Rejections, Incentives, and Employee Creativity: When Chocolate Is Better Than Cash

Eddy Cardinaels

Department of Accountancy, Finance and Insurance, KU Leuven

Department of Accountancy, Tilburg University

eddy.cardinaels@kuleuven.be

Bart Dierynck

Department of Accountancy

Tilburg University

b.dierynck@tilburguniversity.edu

Wenqian Hu

Department of Accounting

Georgia Institute of Technology

wenqian.hu@scheller.gatech.edu

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Abstract: In this study, we experimentally examine the effect of experiencing a rejection of a creative idea on future creative performance, and whether the effect of a rejection is moderated by the reward type used to motivate future creativity. Specifically, we hypothesize that the effect of a rejection on future creative performance will be mitigated when tangible rewards are provided compared to when cash rewards are provided. We derive this prediction from the recent work in behavioral economics that argues that tangible rewards will activate a "non-calculative" process in which experiences of success/failure are less likely to be translated into future expected pay-offs compared to cash rewards that activate a more "calculative" process. Accordingly, the motivational effect of rewards on future creativity will be less sensitive to changes in perceived competence resulting from a rejection when tangible rewards are provided compared to when cash rewards are provided. Results show that rejections lead to lower perceived competence and lower performance in the subsequent creativity task. Further, consistent with our hypothesis, this deterioration in performance only manifests under performance-based cash rewards, but not when tangible rewards are provided. Our study extends the literature on creativity by bringing to the forefront the neglected role of rejections in sustaining employee creativity and the asymmetric effect of incentive schemes for rejected versus accepted employees.

Keywords: *rejections; creativity; incentives; reward type; intrinsic motivation*

I. Introduction

Firms increasingly reach out to their employees to develop creative solutions for important problems. One neglected fact is that the majority of solicited ideas are rejected for implementation as firms only look for one solution or can fund less solutions than submitted proposals. For instance, in a field study of an innovation program at an international company, Deichmann and van den Ende (2014) reports that in a 12-year archive, the average success rate of the submitted proposals was only 10%, with the majority of proposals being rejected for implementation. Rejections can be problematic as employees can perceive rejections as an embarrassing failure and might refrain from future engagement in creativity work (e.g. Amabile, 1983a; Zhou, 1998). It is thus important for firms to ensure that rejected employees can be motivated to be creative in the future.

Despite the ubiquity of rejections in creativity work, prior research provides little insights into (1) how a rejection of a creative idea affects employee's future creativity and (2) how organizations can continue to motivate employees whose proposals are not selected in prior creativity work. Cognitive evaluation theory suggests that social-contextual events such as feedback, communications, and rewards that thwart feelings of competence during an action can undermine intrinsic motivation for that action (Vallerand and Reid, 1984; Deci, 1975). Following this theory, we first predict that rejections will diminish employee's perceived competence and innate propensity to seek out novelty, and consequently undermine the creative performance in subsequent tasks. Next, we investigate whether the effect of a rejection on future creative performance is moderated by the type of reward that is used to motivate employees. We examine three incentive schemes that are commonly used in practice: fixed wage (control condition), performance-based cash rewards, and performance-based tangible rewards.[1] Specifically, we hypothesize that the

[1] A recent survey of US corporations indicates the wide use of tangible rewards: 74% of US businesses use non-cash rewards in the form of gift cards, merchandise and incentive travel (Incentive Federation Inc., 2013). Though the percentage spent on non-cash rewards seems small – about 3-5% of salary (Jeffrey et al., 2013), it still represents significant amount of funds – $76.9 billion per year spent on tangible rewards (Incentive Federation Inc. 2013).

negative effect of rejection (relative to acceptance) on future creative performance will be mitigated when tangible rewards are provided compared to when cash rewards are provided.

We base this prediction on the recent work in behavioral economics (McGraw et al., 2010; Hsee and Rottenstreich, 2004), which suggests that the information processing will differ when employees are provided with performance-based cash rewards versus performance-based tangible rewards. Specifically, when incentivized with performance-based cash rewards, individuals will engage in a "calculative" process where the combination of monetary amount with a probability assessment regarding receiving an acceptance is straightforward to yield an expected payoff value. In contrast, when a performance-based tangible reward is offered, a "non-calculative" or "feeling" process will be activated, in which the tangible reward is not straightforwardly converted into a monetary value and individuals are less likely to engage in a calculation of the expected payoff. As a result, when rejected employees are provided with performance-based cash rewards, the lower assessed probability of success in the next task will be straightforwardly incorporated into the valuation of monetary payoff and result in a lower expected compensation. Whereas for accepted employees, the same "calculative" process incorporates the higher assessed probability fairly automatically and yields a higher expected compensation. On the contrary, as the nonmonetary amount is not readily combined with the assessed probability in the cognitive process (McGraw et al., 2010), the valuation of tangible rewards will be less responsive to changes in perceived competence and the assessed probability of success. As such, we expect that rejections will undermine subsequent creative performance to a lesser extent when performance-based tangible rewards are provided compared to when performance-based cash rewards are provided.

Additionally, we further explore the possibility that the "non-calculative" process might facilitate the intrinsic motivation in creativity tasks. To the extent that employees do not readily consider tangible rewards in monetary terms and engage in a "calculation" of final outcome, the

task itself would be less likely to be perceived as a means to its end (Amabile et al., 1986). Thus, we propose that a performance-based tangible reward may not disrupt intrinsic motivation in creativity tasks compared to a performance-based cash reward. As such, intrinsic motivation, which is especially important in the creativity setting, could be a potential mediator driving the rejection/reward type effect on subsequent creative performance.

To test our predictions, we conduct a laboratory experiment in which participants are required to complete two creativity tasks. Participants are informed before the start of the first creativity task that they will be randomly paired with another participant of the same session, with whom they will compete by submitting one of the creative solutions they have developed during an experimentation period. Participants are provided with a fixed wage of 4 EUR for this task. In each session, we also randomly choose a participant to act as an independent rater. This participant is not involved in developing creative solutions but evaluates each pair of creative solutions and select one of the two solutions, which forms the basis for the acceptance/rejection decision. After participants are informed of the acceptance/rejection decision, they move on to the second creativity task, which is similar in nature as the first creativity task. Before the start of the second creativity task, participants are informed of their incentive scheme in the second task. Participants in the performance-based cash rewards condition receive a cash payment of 6 EUR if their creative solution is selected by the independent rater and 2 EUR if their creative solution is rejected. Participants in the performance-based tangible rewards condition receive tangible rewards in the form of a box of Belgian chocolates, which has a monetary value of 6 EUR, when their creative solution is selected and a packet of M&Ms, which has a monetary value of 2 EUR, when their creative solution is rejected. Finally, those in the fixed wage condition receive 4 EUR for the second task irrespective of how they perform in developing creative solutions.

