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**How little is too little? – The impact of pay level on task performance**

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## **Abstract**

This study aims to investigate the impact of pay level on task performance, using financial stress and intrinsic motivation as mediators. The pay level – performance relationship has been previously explored (e.g. Kalia & Bhardwaj, 2019), however, more attention needs to be given to potential mediators of this relationship. Using the job demands-resources model (e.g. Bakker & Demerouti, 2018) as a foundation, the direct relationship between pay level and task performance, as well as the simple and serial mediation effects of financial stress and intrinsic motivation are investigated. To explore the association between the variables, an experiment is conducted in which 266 participants play the household task (Hilbert et al., 2022). The household task consists of the management of the financial situation of a household over multiple rounds. Each round, participants are asked to perform a task for which they receive a fixed payment and from which expenses have to be paid. In the experiment, pay level is manipulated to be either low or high in relation to the expenses. Additionally, financial stress and intrinsic motivation are assessed through questionnaires before and after the completion of the six rounds. The results of the study show no impact of pay level, financial stress, or intrinsic motivation on task performance. There was however a significant effect of pay level on financial stress, so that participants with a low pay level experienced more financial stress. Participants with a low pay level also showed decreased intrinsic motivation compared to those with a high pay level. The study contributes to the pay level research by finding support for an effect of pay level on financial stress and intrinsic motivation. Furthermore, it shows the usefulness of the household task outside scarcity research, and it highlights potential issues when using the task for performance measurement.

# **How little is too little? – The impact of pay level on task performance**

## **Introduction**

Idowu Koyenikan once said, “The money you make is a symbol of the value you create” (Koyenikan, 2016). These words take on an especially cynical meaning when we consider that in the UK alone, 17.4% of working households were considered to live in “in-work poverty” in 2020 (Inmann, 2021). In-work poverty is broadly defined as a person’s income being less than 60% of the national average and insufficient to meet the cost of living (Chartered Institute of Personnel and Development {CIPD}, 2023). One of the driving factors of in-work poverty is low income, as wages have not risen in concord with the increasing cost of living (CIPD, 2023). Most people who fall under this category stem from disadvantaged groups, for example, ethnic minorities, single-parent households, or people with disabilities (CIPD, 2023). One in eight UK workers struggles to meet their financial needs, and according to the Joseph Rowntree Foundation, working has become less effective as a means to stave off poverty (CIPD, 2023; Joseph Rowntree Foundation, 2022).

As it becomes apparent that employment is no longer sufficient to ward off poverty and that wages are often inadequate to meet the cost of living, research on the effects of poverty on employees’ work has become more pressing. As low income (as a result of a low salary) is one of the driving factors of in-work poverty (CIPD, 2023), the current study will focus on this aspect in particular. Specifically, the effect of a low pay level on task performance will be investigated. Performance has long been seen as a central component of employee outcomes and has been included in many models (e.g., job demands–resources model; Bakker & Demerouti, 2018). As such, performance has received considerable research attention over the years (e.g., Meuris & Leana, 2018). It has not only been linked to financial scarcity in general (e.g., Meuris & Leana, 2018) but also to pay level specifically (e.g., Kalia & Bhardwaj, 2019). While performance has many different dimensions, the ones most commonly included are task performance, contextual performance, and sometimes counterproductive performance (e.g., Koopmans et al., 2014). Since little research on pay level has focused on its relationship with task performance (e.g., Kalia & Bhardwaj, 2019), this relationship specifically will be investigated in this study. Additionally, financial stress and intrinsic motivation are investigated as potential mediators of the relationship between pay level and task performance. Both concepts have previously been

linked to both financial and performance aspects of work (e.g., Cerasoli et al., 2014; Meuris & Leana, 2018). Therefore, the central research questions of this paper are as follows:

RQ1: What is the effect of pay level on task performance?

RQ2: Do financial stress and intrinsic motivation mediate the relationship between pay level and task performance?

The present research aims to shed light on these questions by performing an experiment that simulates working at a low paying job and its effects on financial stress, motivation, and performance.

## **Background and Previous Research**

Before exploring the theoretical assumptions and empirical findings that underlie the present research, previous studies on the general impact of financial matters on performance, stress, and motivation are explored. Prior research has largely revolved around three areas of interest related to the variables in question.

The first area is scarcity research. In fact, there is a long tradition of research on the effects of financial scarcity on various human behaviors. Definitions of financial scarcity vary from being objectively poor because of not meeting an absolute minimum, to relative poverty due to having less than others in society, to feeling like there are not enough financial resources available (subjective poverty) (Hagenaars & Vos, 1988). These differences are not always explicitly acknowledged in the literature, which can cause difficulty in comparing the results (Szecsi & Szaszi, 2022). However, while there are many different definitions, the one that has been most closely investigated in financial scarcity research is the third dimension: subjective poverty. In this context, financial scarcity is generally defined as the feeling of lacking the necessary financial resources (Shah et al., 2012). This feeling can have a profound effect on people, for example, resulting in a focus on short-term needs while disregarding long-term plans (Shah et al., 2012) or diminished cognitive performance (Mani et al., 2013). It has also been shown to cause temporal discounting, where immediate outcomes are valued more than long-term outcomes (Hilbert et al., 2022). These changes in behavior and cognition are usually attributed to increased stress due to lacking the resources to sustain oneself (Haushofer & Fehr, 2014). There seems to be a vicious cycle in place, where financial scarcity diverts cognitive resources to only the most urgent demands, resulting in deficits in other areas, which in turn leads to counterproductive behaviors (Zhao & Tamm, 2018). These counterproductive behaviors then have the

potential to push a person further into financial scarcity, thus starting the vicious cycle all over again (Zhao & Tomm, 2018).

These are not just theoretical concerns. Indeed, some studies have shown that employees with financial concerns perform worse on their assigned tasks than those without such concerns (Meuris & Leana, 2018). Meuris and Leana (2018) developed the behavioral model of financial scarcity, which draws on an older model by Bertrand et al. (2004). The model posits that financial resources have an effect on financial worries, which in turn affects cognitive resources and performance (Meuris & Leana, 2018). In recent years, some concerns have been raised about findings indicating that financial scarcity has a negative impact on cognitive performance (e.g., Szecsi & Szaszi, 2022). An overview of studies conducted on this relationship reveals either inconclusive results or only a small effect size (Szecsi & Szaszi, 2022). Thus, the authors have called for further research in this area (Szecsi & Szaszi, 2022). This area of research generally uses rather broad concepts such as financial scarcity and financial concerns, which could arise from a variety of sources (e.g., debt, [low] wages, job [in]security). There has been no specific research focus on the singular effect of, for example, pay level.

