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RESEARCH REPORT

Working hard for money decreases risk tolerance

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Abstract

This research examines how the *effort* that consumers exert to earn money affects their risk tolerance. We theorize and find that working harder—that is, more effortful earning—increases perceived ownership and valuation of earnings, and thus aversion to losing them, resulting in lower risk tolerance, even when risk is associated with better expected outcomes. Documenting this causal negative effort–risk relationship is important because it (1) runs contrary to consumers' lay beliefs and population-level analysis which conversely suggest a positive effort–risk correlation (i.e., a Simpson's paradox, Experiment 2), (2) expands understanding of how the way in which people acquire money affects risk tolerance beyond classic research on windfall gains (i.e., unanticipated rewards) and house money (i.e., unrealized gains), and hence (3) reveals a unique mechanism of perceived ownership that drives this negative causal relationship. Leveraging this unique mechanism, we further show that this negative effort–risk relationship can be attenuated by changing the *currency* of the money that consumers earn to be one that consumers have low ownership over (e.g., Bitcoin for non-crypto users).

KEYWORDS

earning, effort, psychological ownership, risk taking, valuation

INTRODUCTION

Decades of research in psychology, economics, and behavioral science has identified various factors that drive how, when, and why consumers risk their money. A few key drivers include magnitudes of potential gains and losses (Kahneman & Tversky, 1979), affective reactions to potential gains (Rottenstreich & Hsee, 2001), and connotations of financial accounts (e.g., consumers seek more risk in trading accounts than IRAs; Zhou & Pham, 2004). Noticeably missing from this literature, however, is an understanding of how the *effort* that consumers exert to earn affects their risk tolerance. We draw from research on psychological ownership, valuation, and loss aversion to theorize that working harder—that is, more effortful earning—increases perceived ownership and valuation of earnings, and thus aversion to losing them, resulting in *lower* risk tolerance.

This prediction, if true, runs contrary to both consumers' lay beliefs and correlational, population-level analysis which conversely suggest that the relationship between effortful earning and risk tolerance is positive (i.e., a *Simpson's paradox*; Simpson, 1951), as people who tend to work hard for money also tend to have higher incomes, be more financially literate, and thus be more comfortable taking on prudent risk (Fenton-O'Creevy & Furnham, 2020; Mankiw & Zeldes, 1991; Van Rooij et al., 2011). To assess the true *causal* relationship between consumers' effort exertion and risk tolerance, we develop a unique experimental paradigm that controls for confounding factors. Our experiments leverage risk-taking contexts where riskier options often have greater expected returns (e.g., choosing between investments; Ameritrade, 2020), demonstrating that this effect can lead to suboptimal outcomes (e.g., lower compensation when completing our experiments on average).

The causal relationship between effortful earning and risk tolerance

Recent research shows that consumers can perceive a sense of ownership over *their money* just like they do

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with physical goods (De La Rosa et al., 2021; Shu, 2018). Psychological ownership over money is affected by money's modality (Zhou et al., 2022) and framing (Sharma et al., 2021). Although an effort–ownership relationship has not been tested for money, a positive effort–ownership relationship has been documented for *objects* and *ideas* (Peck & Luangrath, 2023; Pierce et al., 2003). We posit that this relationship extends to money even though money is a medium that has no value in and of itself and exists only to trade for goods (Hsee et al., 2003). That is, even though how hard one works to earn money does not affect the actual ownership or value of that money, we expect consumers to feel that the same $200 paycheck is more "theirs" if it comes from more effortful earning.

We further posit that greater effort and thus higher perceived ownership increases money's perceived value. There exists substantial evidence for the endowment effect, which describes how ownership increases perceived value (Dommer & Swaminathan, 2013; Kahneman et al., 1990; Morewedge et al., 2009), and recent research finds that consumers perceive their own money as more valuable than others' money (Polman et al., 2018). Keeping the amount and the *actual* ownership of money constant, we predict that when consumers work harder to earn, they will value their earnings more because they perceive them as more "theirs."

Finally, building on research documenting that increases in an item's value can correspondingly increase aversion to losing it (Kahneman & Tversky, 1979), we hypothesize that this effort–ownership–valuation relationship will affect consumers' subsequent treatment of earnings—specifically, the risks they take. In short, we predict that working hard to earn increases psychological ownership and valuation of earnings, leading to greater loss aversion and thus lower risk tolerance, even when that risk is associated with higher expected value.