The results of our analyses support our predictions. First, we find that rejections lead to lower

perceived competence and we also find that after controlling for the creative performance in the first task, rejections lead to lower creative performance in the second creativity task. In line with our theory regarding the different information processing elicited by the different reward types, the significant difference in creative performance in the second task between accepted and rejected participants only manifests when participants are provided performance-based cash rewards. When participants are provided with performance-based tangible rewards, we do not observe a significant difference in creative performance in the second task between rejected and accepted participants. Thus, the effect of rejections on future creative performance depends on the reward type that is used to stimulate employees' creativity after they receive the acceptance/rejection decision from the firm.

Additionally, consistent with the prediction that the "non-calculative" cognitive process associated with tangible rewards may improve intrinsic motivation, a mediation analysis reveals that participants' perceived effort in the creativity task, as a measure of intrinsic motivation, mediates the rejection/reward type effect on participants' creative performance. We also investigate how participants in the second creativity task select the idea they consider as the most creative one to submit for evaluation by the rater. Our results indicate that the idea selections of rejected participants provided with cash rewards are inferior to those of participants in the other two incentive conditions. Finally, while affect generally influences the preference and valuation of tangible rewards (Hsee and Rottenstreich, 2004), our theory predicts that participants' affective responses do not explain the observed pattern of results. That is, we attribute the observed pattern of results to the cognitive processing that participants are engaged in when provided with different reward types. Additional analysis corroborates this argument, as the same pattern of results holds in the subgroups that differ in the extent to which they *like* or *value* the chocolate box.

The results of our study have important practical implications for organizations that rely on creativity. Despite the prevalence of rejections in creativity tasks, minimal research has examined

how to motivate rejected employees. Contrary to this scant literature, recent archival studies document significant costs following promotion tournaments resulting from non-promoted executives (Chan et al., 2016). Our results suggest that mangers must tailor the way in which they motivate employees to their prior experience with creativity contests. Importantly, the results suggest that rewards must be employed with caution and can often backfire: while performance-based cash rewards work well with accepted employees, a combination of rejection and cash rewards produces the worst creative performance among all scenarios.

Our study contributes to the current accounting literature on creativity. While there is an emerging body of research on the question of how different incentive contracts *affect* creativity (e.g. Kachelmeier et al., 2008; Kachelmeier and Williamson, 2010; Kachelmeier et al., 2015; Chen et al., 2012), the literature does not speak to how employees can be motivated to deliver high creativity work after a rejection or acceptance decision in an initial creativity task. We address this gap by venturing beyond the point at which creative ideas are generated and shed light on the critical phase in which employees respond to the rejection/acceptance decision from the firm.

Second, we extend the limited literature on the interaction between incentive schemes and feedback (Sprinkle, 2003). While prior studies have investigated how the use of language affects the processing of negative/positive feedback in tournament settings (Loftus and Tanlu, 2017), our study documents that the effect of feedback on future creative performance differs depending on the incentive schemes the employees receive. The commonly held assumption that rewards will produce higher effort does not seem to hold among rejected employees incentivized with cash rewards. Additionally, we contribute to the literature on tangible rewards by demonstrating that reward type can have a profound influence on the cognitive processing that is invoked and hence on the motivation of employees to engage in the tasks. While prior literature draws on mental accounting theory to explain the performance effect of tangible rewards (e.g. Presslee et al., 2013;

Kelly et al., 2017), the extant theory cannot fully explain the asymmetric effect of tangible rewards for accepted versus rejected employees. Our study suggests a new mechanism through which reward type might have an influence on performance.

Finally, while prior literature generally suggests that cash rewards motivate better performance (e.g. Presslee et al., 2013; Kachelmeier et al., 2016), it cannot explain the rationale for the wide use of tangible rewards in practices. This study provides one potential rationale for the use of tangible rewards as we show that tangible rewards tend to be more effective than cash in sustaining creativity when employees' initial creative ideas are rejected. This finding is important as rejections are common to the firms that rely on the creative endeavors of their employees.

II. Background and Hypothesis Development

Background

Firms often look to their employees to provide creative solutions as a way to address problems and gain access to innovation. It seems beneficial to solicit creative ideas from numerous employees as a large suggestion pool increases the chance of finding creative solutions. However, one neglected fact is that firms can only act upon a small subset of solicited ideas, meaning that many of the ideas are rejected for implementation. Once rejected, employees often feel disappointed and frustrated, and might hold a pessimistic view about their chance of having future ideas selected. Such feelings can potentially harm employees' future creativity (e.g. Amabile, 1983a; Zhou, 1998).

Despite the prevalence of rejections in creativity work, minimal research has examined the effect of rejection on employees' future creativity and how we can motivate rejected employees. The general wisdom is that money should motivate effort, and prior research has mainly focused on incentives provided in the form of cash rewards in sustaining creativity, output or both (e.g. Kachelmeier et al., 2008; Chen et al., 2012). Anecdotal evidence, however, suggests that there is

considerable variation in the type of rewards that firms award to the winning creative ideas and it is worth noting that next to cash, tangible rewards are also commonly employed by firms in creativity settings. For instance, individuals having their ideas selected by Dell's Idea Storm platform do not receive a cash reward but are awarded with only a pen in an engraved box (Sullivan, 2010), whereas Samsung's crowdsourcing contest offers more than $10,000 cash prizes for those that come up with the best ideas for their products and technologies (Haynes, 2013). In the next section, we develop our predictions about the effect of rejections on employees' subsequent creative performance and develop new theory on how performance-based cash rewards may not work well, relative to performance-based tangible rewards, in mitigating the negative effects of rejections on future creative performance.

Hypotheses Development

Effects of Rejection on Future Creative Performance

Self-determination theory suggests that the satisfaction of the psychological needs of competence, autonomy, and relatedness can yield enhanced self-motivation (Deci and Ryan, 1985). Relatedly, cognitive evaluation theory, a subtheory within self-determination theory, established that positive performance feedback will enhance intrinsic motivation, whereas negative feedback will diminish it, and these effects are mediated by perceived competence (Vallerand and Reid, 1984). Further, prior psychology research established a strong link between intrinsic motivation and creative performance. Creativity is seen as "uninhabited exploration and playful combination of old elements into new patterns" (Amabile et al., 1986). Thus, according to the intrinsic motivation hypothesis, intrinsic interest is a key element conducive to creativity (Amabile, 1983a, 1983b).

We predict that rejections will hinder the development of competence and as such undermine employees' intrinsic motivation in future creativity work. Employees might take rejection as an

embarrassing failure and refrain from proposing future creative ideas. Rejections will make it more difficult for individuals to maintain a high level of self-efficacy and confidence when engaged in another creativity task (Deichmann and van den Ende, 2014). Hence, we expect that rejections will undermine employees' perceived competence and intrinsic motivation in creativity work and reduce their inherent propensity to seek out novelty and learn from mistakes (Deci and Ryan, 1991).