The second area of research focuses on pay-for-performance (P4P) schemes. There is some indication that the variability of P4P causes stress and therefore decreases performance, although this appears to be dependent on whether employees have a personal preference for variable pay schemes (Dorn et al., 2015). Another important factor related to the impact of P4P on actual performance is motivation. It has been shown that very high rewards can decrease motivation, leading to the so called “crowding-out effect” (e.g., Wenzel et al., 2019). It appears that while high extrinsic incentives create a sharper focus on performance, they also decrease the joy for performing the task, which can ultimately decrease task performance (Weibel et al., 2007). In a similar line of research, Deci et al. (1999) showed that performance-contingent rewards reduce intrinsic motivation. This effect was reaffirmed once more by the same authors in another paper, which also discussed the undermining effect of extrinsic rewards on intrinsic motivation (Deci et al., 2001). However, the interplay of extrinsic rewards, intrinsic motivation, and performance is highly complex. A meta-analysis by Cerasoli et al. (2014) found that performance is not only affected by intrinsic motivation or extrinsic incentives (e.g., payment); the two variables also have a combined effect on performance. More precisely, when extrinsic incentives were directly tied to performance (as in a P4P scheme), intrinsic motivation was less important to performance than when extrinsic incentives were not directly tied to performance (Cerasoli et al., 2014). Thus, it seems that intrinsic motivation is particularly important when it

comes to the effect of payment on performance. Overall, this line of research focuses on variance in pay, with the underlying assumption that the base salary itself is sufficient.

Lastly, there is some research on the effect of pay level on performance. Kuvaas (2006) illustrated the significant effect that pay level has on performance, with higher pay associated with higher work performance. Other research also supports the direct and positive association between pay level and performance (e.g., Gardner et al., 2004). However, the literature tends to be older, and little research has been conducted on this topic in recent years, as the focus seems to have shifted to P4P schemes (e.g., Dorn et al., 2015). While some recent research exists (e.g., Kalia & Bhardwaj, 2019), many potential mediators have yet to be investigated in connection to pay level and performance.

## **The Present Research**

With inflation rising and more people suffering from in-work poverty (CPID, 2023), it is crucial to investigate the impact of a low pay level (compared to a high pay level) on performance and explore possible mediators in combination. Thus, the focus of the present research is on the effect of low and high pay levels on task performance. While pay level has been found to affect work performance overall (e.g., Kuvaas, 2006), little research has investigated the effect of pay level on task performance, specifically. (e.g., Kalia & Bhardwaj, 2019). Since the broader concept of financial scarcity has been linked to diminished cognitive performance (e.g., Mani et al., 2013), it seems reasonable to assume that a low pay level (which can induce feelings of financial scarcity) might negatively affect task performance due to decreased cognitive abilities (e.g., Zhao & Tomm, 2018). Due to the aforementioned scarcity of research on task performance in particular, this performance aspect will be investigated more closely in this study. Since many studies have used self-reported task performance, which could be subject to, for example, common method bias (e.g., Podsakoff et al., 2003), this research utilizes an objective measure of task performance during an experiment, which allows for exact measurement of task performance. The details of the experiment are outlined in the methods section.

Because the connection between pay level and (task) performance has been previously established, additional variables are investigated in this study as potential mediators of the relationship. Financial stress and intrinsic motivation have previously been connected to either pay level (e.g., Kuvaas, 2006; Siravajah et al., 2014) or task performance (e.g., Akter & Rahman, 2012; Zapata-Phelan et al., 2009). Therefore, there seems to be a possible influence of financial stress and intrinsic motivation on the relationship between pay level and task performance.

While the mediating effect of intrinsic motivation on the relationship between pay level and performance has been tested previously (e.g., Kuvaas, 2006), only a partial mediation effect was found, suggesting the presence of additional mediators. Financial stress could be the missing mediator in the relationship between pay level, intrinsic motivation, and task performance. Since the precise combination of these variables remains unexplored, the present study aims to shed light on this specific issue and answer the question of whether pay level has a significant impact on task performance. Furthermore, the study seeks to explore the role of intrinsic motivation and financial stress in the pay level–task performance relationship. Social exchange theory (Homans, 1958) and the job demands–resources model (Bakker & Demerouti, 2018) will be used to support the connections between the variables and create the hypotheses. To test the hypotheses, an experiment with a novel design will be performed to artificially induce either the feeling of receiving a low pay level or high pay level by simulating the management of a household over multiple rounds. The household task was developed and tested by Hilbert et al. (2022). Participants need to perform a task for which they receive either low or abundant payment. They then need to pay expenses from that salary. Over six rounds, participants will either accumulate debt (in the low pay level condition) or savings (in the high pay level condition). Intrinsic motivation will be measured before and after the completion of the household task, and stress will also be measured after the completion of the household task.

An experiment was chosen for this research to explore the causal links between the variables. Furthermore, the experiment allows for the precise monitoring of participants' performance and is therefore not reliant on self-rated or other-rated measures, which can be subject to biases. The simplification inherent in the experiment also makes it possible to reduce some of the complexities that could influence the outcome of questionnaire studies conducted under less controlled conditions.

## **Pay Level and Task Performance**

According to the job demands–resources model, both job demands and resources can have an impact on various organizational outcomes (e.g., Bakker & Demerouti, 2018). In the model, these impacts come about through the avenues of strain and motivation. In the context of this study, pay level will be considered as a job demand. While Bakker and Demerouti (2007) originally grouped pay as a job resource, there has since been considerable debate over the imprecise categorizations of demands and resources (e.g., Schaufeli & Taris, 2014). The authors argue that job resources can be thought of as aspects that are valued positively, whereas job



demands can be thought of as aspects that are valued negatively (Schaufeli & Taris, 2014). Although pay itself may be fairly value neutral, a low pay level might be thought of as a job demand, as it is likely valued negatively. Accordingly, in this study, pay level will be considered a job demand. As such, it may have an impact on organizational resources like task performance. The job demands–resources model does not focus on a direct relationship between job demands and outcomes, so other supplemental theories may be considered. According to social exchange theory (Homans, 1958), people tend to exhibit a behavior more frequently when they are rewarded for that behavior. Additionally, the exchange is based on mutual dependence: one actor controls a resource the other actor values (Gardner et al., 2004). The exchange is based on three key principles. First, the actors exchange valued outcomes. Second, the actors are motivated to receive more of their respective outcome. Third, the exchanges between the actors occur repeatedly over time (Molm et al., 2003).