A novel illustration of Simpson's paradox

If our theorizing is true, this pattern would be a novel illustration of Simpson's paradox, a statistical phenomenon where a relationship between two variables exists at the population level but disappears or reverses when the data are examined more granularly at a person or subpopulation level (Simpson, 1951). Documenting instances of Simpson's paradox is not only important for theory building, but also for practice as conclusions based on population-level correlations can lead to ineffective interventions.

One classic example of Simpson's paradox involves typing speed, accuracy, and experience (Hamaker, 2012). A manager might notice a positive association between employees' typing speed and their accuracy. However, intuitively, implementing an intervention encouraging employees to type faster to improve their accuracy would backfire. This is because at the population level, an unobserved individual difference—typing experience—confounds the relationship between typing speed and accuracy. While employees who type faster are more accurate, each individual employee becomes *less* accurate when they type faster.

Analogously, we propose that a Simpson's paradox exists for the relationship between effortful earning and risk tolerance. In a Pilot Study, we asked 152 participants (MDA-P) to think about someone who "works hard to earn"—relative to someone who "does not work hard to earn." People intuited that individuals who work *harder* to earn would be *more* likely to invest, would invest *more*, and would invest *more frequently*, $ts > 8.11$, $ps < 0.001$. One possible unobserved variable here (among many) is that those who work harder to earn tend to seem more financially savvy, and thus more open to prudent financial risks. While on the aggregate, people who work harder might be more risk tolerant, we propose a negative *causal* effect of effortful earning on risk tolerance, such that *each* individual will become *less* risk tolerant when they work harder for their money. We test for this Simpson's paradox in Experiment 2.

Theoretical contribution

Our research contributes to multiple streams of literature. Most importantly, we enrich the literature on decision-making under risk and uncertainty. While there exists limited work on the effect of effortful earning on risk tolerance, some research hints that the causal effect can be *opposite* of what we predict. Specifically, effort can increase compensation expectations, sometimes leading to *greater* risk taking because consumers prefer larger, riskier rewards (vs. smaller, sure rewards) to achieve appropriate compensation for their effort when the small, sure rewards feel like underpayment (Kivetz, 2003). The most critical distinction between this research and our context is that Kivetz's mechanism of compensation expectation is prominent when rewards have not yet been received, whereas aversion to losing rewards (i.e., earnings) comes into play upon receiving them. In our paradigm, participants work, are paid, and then risk (or do not risk) their recent earnings, rendering the unique mechanisms of perceived ownership, valuation, and aversion to losing earnings more prominent.

More broadly, researchers have directed limited attention to how changing the *way* in which people acquire money affects risk tolerance. Research exploring this question focuses on windfall gains and the house money effect, and in neither case has effort been shown to play a role. Windfall gains, or gains that are definitionally *not anticipated*, are associated with increased risk tolerance. Although windfall gains are often obtained through zero effort, researchers have demonstrated that the key factor driving consumers to seek risk when spending/investing windfalls is their unanticipated nature (Arkes et al., 1994; Soman & Cheema, 2001). Relatedly, the house money effect describes how individuals are more risk-seeking when they have *unrealized* prior gains than when they do

not receive these gains or when these gains are *realized* (Corgnet et al., 2015; Thaler & Johnson, 1990). Realizing a gain means that the gain is transferred between accounts or individuals and it resets one's reference point (Imas, 2016), making risk-taking less appealing. Importantly, the house money effect makes no claims about how the effort exerted to gain equally realized money impacts risk tolerance.

Our work fills these important gaps, enriching prior literature by showing that the way in which consumers acquire anticipated and identically realized/received earnings can affect their risk tolerance.

Overview

Across four experiments and one supplemental study (three pre-registered) participants exerted different amounts of effort to earn money and subsequently made decisions involving risk. Each experiment employed a unique, incentive-aligned paradigm that controlled for confounding factors to assess the true causal relationship between effort and risk taking. Participants exerted effort to acquire money over three to six "periods" (i.e., months) within a microcosmic financial cycle. After each period, participants received an opportunity to risk their earnings. Earnings were always *anticipated* (i.e., consumers were informed about the compensation structure at the beginning) and *identically realized* (i.e., consumers were paid in the exact same way and time each pay period). Opportunities to risk earnings were framed as "investments" (Experiments 1–3 and Supplemental Study) or "gambles" (Experiment 4). For more information on the benefits of our experimental paradigm (e.g., how it provides evidence against alternative explanations and removes confounds), see MDA-O.

