptions of task autonomy are influential in determining eLancer responsibility, effort, and work outcomes. The findings of this study highlight how perceived autonomy in eLance work can play a role in determining job performance and job satisfaction.

Keywords: nonstandard employment, eLancing, autonomy

CHAPTER 1: INTRODUCTION

1.1 Nonstandard Work

As technology has made significant advancements in recent years, organizations have adapted in order to integrate innovative technology into their customary work processes. Employment has been frequently researched, especially in relation to influences on work performance outcomes (Blumberg & Pringle, 1982; Campbell, McHenry, & Wise, 1990; Hackman & Oldham, 1976; Spector, Dwyer, & Jex, 1988). However, most of this research has historically been conducted in a traditional work context, comprised of standard employees. Standard employment is characterized as full-time work conducted for an indefinite amount of time, which takes place at the employer's established place of business and involves work that is determined by the employer (Broschak & Davis-Blake, 2006; Kalleberg, Reskin, & Hudson, 2000). Nonstandard employment, on the other hand, encompasses any type of work that falls outside of these structural confines (Ashford, George, & Blatt, 2007; Kalleberg et al., 2000). Whereas previous research is applicable in traditional work environments, it is challenging to apply these findings to a nonstandard work environment due to the differences between the attributes of standard and nonstandard work.

Employment of nonstandard workers is a practice that organizations have engaged in for centuries (Kalleberg, 2000). In fact, Kalleberg (2000) presented historical evidence that suggests that nonstandard work was previously the primary type of employment in the form of temporary or irregular employment, with standard work becoming prevalent after World War II. Nonstandard work arrangements have been referred to by many terms. These include, but are not limited to, part-time, temporary, or contract-based work (Kalleberg, 2000), self-employment

(Hipp, Bernhardt, & Allmendinger, 2015; Lombard, 2001), telecommuting (Ashford et al., 2007; Spreitzer, Cameron, & Garrett, 2017), contingent work (Connelly & Gallagher, 2004; Kalleberg et al., 2000; Polivka & Nardone, 1989), and flexible staffing arrangements (Houseman, 1997; Kalleberg, 2003; Kalleberg, Reynolds, & Marsden, 2003). Notably, the prevalence of nonstandard workers increased in the U.S. from 35.4% to 40.4% between 2006 and 2010 (U.S. Government Accountability Office, 2015), and 94% of the U.S. employment growth between 2005 and 2015 has been attributed to the rise in alternative work arrangements (Katz & Krueger, 2016). Thus, the use of nonstandard work arrangements by organizations is a practice that is unlikely to be eradicated in the near future (Ashford et al., 2007).

Nonstandard employment is a rapidly expanding segment of work arrangements (Kalleberg, 2000) that has further grown with the increased use of technology in organizations (George & Chattopadhyay, 2017). Within the nonstandard work category, there is a subset of individuals referred to as the digital workforce (Colbert, Yee, & George, 2016), who incorporate the use of technology into the completion of their work. In the context of the gig economy, in which short-term jobs are completed remotely, and contact with the employer is brief and minimal (Spreitzer et al., 2017), the digital workforce is comprised of a group of workers known as crowdsourcers (Howe, 2006) or eLancers (Aguinis & Lawal, 2013). eLancing consists of an economy in which organizations outsource work to individuals over the Internet (Ford, Richard, & Ciuchta, 2015).

eLance work can vary widely, ranging from microwork, which involves the completion of small tasks, to more project-based work requiring professional knowledge and abilities (Webster, 2016). An example of a platform that utilizes eLancers is Amazon Mechanical Turk (MTurk), which functions by allowing "requesters" to post minor work tasks to be completed by

eLancers, referred to on MTurk as "workers" (Kaufmann, Schulze, & Veit, 2011). The microwork market is rapidly expanding, as two of the most popular microwork platforms (i.e., MTurk and CrowdFlower) have been reported to host tens of millions of workers and gross \$120 million annually (Kuek et al., 2015). Use of microwork platforms to recruit workers is attractive to organizations, as it provides steady access to workers who require less compensation than the organization's standard employees and a work population that the organization is not obligated to provide with training or work equipment (Bergvall-Kåreborn & Howcroft, 2014). Due to the simplicity of microwork tasks, this form of work has been referred to as "menial clickwork" (Howe, 2008) that consists of laborious and repetitious tasks (Bergvall-Kåreborn & Howcroft, 2014) requiring minimal skill (Chandler & Kapelner, 2013). Taken together, microwork has been portrayed in the literature as a form of work that requires minimal previous work experience and offers limited control regarding the completion of tasks.

Additionally, a defining characteristic of eLance work is the temporary and anonymous nature of tasks. Tasks are completed by relatively anonymous workers, thereby resulting in a lack of communication and interaction between workers and employers (Chandler & Kapelner, 2013). For these reasons, it has been argued that microwork is an employment context in which autonomy is likely lower than in nonstandard jobs that require higher skill levels (Dunn, 2017; Kalleberg & Dunn, 2016), as microworkers have limited control over determining how work is completed. Further, it has been suggested that the frequency with which microwork has been utilized worldwide has influenced the work norms for similar types of nonstandard employees, such as freelance digital journalists, as they are expected to work irregular hours for a short-term task that offers minimal job security and autonomy (Surugiu, 2016). However, despite propositions that microwork will generally be low in autonomy, it is likely that increasing the

amount of autonomy in this specific work context will improve worker outcomes, similar to what has been demonstrated in standard work contexts.

Whereas eLancers represent a prevalent and influential sector of the workforce (Aguinis & Lawal, 2013), there is a critical gap in the literature regarding the factors that influence eLancer work outcomes. As such, scholars have acknowledged the need for further research regarding the impact of the nonstandard work context on individual outcomes (Ashford et al., 2007; Ashford, Caza, & Reid, 2018). As detailed below, this study investigated whether the amount of autonomy given to an employee influences employee felt responsibility, meaningfulness, effort, satisfaction, and performance in an eLancing environment, as well as whether an eLancer's preference for autonomy has an impact on the relationship between autonomy and felt responsibility or meaningfulness.

1.2 Applicability of Job Theory to a Nonstandard Work Context

Autonomy refers to the extent to which an employee is given freedom and discretion over a task (Hackman & Oldham, 1976) and is a key component of Hackman and Oldham's (1976) Job Characteristics Theory (JCT). JCT examines the interactions between specific core job dimensions (i.e., autonomy, skill variety, task identity, task significance, and feedback) that prompt critical psychological states, resulting in outcomes such as increased internal motivation, job performance, and job satisfaction, as well as decreased absenteeism and turnover (Hackman & Oldham, 1976). In particular, autonomy has been identified as a robust predictor of positive work outcomes among standard workers, such as increased intrinsic motivation, effort, task performance, perceived competence, preference for challenge (Patall, Cooper, & Robinson, 2008), job satisfaction, and job performance (Humphrey, Nahrgang, & Morgeson, 2007; Spector, 1986). The established strength of autonomy as a predictor of positive work outcomes in a

standard work environment presents an opportunity to investigate the generalizability of this relationship to other employment contexts. Furthermore, due to the unrestricted nature of work, autonomy is likely to be highly valued by eLancers, resulting in particularly strong manipulation effects.

Since the conception of JCT, the theoretical model has undergone large amounts of empirical testing. For instance, Fried and Ferris' (1987) meta-analytic findings demonstrated partial support for the JCT model, in that experienced responsibility mediated the relationship between autonomy and outcomes, but inconsistent with JCT, they found that autonomy was also correlated with experienced meaningfulness. This finding was replicated in a more recent meta-analysis (Humphrey et al., 2007), thereby providing further support for the mediating role of meaningfulness in relation to autonomy and work outcomes. Therefore, these findings suggest that perhaps the JCT model should be updated to incorporate both meaningfulness and responsibility as mediators between autonomy and work outcomes.