In the context of the present research, this logic can be applied as follows. The organization provides payment to the employee in exchange for the employee’s performance. Both parties are motivated to keep this exchange going, and so the exchange of payment for performance keeps reoccurring (Gardner et al., 2004). However, when the exact terms of the exchange are unclear, the norm of reciprocity is often applied (Gardner et al., 2004). Since the exact ratio of payment to performance is not always directly specified, it seems reasonable to assume that the norm of reciprocity holds for the exchange of a certain pay level for an expected amount of performance. An employee who feels sufficiently paid for their performance will maintain the same level of performance. However, if the employee does not feel that their pay level is appropriately high for the performance they are offering, the employee might feel justified adjusting their performance to a lower level that they feel is more in line with their current pay level, thus adhering to the norm of reciprocity. In other words, the lower the pay level, the lower the performance (Gardner et al., 2004). The direct effect of pay level on overall performance has been shown previously (e.g., Gardner et al., 2004; Kuvaas, 2006). Recently, the direct effect of pay level on task performance specifically has also been established (e.g., Kalia & Bhardwaj, 2019). The present study aims to replicate these previous findings. Thus, the first hypothesis is as follows:

H1: The lower the pay level participants receive, the lower the task performance will be.

## **Pay Level, Financial Stress, and Task Performance**

The job demands–resources model posits that job demands can have an indirect effect on organizational outcomes through a strain variable (Bakker & Demerouti, 2018). Therefore, a low pay level may lead to an increased amount of financial stress. This in turn can lead to decreased performance. This assumption of the model is based on observations from biological psychology (e.g., Hockey, 1997). Under strenuous conditions, individuals may enter a performance-protection process, where either further resources are temporarily mobilized under increased expenditure of effort or performance goals are reduced (Hockey, 1997). This may not always lead to a decreased output but to inefficient strategies or diminished work quality (Hockey, 1997). Based on the job demands–resources model, a mediation effect may be inferred between pay level, financial stress, and task performance.

While the mediating effect of financial stress on the relationship between pay level and task performance has not been investigated previously, the individual connections between the variables have been demonstrated. As already stated above, there is evidence for a connection between pay level and task performance (e.g., Kalia & Bhardwaj, 2019). There is also evidence for an effect of pay level on financial stress (e.g., Siravajah et al., 2014) as well as financial stress on task performance (e.g., Akter & Rahman, 2012). Since there appear to be connections between the individual variables, and as the job demands–resources model also points to a mediation effect, the second hypothesis is as follows:

H2: The relationship between pay level and task performance is mediated by financial stress.

## **Pay Level, Intrinsic Motivation, and Task Performance**

The job demands-resources model does not assume a direct connection between job demands and motivation (e.g., Bakker & Demerouti, 2018). However, some of the arguments used to support the connection between job resources and motivation can be used to support a connection between job demands and motivation as well. The authors of the model themselves (e.g., Bakker et al., 2010) draw on self-determination theory (e.g., Ryan & Deci, 2000). Based on this as well as arguments from previous studies, the connection may be elaborated as follows. Kuvaas (2006) argued that pay level can serve as a reward that communicates to the employee something about their competence and has the potential to fulfill their need for autonomy. In turn, the fulfillment of competence and autonomy can increase the employee's intrinsic motivation (Ryan & Deci, 2000; Kuvaas, 2006). A high pay level signals to the individual trust that

they will continue to perform well, which increases their perception of autonomy and competence (Gagné & Deci, 2005; Kuvaas, 2006). Their increased motivation can then have a positive effect on their performance, which is consistent with the job demands–resources model (Bakker & Demerouti, 2007).

Following this path, the pay level (as a job demand) may have a negative effect on the motivation of an individual. Cerasoli et al. (2014) showed that intrinsic motivation is more important for performance when payment is only indirectly tied to performance. Since the subject of this research is the absolute pay level (as opposed to P4P), intrinsic motivation will be investigated here. It is assumed that a low pay level decreases the intrinsic motivation of an employee, which in turn decreases the employee's performance.

Support for the mediating effect of intrinsic motivation on the relationship between pay level and work performance can be found in the study of Kuvaas (2006). Task performance as a component of work performance could therefore be subject to the same mechanism. Furthermore, Kuvaas (2006) highlighted the link between pay level and intrinsic motivation, whereas Zapata-Phelan et al. (2009) found evidence for the specific connection between intrinsic motivation and task performance. As all the individual connections between the variables have been established, and as the job demands–resources model points to the presence of a mediating effect of motivation on the relationship between job resources and outcomes, the third hypothesis is as follows:

H3: The relationship between pay level and task performance is mediated by intrinsic motivation.

### **Serial Mediation of Financial Stress and Motivation on the Relationship between Pay Level and Task Performance**

Earlier versions of the job demands–resources model did not suggest a direct relationship between strain and motivation (e.g., Bakker & Demerouti, 2007). However, more recent versions of the model have included a negative effect of strain on motivation (e.g., Bakker & Demerouti, 2018). The model was extended to respond to criticism about its one-sidedness (Bakker & Demerouti, 2014). It can therefore be argued that both strain and motivation together affect the relationship between job demands and outcomes. Therefore, the relationship between pay level and task performance may not only be affected by financial stress and intrinsic motivation individually but also by both variables together. Following this line of thought, pay level has an

effect on financial stress, as outlined above. Financial stress in turn has an effect on intrinsic motivation. Finally, intrinsic motivation affects task performance. The fact that stress related to work issues can have a negative impact on intrinsic motivation, has been previously shown (e.g., Barney & Elias, 2010). While this notion has not yet been applied to financial stress specifically, it stands to reason that any kind of stress might have a negative impact on intrinsic motivation. In arguing for this connection, Bakker et al. (2008) draw on the conservation of resources theory (Hobfoll, 1989), claiming that when people experience stress, they will try to protect themselves from further losses (Bakker et al., 2008). This leads to a certain cynicism towards one's work and detaching oneself from the job, thus experiencing a lack of motivation (Bakker et al., 2008). Since all other connections have been established, and as the job demands–resources model also shows a direct relationship between strain and motivation (Bakker & Demerouti, 2018), the fourth hypothesis is as follows:

H4: The relationship between pay level and task performance is serially mediated by financial stress and intrinsic motivation.

The complete model can be seen in Figure 1.