Our experiments documented converging evidence for the negative effort–risk causal relationship, despite the riskier options having greater expected returns. Experiments 3–4 showed that this effect was mediated by psychological ownership, valuation, and loss aversion. Experiment 4 and Supplemental Study tested theory-driven interventions that attenuate this effect. In all studies, we determined sample sizes before data collection and did not exclude any participants. See MDA and https://osf.io/d5awr for experimental materials and data.

EXPERIMENT 1: EFFORTFUL EARNING DECREASES RISK TOLERANCE

Method

One hundred participants (M_{age} = 37.7) completed Experiment 1. All participants earned $0.15 in each of six periods. In three random periods, participants were required to transcribe 10 lines of Dutch poetry to earn their payment (High Workload). In the remaining three random periods, participants were only required to transcribe two lines (Low Workload). This design mimics the pay structure for a data entry job where the actual workload may vary across pay periods while the pay remains fixed.

After completing the earnings task in each round, participants could take on risk by choosing to place their earnings in one of the five investments. These investments all had positive expected returns but varied in terms of risk and return (Figure 1), such that higher expected returns were associated with greater risk. Participants also had the option to not invest. We constructed the investments based on investment options available in the real world (e.g., 20 mutual funds were performing within one percentage point of the mean and standard deviation of Investment D as of November 3, 2020; Ameritrade, 2020). Participants' pay thus included their earnings in each period, plus gains (or minus losses) from their chosen investment's performance each period. See MDA-1 for procedural details.

Results

Consistent with our hypothesis, when participants had higher workloads (i.e., were required to transcribe more lines to earn), they took on less risk when investing

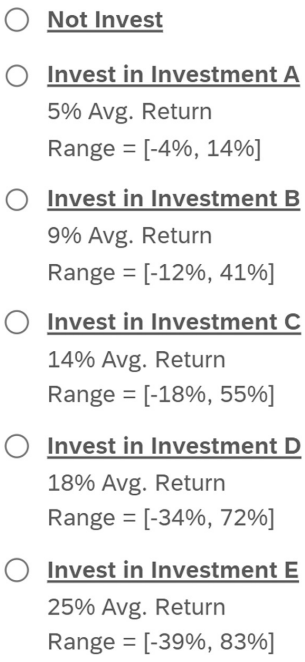

FIGURE 1 The options for what participants could do with their earnings from each period in Experiments 1–2 and Supplemental Study. These options were the same in Experiment 4 in terms of average return and range of outcomes, but were framed as "gambles" rather than "investments."

TABLE 1 Results for all experiments.