In a similar vein, in a study conducted on a sample of eLancers, autonomy emerged as one of the most consistently important values to workers, with eLancers emphasizing the "desire of making an impact, contributing to the community and having a positive impact in others' lives, such as in performing research-related, survey HITs [i.e., human intelligence tasks]" (Deng, Joshi, & Galliers, 2016, p. 286). In addition, Kost, Fieseler, and Wong (2018) reported that eLancers identified autonomy as a factor that directly influences their perceived meaningfulness of work. Further, Chandler and Kapelner (2013) found that when eLancers were informed about the meaningfulness of a task (i.e., informed that their work contributed to research regarding cancer treatments), participation in the task and the amount of output increased. This highlights

the importance of not only autonomy, but also the desire to do tasks that are impactful, thus initiating feelings of responsibility and meaningfulness toward the outcome of the work.

Additionally, whereas little research has been conducted regarding the amount of effort that eLancers expend in completing their work, employee effort has been studied frequently in standard work contexts. For instance, Spector (1986) found that standard employees who had more control or autonomy were more participative in their tasks, and Ollo-Lopez, Bayo-Moriones and Larazza-Kintana (2010) reported a positive relationship between autonomy and effort. Research on eLancer effort has often been linked to various levels of compensation. For example, it has been found that quota systems (i.e., payment for overall completion of a task) induce more effort from eLancers than piece-rate pay (i.e., payment for each task completed within a work assignment), and increased payment was linked to a greater quantity of work completed, but not greater quality of work (Mason & Watts, 2009). Additionally, recent research has demonstrated that heightened perceptions of work autonomy were significantly related to increased intrinsic motivation (Zheng, Li, & Hou, 2011) and participation in crowdsourcing (Ye & Kankanhalli, 2017). Notably, it has been argued that whereas worker effort and outcomes typically cannot be directly impacted in an eLance work context due to the proximal nature of eLance work in which there is a lack of interaction between the worker and employer, indirect efforts can be made to impact outcomes by designing the task in a way that encourages favorable work outcomes, leading to an improved work process and subsequent outcomes (Ellmer & Reichel, 2018). In an attempt to replicate the mediating effect of responsibility and meaningfulness in a nonstandard work context, as well as implement task design principles by offering varying levels of autonomy, the following hypotheses are proposed:

Hypothesis 1 (H1a & H1b): There will be a significant indirect effect of task autonomy on effort via (a) felt responsibility and (b) meaningfulness, such that eLancers who have more autonomy will feel more responsible for the outcome of the task and consider the task to be more purposeful, therefore exerting greater effort.

In addition, both performance and satisfaction have been identified as factors that are influenced by autonomy. In a standard work context, autonomy has been demonstrated to have a positive association with both task performance (Langfred & Moye, 2004; Legault & Inzlicht, 2013; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) and work satisfaction (Chung-Yan, 2010; DeCarlo & Agarwal, 1999; Spector, 1986). In addition to autonomy, effort has been established as a mutual antecedent to both employee satisfaction (Christen, Iyer, & Soberman, 2006) and performance (Blau, 1993; Brown & Peterson, 1994; Christen et al., 2006). However, there is a lack of consensus in the literature regarding how effort influences employee satisfaction. Whereas effort has been positively linked to job satisfaction (Brown & Peterson, 1994; Karatepe, Uludag, Menevis, Hadzimehmedagic, & Baddar, 2006; Mengüç, 1996), some have found that effort that is considered costly or strenuous results in a negative relationship between effort and job satisfaction (Christen et al., 2006; Clark & Oswald, 1996).

Christen et al. (2006) argued that the negative effect of effort on job satisfaction was more accurate due to the realistic design of their study, which took into account moderating organizational factors, such as performance-dependent payment (e.g., incentive pay for increased performance in a sales position) or excessive monitoring. These are factors that are intended to discourage employees from applying small amounts of effort in completion of their work and may result in enhanced job performance, but often result in reduced job satisfaction (Christen et al., 2006). In an eLance context, organizational factors such as direct supervision are often not

applicable to the eLance population; therefore, an inverse relationship between effort and satisfaction due to moderating organizational factors seems unlikely. Notably, although the literature has largely focused on the influence of effort on general job satisfaction, rather than task satisfaction, task satisfaction has been conceptualized as a counterpart to job satisfaction (Mason & Griffin, 2005). Thus, the effect of effort on task satisfaction is expected to be similar to the positive relationship between effort and job satisfaction that has been shown by Brown and Peterson (1994), among others. Therefore, a positive relationship between effort and task satisfaction is hypothesized.

Hypothesis 2 (H2): There will be a significant indirect effect of felt responsibility and meaningfulness on both task performance and task satisfaction through the mediating mechanism of effort, such that eLancers who feel more responsibility and consider the task to be more meaningful will exert more effort, therefore performing better and experiencing greater satisfaction.

1.3 Preference for Autonomy

It is important to consider that the effect of autonomy on outcomes can be influenced by the worker's innate preference for autonomy, as individuals may not always respond to autonomy favorably (Rodin, Rennert, & Solomon, 1980). Previous research has suggested that individual-level factors, such as preference for autonomy, can justify the varying effects of autonomy on work outcomes (Landeweerd & Boumans, 1994; Strain, 1999; Wageman, 1995). Wageman (1995) identified preference for autonomy as a stable personality trait that is also capable of changing as a worker gains experience. Others have argued that preference for autonomy can vary, depending upon situational factors (Dwyer, Schwartz, & Fox, 1992; Strain, 1999).

eLancing is a type of work that greatly complements individuals with an innately high preference for autonomy; therefore, workers who possess this characteristic are likely to seek work that allows for autonomy in the manner and frequency in which work is completed. The practice in which a worker designs a job around his/her individual preferences is referred to as job crafting (Wrzesniewski & Dutton, 2001). Job crafting is unique in that individuals are in control of deciding the factors that are incorporated into their work, which in standard work contexts is traditionally determined by managers or supervisors. Oldham and Hackman (2010) suggest that whereas job responsibility previously belonged to managers and supervisors, job crafting involves shifting responsibility to the individual jobholder. More specifically, eLancing has been identified as a form of employment in which work design, training, and personal development become the responsibility of the worker rather than the hiring organization (Ellmer & Reichel, 2018), which is representative of the job crafting process. Job crafting has been referred to as a practice in which individuals increase the meaningfulness of work by restructuring their responsibilities (van den Huevel, Demerouti, & Peeters, 2015; Wrzesniewski & Dutton, 2001). Employees who engage in job crafting have reported an increase in positive attitudinal outcomes, such as enjoyment and meaning in work (Berg, Dutton, & Wrzesniewski, 2008; Berg, Grant, & Johnson, 2010). These findings suggest that preference for autonomy, specifically in a microwork context, may have an effect on the relationship between autonomy and the critical psychological states of felt responsibility and meaningfulness. Therefore, the following is hypothesized:

Hypothesis 3 (H3): Preference for autonomy will moderate the relationship between autonomy and felt responsibility and meaningfulness among eLancers, such that the

effect will be weaker when preference for autonomy is low, as compared to when preference for autonomy is high (see Figure 1).