There may also be some countervailing forces that induce rejected employees to perform better in future creativity tasks. First, some recent studies in organizational behavior point to the learning effect from unsuccessful interactions in the past (e.g. Deichmann and van den Ende, 2014). Rejections might foster learning when firms provide employees with feedback (Loftus and Tanlu, 2017), which draws employees' attention to the particular problems with the creative ideas they developed (Hammond et al., 2011). Second, the dual pathway to creativity model proposed by De Dreu et al. (2008) suggests that both positive and negative moods can engender creativity and that negative moods enhance creativity through cognitive persistence and perseverance. Thus, rejections can potentially improve future creativity, provided that enough feedback is provided to employees and environment offers opportunities to learn from this feedback.

While these countervailing forces suggest that rejections can also be leveraged to improve future creativity, we expect them to be less influential in the context we examine. First, we examine a context in which no additional content-based feedback is provided to accepted or rejected employees. The absence of feedback is quite common in real life as developing appropriate explanations and rationales for rejected ideas is time-consuming and costly (Dahlander and Piezunka, 2014). Second, our context pertains to individual's relatively short-term reaction to rejections. As in corporate settings creativity tasks often come close to each other and resources often flow to those who achieve initial success, the short-term reaction to negative experiences can be an important determinant of long-term creative performance. Therefore, we expect that learning

effect based on feedback and the long-term persistence and perseverance are less likely to manifest in the context we examine. This leads to the following hypothesis:

H1: *Employees whose creative ideas are rejected will have lower creative performance in subsequent creativity tasks than employees whose creative ideas are accepted for implementation.*

Incentives and Creativity

The effect of financial incentives on creativity has been a topic of debate (e.g. Amabile, 1996; Hennessey, 2003; Grant and Berry, 2011; Kachelmeier et al., 2008). While the psychology and behavioral economics literature generally takes the perspective that extrinsic incentives such as financial rewards will crowd out intrinsic motivation for creativity (e.g. Amabile, 1996; Fehr and Falk, 2002), the general theme within the accounting literature is that creativity and incentives can be compatible (e.g. Kachelmeier et al., 2008; Chen et al., 2012; Kachelmeier et al., 2015). The wide use of performance-based pay among creativity-dependent firms reported by Grabner (2014)'s survey-based study supports the idea that creativity can be motivated via the use of incentives. Experimental studies in accounting also corroborate this finding (e.g., Kachelmeier et al., 2008; Kachelmeier et al., 2015; Chen et al., 2012).

In this study, we examine a situation in which firms solicit creative solutions from employees to address important problems. It is likely that the higher effort employees exert, the more ideas they come up with, the more likely they are to find the most creative solutions. Thus, in our setting, we assume a positive link between "trying hard" and creative performance – i.e., we assume that creativity can be motivated. While we establish it as a baseline assumption from which we examine the difference between performance-based tangible and performance-based cash rewards, our experiment also includes fixed wage as a control condition to empirically test this assumption.

Reward Type and Performance

Prior studies that investigate the performance effects of tangible rewards have produced mixed results (e.g., Jeffrey, 2009; Presslee et al., 2013; Kelly et al., 2017). Further, prior literature often uses mental accounting theory and the hedonic attributes of tangible rewards in explaining the performance differences observed in lab and field experiments (e.g., Choi and Presslee, 2016). Specifically, tangible rewards with hedonic attributes are categorized in a distinct mental account compared to cash rewards, which induces a different reference value in goal selection (Presslee et al., 2013) and stronger affective response in motivating effort (Kelly et al., 2017).[2] Additionally, while prior literature generally finds cash rewards motivate better performance (e.g. Shaffer and Arkes, 2009; Presslee et al., 2013; Kachelmeier et al., 2016), the efficacy of cash rewards suggested in the literature is at odds with the wide use of tangible rewards in practice (Incentive Federation Inc., 2013). In the following section, we develop predictions based on a new theoretical mechanism driving the performance difference between cash and tangible rewards, and we suggest a potentially important setting where tangible rewards can have superior motivational power than cash rewards.

The Combined Effects of Rejection and Reward Type on Subsequent Creative Performance

When considering whether to exert higher effort, employees will assess an expected value of payoff, i.e., employees will evaluate both the amount of a reward and the probability that the future attempts will eventually lead to a reward. The normative economics theory of decision-making predicts that outcomes and probabilities are independently evaluated and then combined to yield an expected value. Recent experimental research, however, provides mounting evidence showing the violation of the independence assumption in which probability prospects and value of the outcome

[2] Kelly et al. (2017) find that hedonic gift rewards motivate higher effort for first-tournament *losers* rather than first-tournament *winners*, which suggests that tangible rewards work differently for past winners and past losers. However, mental accounting theory or the affective reactions to the hedonic goods cannot fully explain the asymmetric effect of tangible rewards in motivating past winners and past losers.

interact to affect the assessment of expected value (e.g. Gneezy et al., 2006; Camerer and Weber, 1992; Rottenstreich and Hsee, 2001). Hsee and Rottenstreich (2004) further advances a distinction between evaluation by calculation versus evaluation by feeling in which monetary stimuli lead people to engage in calculation of outcome prospects, whereas nonmonetary outcomes generate "feelings" toward the stimuli rather than a precise measure of expected value.

McGraw et al. (2010) refers to differences in individual's cognitive processing when outcomes are expressed in monetary payoffs as opposed to nonmonetary payoffs. Specifically, as both the valuation and payoffs are in monetary (and numeric) units, the numeric amount is straightforwardly combined with the probability information to yield an expected value assessment when monetary outcomes are used (McGraw et al., 2010). Whereas for nonmonetary outcomes, the non-compatibility between input and response mode requires additional mental operations that convert nonnumeric valuations into dollar amount before they can be combined with probabilities to yield an expected value assessment (Slovic et al., 1990; McGraw et al., 2010). Such conversions do not occur naturally but require additional mental effort (Tversky et al., 1988). As such, relative to monetary rewards where individuals spontaneously combine monetary rewards with a likelihood assessment to yield an expected value, the valuation of nonmonetary rewards is less sensitive to changes in probability, as people do not readily combine nonmonetary rewards with a probability assessment to yield an expected value.

These recent work suggests that the above distinction between calculative and non-calculative processes in value assessment offers useful insights for how cash versus tangible rewards affects the cognitive process of employees. Specifically, cash rewards will likely elicit calculative mindsets where the combination of a monetary amount with a probability assessment is straightforward to generate an expected payoff. On the contrary, when employees receive tangible rewards, they will likely engage in a non-calculative process or a "feeling" process of value assessment where the

nonmonetary payoff is not readily considered in monetary terms, and the valuation of tangible rewards is less sensitive to the probability assessment.