Experiment	Independent variable	Dependent variable	Variables included in the linear mixed-effects model	Effort–risk causal effect	Tests for interaction with workload	Other statistics
1	*Workload Manipulation*: Low Workload (two lines of Dutch Transcription) versus High Workload (10 lines of Dutch Transcription)	Investment Choice (see Figure 1 for investment options)	Workload, trial order, and participant-level intercepts as random effects	*Effort–Risk Causal Effect*: $b=-0.24$, $t=-2.82$, $p=0.005$ Participants chose investments with a 1.19% lower return rate on average when they experienced a High Workload period		
2	*Workload Manipulation*: Low Workload (2 lines of Dutch Transcription) versus High Workload (10 lines of Dutch Transcription)	Investment Choice (Figure 1)	Workload, Payment Structure, trial order, and participant-level intercepts as random effects	*Effort–Risk Causal Effect*: $b=-0.19$, $t=-4.01$, $p<0.001$ Participants chose investments with a 0.97% lower return rate on average when they experienced a High Workload period	No interaction between Workload and Payment Structure, $t=1.07$, $p=0.28$	No effect of Payment Structure, $t=1.15$, $p=0.25$
	Autonomous Effort Exertion: The number of lines participants accurately transcribed	Investment Choice (Figure 1)	Autonomous Effort, Payment Structure, trial order, and participant-level intercepts as random effects	*Autonomous Effort–Risk Causal Effect*: $b=-0.03$, $t=-2.93$, $p=0.003$ Transcribing a single additional line was associated with choosing an investment with an average of 0.13% lower return (Figure 2: Top Panel)	No interaction between Autonomous Effort and Payment Structure, $t=0.83$, $p=0.41$	No effect of Payment Structure, $t=1.44$, $p=0.15$
3	*Workload Manipulation*: Number of times pressing the 's' key (10, 200, and 400 button presses)	Investment Amount (i.e., how much of their earnings or savings participants chose to invest)	Workload, Effort Frame, Investment Risk, trial order, and participant-level intercepts as random effects	*Effort–Risk Causal Effect*: $b=-0.003$, $t=-6.74$, $p<0.001$ One hundred button presses corresponded to a decrease of 0.27 cents invested or 1.8% of participants' acquired money for each period. Whereas participants invested on average 9.0 (median = 10) of the 15 cents they acquired after pressing the 's' key 10 times, they only invested 8.3 (median = 8) cents after pressing it 200 times, and 7.9 (median = 7) cents after pressing it 400 times	No interaction between Workload and Effort Frame, $t=0.95$, $p=0.34$ No interaction between Workload and Investment Risk, $t=0.24$, $p=0.81$	Marginal effect of Effort Frame, $b=0.75$, $t=1.82$, $p=0.069$, such that participants invested more when effort was framed as earning Effect of Investment Risk, $b=1.68$, $t=13.38$, $p<0.001$, such that participants invested more when the investment was lower risk
4	*Workload Manipulation*: Low Workload for USD (10 button presses for USD) versus High Workload for USD (250 button presses for USD) versus High Workload for Bitcoin (250 button presses for Bitcoin)	Gamble Choice (Figure 1)	Workload, trial order, and participant-level intercepts as random effects	*Effort–Risk Causal Effect When Working Hard for USD*: $b=-0.17$, $t=-2.02$, $p=0.044$ Participants chose investments with a 0.83% lower return rate when they experienced a High (vs. Low) Workload for USD period *Effort–Risk Causal Effect When Working Hard for Bitcoin*: $t=1.00$, $p=0.32$		Effect of High Workload for USD versus High Workload for Bitcoin: $b=-0.25$, $t=-3.01$, $p=0.003$, such that participants chose less risky investments when they experienced a High Workload for USD period
Sup. Study	*Workload Manipulation*: Number of times pressing the 's' key (10, 75, 100, 200, 300, and 400 button presses)	Investment Choice (Figure 1)	Workload, Intervention, trial order, all two-way interactions, and participant-level intercepts as random effects	*Effort–Risk Causal Effect in Baseline Condition*: $b=-0.001$, $t=-3.55$, $p<0.001$ One hundred additional button presses corresponded to choosing an investment with an average of 0.38% lower return. This effect was attenuated in the Effort–to-Invest Intervention Condition: $t=-0.79$, $p=0.43$	*Workload × Intervention*: $b=0.001$, $t=1.96$, $p=0.050$	

their earnings, $b=-0.24$, $t=-2.82$, $p=0.005$. For ease of reference, Table 1 displays the models conducted, statistical results, and effect size for this and subsequent experiments.

EXPERIMENT 2: AUTONOMOUS EFFORT EXERTION DECREASES RISK TOLERANCE

In Experiment 1, participants were required to complete a prescribed amount of work each period to earn their payment. In many situations, however, individuals have some autonomy over the amount of effort they want to exert. For example, an employee who is paid an annual salary and expected to work 40-h weeks may work a few extra hours 1 week to impress their manager or slack off another week. Similarly, an employee who is paid via commission may choose to work harder in some months than others. In Experiment 2, we allowed individuals to choose how much effort to exert to test the robustness of the effort–risk relationship. We further increased generalizability by framing the earning as either salary or commission—two of the most common pay structures consumers are familiar with.

Method

Experiment 2 ($N=300$; $M_{age}=37.8$; https://aspredicted.org/4r2k8.pdf) had a similar design as Experiment 1 except for two key features. First, although participants encountered the same High Workload and Low Workload periods, participants were always permitted to choose how much effort they wanted to exert. That is, in a high [low] workload period, they could transcribe from 0 lines up to all 10 [2] lines. Second, participants were randomly assigned to one of two pay structures—Salary Pay or Commission Pay. In the Salary Pay condition, participants earned \$0.20 for each round (i.e., a fixed paycheck) regardless of how many lines they chose to transcribe. In the Commission Pay condition, participants earned \$0.04 for each accurate transcription, mimicking a performance-based commission structure. We chose these wage rates to equate the average total payment across pay structures; confirming expectations, payments were equivalent across structures, $t=0.34$, $p=0.73$. MDA-2 provides procedural details.