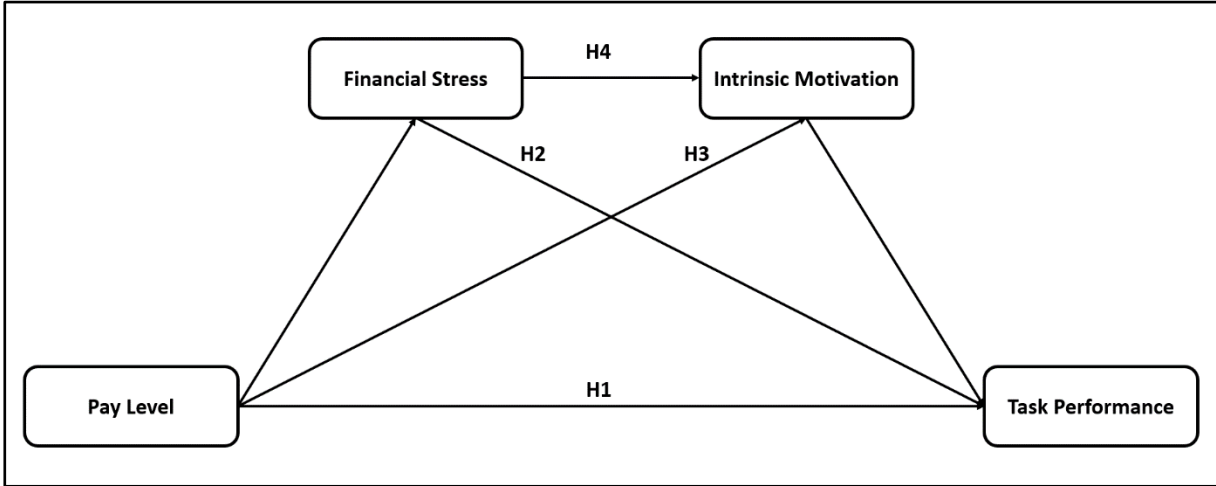


Figure 1. Conceptual model.

## Methods

### Participants

A total of 276 participants were recruited through the online platform Prolific. Inclusion criteria for the study were British nationality, fluency in English, and active employment status. After data collection, 10 participants were excluded from the sample because their performance showed a clear lack of understanding of the experimental task, and they represented severe outliers on the performance variable. Thus, the final sample included 266 participants (male = 133,  $M_{\text{age}} = 39.05$  years).

### Procedure

Once the participants consented to being part of the study, the experiment began. First, the participants were randomly assigned to one of two pay level conditions (low/high). Then, they received information about the household task, namely, the number of rounds and the structure of each round. Afterwards, the participants played the household task. In this task, participants managed the finances of a household over six rounds, each round representing one week. Every round, the participants had to perform a work task, consisting of adjusting 15 sliders to a number indicated on the left of each slider. Each correctly adjusted slider earned them a small bonus to their salary.<sup>1</sup> This salary was added to a running balance.

Afterwards, the participants had to pay their expenses. These expenses were chosen to be things that the participants were familiar with from their daily life, such as rent, groceries, or restaurant bills. These expenses were subtracted from their updated balance. The real-life payment at the end of the experiment was partially based on the ending balance the participants obtained in the household task.

After playing a practice round of the household task, the participants were asked to indicate their enjoyment of the work task.<sup>2</sup> Afterwards, the six rounds of the game were played. After

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<sup>1</sup> This form of incentivized salary was chosen to prevent the participants from not performing the task altogether, a problem that had been discovered during the pretest. While this does deviate from the regular pay structure most employees experience, this step was necessary to ensure the usability of the results. In a real-world setting, employees are generally discouraged from lack of performance by a fear of repercussions. Since this was not a concern in the experiment, a compromise had to be made. However, the amount of variable salary was so small that the manipulation was still largely driven by the fixed base salary.

<sup>2</sup> The fact that the task can induce enjoyment was established through the pretest. Here, the participants clearly expressed their enjoyment of the task in the form of free-text comments.

the six rounds were completed, the participants were again asked to indicate their enjoyment of the work task and were also asked to rate their financial stress. Then, the participants filled out demographics and were debriefed. Payment was dispensed once all responses had been collected.

## **Measures**

### ***Pay Level***

Pay level was manipulated following Hilbert et al. (2022) based on the amount of fixed payment that the participants received during the experiment. In the low pay level condition, the fixed payment was always lower than the expenses that had to be paid. Even with the variable payment for the correct responses during the work task, the participants accumulated debt consistently. In the high pay level condition, the opposite was the case. The fixed payment was always higher than the expenses, and the participants accumulated savings, even if they did not have any additional payment from correct responses.

### ***Financial Stress***

Financial stress was measured with the seven-item questionnaire used by Hilbert et al. (2022) in their original pretest. A sample item was “During the household task, I felt like I had no control over my financial situation.” The participants indicated their agreement or disagreement on a five-point Likert scale ranging from “totally disagree” to “totally agree.” Cronbach’s alpha for this scale was 0.917, indicating adequate reliability.

### ***Intrinsic Motivation***

Intrinsic motivation was measured using the seven-item Interest/Enjoyment subscale of the Intrinsic Motivation Inventory (Ryan, 1982). A sample item was “This activity was fun to do.” The participants indicated their agreement or disagreement on a seven-point Likert scale ranging from “totally disagree” to “totally agree.” Cronbach’s alpha for this scale was  $\alpha = 0.925$ .

### ***Task Performance***

Task Performance was measured by calculating the number of correctly adjusted sliders for each round of the household task and adding the scores across rounds.

## ***Demographics***

Age (continuous scale), gender (0 = male, 1 = female), and annual income (continuous scale) were collected and used as control variables.

## **Analytical Approach**

To test the hypotheses, a series of regression analyses were performed. First, the direct relationship between salary level and task performance was tested using a simple linear regression analysis. In this analysis, pay level was used as a dummy variable. Afterwards, the mediation hypotheses was tested using the PROCESS plugin for SPSS. The two simple mediation effect were tested separately from the serial mediation.

## Results

### Analysis of Measurement Instruments

First, an analysis of the measurement instruments for intrinsic motivation and financial stress was conducted. Task performance was calculated based on the actual performance during the household task and thus could not be subjected to the analysis. The experimental condition was similarly excluded from the analysis of the measurement instruments. The reliability for both instruments was good. As mentioned above, the Cronbach's alpha for intrinsic motivation was 0.939 for the measurement before the household task and 0.925 for the measurement after. Financial stress had a Cronbach's alpha of 0.917. Furthermore, average variance extracted (AVE) was satisfactory for both constructs as well, with an AVE of 0.713 (before) and 0.699 (after) for internal motivation and an AVE of 0.639 for financial stress.