Recall that our first hypothesis predicts that rejections will likely depress employee's perceived competence in creativity tasks. As a result, rejected employees will assess a lower probability that their efforts in future attempts will lead to rewards. Combined with the above analysis, this assessed lower probability of obtaining the rewards will be fairly automatically incorporated into the valuation of expected compensation when employees are provided with cash rewards, resulting in a lower expected payoff and less attractiveness to provide high effort. Similarly, in the case of an acceptance, the higher assessed probability of getting the rewards will be straightforwardly incorporated into the valuation of expected compensation, resulting in a higher expected payoff and strong incentive to provide effort under performance-based cash rewards. On the contrary, when employees are provided with tangible rewards, the combination of a nonmonetary payoff and a probability assessment does not occur spontaneously, such that the valuation will be less affected by the lower (higher) probability assessment induced by rejections (acceptance). Therefore, we expect that a rejection or acceptance decision will less likely influence future creative performance when performance-based tangible rewards are provided. Overall, we propose the following hypothesis:

H2: *The negative effect of rejection on employee's subsequent creative performance will be mitigated when performance-based tangible rewards are provided compared to when performance-based cash rewards are provided.*

Taken together, H1 and H2 combined predict that under the performance-based cash rewards condition, the subsequent creative performance will be high when there is an initial acceptance of creative idea and low when there is a rejection, whereas future creative performance differs less between rejected and accepted employees when they receive tangible rewards. In other words, we predict that rejections will more likely lead to deterioration in future creative performance under cash-based rewards than under tangible rewards. Figure 1 offers a graphical representation of our

hypothesized pattern of results on subsequent creative performance.

--- Insert Figure 1 about here ---

III. Method

Participants

We recruited 188 student participants, including 12 independent raters, in 12 sessions (one rater per session), to participate in a compensated lab experiment. Participants either volunteered to participate (recruited via the university's lab participant pool) or received a course credit for an accounting course in addition to the compensation they earned in the experiment. Sessions varied between 13 to 17 participants per session and lasted about 70 minutes.[3] Participants received an average compensation of 8 EUR for participation in the experiment. 61% of the participants are male, with an average age of 22.3 years old. They have an average working experience of 34 months (including part-time jobs).[4] Participants remained anonymous during the entire experiment. All interactions took place via the computerized z-Tree program (Fischbacher, 1998).

Experimental Procedures

In each experimental session, participants read a set of instructions about the experimental task on their computer screens. Participants were required to complete two creativity tasks related to developing creative solutions for two real-world problems. Following prior psychology and management accounting literature on creativity (Amabile, 1996; Chen et al., 2012), we define a creative solution as one that is "original, innovative, and potentially implementable from the perspective of the organization". The first creativity task involves developing creative solutions to

[3] We require an odd number of participants in each session, as we randomly select one participant as the independent rater in each session and the remaining participants are randomly formed in pairs.

[4] Participants have diverse background including Business Administration, Economics, Information and Communication Science, Law, and Liberal Arts. As our experimental task does not require specific knowledge in a particular field, the diverse educational background allows us to draw more general implications about creativity.

help people aged over 50 to find a job, and the second task is about how to help children under 7 to move more. Thus, although we change the content of the two tasks, we try to keep other dimensions such as difficulty and familiarity level similar across the two tasks.

Participants were informed that only a limited number of creative solutions will be selected to advice the organization that seeks the creative solutions. To determine the creative solutions that will be selected, each participant was randomly paired with another participant. An independent rater was randomly chosen to evaluate each pair of creative solutions and to select the most creative one of each pair. The independent rater was instructed to select the solutions based on creativity alone and was not involved in developing creative solutions.

The experimental task consists of two phases. During Phase I, participants had 8 minutes to draft up to 10 creative solutions. During Phase II, participants had 2 minutes to select one of the creative solutions they had developed to submit for evaluation by the independent rater. It is important to mention that participants were allowed to stop working in Phase I at any moment, which allows us to observe any give-up behavior after the acceptance/rejection decision.[5] During the 10-minute period that participants used to draft and submit creative solutions, the independent rater was asked to read two news articles on the socially important problem.

After participants submitted their creative solutions, the independent rater evaluated each pair of creative solutions and determined the acceptance/rejection decision for each pair.[6] This evaluation process took 5 minutes. During this time, participants were asked to answer a short questionnaire adapted from Intrinsic Motivation Inventory (IMI) (Ryan, 1982) to capture their intrinsic motivation in the task. After participants finished the questionnaire, they were informed

[5] If participants quit the task early, they cannot leave the experiment but have to wait until all other participants finished the task. This design avoids that participants who want to quit earlier influence the behavior of the other participants.
[6] The independent rater received a payment of 8 EUR for evaluating the creative solutions. To ensure that they finish the evaluation within the specified time, we introduced a piece-rate wage with 8 EUR divided by the number of pairs they need to evaluate. All the raters finished the evaluation within 5 minutes and received 8 EUR for the evaluation.

about the acceptance/rejection decisions. Appendix A provides the experimental materials used to inform the participants. Before participants moved on to the second creativity task, they were asked to respond to questions designed to elicit their perceived competence (IMI subscale, Ryan 1982) in the task. The procedures for the second task are the same as in the first one, except that we manipulate the incentive scheme between subjects in the second task (instructions about the incentive schemes are provided in Appendix B). Participants were informed that they will be randomly re-matched to a new player in the second task, who could be a rejected or accepted participant in the first task. After participants submitted their creative solution for the second task, they completed an ex-post questionnaire eliciting their intrinsic motivation in Task 2, as well as manipulation checks and demographics. Before participants left the experiment, they were informed of the decision for the second creativity task and received rewards corresponding to their incentive scheme and acceptance/rejection decision. The experiment involved no deception of any form.

Experimental Design

All participants receive a fixed wage of 4 EUR for the first creativity task. While we keep the average expected payment for the second task the same as in the first task (4 EUR), we manipulate incentive scheme between subjects in the second creativity task and randomly assigned participants to one of the three experimental conditions: fixed wage, performance-based cash rewards, and performance-based tangible rewards. Participants in each pair are in the same incentive condition, and the independent rater do not know how the participants are rewarded.

Incentive Schemes in the Second Task. We manipulate the incentive schemes offered to the participants in the second task. In the fixed wage condition, participants are informed that they will receive 4 EUR for the second creativity task, irrespective of how they perform in developing the creative solutions. Participants in the performance-based cash rewards condition are informed that they will receive 6 EUR for the second creativity task if their creative solution is selected by the

independent rater or 2 EUR if their creative solution is *not* selected. In the performance-based tangible rewards condition, participants will receive a box of Belgian chocolates (worth on average the counterpart of 6 EUR) if their creative solution is selected by the rater, but a packet of M&M's (worth on average the counterpart of 2 EUR) if their creative solution is *not* selected.