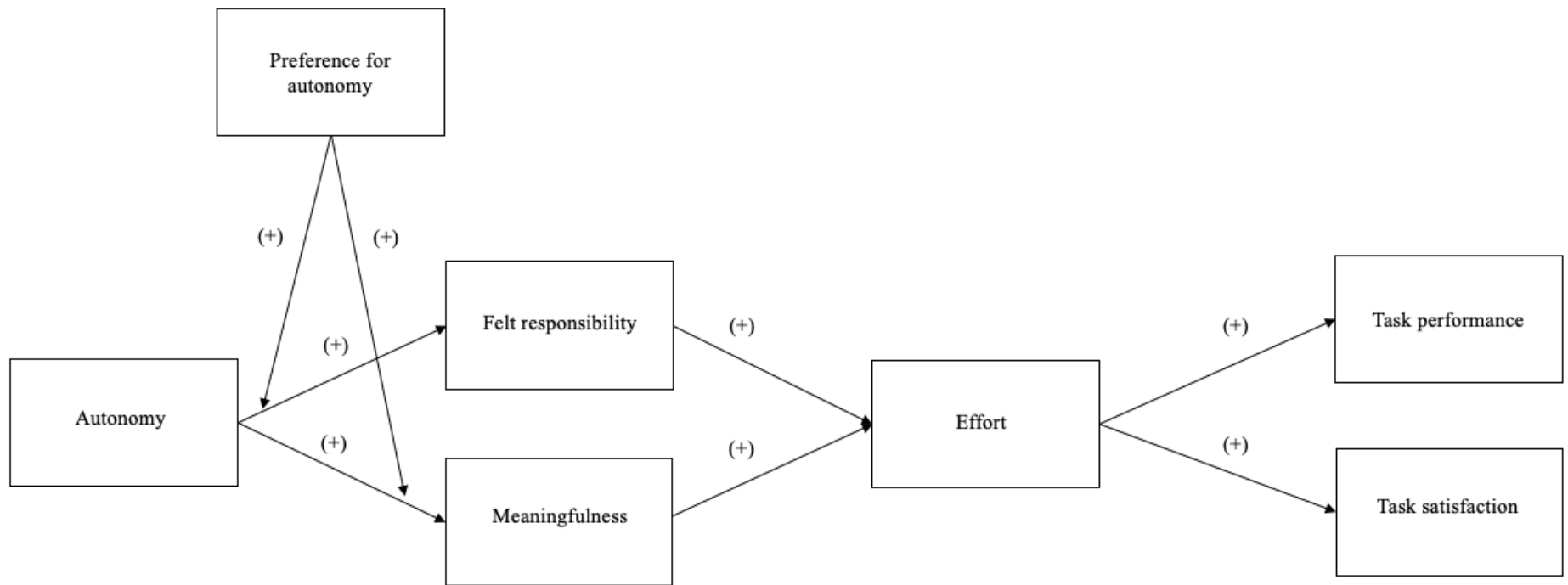


Figure 1. Mediation model predicting that there will be an indirect effect of autonomy on effort via felt responsibility and meaningfulness and that there would be an indirect effect of felt responsibility and meaningfulness on both task performance and task satisfaction through the mediating mechanism of effort. Further, it was predicted that preference for autonomy would moderate the relationship between autonomy and felt responsibility and meaningfulness.

CHAPTER 2: METHOD

2.1 Experimental Study Information

Participants

The purpose of this study was to examine the applicability of existing work design theory to a nonstandard, eLance work context. More specifically, this study investigated the impact of autonomy on the felt responsibility, meaningfulness, effort, performance, and satisfaction of eLancers, as well as how preference for autonomy influenced the relationship between autonomy and felt responsibility or meaningfulness. Data were collected from 396 college students at a large Southwestern university over the age of 18 who received course credit in exchange for participation in the study. After filtering out participants who did not follow the required instructions for the task, the final sample consisted of 350 participants (65.70% female; 34.30% Caucasian; mean age = 20.20, $SD = 4.09$; average hours worked per week = 12.97 hours, $SD = 13.19$).

Design and Procedure

One context in which autonomy has been shown to influence performance is creativity (Grawitch, Munz, Elliott, & Mathis, 2003; Yang & Ok Choi, 2009; Zhou, 1998), which is defined as the origination of ideas that are both innovative and beneficial (Amabile, 1983). However, there is a lack of consensus in the literature regarding the manner in which autonomy influences creativity. In some cases, total autonomy has been shown to inhibit creativity, as people tend to revert to familiar, previously effective patterns of thought and choose to take the path of least resistance (Caniëls & Rietzschel, 2015; Ward, 1994). In contrast, a lack of autonomy has been linked to reduced intrinsic motivation, therefore hindering creativity

(Amabile, 1996; Deci & Ryan, 2002). In addition to research conducted on autonomy in a creative context, effort has also been studied in relation to creativity. It has been well-established that creative performance requires effort due to the degree of introspection required to produce novel ideas (Gardner, 1996; Sternberg & Lubart, 1999; Zimmerman, 2006).

Although creativity is not a construct of interest in this study, it has been frequently used as an avenue to assess autonomy. Further, an example of an eLance task that provides high task autonomy has been identified as one that allows a worker to be creative, therefore leading to enhanced motivation (Kaufmann et al., 2011). Due to the prevalence of research investigating the effect of autonomy and effort on performance that has been conducted in a creative context, a creativity task was used to assess participant performance. This study utilized two unique operationalizations of autonomy to influence creative performance. The intent of the two new operationalizations was to compare the effects of restricting the length of a product description statement, as well as limiting the content included in the statement. More specifically, a between-subjects experimental design was implemented in which autonomy was manipulated (i.e., four levels: both length and content restrictions, length restriction, content restriction, and no restriction).

To assess the impact of autonomy on task performance, participants were randomly assigned to one of four conditions, in which participants were given a prompt for a photo description task that provided either low (i.e., length and content restrictions), moderate (i.e., two conditions with either a length [moderate I] or a content restriction [moderate II]), or high (i.e., no restriction) autonomy. In all conditions, participants received a photo of a scenic landscape (see Appendix A) and were asked to provide a description of the photo for use on a tourism website. Those assigned to the low autonomy condition received a prompt with content

requirements (e.g., "the first sentence must mention that the photo was taken in Colorado") and were required to write a five-sentence description. The two moderate autonomy condition prompts either included the five-sentence requirement (i.e., moderate autonomy I condition) or mandatory statements to be incorporated into the description (i.e., moderate autonomy II condition). Finally, the high autonomy condition had basic instructions, but no formal task requirements (see Appendix B for full prompts). This manipulation simulated Zhou's (1998) methodology, in which participants were asked to generate creative solutions to problems but were assigned either high or low autonomy in completion of the task.

Before the task, participants completed measures assessing their preference for autonomy, demographics, and need for cognition. Need for cognition was included in the analyses as a control variable, as it has been shown to influence creative performance (Osburn & Mumford, 2006). Immediately after the task, participants completed measures regarding felt responsibility for the task, meaningfulness of the task, effort expended while completing the task, task satisfaction, and perceptions of autonomy in the task. Each measure is described below.

2.2 Experimental Study Measures

Below is a description of each measure that was used. Unless otherwise noted, each measure used a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Preference for autonomy. Preference for autonomy was assessed using an adaptation of Morgeson and Humphrey's (2006) decision-making subscale of the Work Design Questionnaire (WDQ; see Appendix C). The original items in the decision-making autonomy subscale measure the degree of autonomy that is felt in one's current work position, whereas the modified items assess the degree to which the participant *prefers* autonomy in their work. An example item is "I

prefer tasks that give me a chance to use my personal initiative or judgment in carrying out the work." The reliability coefficient for this scale was 0.827.

Demographics. Assessed demographics included age, gender, race/ethnicity, education level, and average number of hours worked each week (see Appendix D).

Need for cognition. Need for cognition (NFC) is the extent to which an individual is satisfied by situations that require cognitive effort (Cacioppo, Petty, & Kao, 1984). Cacioppo et al.'s (1984) 18-item measure was used to evaluate each participant's general NFC, which was included in the analyses as a covariate (see Appendix E). Example items include "I would prefer complex to simple problems," and "I like to have the responsibility of handling a situation that requires a lot of thinking." The reliability coefficient for this measure was 0.835.