Testing of the goodness of fit indices of both scales revealed mixed results. Comparative fit index (CFI), Tucker-Lewis index (TLI), and the standard root mean residual (SRMR) were satisfactory for intrinsic motivation before the household task (CFI = 0.949, TLI = 0.924, SRMR = 0.045). However, the root mean square error of approximation (RMSEA) indicated a poor fit of the data at 0.150 and Chi-square adjusted for the degrees of freedom ( $\chi^2/df$ ) was at 6.95. Kenny et al. (2015) pointed out that RMSEA can indicate a poor fit with a combination of lower sample sizes and low degrees of freedom. With the sample size over 200 in the present study, this is less likely. Because the other values were satisfactory, with all items having good item loadings above 0.4, and the measurement instrument having long been established in research, the measurement was retained in its totality and used for further analysis. However, this should be considered with regard to the limitations of this research.

For intrinsic motivation after the household task, a similar picture emerged. The CFI, TLI and SRMR values were satisfactory (0.934, 0.900, and 0.079, respectively). But again, RMSEA (0.176) indicated a poor fit of the data, and  $\chi^2/df$  was 9.24. Due to similar considerations as laid out above, the scale was still retained and used for analysis. However, this should be considered regarding study limitations.

Finally, financial stress was evaluated. CFI was satisfactory (0.942), as was TLI (0.913). SRMR was good (0.027). The RMSEA (0.165) indicated a poor model fit, and the  $\chi^2/df$  was 8.23. Again, due to the considerations outlined above, the scale was retained in its totality and used for further analysis. Again, this should be considered in terms of study limitations.



## Descriptive Statistics and Correlations

Descriptive statistics are presented in Table 1. The overall task performance across both experimental groups in the whole sample was 46.67 correctly adjusted sliders out of 90 possible sliders. On average, half of all sliders were adjusted correctly. The average financial stress (across both groups) was 4.10 out of 7 over the whole sample. There was an above-average level of financial stress reported. Mean intrinsic motivation before the household task was 4.30 out of 7 for the entire sample. After the completion of the household task, mean intrinsic motivation was 4.29 across both experimental groups. Thus, intrinsic motivation was above average before as well as after the completion of the household task.

*Table 1. Descriptive Statistics*

	Task performance			Financial Stress			Motivation (before)			Motivation (after)		
	LP	HP	All	LP	HP	All	LP	HP	All	LP	HP	All
<b>Mean</b>	45.80	47.56	46.67	5.07	3.09	4.09	4.34	4.23	4.29	3.89	4.71	4.29
<b>Std.</b>	12.24	11.92	12.09	.64	.67	1.19	1.34	1.34	1.34	1.36	1.41	1.44
<b>N</b>	135	131	266	135	131	266	135	131	266	135	131	266

LP = Low Pay Level, HP = High Pay Level

The correlations between all measured variables can be seen in Table 2. The independent variable pay level as well as the two mediating variables, financial stress and intrinsic motivation, were not significantly correlated with task performance. There was a significant correlation between pay level and both financial stress and intrinsic motivation as well as a significant correlation between financial stress and intrinsic motivation themselves. Age and gender were also significantly correlated with task performance. Although the sample was balanced for gender across groups, there was a significant correlation between pay level and gender.

Table 2. Correlations

	PL	FS	IM (before)	IM (after)	TP	Age	Gender	Income
PL	-							
FS	-.836**	-						
IM (before)	-.032	.003	-					
IM (after)	.283**	-.290**	.774**	-				
TP	.073	-.047	.014	.076	-			
Age	-.113	.016	.039	.033	-.262**	-		
Gender	.146*	.113	.121*	-.082	-.168**	-.045	-	
Income	-.010	-.052	.075	.086	.011	.130*	.002	-

PL = Pay Level, FS = Financial Stress, IM = Intrinsic Motivation, TP = Task Performance

\*Correlation is significant at the 0.05 (two-tailed) level

\*\*Correlation is significant at the 0.01 (two-tailed) level

## Hypothesis Testing

After checking assumptions regarding the execution of the regression analyses, a series of regression analyses was performed. In every regression, gender, age, annual income, and the intrinsic motivation before the household task were included as control variables. The first hypothesis stated that pay level would have a direct effect on task performance. The results showed that there was no effect of pay level on task performance ( $\beta = 0.086$ ,  $p = 0.152$ ) (see Table 3). This can also be seen when comparing the means of the overall task performance between the groups (see Table 1). In the low pay level condition, the number of correctly adjusted sliders over all rounds was 45.80 (out of 90), and in the high pay level condition the number of correctly adjusted sliders was 47.56 (out of 90). Thus, the first hypothesis was not supported. Interestingly, both gender ( $\beta = -0.198$ ,  $p < 0.001$ ) and age ( $\beta = -0.269$ ,  $p < 0.001$ ) significantly effected task performance. Female and older participants performed worse on the task.

Table 3. Regression Results for Pay Level on Task Performance

	<b>Beta<sup>a</sup></b>	<b>T</b>	<b>Sig.</b>	<b>R<sup>2</sup> adj.</b>
<b>Age</b>	-.269	-4.482	<.001	
<b>Gender</b>	-.198	-3.297	.001	
<b>Income</b>	.050	.836	.404	
<b>Motivation (before)</b>	.026	.435	.664	
<b>Pay Level</b>	.086	1.435	.152	
				.095

<sup>a</sup> Dependent Variable: Task Performance

The second hypothesis proposed that financial stress would mediate the relationship between pay level and task performance. There was a significant effect of pay level on financial stress ( $\beta = -1.70$ ,  $p < 0.001$ ) (see Table 4). Financial stress was higher in the low pay level condition ( $M = 5.07$ ) than in the high pay level condition ( $M = 3.09$ ) (see Table 1). However, there was no significant effect of financial stress on task performance ( $\beta = 0.001$ ,  $p = 0.994$ ), nor was there a significant mediating effect ( $\beta = -0.0015$ , 95% CI [-0.393;0.379]) (see Table 6). Thus, the second hypothesis was not supported.