Acceptance vs. Rejection in the First Task. As described above, the treatment of rejection/acceptance is not manipulated randomly in our experiment, but determined as a function of participants' performance plus some random errors such as raters' personal judgment or preferences. While the treatment is not exogenously determined, we note that this design choice reflects the selection process in organizations, which involves comparison and selection biases. Furthermore, a rejection decision that is based on the evaluation by another individual, rather than random assignment, increases the credibility of the acceptance/rejection decision to the participants, which increases the power of our treatment.

Measure of Creative Performance. To obtain the measure of the creative performance of participants, we follow prior literature (Kachelmeier et al., 2008; Chen et al., 2012) and conduct additional rating sessions by recruiting another group of participants to rate all the creative solutions (i.e., both the submitted and un-submitted creative solutions). 28 raters were recruited from the university's participant pool and participated in one of the 4 compensated rating sessions. Each creative solution was evaluated by 5 to 8 raters, depending on the specific session in which the evaluation was carried out.[7] Each rating session lasted one and half hour, and the raters received 15 EUR for the evaluation of the creative solutions. Being blind to our experimental conditions, the raters first read through the instructions of their task and were informed that the creative solutions were developed by other students of the university as part of a research study. The raters were

[7] There are a total of 1192 creative solutions generated for the two tasks. We divided all the creative solutions into 4 parts, with raters in each session evaluating one part. The 4 rating sessions recruited 7, 8, 8, 5 raters respectively.

instructed that the evaluation should be based on creativity alone. Working independently, the raters evaluated each creative solution using a full scale from 1 (=not at all creative) to 10 (=very creative). Cronbach's alpha for the ratings in each session varies from 0.69 to 0.72, indicating a reasonable level of consistency in the ratings (Peterson, 1994). We averaged the ratings from all the raters for each creative solution to obtain our measure of creative performance.

IV. Results

The analyses below examine the effects of the acceptance/rejection decision and incentive schemes on participants' subsequent creative performance. The analyses in this section are conducted on participants' submitted creative solutions. In our empirical tests, we also control for participants' creative performance in the first task to alleviate any endogenity concerns and differences in creative ability across cells.[8]

Descriptive Statistics: Creative Performance in Task 1 and Task 2

Panel A of Table 1 provides descriptive statistics for the subsequent creativity ratings of participants' submitted creative solutions in the second task. Consistent with H1, rejected participants have worse subsequent creative performance in the second creativity task compared to accepted participants (t = -1.47, one-tailed p = 0.07). The descriptive statistics only lend partial support to our baseline assumption that incentives will motivate creativity, as performance-based incentive schemes elicit higher creativity level than fixed wage, but only for the accepted participants (t = 1.80, one-tailed p = 0.04, when we combine cash and tangible rewards conditions). For rejected participants, we observe no significant difference in creative performance between

[8] Further, untabulated tests indicate that there is no significant difference in gender and age across treatment conditions, suggesting successful randomization. Also we detect no significant difference in the KAI measure, which elicits participants' creative potential in general cases based on Kirton (1978), alleviating concerns for any ex-ante difference in creativity across cells.

participants receiving a performance-based reward and those receiving a fixed wage (t = 0.02, one-tailed p = 0.49, when combining cash and tangible rewards conditions). Overall, the descriptive statistics seem to indicate that the same incentive schemes that work well for accepted participants may not necessarily work for rejected participants.

Additionally, consistent with our hypotheses, results in Panel A of Table 1 suggest that while there is a significant performance discrepancy between accepted and rejected participants under cash rewards condition (a difference of 0.61, t = 2.10, one-tailed p = 0.02), performance-based tangible rewards seem to mitigate the detrimental effect of rejections on performance in the subsequent creativity task (a difference of 0.17, t = 0.57, one-tailed p = 0.29). Further, untabulated results suggest that both participants in the two cells of the tangible rewards condition (i.e., accepted and rejected participants) deliver creative performance that is not significantly different from those in the acceptance/cash rewards condition.[9] Thus, the descriptive statistics for creative performance in Task 2 support the idea that cell means are in line with our pattern of theoretical prediction (see Figure 2 for a graphical representation of the observed pattern of results for Task 2).

To alleviate concerns for the level effect from Task 1, Panel B of Table 1 also presents the descriptive statistics for participants' creative performance in Task 1. First, creative performance in Task 1 is lower for rejected participants but only at a significance level that borders on the conventional significance levels (t = -1.28, one-tailed p = 0.10), reflecting independent raters' selection of acceptance based on creativity. Second, we do not detect any systematic difference in Task 1 performance across the incentive conditions for both accepted and rejected participants, neither is there any significant difference between accepted and rejected participants within each incentive condition. Thus, the pattern of results for the first creativity task mitigates the possibility

[9] Acceptance/cash rewards vs. acceptance/tangible rewards: 6.55 vs. 6.41, t = 0.61, two-tailed p = 0.55; acceptance/ cash rewards vs. rejection/tangible rewards: 6.55 vs. 6.24, t = 1.08, two-tailed p = 0.29.

that it is the *ex-ante* differences in the creative potential that leads to the performance difference in the second creativity task (also see Figure 3 for the observed pattern of results for Task 1).

--- Insert Table 1, Figure 2 and Figure 3 about here ---

Hypotheses Testing: Performance Effect – H1 and H2

H1 and H2 predict a pattern of results illustrated in Figure 1. Specifically, we predict an ordinal interaction such that acceptance will lead to better creative performance than rejection when participants are awarded performance-based cash rewards, but the rejection effect will be mitigated when participants are awarded performance-based tangible rewards.[10] We use a single planned contrast to test whether creative performance falls into the pattern predicted.[11] As conventional ANOVA tests for a disordinal interaction (Buckless and Ravenscroft, 1990), it is more appropriate to examine the results of the planned contrast test for hypotheses testing, given the pattern predicted by H1 and H2 (Kadous et al., 2003). We use contrast weights of –3 for the rejection/cash rewards condition, –1 for the rejection/tangible rewards condition, +1 for acceptance/tangible rewards condition, and +3 for acceptance/cash rewards condition. With these contrast codes, we test both a main effect of rejections on creative performance (H1), and an interaction effect of rejection and reward type (H2). Specifically, the weights predict higher creative performance for participants receiving acceptance than rejection, as contrast coefficients for acceptance conditions are greater than those for rejection conditions. Meanwhile, given that we expect tangible rewards to mitigate the effect of a rejection, the weights specify smaller discrepancy in performance between accepted

[10] The control condition of fixed wage is excluded from the main tests, as H2 is mainly concerned with the difference in the incremental influence of cash rewards vs. tangible rewards. Given the divergent views in prior literature, we do not make directional predictions of the performance effects of fixed wage, nor do we make predictions of its interaction effect with acceptance/rejection on performance.