Felt responsibility. Four items from Fass, Bishop, and Glissmeyer's (2006) measure were adapted to assess felt responsibility for the task, which included questions that were derived from Hackman and Oldham (1975), Cammann, Fichman, Jenkins, and Klesh (1979), Seashore, Lawler, Mirvis, and Cammann (1982), and Caplan (1971). Whereas the original scale consisted of eight items, four items that referenced teams or a traditional work setting were removed (see Appendix F). This scale was additionally modified in order to be stated in past tense and to be task-specific. Example items include "I felt personally responsible for the work I did on this task," and "Whether or not this task was done right was clearly my responsibility." The reliability coefficient for the adapted scale was 0.854.

Experienced meaningfulness. May, Gilson, and Harter's (2004) meaningfulness scale was used to assess the level of meaning that the participant experienced regarding the task. This scale was adapted to be phrased in past tense, as well as to reference the meaningfulness of the specific task, rather than work in general. The original scale was six items, but two items were

removed, as they referenced job activities as a whole. Therefore, the final scale consisted of four items (see Appendix G). Example items include "The work I did on this task was important to me," and "I feel that the work I did on this task was valuable." The reliability coefficient for the scale was 0.913.

Effort. De Cooman, De Gieter, Pepermans, Jegers, and Van Acker's (2009) work effort scale was used to assess the effort that the participant put into their performance on the task. In order to prevent dishonest responses, this scale was accompanied by a clause stating that responses will not have any impact on receipt of course credit. The original scale was 10 items, but one item assessed how the employee felt that he/she worked to achieve the objectives of the organization, which was not relevant to an eLance setting. Therefore, that item was omitted, resulting in a scale consisting of nine items (see Appendix H). This scale was further modified in order to be stated in past tense, and to reference the specific task that was just completed. Example questions include "I was trustworthy in the execution of the task that was assigned to me," and "In this task, I did not give up quickly when something did not work well." The reliability coefficient for this measure was 0.896.

Task satisfaction. Task satisfaction was measured by using the four-item Brief Index of Affective Job Satisfaction (Thompson & Phua, 2012). As the original items measure job satisfaction in a standard work context, the items were modified to reference satisfaction in regard to the study task (see Appendix I). Example items include "I liked this task better than the average person might have," and "I felt fairly well satisfied with this task." The reliability coefficient for the scale was 0.923.

Perceptions of autonomy. Notably, perceptions of task autonomy were assessed as a manipulation check using items adapted from the WDQ (Morgeson & Humphrey, 2006), which

consists of three distinct autonomy subscales: work scheduling autonomy, decision-making autonomy, and work methods autonomy. Work scheduling autonomy was determined not to be a construct of interest, as the freedom to schedule one's work is consistently high across all crowdsourcing platforms and innate in the definition of eLance work. Further, the work method autonomy subscale was excluded due to its lack of relevance in the majority of microwork tasks, as there are limited opportunities for work method decisions to be made in tasks such as coding or image tagging.

In contrast, decision-making autonomy has been shown to align well with the eLance work context. In a study examining work characteristics that were of importance to eLancers, autonomy was repeatedly expressed as an imperative work component for eLancers, particularly because it created enhanced opportunity for decision-making in work (Deng et al., 2016). Therefore, the decision-making subscale was determined to be the most appropriate measure for the manipulation check for autonomy. Narrowing the measurement of autonomy to focus specifically on decision-making autonomy is beneficial for future research, as it provides greater opportunity to apply the findings of this study in order to examine specific interventions that pertain to decision-making autonomy in broader microwork contexts.

Therefore, perceptions of task autonomy were measured by using the three-item decision-making autonomy subscale (see Appendix J). This scale was modified in order to be phrased in past tense, as well as reference the task completed, rather than the job in its entirety. An example item is "This task provided me with significant autonomy in making decisions." The reliability coefficient for this scale was 0.798. In particular, this measure was used as a manipulation check to assess perceptions of autonomy after the task was completed to determine if the manipulation of autonomy in each condition was effective.

Task performance. Task performance was assessed by three independent undergraduate research assistants (RAs), who coded each description on a five-point Likert scale tailored to each variable (e.g., 1 = *very low quality*, 5 = *very high quality* for quality ratings). This coding process took place for each description, which was rated on its quality, originality, and elegance, as developed by Besemer & O'Quin (1999; see Appendix K). Quality was defined as the degree to which the description is logical and coherent, originality was the degree to which the description is unique and novel, and elegance was the degree to which the description is sequential and transitions between ideas seamlessly. The RAs completed frame of reference training before beginning the rating process, following the procedures detailed by Sulsky and Day (1992). Further, raters were given example responses from the dataset that characterized each scale point for all three variables. Following the training, the RAs provided ratings for each photo description.

After ratings were completed, raters attended calibration meetings to discuss ratings that had a variance score above 0.50. Interrater agreement was calculated using $r^*_{WG(J)}$, which is a metric for calculating interrater agreement that accounts for rater scores on a multiple-item scale (Lindell, Brandt, & Whitney, 1999). Using this index, scores above .70 are considered to have acceptable levels of agreement. Final interrater agreement scores were .747 for quality, .744 for originality, and .716 for elegance. Once it was determined that there was acceptable inter-rater reliability, the three rater quality, originality, and elegance scores were compiled for each response to create a composite task performance variable, which had a Cronbach's alpha value of 0.862. Compilation of these constructs follows the precedent set by Madjar & Oldham (2002), and was further deemed appropriate by the strong positive correlations between quality,

originality, and elegance as demonstrated in Table 1, in addition to the high reliability estimate for the composite performance measure.

CHAPTER 3: RESULTS

3.1 Testing of Proposed Model

First, to examine the effectiveness of the autonomy manipulation, a one-way ANOVA was conducted. Results revealed that there was not a significant difference in perceptions of autonomy between the experimental conditions, $F(3, 346) = 1.749, p = .157, \eta^2_p = .015$. Thus, although the high autonomy condition had the highest mean score ($M = 5.448, SD = 0.998$), perceptions of autonomy were not significantly higher in this condition than in the low autonomy ($M = 5.232, SD = 1.029$), moderate autonomy I ($M = 5.123, SD = 1.280$), or moderate autonomy II ($M = 5.121, SD = 1.150$) conditions. Therefore, it was concluded that the autonomy manipulation was not effective.

Intercorrelations and descriptive statistics for the study variables can be located in Table 1. To test the overall proposed model, adaptations to PROCESS model 80 (Hayes, 2018) were made, and the model was tested using 1000 bias-corrected bootstrapping estimates. Notably, a simple dummy coding system was implemented to allow for an examination of differences between conditions, with the low autonomy condition serving as the comparison group. The overall model predicting felt responsibility was significant, $R^2 = .105, F(8, 341) = 4.975, p < .001$, as well as the overall model predicting meaningfulness, $R^2 = .010, F(8, 341) = 4.724, p < .001$. However, as indicated in Figure 2, which provides coefficients for the overall serial mediation model, none of the comparisons between autonomy conditions significantly predicted felt responsibility or meaningfulness while controlling for participant NFC, although moderate autonomy condition II demonstrated marginally higher felt responsibility perceptions than the low autonomy condition. Both felt responsibility and meaningfulness were positively related to

effort, such that those who felt responsible for the outcome of the task and considered the task to be meaningful exerted greater effort.