Table 4. Regression Results for Financial Stress and Task Performance

	<b>Beta<sup>a</sup></b>	<b>T</b>	<b>Sig.</b>	<b>R<sup>2</sup> adj.</b>	<b>Beta<sup>b</sup></b>	<b>T</b>	<b>Sig.</b>	<b>R<sup>2</sup> adj.</b>
<b>Age</b>	-.072	-2.122	.035		-.269	-4.433	<.001	
<b>Gender</b>	.037	1.070	.286		-.198	-3.283	.001	
<b>Income</b>	-.043	-1.251	.212		.050	.833	.406	
<b>Motivation before</b>	-.027	-.806	.421		.026	.434	.664	
<b>Pay Level</b>	-1.704	-24.982	<.001		.174	.777	.438	
<b>Financial Stress</b>					.001	.008	.994	
				.733				.092

<sup>a</sup> Dependent Variable: Financial Stress; <sup>b</sup> Dependent Variable: Task Performance

The third hypothesis stated that there would be a mediating effect of intrinsic motivation on the relationship between pay level and task performance. Again, there was a significant effect of pay level on intrinsic motivation ( $\beta = 0.624$ ,  $p < 0.001$ ) (see Table 5). As shown in Table 1, intrinsic motivation after the household task was higher in the high pay level condition ( $M = 4.71$ ) than in the low pay level condition ( $M = 3.88$ ). Before the household task, intrinsic motivation was almost equal between the groups ( $M_{\text{low}} = 4.33$ ,  $M_{\text{high}} = 4.25$ ). However, there was no significant effect of intrinsic motivation on task performance ( $\beta = 0.158$ ,  $p = 0.140$ ). Additionally, there was no significant mediating effect ( $\beta = 0.099$ , 95% CI =  $[-0.035; 0.246]$ ) (see Table 6). Thus, the third hypothesis could not be supported.

*Table 5. Regression Results for Intrinsic Motivation and Task Performance*

	<b>Beta<sup>a</sup></b>	<b>T</b>	<b>Sig.</b>	<b>R<sup>2</sup> adj.</b>	<b>Beta<sup>b</sup></b>	<b>T</b>	<b>Sig.</b>	<b>R<sup>2</sup> adj.</b>
<b>Age</b>	.037	1.050	.295		-.275	-4.580	<.001	
<b>Gender</b>	-.007	-.186	.853		-.198	-3.287	.001	
<b>Income</b>	.005	.142	.887		.049	.825	.410	
<b>Motivation before</b>	.774	22.067	<.001		.026	.346	.346	
<b>Pay Level</b>	.624	8.854	<.001		.074	.539	.590	
<b>Motivation after</b>					.158	1.480	.140	
				.688				.099

<sup>a</sup> Dependent Variable: Intrinsic Motivation (after); <sup>b</sup> Dependent Variable: Task Performance

The fourth and final hypothesis stated that the relationship between pay level and task performance would be serially mediated by financial stress and intrinsic motivation. Apart from the unchanged significant relationship between pay level and financial stress as well as the unchanged insignificant relationship between intrinsic motivation and task performance, the relationship between financial stress and intrinsic motivation was not significant ( $\beta = -0.110$ ,  $p = 0.089$ ). Furthermore, the serial mediation effect of financial stress and intrinsic motivation on the relationship between pay level and task performance was not significant either ( $\beta = 0.030$ , 95% CI =  $[-0.012; 0.109]$ ) (see Table 6). Thus, the fourth hypothesis could also not be supported.

Table 6. Indirect Effects Results

	Effect	Boot SE	Boot LLCI	Boot ULCI
PL → FS → TP	-.032	.198	-.428	.357
PL → IM → TP	.070	.052	-.021	.185
PL → FS → IM → TP	.030	.032	-.0115	.109

PL = Pay Level, FS = Financial Stress, IM = Intrinsic Motivation, TP = Task Performance

### Supplementary Analyses

To further explore the data, additional exploratory analyses were performed. First, in order to explore whether there were performance differences between the groups over the six rounds separately, a repeated measures analysis of variance (ANOVA) with Greenhouse–Geisser correction was conducted with task performance as the within-subject factor and pay level as the between-subject factor. The within-subject factor task performance was significantly different between the different rounds ( $F(4.19, 1108.14) = 38.79, p < 0.001, \text{partial } \eta^2 = 0.124$ ). There was no significant effect of between-subjects factor pay level ( $F(1, 264) = 1.41, p < 0.237, \text{partial } \eta^2 = 0.005$ ). There was also no significant interaction between pay level and task performance over time ( $F(4.19, 1108.14) = 2.93, p = 0.382, \text{partial } \eta^2 = 0.004$ ).

To determine where the significant differences between task performance measures lay, a Bonferroni-adjusted post hoc analysis was conducted, which showed that there was (among others) a significant ( $p < 0.001$ ) difference in performance between rounds 1 and 2 ( $M_{\text{diff}} = -1.395, 95\% \text{ CI } [-1.746; -1.043]$ ), a significant ( $p < 0.001$ ) difference between performance in rounds 2 and 3 ( $M_{\text{diff}} = -1.410, 95\% \text{ CI } [0.911; 1.910]$ ), and a significant ( $p = 0.002$ ) difference between performance in rounds 5 and 6 ( $M_{\text{diff}} = -0.433, 95\% \text{ CI } [0.105; 0.762]$ ). Other performance comparisons across rounds can be seen in Table 7.

Table 7. Pairwise Comparisons Between Performance Over Rounds

(I) Performance		M(diff) (I-J)	Std. Error	Sig. <sup>b</sup>	95% confidence interval for dif- ference	
					Lower Bound	Upper Bound
<b>Round 1</b>	Round 2	-1.395*	.118	<0.001	-1.746	-1.043
	Round 3	.016	.144	1	-.409	.441
	Round 4	-.150	.109	1	-.474	.173
	Round 5	-.180	.117	1	-.527	.167
	Round 6	.253	.122	0.577	-.107	.613
<b>Round 2</b>	Round 1	1.395*	.119	<0.001	1.043	1.746
	Round 3	1.410*	.169	<0.001	.911	1.910
	Round 4	1.244*	.149	<0.001	.802	1.686
	Round 5	1.215*	.150	<0.001	.771	1.658
	Round 6	1.648*	.140	<0.001	1.234	2.062
<b>Round 3</b>	Round 1	-.016	.144	1	-.441	.410
	Round 2	-1.410*	.169	<0.001	-1.910	-.911
	Round 4	-.166	.140	1	-.580	.248
	Round 5	-.196	.147	1	-.631	.239
	Round 6	.237	.136	1	-.164	.639
<b>Round 4</b>	Round 1	.150	.109	1	-.173	.474
	Round 2	-1.244*	.149	<0.001	-1.686	-.802
	Round 3	.166	.140	1	-.248	.580
	Round 5	-.030	.112	1	-.363	.303
	Round 6	.403*	.112	0.006	.072	.735
<b>Round 5</b>	Round 1	.180	.117	1	-.167	.527
	Round 2	-1.215*	.150	<0.001	-1.658	-.771
	Round 3	.196	.147	1	-.239	.631
	Round 4	.030	.112	1	-.303	.363
	Round 6	.433*	.111	0.002	.105	.762
<b>Round 6</b>	Round 1	-.253	.122	0.577	-.613	.107
	Round 2	-1.648*	.140	<0.001	-2.062	-1.234
	Round 3	-.237	.136	1	-.639	.164
	Round 4	-.403*	.112	0.006	-.735	-.072
	Round 5	-.433*	.111	0.002	-.762	-.105

\*. Mean (diff) is significant at the 0.05 level

b. Adjustment: Bonferroni.