Results

We replicated the negative effort–risk relationship demonstrated in Experiment 1 across both Payment Structure conditions (causal effect: $b=-0.19$, $t=-4.01$, $p<0.001$; interaction: $t=1.07$, $p=0.28$; Table 1). Additionally, because participants could choose how much effort to exert in this experiment, we explored the degree to which *autonomous effort exerted* (i.e., the number of lines participants actually transcribed) was also negatively associated with risk tolerance: The more lines participants transcribed, the less risky investments participants chose, $b=-0.03$, $t=-2.93$, $p=0.003$ (Figure 2: Top Panel).

Importantly, the fact that participants could choose how much effort to exert in Experiment 2 created both within-participant and between-participant variance in effort exertion, permitting us to test if the relationship between effort and risk differs at the population level from the individual level (i.e., the presence of a Simpson's paradox). Indeed, at the population level (across both pay structures), there was a significant positive correlation between the average number of lines transcribed and risk tolerance, $b=0.22$, $t=2.97$, $p=0.003$ (Figure 2: Bottom Panel). Stated differently, participants who chose to do more work overall (across all six rounds) chose riskier investments on average compared with participants who exerted less effort overall. However, and importantly, at the within-participant level, greater exerted effort caused participants to take on less risk, such that *each* individual became *less* risk tolerant when they worked harder for their money.

Thus, our hypothesized causal effect of effort on risk is "hidden" at the population level and is only revealed when we account for participant random effects. As we elaborate in the General Discussion, documenting this nuanced relationship is critical for crafting effective policy to improve consumer welfare. Despite a positive overall correlation between effortful earning and risk tolerance, policies that require *each* individual to work harder could decrease investing.

EXPERIMENT 3: A PHYSICAL LABOR TASK AND MECHANISMS

Method

In Experiment 3 (https://aspredicted.org/ye372.pdf), we aimed to enhance the generalizability of the negative effort–risk relationship in three ways: extend the paradigm to physical effort (using a more mindless task that mimicked physical work/labor), examine if effort exerted to accumulate money in another way (refraining from spending, i.e., "saving") similarly reduces risk tolerance, and test another proxy for risk tolerance—*how much* to invest. We also aimed to capture two of the proposed mechanisms: perceived value and aversion to loss.

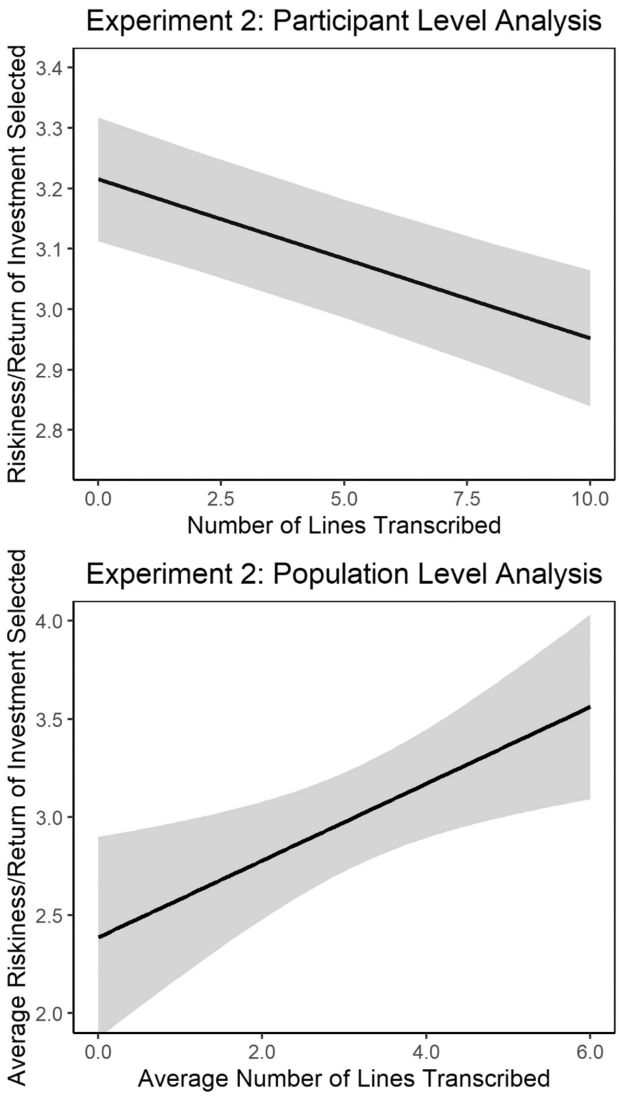

FIGURE 2 Shaded areas represent standard errors. *Top Panel*: Participant-level analysis of risk tolerance by number of lines transcribed. *Bottom Panel*: Population level analysis of risk tolerance by average number of lines transcribed.