Table 1

Means and Intercorrelations Among Study Variables

Variable	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10
1. Need for cognition	4.378 (0.731)										
2. Preference for autonomy	5.266 (1.099)	.214**									
3. Perceptions of autonomy	5.237 (1.120)	.100	.134*								
4. Felt responsibility	5.921 (0.949)	.123*	.268**	.424**							
5. Experienced meaningfulness	4.554 (1.353)	.210**	.213**	.423**	.401**						
6. Effort	5.442 (0.943)	.190**	.196**	.562**	.564**	.608**					
7. Task satisfaction	4.337 (1.439)	.227**	.156**	.547**	.370**	.669**	.609**				
8. Performance: Quality	2.696 (1.016)	-.012	-.079	.157**	.114*	.036	.158**	.102			
9. Performance: Originality	2.940 (0.959)	.128*	.023	.177**	.248**	.174**	.232**	.263**	.587**		
10. Performance: Elegance	3.125 (0.825)	.107*	.005	.187**	.225**	.118*	.230**	.202**	.626**	.863**	
11. Overall performance	2.920 (0.830)	.080	-.022	.194**	.217**	.121*	.230**	.210**	.842**	.911**	.920**

Note. $N = 350$. All variables were measured on a 7-point Likert scale with the exception of quality, originality, elegance, and performance, which were measured on a 5-point Likert scale.

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

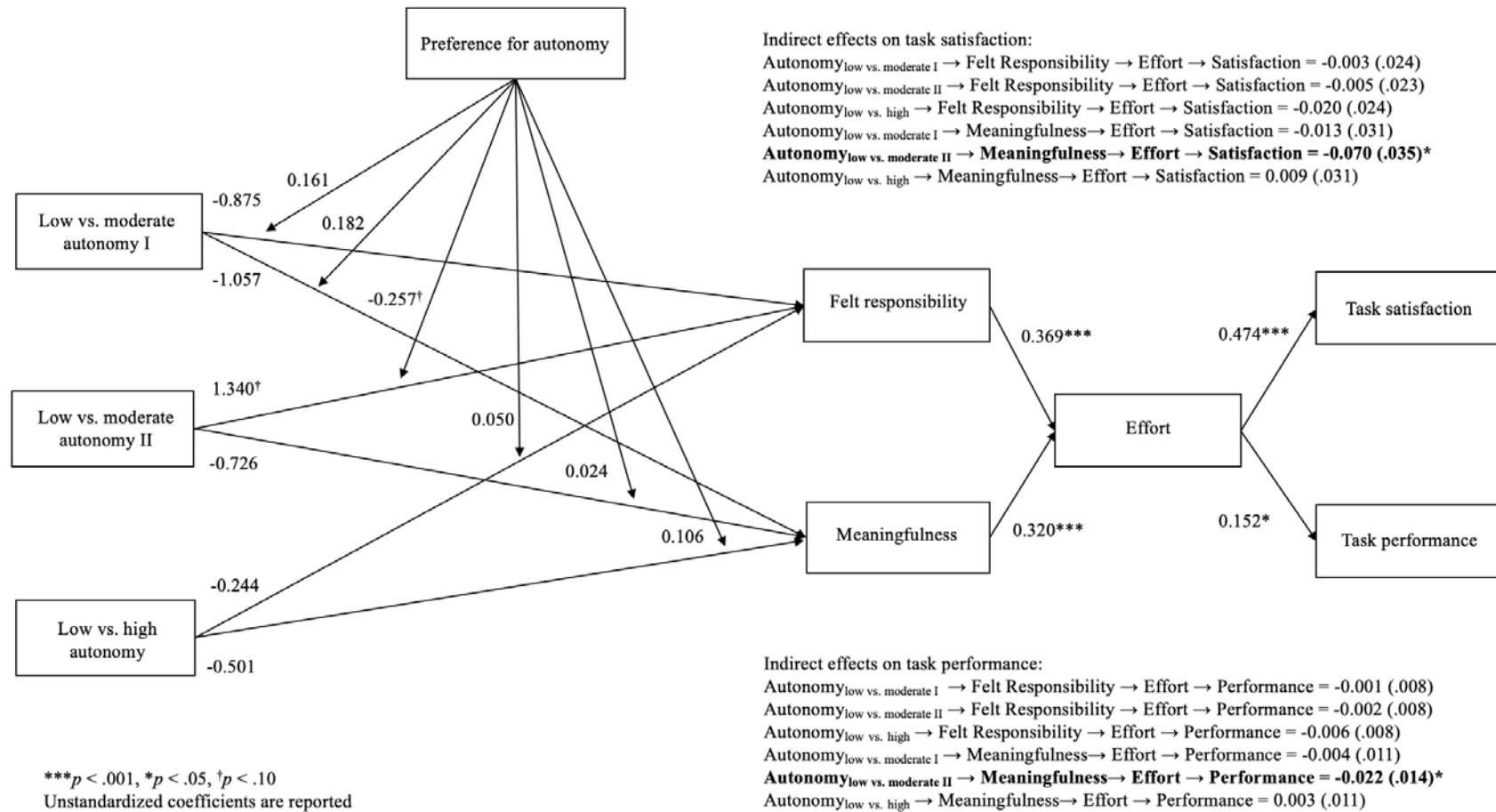


Figure 2. Serial mediation model examining the effect of autonomy condition on felt responsibility and meaningfulness, as well as the effects of felt responsibility and meaningfulness on effort, and effort on task satisfaction and task performance. Further, the model examined the moderating effect of preference for autonomy on the relationship between autonomy condition and felt responsibility and meaningfulness. The multicategorical IV is coded such that the comparison group (low autonomy) was coded as 0, and the other conditions were coded as 1. Bold text indicates significant indirect effects at $p < .05$.

To test *H1a*, PROCESS model 4 was used to examine the indirect effect of autonomy condition on effort via the mediating path of felt responsibility. Results indicated that there were no indirect effects when comparing the low autonomy condition to moderate autonomy condition I, $b = -0.013$, $SE = .056$, moderate condition II, $b = 0.007$, $SE = .049$, or the high autonomy condition, $b = -0.027$, $SE = .052$. When examining *H1b*, in which an indirect effect of autonomy condition on effort via experienced meaningfulness was expected, similar results were found. More specifically, there were no indirect effects when comparing the low autonomy condition to moderate autonomy condition I, $b = -0.035$, $SE = .064$, moderate autonomy condition II, $b = -0.129$, $SE = .067$, or the high autonomy condition, $b = 0.028$, $SE = .064$. Therefore, neither *H1a* nor *H1b* was supported.

Despite the lack of support for *H1*, the remainder of the mediation model aligned with expectations. More specifically, *H2* stated that there would be an indirect effect of felt responsibility and meaningfulness on both task performance and satisfaction through the mediating mechanism of effort. Notably, the overall model predicting effort was significant, $R^2 = .500$, $F(6, 343) = 57.264$, $p < .001$, in addition to the overall models predicting satisfaction, $R^2 = .526$, $F(7, 342) = 54.297$, $p < .001$, and performance, $R^2 = .143$, $F(7, 342) = 8.152$, $p < .001$. Using PROCESS model 4 to test indirect effects, it was revealed that there was a significant ($p < .05$) indirect effect of felt responsibility on satisfaction through effort, $b = 0.181$, $SE = .040$, and of meaningfulness on satisfaction through effort, $b = 0.149$, $SE = .028$. Similarly, there was a significant ($p < .05$) indirect effect of felt responsibility on performance through effort, $b = 0.059$, $SE = .024$, and of meaningfulness on performance through effort, $b = 0.048$, $SE = .021$. As such, *H2* was supported.