[11] Similar treatment of contrast test was also used in prior accounting literature (e.g. Kadous et al., 2003; Lambert and Agoglia, 2011). Prior literature indicates a limitation of ANOVA that "it only detects significant differences among cell means, but does not indicate the functional form of the relationship among cell means" and proposes contrast coding as a refinement of ANOVA (Buckless and Ravenscroft, 1990). Because we hypothesize an ordinal interaction, we perform hypothesis testing with planned contrast tests and presents the results of the traditional ANOVA for completeness.

and rejected participants provided with performance-based tangible rewards (+1 for acceptance/tangible vs. –1 for rejection/ tangible) than performance-based cash rewards (+3 for acceptance/cash vs. –3 for rejection/cash).

Table 2, Panel A presents the traditional ANCOVA results with rejection/acceptance and reward type for Task 2 as our independent variables, and creative performance in Task 1 as a covariate. Consistent with H1, the ANCOVA results yield a significant main effect of rejection (F = 2.88, two-tailed p = 0.09).[12] Table 2, Panel B presents the planned contrast test. Results show support for the pattern of results predicted by H1 and H2 at a significance level of p = 0.05.[13] Follow-up analysis of simple main effects, reported in Table 2, Panel C provides further support for the predictions of H2. Rejected participants produced lower creative performance than accepted participants when offered performance-based cash rewards (F = 4.17; two-tailed p = 0.05). Consistent with the idea that tangible rewards can mitigate the negative impact of rejections, rejected participants did not develop worse creative solutions than accepted participants in the subsequent creativity task when incentivized with performance-based tangible rewards (F = 0.34; two-tailed p = 0.67). Collectively, these results support our hypotheses.

Thus, from the analysis above, we conclude that participants deliver worse performance in future creativity tasks when receiving a rejection than an acceptance. In addition, rejection induces greater deterioration in performance when cash rewards are provided to incentivize future creativity. While cash rewards are particularly successful with accepted participants, the results suggest that rewards must be employed with caution and can often backfire: a combination of a rejection with cash rewards produces the worst performance among all conditions. Interestingly, the deterioration in performance for participants in the rejection/cash rewards condition is not due to the giving-up

[12] Similar results are obtained when we use covariates such as number of ideas in Task 2, time spent in Task 2, performance difference between rejected and accepted participants in each pair in Task 1, or number of ideas in Task 1. The main effect of rejection remains significant in all specifications (two-tailed $p < 0.10$).

[13] Alternative sets of contrast weights of -3, 0, 0, +3 or -2, -1, 1, 2 yield identical inferences (all $p \leq 0.05$, two tailed).

behavior of rejected participants. Untabulated results on time spent in Task 2 (the generation phase) indicate that actually rejected participants in the cash rewards condition spent significantly more time than those in the fixed wage and tangible rewards condition (cash rewards vs. tangible rewards: $t = 1.70$, two-tailed $p = 0.09$; cash rewards vs. fixed wage: $t = 2.33$, two-tailed $p = 0.02$). This result suggests that our results are not driven by the mere give-up behavior.[14]

--- Insert Table 2 about here ---

Additional Analyses

Test of Mediating Effect of Intrinsic Motivation

Our second hypothesis suggests that reward type can have a profound influence on the cognitive process that is elicited when employees are provided with different incentive schemes. That is, participants are fairly insensitive to the impact of rejections when provided with tangible rewards but are more sensitive to rejections when provided with cash rewards. To the extent that employees do not spontaneously engage in calculation of expected outcomes, we expect that the different cognitive processes can have a corresponding impact on employees' intrinsic motivation in the creativity task when provided with tangible rewards. Prior studies show that rewards will not undermine interest if they are not seen as an end for which task engagement is the means (Amabile et al., 1986; Lepper et al., 1973). If employees do not readily engage in calculation of payment, we expect that tangible rewards will less likely disrupt intrinsic motivation compared with cash rewards. We explicitly test for this potential psychological mechanism in the mediation analysis.

Intrinsic motivation encapsulates people's interest/enjoyment, perceived effort, competence, value/usefulness, felt pressure and tension, perceived choice, and experience of relatedness while

[14] It seems that people do not fully recognize this asymmetric effect of reward type for rejected and accepted individuals, as when asked about which incentive schemes to choose to motivate employees if they are the supervisor, most participants select the same incentive schemes for both accepted and rejected employees. We asked this question to the participants in the rating sessions in the post questionnaire. 68% of the participants select the same incentive scheme for both accepted and rejected employees.

performing a given activity (Ryan, 1982). Using the Intrinsic Motivation Inventory (Ryan, 1982), we capture participants' intrinsic motivation in Task 2 using items for the above-mentioned seven subscales. Table 3 summarizes the subscales used to assess intrinsic motivation and the descriptive statistics by condition.[15] We averaged across responses to all items within each subscale, resulting in seven subscale scores reported to assess participants' intrinsic motivation in Task 2.[16]

The process variables reveal some interesting pattern of results. As shown in Table 3, rejection induces significantly lower perceived competence (t = -1.75, one-tailed p = 0.04) and perceived effort (t = -1.99, one-tailed p = 0.02) compared with acceptance. Thus the results for the perceived competence and perceived effort corroborate the psychological mechanism of intrinsic motivation that drives the negative effect of rejection on employees' future creative performance. Interestingly, cash rewards aroused significantly greater pressure and tension than tangible rewards for all participants (t = 3.41, p < 0.01). This result suggests that cash rewards conduced toward a strong sense of pressure in the minds of participants, which is likely to result from a calculative mindset, whereas tangible rewards induced a more relaxed mindset in finding out the creative solutions.

--- Insert Table 3 about here ---

We further investigate whether intrinsic motivation in the task mediates the effect of rejection and reward type on creative performance. We primarily focus on the subscale of perceived effort as it is the subscale that most directly reflects participants' motivation in the task (Ryan, 1982). We establish mediation if the following conditions are met: (1) rejection reduces perceived effort under cash rewards condition; (2) perceived effort significantly affects creative performance; and (3) after controlling for perceived effort, the observed effect of rejection on creative performance reduces in

[15] Participants were asked to rate their agreement to the statements such as "I enjoyed working on the creative solutions very much" (interest/enjoyment), "I tried very hard to find out the creative solutions" (perceived effort). Participants respond to the 7-point Likert scale items with "1" labeled "Not at all true" and "7" labeled "Very true". Items for each subscale and participants' mean responses to each statement are provided in the supplemental materials.