The differences in task performance across rounds were inconsistent. In round 2, task performance improved compared to round 1, but it declined afterwards and stayed on a fairly consistent level in rounds 3, 4, and 5. In round 6, task performance decreased again.

To explore whether there might be a possible mediating effect of financial stress on the relationship between pay level and intrinsic motivation, a linear regression analysis was conducted, with age, gender, income, and motivation before the household task included as control variables. The results showed that there was no significant mediation effect ( $\beta = -0.06$ , 95% CI [-0.146;0.008]).

## Discussion

After completion of the analysis, the results will now be discussed. Unfortunately, none of the hypotheses could be confirmed. This study set out to explore the effect of pay level on task performance as well as the mediating effect of financial stress and intrinsic motivation on this relationship. While there was a significant effect of pay level on both financial stress and intrinsic motivation, there was absolutely no effect of pay level on task performance, and there were also no mediating effects. There are a few potential reasons for these results.

While social exchange theory and previous empirical findings (e.g., Kalia & Bhardwaj, 2019) suggest that there should be a relationship between pay level and task performance, no such relationship was found in the present study. This might be due to the nature of the household task. In the original household task, the participants had to type various strings of letters and numbers backwards (see e.g., Hilbert et al, 2022). Because this task was dependent on the participants' typing speed and could therefore have created unwanted variance, the task was changed for this study. In order to generate income, the participants had to adjust several sliders to specific numbers. The slider task has previously been established as a functional real-effort task (Gill & Prowse, 2013). However, the specific execution of the slider task can vary. During a pretest for this study, with a sample of 42 participants, the slider task consisted of adjusting all the sliders to the same number. However, this proved to be too easy, and the performance was very high, with no significant effects between the groups. The adjusted slider task used in this study might have been too difficult, with at least ten participants failing to understand the task and the rest achieving a mean performance of about half of all sliders being adjusted correctly. Additionally, age seemed to strongly affect task performance, as presumably older participants were slower and therefore adjusted fewer sliders. Female participants also performed worse on the task. This could be due to an unintentional priming of stereotype threat. The introduction to the study described the experiment as being about financial decision-making. Previous research has shown that women perform worse on financial tasks when primed with negative stereotypes about women's lack of financial ability (e.g., Carr & Steele, 2010). Obviously, financial decision-making was not actually required for this study, but the mere mention could have primed female participants to perform worse on the task altogether. This could have biased the results and overridden the intended manipulation of pay level.

Generally, the participants did not exhibit consistent performance throughout the household task. Performance went up after the first round, possibly because the participants were trying



to figure out how strongly they would be able to influence their income. After round 2, and presumably after realizing that the actual performance on the slider task did not affect their income that much, their performance fell and stayed fairly consistent for rounds 3, 4, and 5. In the last round, performance dwindled further, possibly because the participants had given up by that point. Taken together, the potentially too-high difficulty of the slider task along with the unanticipatedly strong effect of gender and age on performance could explain the lack of significant findings regarding the relationship between pay level and task performance.

The second hypothesis postulated a mediating effect of financial stress on the relationship between pay level and task performance. Pay level did have a significant effect on financial stress. It seems that experiencing the dwindling of their finances and the resulting accumulation of debt led to financial stress for the participants in the low pay level condition. This is in alignment with previous research (e.g., Siravajah et al., 2014), which also found an effect of pay level on financial stress. It is also consistent with the job demands–resources model (e.g., Bakker & Demerouti, 2018), which shows a negative effect of job demands (e.g., low pay level) on strain variables (e.g., financial stress). However, contrary to the job demands–resources model (Bakker & Demerouti, 2018) and also contrary to some empirical findings (e.g., Akter & Rahman, 2012), there was no effect of financial stress on task performance found in the present study. There have been other studies that have not found an effect of financial stress on task performance (e.g., Dewi-Izzwi & Emenike, 2021). However, the authors did not explain this finding in their studies. Alternatively, instead of there being no relationship between financial stress and task performance, other factors might have led to the lack of significant findings in the current study. For example, it might be due to the previously mentioned effects of gender and age on task performance, which superseded all other potential effects. However, running the regressions without the control variables did not lead to significant results, although the *p*-values were closer to significance. Alternatively, the financial stress measurement’s less-than-optimal RMSEA and  $\chi^2/df$  score might have caused the results to be unreliable. However, the measure did have other satisfactory goodness of fit indices and has been used previously in conjunction with the household task (Hilbert et al., 2022), which was the reason it was retained in the first place. Another possibility is a combination of the overshadowing effects of the control variables and difficulties related to the real-effort task and the measurement instruments. Due to the lack of a direct effect of financial stress on task performance, there could not have been a mediation effect.

The third hypothesis suggested a mediating effect of intrinsic motivation on the relationship between pay level and task performance. A direct relationship between pay level and intrinsic motivation was found, as in the high pay level condition, intrinsic motivation was also higher. This finding is in line with the propositions outlined above, suggesting that job demands may also impact motivation due to a lack of satisfaction of psychological needs (e.g., Ryan & Deci, 2000; Gagné & Deci, 2005). Previous research also supports the impact of pay level on intrinsic motivation (e.g., Kuvaas, 2006). However, despite the proposed effect of intrinsic motivation on performance in the job demands–resources model (Bakker & Demerouti, 2018) as well as empirical findings to support this connection (e.g., Kuvaas, 2006), no such effect was found in the present study. The lack of relationship between intrinsic and task performance is likely due to the same mechanisms as outlined for financial stress and task performance, namely, the overshadowing effect of age and gender on performance, which “crowds out” any potential effect of intrinsic motivation, paired with the difficulties regarding the real-effort task. It could also be due to the high RMSEA and  $\chi^2/df$  value, making the measurement less reliable. As can be seen in Table 1, there was enough variance in the intrinsic motivation measure for a significant effect to have been found.