Overall, these findings suggest that individuals did exert more effort when they felt responsible for the task and perceived it to be meaningful, and effort was positively related to both task satisfaction and task performance. Further examination of the serial mediation indirect effects revealed that there were two significant indirect effects in the model, which were the indirect effects from the comparison between the low and moderate autonomy II conditions to both satisfaction and performance, serially mediated by meaningfulness and effort. Closer examination of the mechanisms by which these indirect effects occurred revealed that the comparison of the low and moderate autonomy II condition was a marginal predictor of felt responsibility and a non-significant predictor of meaningfulness, which suggests that the serial mediation indirect effect was largely driven by the latter half of the model, in which felt responsibility and meaningfulness predicted effort, which predicted task satisfaction and performance. These serial mediation indirect effects offer some support for the overall proposed model.

Further, there were no significant interactions between autonomy condition and preference for autonomy, with the exception of a marginally significant interaction between the comparison of the low and moderate autonomy II conditions on preference for autonomy. Contrary to expectations, the interaction between the comparison of the low autonomy versus moderate autonomy II conditions and preference for autonomy in predicting felt responsibility was negative, such that the effect of autonomy condition on felt responsibility was weakened as preference for autonomy increased. In other words, the difference in felt responsibility between the low autonomy and moderate II autonomy conditions decreased as preference for autonomy increased, which was the opposite of what was hypothesized. As such, support was not garnered for *H3*. An additional unexpected finding revealed that there was a significant difference

between the high and low autonomy conditions on performance scores, such that those in the low autonomy condition had higher performance scores than those in the high autonomy condition, $b = -0.545$, $SE = .117$, $p < .001$.

3.2 Testing of Revised Model

One explanation for the lack of significant effects of autonomy on responsibility and meaningfulness is provided by the manipulation check results, which indicated that the study manipulation did not produce significant differences in perceived autonomy. As work characteristic perceptions are highly subjective (Ehrhart, 2006), such that two individuals who experience the same work environment can report different experiences (Lazarus & Folkman, 1984; Phelan, Bromet, Schwartz, Dew, & Curtis, 1993), an additional model was tested in which autonomy conditions were replaced with participant perceptions of autonomy (see Figure 3). The revised model represents an indirect test of the proposed hypotheses, as it replaces the ineffective manipulations with participant perceptions of autonomy inherent in the task. Results demonstrated that the overall models predicting felt responsibility, $R^2 = .243$, $F(4, 345) = 27.727$, $p < .001$, and meaningfulness, $R^2 = .232$, $F(4, 345) = 26.000$, $p < .001$, were significant. In regard to *H1*, results of the test for indirect effects using PROCESS model 4 revealed that there was a significant indirect effect of perceptions of autonomy on effort through both felt responsibility, $b = 0.103$, $SE = .023$, and meaningfulness, $b = 0.124$, $SE = .022$. Although perceptions of autonomy did not significantly impact meaningfulness, the significant indirect effect of autonomy on effort via meaningfulness is still viable, as indirect effects are calculated using the product of the included model paths rather than examining each individual path (Hayes, 2018). Thus, *H1a* & *H1b* were supported in this model.

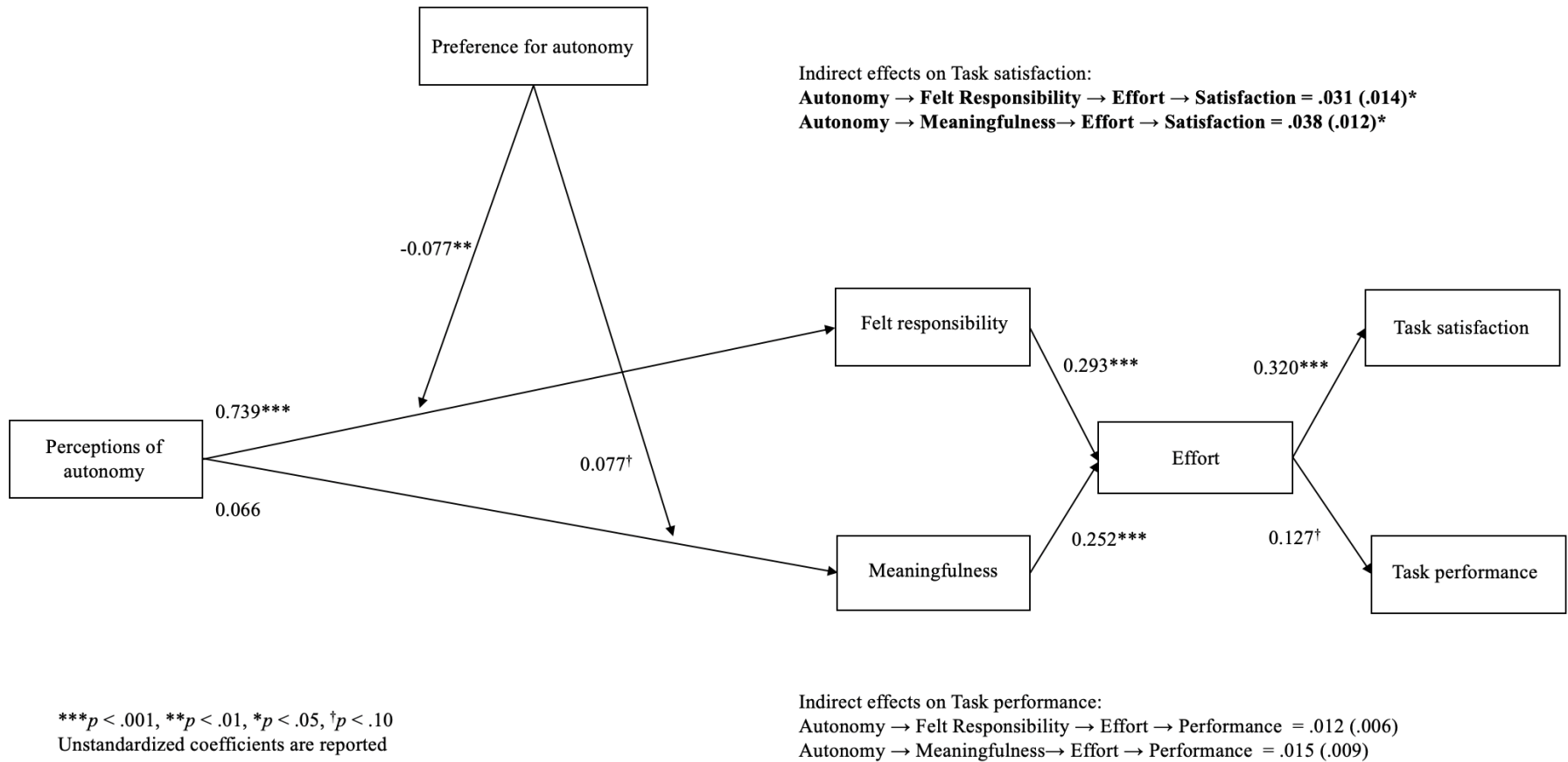


Figure 3. Serial mediation model examining the effect of perceptions of autonomy on felt responsibility and meaningfulness, as well as the effects of felt responsibility and meaningfulness on effort, and effort on task satisfaction and task performance. Further, the model examined the moderating effect of preference for autonomy on the relationship between preference for autonomy and felt responsibility and meaningfulness. Bold text indicates significant indirect effects at $p < .05$.

In the revised model, the overall model predicting effort was significant, $R^2 = .553$, $F(4, 345) = 106.596$, $p < .001$, in addition to the overall models predicting satisfaction, $R^2 = .559$, $F(5, 344) = 87.264$, $p < .001$, and performance, $R^2 = .071$, $F(5, 344) = 5.287$, $p < .001$. *H2* results examining indirect effects were the same as the original model, in which significant indirect effects were found for felt responsibility to both task satisfaction and performance via effort, as well as meaningfulness to task satisfaction and performance through effort. Therefore, *H2* was once again supported. When looking at the overall serial mediation model, both felt responsibility and meaningfulness predicted increased effort, which was positively related to higher levels of task satisfaction, but not task performance, although this effect approached statistical significance.