[16] The Cronbach's alphas on the items for each subscale are all above 0.70, which exceed typical reliability thresholds (Peterson, 1994). Untabulated factor analysis reveals that items load on one factor for each subscale.

significance (Baron and Kenney, 1986; Mackinnon et al., 2002). Our mediation analyses are summarized in Table 4.[17] Using perceived effort as our measure of intrinsic motivation, condition 1 is satisfied: the ANCOVA results and follow-up analyses in Table 4 Panel A and Panel B reveal that rejection reduces participant's perceived effort in the second task under cash rewards condition (F = 3.74, p = 0.08), and that rejection has no effect on perceived effort when participants are provided with tangible rewards (F = 1.18, p = 0.34).[18] To test condition 2 and 3, we re-estimate the ANCOVA and follow-up analyses in Table 2 after adding our measure of perceived effort as a covariate. Consistent with condition 2, results in Table 4 Panel C show that participant's perceived effort in the task is significantly associated with the creative performance in Task 2 (F = 3.25, two-tailed p = 0.07). Further, when perceived effort is included in the model, the main effect of rejection is no longer significant (F = 2.51, p = 0.12) and the rejection effect under cash rewards condition reduces in significance (F = 4.57, p = 0.07 vs. F = 4.17, p = 0.05 reported in Table 2), consistent with condition 3. Collectively, these analyses lend support for the mediating effect of perceived effort, as a measure of intrinsic motivation, in driving treatment effect on creative performance.

--- Insert Table 4 about here ---

Does Affect or Valuation Drive the Performance Effect of Tangible Rewards?

Prior literature that investigates the performance effect of cash versus tangible rewards has attributed the observed performance differences to people's mental accounts for tangible rewards and their affective response to the hedonic goods (e.g. Kelly et al., 2017; Presslee et al., 2013). While we endorse the notion that affect can influence people's valuation and motivation to engage in tasks, we note that the observed pattern of results is independent of participants' affective

[17] For the mediation analyses, we exclude outliers at 1 percentile of the distribution of the whole sample based on the average score of all intrinsic motivation items, i.e., subjects that report extreme values on intrinsic motivation measures at 1 percentile (3 observations). The majority of the results are qualitatively the same when we include the outliers, though the effect of perceived effort on creative performance becomes insignificant, which does not satisfy condition 2.

[18] We control for Task 1 perceived effort in the analyses to control for the level effect from Task 1.

responses to the tangible rewards. In other words, we attribute the observed incentive effect to the cognitive processing of different reward types. In this section, we provide additional analyses to mitigate the alternative explanation that affect or overvaluation of tangible rewards might potentially drive the results.

Specifically, in the ex-post questionnaire, we asked participants to indicate the extent to which they like the tangible rewards on a 5-point Likert scale with "1" labeled "Not like at all" and "5" labeled "Like very much". Participants were also asked to estimate the monetary value of the tangible rewards. Thus, we re-conduct the same analyses summarized in Table 2 on the subsample of participants based on the extent to which they like or value the chocolate box. Specifically, Table 5, Panel A (Panel B) reports the planned contrast results and follow-up simple effects for the participants who self-report they like the chocolate box *less* (*more*), i.e., a score below (above) "3" on the 5-point Likert scale.[19] Similarly, Table 5, Panel C (Panel D) presents the results for the subsample of participants who assess *less* (*more*) monetary value for the chocolate box, i.e., a value below (above) the mean value assessment of 5 EUR.

Across the four sets of results, the pattern of results that we observed for the main analyses also holds for the analyses with the subsample of groups in the tangible rewards condition. Importantly, planned contrast and simple effects results suggest that the same pattern of results also holds for the participants who like or value the chocolate box *less.*[20] In other words, for those who *dislike* or *under-value* the chocolate box, tangible rewards still mitigate the rejection effect for this group of participants. Therefore, the observed results in the main analyses cannot merely be

[19] For brevity, we do not report conventional ANCOVA results for the additional tests in Table 5. Untabulated ANCOVA results suggest that for the subsample of participants that like/value chocolate box *less*, the main effect of rejection/acceptance remains significant ($p < 0.10$), with the same pattern of ANCOVA results as in the main analyses.

[20] The only planned contrast result that is insignificant is for the subgroup that value the chocolate box *more*. Untabulated descriptives suggests that rejected and accepted participants produced same performance under tangible rewards condition for this subgroup, which drives the insignificant planned contrast result. Thus, the performance effect resulting from overvaluation of tangible rewards (Presslee et al., 2013) also manifests in our study. But overvaluation cannot fully explain the pattern of results, as the same results also hold among those that *under-value* the chocolate box.

attributed to those participants that like or overvalue tangible rewards. The fact that the same pattern of results holds for the different subgroups that differ on the extent to which they *like or value* the chocolate box suggests that the mechanism that we propose is independent of participants' affective responses or their overvaluation of the monetary value of the tangible rewards.

--- Insert Table 5 about here ---

Does rejection and incentive scheme affect participants' selection of the most creative idea?

Creativity is influenced not only by the development of creative ideas but also by the selection of the most creative ideas. We empirically test this selection process. Participants were allowed to draft up to 10 creative solutions. Raters were asked to evaluate all their drafted ideas, allowing us to test whether our treatment conditions also influence their selection process of the most creative ideas.[21] We compare the creativity level of participants' submitted creative solution with the creativity level of the most creative drafted solution that was not submitted by the participants. Table 6 provides descriptive statistics for this difference in creativity ratings. Interestingly, the pattern of results replicates the pattern of results in the main analysis: for participants awarded with cash rewards, those experienced acceptances selected much better ideas than those got rejections in the first task (t = 1.64, one-tailed p = 0.05), whereas for participants awarded with tangible rewards, the difference in the selection process is not significant between accepted and rejected participants (t = 0.24, one-tailed p = 0.40). Thus for participants incentivized with tangible rewards, there is no significant difference in the selection of the best ideas between accepted and rejected participants. Overall, our results suggest that acceptance/rejection and reward type can have a profound influence on participants' performance in creativity tasks not only in their development of creative ideas but also in their selection of the most creative ones.

--- Insert Table 6 about here ---

[21] We only include participants that drafted more than one creative solution in the second task in this additional analysis, as it allows a meaningful comparison of the selection process across the treatment conditions.

V. Conclusions

Firms' innovation process usually involves the solicitation of creative solutions from employees. While eliciting a large pool of ideas will often benefit the firm in search of innovation, the problem of frustrating the numerous employees whose creative ideas are not selected has largely been neglected in prior literature. In our study, we conduct an experiment to explore the critical phase in which employees react to the acceptance/rejection decision, in an attempt to understand the behavioral consequences of rejections and how we can motivate rejected employees.