Finally, the fourth hypothesis proposed a potential serial mediation effect of financial stress and intrinsic motivation on the relationship between pay level and task performance. No mediating effect was found, which is unsurprising in light of the issues outlined above. However, there was also no effect of financial stress on intrinsic motivation. This is contrary to the proposition of the job demands–resources model (Bakker & Demerouti, 2018), which was extended to include a direct effect of strain on motivation. It is also inconsistent with previous research that indicated that stress related to work issues can have an effect on intrinsic motivation (e.g., Barney & Elias, 2010). The effect of financial stress on intrinsic motivation approached significance ( $\beta = -.110$ ,  $p = 0.089$ ), with a p-value below 0.10. It is possible that, despite being compensated for their participation, the participants did not answer the questions with sufficient concentration or interest. Possibly, with a slightly larger, or more focused sample, a significant direct effect might have been found as well as a mediation of the relationship between pay level and intrinsic motivation through financial stress. Of course, as stated above, this may also have been a measurement issue.

There might be one other reason for the lack of significant findings regarding pay level and task performance. It is possible that a low pay level does represent a job demand, but that a high pay level represents a job resource. According to the job demands–resources model, pay has been

historically categorized as a resource (e.g., Bakker & Demerouti, 2007). However, based on the arguments laid out above, while pay itself is value natural, low pay is valued negatively and is therefore a job demand in accordance with the definition of Schaufeli and Taris (2014). Using the same argument, high pay could thus be a job resource, as it is valued positively (Schaufeli & Taris, 2014). It is therefore possible that pay level in the binary form used here actually constitutes separate variables. In that case, it would make sense to not find significant effects on task performance. However, there were some significant effects of pay level on financial stress and intrinsic motivation, which would not be expected if pay level was indeed actually two variables. This might be an interesting avenue for future research.

Despite the largely nonsignificant findings of this study, it seems unlikely that there are actually no relationships between pay level and task performance or mediation effects of intrinsic motivation and financial stress. Both models like the job demands–resources model and theories like social-exchange theory suggest that there should be a connection. Furthermore, some empirical evidence already exists to suggest that a connection should be present. Therefore, it seems likely that methodological issues may have obscured the relationships between the variables in this study.

## Limitations

While most of the results of the present study were nonsignificant, this research still has some limitations that need to be considered. First, the generalizability of the sample needs to be mentioned. The study involved employed British participants who were signed up on the platform Prolific. This could have led to a certain selectivity of participants that makes the results regarding the effects of pay level on financial stress and intrinsic motivation less generally applicable. Since participants sign up to the platform with the explicit purpose of participating in studies, this might skew the results. In other words, the participants might have had higher intrinsic motivation to begin with.

Furthermore, it is possible that the task was simply too difficult for the participants, which is why no effects could be found. Other effects that were not dependent on the task (e.g., financial stress and intrinsic motivation) were influenced by the manipulation of pay level. Hence, the most prudent approach for the future would be to keep refining the task to an optimal level of difficulty. The lack of findings related to task performance does not invalidate the rest of the findings.

The third aspect to consider is the simplification inherent in all experiments. Obviously, there are many factors at play that might influence an employee's performance besides their pay level, financial stress, and intrinsic motivation. An employee might maintain their performance due to their supervisor's leadership style (e.g., Lee et al., 2017) or because they feel attached to the organization (e.g., Al Zefeiti & Mohamad, 2017). That, on the other hand, is the strength of experiments that allow for the isolation of specific effects. Even though this study simplifies reality, it still offers insights on the effects of pay level on financial stress and intrinsic motivation. The findings can be explored further in more realistic settings.

Additionally, the experiment could not wholly rely on manipulation of the base pay level. The pretest showed that when participants had no influence on their pay at all, they simply stopped performing the task altogether. Since that would have made any results completely unusable, a compromise had to be found. Here, a small amount of pay was dependent on performance, just enough to give the participants some illusion of control. Since the vast majority of pay was still set by the base pay level, the effects that were found are still applicable to this area of research. As illustrated by the significant findings regarding the effect of pay level on financial stress and intrinsic motivation, the intended manipulation (to create the feeling of being paid a low or high salary) clearly worked as planned.

Finally, the poor RMSEA and  $\chi^2/df$  values should be considered when viewing the results of this study. The decision was made to retain the measurement instruments because all other fit indices were satisfactory, and the scales were well established. The subscale of the intrinsic motivation inventory (Ryan, 1982) has long been used in all kinds of research. The scale chosen for financial stress has also been used specifically in connection with the household task (e.g., Hilbert et al., 2022). Nevertheless, the fact that the RMSEA and  $\chi^2/df$  values were unsatisfactory should not go unmentioned here.

## Contributions

While none of the hypotheses were supported, and despite the limitations listed above, this study still makes some important contributions. First, it contributes to the research on pay level by showing that pay level can have a direct impact on financial stress and intrinsic motivation. This is important for organizations, as both have been shown to negatively affect organizational outcomes, even though that could not be shown in the present study. Furthermore, it strengthens the suggestion that job demands like a low pay level can have a direct effect not only on strain variables like financial stress but also on motivational variables. Although this relationship is not included in the job demands–resources model (e.g., Bakker & Demerouti, 2018), it appears to exist.

Second, this study highlights additional uses of the household task outside of scarcity research, for which it was originally developed (e.g., Hilbert et al, 2022). It links the task, for the first time, to intrinsic motivation. It also serves as a lesson of what to consider with this application in future research by shining a light on some of the problems that occur when transferring the household task to a different area of research. The insights gained from this study can be used to prevent future research from encountering the same issues. Clearly, careful consideration must be given to the effort task that is utilized in this kind of experiment. If it is too easy, ceiling effects can occur like the ones seen in the pretest. If the task is too difficult, as seems to have been the case here, performance will not differ significantly between the experimental groups. It is possible that clearer instructions could have prevented this (e.g., explicitly stating that the number a slider must be adjusted to will differ and is not the same for all sliders). Furthermore, due to the observed effects of gender on performance, the framing of the household task as a study about financial decision-making should be reconsidered. It is possible that this might have resulted in some stereotype threat, which can be avoided by framing the task differently.

Finally, this study opens up avenues for further research by laying the groundwork for a connection between pay level, financial stress, intrinsic motivation, and task performance. New studies could build on this foundation to continue exploring this connection and hopefully find relationships between the variables that this study could not find.

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