Finally, examination of the moderating effect of preference for autonomy revealed that its impact on the relationship between perceptions of autonomy and felt responsibility was significant, $b = -0.077$, $SE = 0.028$, $p = .006$, yet in the opposite direction of what was expected. This indicates that as preference for autonomy increased, the relationship between perceptions of autonomy and responsibility was weakened. Further, the moderating effect of preference for autonomy on the relationship between perceptions of autonomy and meaningfulness was marginally significant, and in the expected direction. Therefore, *H3* garnered limited supported in the revised model. Notably, the overall serial mediation model indicated indirect effects of perceptions of autonomy on satisfaction through effort and both felt responsibility, $b = 0.031$, $SE = .011$, and meaningfulness, $b = 0.038$, $SE = .012$. However, there were no significant serial mediation indirect effects of perceptions of autonomy on performance via felt responsibility, meaningfulness, or effort. In conclusion, the revised model provided partial support for study hypotheses.

CHAPTER 4: DISCUSSION

The purpose of the present effort was to investigate the role of autonomy in an online work context, particularly examining its impact on felt responsibility, experienced meaningfulness, effort, task satisfaction, and task performance. The findings of the study provided partial support for the proposed theoretical model, with the ineffectiveness of the autonomy manipulations likely contributing to the lack of full support for the model. More specifically, the experimental autonomy manipulation did not impact perceptions of felt responsibility or meaningfulness, with the exception of one marginal effect when comparing low autonomy to the moderate II autonomy condition predicting felt responsibility. The failure of the autonomy manipulations to impact felt responsibility and meaningfulness can potentially be attributed to the sample used in the study, which consisted of college students. As college students have been shown to be less attentive to task instructions than eLancers (Hauser & Schwarz, 2015), it is possible that the study manipulations would be more salient in a true eLancer sample due to their increased attention to instructions. For instance, 46 respondents were excluded from analyses in the current study for failure to follow the task instructions related to the autonomy manipulation, which highlights that participant attention may have been a concern. Further, it is possible that those who were included in analyses completed the task per the instructions but did so quickly without taking time to reflect on the task itself, as 8% of participants included in analyses completed the task and survey items in seven minutes or less, whereas the median completion time for the full sample was over 12 minutes. Notably, eLancers are paid for completing tasks and are subject to rejection of inadequate work and poor evaluations from eLance employers (Sheehan & Pittman, 2016), whereas college students are

compensated via class credit for task completion regardless of their performance, therefore eLancers are likely to be more attentive while completing the task.

Further, aside from one marginally significant moderation path, preference for autonomy did not moderate the relations between autonomy conditions and felt responsibility or meaningfulness. As discussed above, the similarity of perceptions of autonomy across conditions likely explains the lack of significant moderation paths, such that the effects may have been suppressed due to range restriction. However, the latter half of the model aligned with expectations, such that felt responsibility and meaningfulness were positively related to effort exerted in the task, which was positively related to task satisfaction and task performance. These findings suggest that more positive outcomes are likely to occur once felt responsibility and meaningfulness are increased via work design, which aligns with work design expectations in a traditional work environment. Demonstrating that work design theory is applicable in a nonstandard context allows for greater understanding of this unique form of work, which can lead to development of strategies to enhance nonstandard work outcomes.

Because the experimental manipulation was not effective, a perceptions of autonomy factor was included as the independent variable as an alternate means of testing the model. The revised model was partially supported, with perceptions of autonomy predicting felt responsibility, but not meaningfulness. However, perceptions of autonomy were positively correlated with both felt responsibility and meaningfulness. This is a particularly interesting finding, as Hackman and Oldham's (1976) JCT proposed that the relationship between work autonomy and work outcomes would be mediated by felt responsibility, but not meaningfulness; however, Fried and Ferris's (1987) meta-analysis found that autonomy was also correlated with meaningfulness. These findings demonstrate support for both Hackman and Oldham's (1976)

original theoretical model and Fried and Ferris's (1987) meta-analytic findings, although autonomy perceptions did not predict meaningfulness.

The second segment of the model was similar to the proposed model, in which felt responsibility and meaningfulness had a positive relationship with effort, which was positively linked to task satisfaction and had a marginally significant positive relationship with performance. In addition, the moderating effect of preference for autonomy on the relationship between autonomy perceptions and meaningfulness was marginally significant and in the expected direction. Interestingly, preference for autonomy moderated the relationship between perceptions of autonomy and felt responsibility, yet in the opposite direction of what was expected, such that participants with a high preference for autonomy and perceptions of autonomy reported lower felt responsibility for the task. A potential explanation for this finding is that the participants completed a measure of preference for autonomy, which may differ from their preference for microwork autonomy. The importance of contextualizing measures in order to tailor them to a specific scenario has been highlighted by a number of researchers (Bing, Whanger, Davison, & VanHook, 2004; Robie, Schmit, Ryan, & Zickar, 2000; Shaffer & Postlethwaite, 2012), and contextualization of personality measures has been shown to increase the incremental (Bing et al., 2004) and predictive validity (Shaffer & Postlethwaite, 2012) when compared to noncontextualized measures. As the microwork context is highly discrepant to a traditional work context and even other forms of nonstandard work (Aguinis & Lawal, 2013), autonomy preferences in a standard work setting are likely to manifest differently than preferences for microwork autonomy. Therefore, implementing a contextualized measure in which preference for autonomy is tailored to reflect preference for microwork autonomy may render the expected results in an eLance work setting. Nonetheless, the unexpected directionality

of one of the moderating paths is contradictory to both previous empirical findings and logical deduction, indicating that further research should be conducted to examine the nature of this relationship.

The findings of this study have significant implications for both eLancers and eLance employers. Informing employers about the potential benefits of eLance work design, such as encouraging them to design tasks in a way that makes workers feel responsible for the task and that the task is meaningful, would be beneficial to both workers and eLance employers. More specifically, the results of this study suggest that workers are likely to perform better and experience greater satisfaction in the presence of felt responsibility and meaningfulness, whereas employers would benefit from receiving high quality work that has been completed with increased levels of effort. Implementing these aspects of work design in an eLancing environment has the potential to improve the reputation of eLance work, as some have questioned the credibility and quality of eLance work sources (Paolacci, Chandler, & Ipeirotis, 2010). Therefore, the suggested work design strategies may encourage researchers and organizations to consider eLance work platforms as a quality source of data and increase the frequency with which they use them for data collection or task completion.

4.1 Limitations

One limitation of this study was that a college student sample was used to test the proposed model and hypotheses. However, as students completed the study online, it simulated the eLance work environment in which workers complete tasks solely through the internet, with limited interaction between the worker and requestor (Chandler & Kapelner, 2013). Therefore, although the study was not completed by paid eLancers, the sampling method serves as an indirect test of the theory within a context that is similar to eLance work. Additionally, the study

design offers limitations regarding the ability to make causal inferences from the findings. More specifically, as only autonomy was experimentally manipulated, causality can only be determined in the first path of the model, rather than establishing causality for all model paths. To make further inferences about causality in the proposed model, manipulations of felt responsibility, meaningfulness, and effort would be required. The decision to manipulate autonomy was the most logical causal sequence, as it allowed for investigation into the causal impact of different levels of autonomy in work.