Four hundred participants (M_{age} = 38.9) performed six periods of the microcosmic financial cycle. Participants exerted effort by pressing the 's' key a certain number of times to accumulate \$0.15. Once the total amount of presses was reached, participants either earned or saved their money and were given an opportunity to invest (i.e., chose *how much* of their earnings/savings each period [max \$0.15] they would allocate to an investment). In each period, the expected return of the investment was always positive and the same (10%), but the range of potential outcomes differed (lower risk, lower reward: from −12% to 46%; higher-risk, higher reward: from −36% to 75%).

We utilized a 3 (Workload: 10, 200, and 400 button presses) × 2 (Investment Risk: Low vs. High) × 2 (Effort Frame: Earn vs. Save) mixed design. Workload and Investment Risk were within-participants factors and Effort Frame was a between-participants factor. After participants performed the investment task for each period, we asked them how much they valued their earnings/savings this period and how painful it would feel to lose some of these earnings/savings. We also assessed perceived effort at the end of the experiment (manipulation check). See MDA-3 for procedural details, manipulation check results, and discussion regarding the lack of a Workload × Investment Risk interaction.

Results

Consistent with our hypothesis and prior experiments, the greater the workload, the less money participants were willing to risk/invest, $b = -0.003$, $t = -6.74$, $p < 0.001$ (Table 1; Figure 3). There was no interaction between Workload and Effort Frame ($t = 0.95$, $p = 0.34$) or Workload and Investment Risk ($t = 0.24$, $p = 0.81$). To examine the proposed mechanism, we conducted a structural equation model clustering by participant (Oberski, 2014; Rosseel, 2012); we found a significant serial mediation (Model 6) such that the exerting effort led people to more highly "value" their acquired money, which in turn led to greater aversion to losing some of this money, and thus, less risk taking, $z = -2.55$, $p = 0.011$.

EXPERIMENT 4: ATTENUATION BY MODIFYING THE CURRENCY EARNED

Method

In Experiment 4, we sought to test the driving role of psychological ownership. If increased effort to earn money leads to lower risk tolerance because consumers perceive greater ownership over this money and place greater value on it, this effect could be mitigated when individuals work hard for a currency that they do *not* feel high ownership over. Thus, in this experiment, we asked non-crypto users to work for Bitcoin. This intervention draws from research showing that (1) consumers feel differential ownership over different forms of currency (they tend to feel more ownership over cash than digital money; Zhou et al., 2022) and (2) familiarity is an antecedent of psychological ownership (consumers feel more ownership over goods they are familiar with; Pierce et al., 2003). We expected that when consumers exerted effort to earn a digital currency that they were unfamiliar with, they would feel less psychological ownership over these earnings and be more tolerant of risking them, compared to when they exerted effort to earn a familiar currency.

Three hundred ninety-nine participants (M_{age} = 41.7) who had never owned cryptocurrency performed three