Another limitation to the study is that the autonomy manipulation was not effective in impacting participant perceptions of autonomy. As noted previously, this failed manipulation likely impacted the model results, in which autonomy condition did not impact felt responsibility or meaningfulness, with the exception of one marginally significant path. A potential explanation for the ineffective manipulation is that it may have represented a task clarity (i.e., availability of coherent instructions in a task; Deng & Joshi, 2016) manipulation rather than a manipulation of decision-making autonomy. Stated differently, participants may have perceived the task to be more or less clear depending upon their experimental condition, rather than feeling as if they had been given a certain level of autonomy to complete the task. Future study replications should investigate this more thoroughly by administering a task clarity measure and considering additional methods by which to manipulate autonomy, such as allowing participants to choose which task to complete or the order with which they would like to complete aspects of a work task.

In addition, the nature of the study design does not allow for the inclusion of a formal control group, thereby limiting the ability to monitor the effects of the autonomy intervention. A control group would be difficult to design and implement, as this study investigates the effects of

varying levels of autonomy, rather than a task intervention with and without task autonomy. However, in the present effort, the low autonomy condition essentially acts as a control group, as participants were not given free reign over their responses and therefore offers a lack of autonomy, whereas the high autonomy condition represents total autonomy. Therefore, within the context of this study, the low autonomy condition is representative of a control group.

4.2 Future Directions

There are numerous avenues in which eLance research can be expanded. For instance, in order to further validate the findings of this study, this methodology should be replicated on an eLance platform, such as MTurk. This will allow for an examination of the effects among a true eLancer sample, which would help determine whether the same trends observed in the current study also occur among eLancers. However, prior to replicating the study, the manipulations that were shown to be ineffective among students should be retested among eLancers through a small pilot study. If the manipulations are still shown to have similar levels of perceptions of autonomy across conditions, then the manipulations will need to be redesigned prior to study replication.

Further, as recent efforts have emphasized the need to consider other task characteristics in an eLance setting (i.e., the remainder of the JCT work characteristics, as well as others such as task clarity; Schroeder, Bricka, & Whitaker, 2019), future studies should empirically test the impact of additional work characteristics on the outcomes highlighted in this study. For example, experimental manipulations of the task characteristics identified by Schroeder et al. (2019) should be developed, in order to determine how those impact felt responsibility, meaningfulness, effort, task satisfaction, and task performance in eLance work. Such research will further our understanding of the applicability of existing job design theory to a nonstandard, eLance work context. Additionally, as payment has been demonstrated to be a stronger predictor of eLancer

motivation than task autonomy (Kaufmann et al., 2011), another avenue for future research is investigating the motivating role of the task characteristics highlighted by Schroeder et al. (2019) in conjunction with extrinsic motivators, such as pay. More specifically, future research can investigate how varying levels of payment will impact outcomes, particularly when compared to the impact of various task characteristics.

4.3 Conclusion

The rapidly evolving nature of work renders it necessary for research practices to adapt in order to address relevant issues in the modern workplace. As nonstandard employment continues to become more prevalent in the American workforce, it is important to examine issues pertaining to this specific segment of the workforce, rather than assuming that research on standard work is applicable to eLancers. The current study demonstrated that perceptions of autonomy in a task can impact a worker's felt responsibility for the task, which is positively related to effort, whereas effort is positively related to task performance and satisfaction. Continued research efforts tailored to the eLance work context will be beneficial to eLancers and their employers, and such research should continue to progress in order to create a more positive eLance work environment.

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APPENDIX A



APPENDIX B

Low Autonomy Prompt (Both Length and Content Restrictions)

Please create a description of this photo, taken in Colorado, that is exactly 5 sentences.

Describe the photo in a way that would entice a consumer to visit this location. The first sentence must mention that the photo was taken in Colorado. The last sentence must include the phrase "among the best scenery in America." The description needs to include information about the appearance and desirability of the location. Creativity is encouraged.

Moderate Autonomy I Prompt (Length Restriction)

Please create a description of this photo, taken in Colorado, that is exactly 5 sentences.

Describe the photo in a way that would entice a consumer to visit this location. Creativity is encouraged.

Moderate Autonomy II Prompt (Content Restriction)

Please create a description of this photo, taken in Colorado. Describe the photo in a way that would entice a consumer to visit this location. The first sentence must mention that the photo was taken in Colorado. The last sentence must include the phrase "among the best scenery in America." The description needs to include information about the appearance and desirability of the location. Creativity is encouraged.

High Autonomy Prompt (No Restrictions)

Please create a description of this photo, taken in Colorado. Describe the photo in a way that would entice a consumer to visit this location. Creativity is encouraged.

APPENDIX C

Preference for Autonomy

1. I prefer tasks that give me a chance to use my personal initiative or judgment in carrying out the work.
2. I prefer tasks that allow me to make a lot of decisions on my own.
3. I prefer tasks that provide me with significant autonomy in making decisions.

APPENDIX D

Demographics

1. Please report your age in years.

Text response: _____

2. Please select which best describes you:

Male

Female

3. Select all of the following that apply to you:

White/Caucasian

African American

Hispanic Origin

Asian American

Native American

Hawaiian/Pacific Islander

Other (please specify): _____

4. Please identify your highest level of education.

Some High School

High School Degree/GED

Some College

Associate's Degree

Bachelor's Degree

Master's Degree

Doctoral Degree

Professional Degree

5. How many hours per week do you typically work in a face-to-face environment?

Text response: _____

APPENDIX E

Need for Cognition

1. I would prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.*
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.*
6. I find satisfaction in deliberating hard and for long hours.
7. I only think as hard as I have to.*
8. I prefer to think about small daily projects compared to long-term ones.*
9. I like tasks that require little thought once I've learned them.*
10. The idea of relying on thought to make my way to the top appeals to me.
11. I really enjoy a task that involves coming up with new solutions to problems.
12. Learning new ways to think doesn't excite me very much.*
13. I prefer my life to be filled with puzzles that I must solve.
14. The notion of thinking abstractly is appealing to me.
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.*

17. It's enough for me that something gets the job done; I don't care how or why it works.*

18. I usually end up deliberating about issues even when they do not affect me personally.

*Reverse scoring is used on this item.

APPENDIX F

Felt Responsibility

1. I felt personally responsible for the work I did on this task.
2. I deserve most of the credit or blame for how well my work was done.
3. I felt a very high degree of personal responsibility for the work I did on this task.
4. Whether or not this task was done right was clearly my responsibility.

APPENDIX G

Experienced Meaningfulness

1. The work I did on this task was very important to me.
2. The work I did on this task was worthwhile.
3. The work I did on this task was meaningful to me.
4. I feel that the work I did on this task was valuable.

APPENDIX H

Work Effort

1. In this task, I did not give up quickly when something did not work well.
2. In this task, I did my best to get my work done, regardless of potential difficulties.
3. When I started this task, I pursued it to the end.
4. In this task, I did my best to do what was expected of me.
5. I was trustworthy in the execution of the task that was assigned to me.
6. In this task, I thought of myself as a hard worker.
7. I really did my best in this task.
8. I put a lot of energy into this task.
9. I exerted energy equally throughout the execution of the task.

APPENDIX I

Task Satisfaction

1. I found real enjoyment in this task.
2. I liked this task better than the average person might have.
3. I was enthusiastic about this task.
4. I felt fairly well satisfied with this task.

APPENDIX J

Autonomy

1. This task gave me a chance to use my personal initiative or judgment in carrying out the work.
2. This task allowed me to make a lot of decisions on my own.
3. This task provided me with significant autonomy in making decisions.

APPENDIX K

Rater Assessment of Work Quality

1. Using the definition below, how would you rate the quality of this description?

Quality: the degree to which the description is logical and coherent

2. Using the definition below, how would you rate the originality of this description?

Originality: the degree to which the description is unique and novel

3. Using the definition below, how would you rate the elegance of this description?

Elegance: the degree to which the description sequentially flows together and transitions between ideas seamlessly