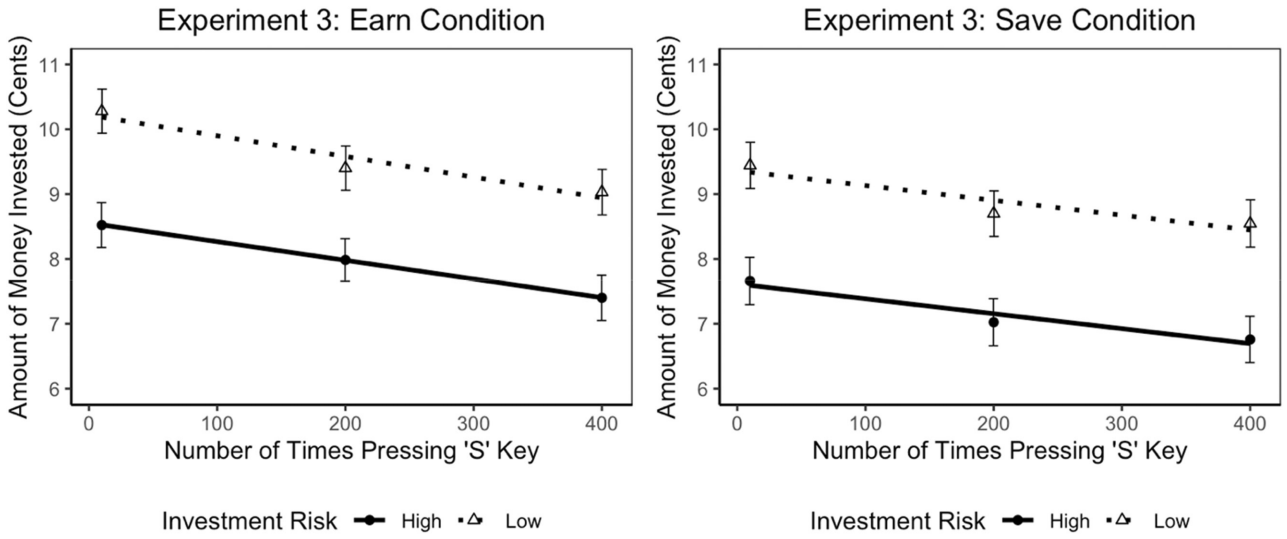

FIGURE 3 The amount of money that participants were willing to invest in Experiment 3 by Investment Risk and the number of button presses required for the period. Error bars represent standard errors. *Left Panel*: Earn condition. *Right Panel*: Save condition.

periods of earning and risk-taking. In each period, participants either pressed 10 times to earn \$0.17 (Low Workload for US Dollars), 250 times to earn \$0.17 (High Workload for US Dollars), or 250 times to earn 0.0000081 Bitcoin[1] (High Workload for Bitcoin). We expected to replicate the negative effort–risk relationship when participants exerted high (vs. low) effort to earn US Dollars. The key addition was the period requiring participants to work hard for Bitcoin: Based on our theory, working hard for Bitcoin should not decrease risk tolerance because of the low perceived ownership (and thus lower valuation) of earnings in an unfamiliar currency.

The study further differed from prior experiments in three important ways. First, we measured psychological ownership and valuation of the earnings to directly capture these two mechanisms. Second, to test the generalizability of the negative effort–risk relationship, participants chose between "gambles" that had the same average return and range of outcomes as "investments" in Experiments 1–2. Third, instead of earning for oneself, participants worked to earn money that would be donated to Ukraine on their behalf. This allowed us to keep the paradigm incentive-compatible across currencies (as non-crypto users may not have a way to receive Bitcoin); in addition, we expect the link between effort and perceived ownership/valuation should hold for money earned for donations (i.e., others) because prior research shows that consumers value goods they make for others more when they exert more effort to create them (Moreau et al., 2011), just as they value their own goods more when they exert more effort to create them (Norton et al., 2012).

[1]0.0000081 Bitcoin was equivalent to \$0.17 on the day the experiment was conducted. Participants were explicitly informed of this equivalence when earning, which was prior to making their decisions involving risk (MDA-4).

Results

Consistent with our hypothesis and prior experiments, when participants worked harder to earn US Dollars, they were less willing to take on risk, $b=-0.17$, $t=-2.02$, $p=0.044$ (Table 1; Figure 4). This pattern was serially mediated through greater psychological ownership and higher valuation of the earnings, $z=-3.90$, $p<0.001$. However, this effort–risk relationship disappeared when participants exerted high effort to earn Bitcoin, $t=1.00$, $p=0.32$. As predicted, this null effect was driven by the same process ($z=2.75$, $p=0.006$); because participants no longer perceived greater ownership over or highly valued their effortfully earned Bitcoin (vs. less effortfully earned US Dollars), their investment of Bitcoin was insensitive to effort exertion. Analyzed another way, participants were less willing to take on risk when they effortfully earned US Dollars relative to when they effortfully earned Bitcoin, $b=-0.25$, $t=-3.01$, $p=0.003$. This effect was again serially mediated through greater psychological ownership and higher valuation of US Dollar earnings, $z=-4.44$, $p<0.001$.

GENERAL DISCUSSION

We documented that effortful earning produces a *negative* effect on consumers' risk tolerance across four incentive-compatible experiments that employed different pay structures and operationalizations of effort and risk tolerance. In an incentive-compatible Supplemental Study (see MDA-S for the detailed procedure and results), we provide further support for our theory through moderation. When participants' effort was connected to gaining investment opportunities rather than to accumulating money, perceived ownership over their accumulated money decreased, again mitigating the negative effort–risk relationship.

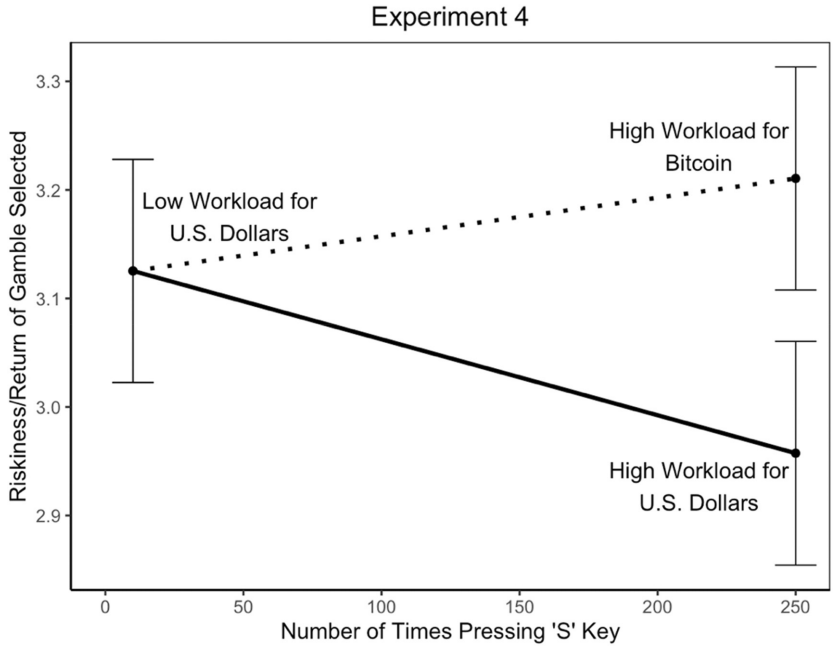

FIGURE 4 Error bars represent standard errors. The solid line shows the replicated effect from Experiments 1–3 ($b=-0.17$, $t=2.02$, $p=0.044$). The dotted line shows how the negative effort–risk relationship disappeared when these same participants instead exerted high effort to earn an equivalent amount of Bitcoin ($t=1.00$, $p=0.32$).

This effort–risk effect runs contrary to the positive population-level effort–risk correlation intuited by consumers (Pilot Study), documented in Experiment 2, and that exists in national surveys (e.g., FINRA, 2018; $r[25779]=0.28$, $p<0.001$)—the results of which help guide policy making. Appreciating the intricacies and causality of this effort–risk relationship is a critical precursor to theory development and creating effective interventions that improve financial decision-making. Taking prudent risks, such as investing in stocks or mutual funds, is an important means of achieving long-term financial goals (Markowitz, 1952; Securities and Exchange Commission, 2023). However, despite the benefits associated with taking these risks, today a lower percentage of U.S. consumers own stocks than in the early 2000s (Saad & Jones, 2022). Research has identified various factors that contribute to this reluctance, including the lack of financial literacy (Fernandes et al., 2014) and myopic loss aversion (Benartzi & Thaler, 1995). Our findings suggest another important factor to consider—consumers' perceived effort exerted to accumulate money to invest. We encourage future research to examine these dynamics in the marketplace and explore other aspects of effort exertion that might explain why people do not take prudent financial risks.

We expect that this negative effort–risk relationship is becoming increasingly influential. People have always worked hard to earn money, and the COVID-19 pandemic, persistent high inflation, and low wage growth have forced consumers to work even harder to maintain their purchasing power (Federal Reserve Bank of St. Louis, 2022). Additionally, while the temporal gap between effortful earning and spending/investing decisions has always been short in some industries (e.g., individuals working for tips often receive daily compensation), technological advancements are further reducing this gap, helping workers get paid immediately after work (e.g., Walmart employees can be paid daily; Corkery, 2017) and allowing earnings to be immediately spent or invested (e.g., on Robinhood). We encourage future research to examine how effort and risk perceptions may evolve in these increasingly prevalent real-world situations where the temporal gap between financial actions can become nonexistent.

Finally, our results provide support for interventions and tools to facilitate consumers' accumulation of overall wealth, including interventions that make hard work feel easy or that change the modality of earnings (e.g., to lower ownership currencies), and tools that subtly nudge consumers toward earning without increasing perceived effort or "automate" the accumulation of assets by moving income directly into an investment plan (Thaler & Sunstein, 2009). Our findings suggest that these interventions and tools can be beneficial because they do not permit consumers' perceived ownership over their earnings to dissuade them from taking prudent risks. While it is paramount that consumers work hard to earn more, we must be mindful of the potentially negative consequences of escalating consumers' perceptions of effortful earnings to keep consumers' hard work from undermining their investment decisions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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