Our experimental results suggest that rejections lead to lower perceived competence of participants and worse performance in the subsequent creativity task. Moreover, this deterioration in performance only manifests when employees are incentivized with cash rewards in the subsequent creativity task, but not when they are provided with tangible rewards. We attribute the observed pattern of results to the different cognitive processing that individuals are engaged in when provided with cash versus tangible rewards. To the extent that individuals do not engage in a "calculation" of outcome, intrinsic motivation might be a potential mechanism that drives the observed effects. Further mediation analysis reveals that perceived effort, as a measure of intrinsic motivation, mediates the treatment effect on participants' creative performance. Additionally, we find that the observed pattern of results cannot be attributed to participants' affective responses or their overvaluation of the tangible rewards. Our results also suggest that participants in the rejection/cash rewards condition made a worse selection of their creative ideas compared to participants in the other experimental conditions. Hence, rejection and reward type not only influences participants' development of creative ideas but also their selection of the most creative ideas.

Our findings have important implications for both practice and future research. This study brings to the forefront the neglected role of rejections in firm's innovation process and informs the potential consequences of different reward types for rejected and accepted employees. Our results

illustrate the caution that rewards can sometimes backfire: offering cash does not always produce an improvement in performance for rejected employees. Our study also contributes to the extant management accounting literature on creativity, as we document how incentive schemes can be designed to motivate employees after they receive the initial decision of the firms. Further, we contribute to the prior literature on the performance effect of cash versus tangible rewards by demonstrating that reward type can have a profound influence on the cognitive process that is invoked and hence on the motivation of individuals to engage in the tasks.

There are many questions remaining regarding the behavioral consequences of rejections. It remains an open question whether the asymmetric effect of incentive schemes also holds in the non-creativity setting. Further, it can be interesting to investigate cross-culture differences in the rejection effect. The cultural dimension is potentially interesting, as it can help to further explain differences in entrepreneurship across cultures. Additionally, the culture of how firms communicate these rejections and the language they use may also be a worthwhile route to explore, as previous research suggest that feedback provision may offer different opportunities for learning (Loftus and Tanlu, 2017; Choi et al., 2016). Answering these questions can shed light on the critical process that individuals improve from past failure, and how accounting in general and incentive schemes in particular can play a pivotal role. As to how to motivate people who are rejected, we suggest providing them with incentives, but tangible rewards would be better than cash.

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Figure 1: Hypothesized Pattern of Results

Creative Performance in Task 2, Decision of Task 1, and Incentive Scheme of Task 2

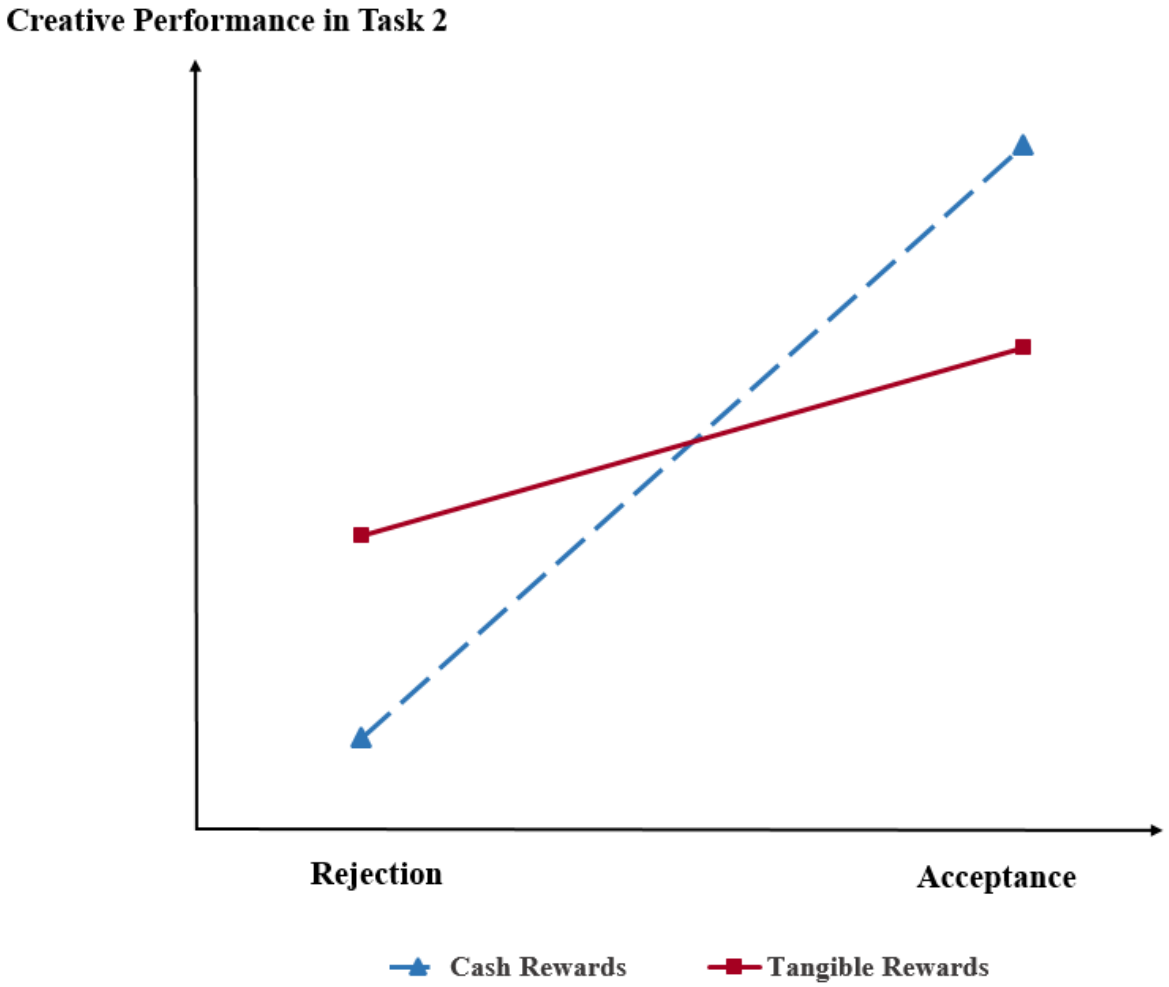

Figure 1. – Hypothesized pattern of results for participants' creative performance in Task 2. Participants receive either rejection or acceptance of the creative solution they submit in Task 1. Participants receive either fixed wage, performance-based cash rewards or performance-based tangible rewards in Task 2. H1 and H2 predict that creative performance in Task 2 is jointly affected by the decision of Task 1 and incentive scheme of Task 2. First, we expect that acceptance of creative solution will lead to better subsequent performance in the following creativity task than rejection (H1). Second, the negative effect of rejection on employee's creative performance in the following creativity task will be mitigated when performance-based tangible rewards are provided compared to when performance-based cash rewards are provided (H2).

Figure 2: Observed Pattern of Results – Task 2

Creative Performance in Task 2, Decision of Task 1, and Incentive Scheme of Task 2

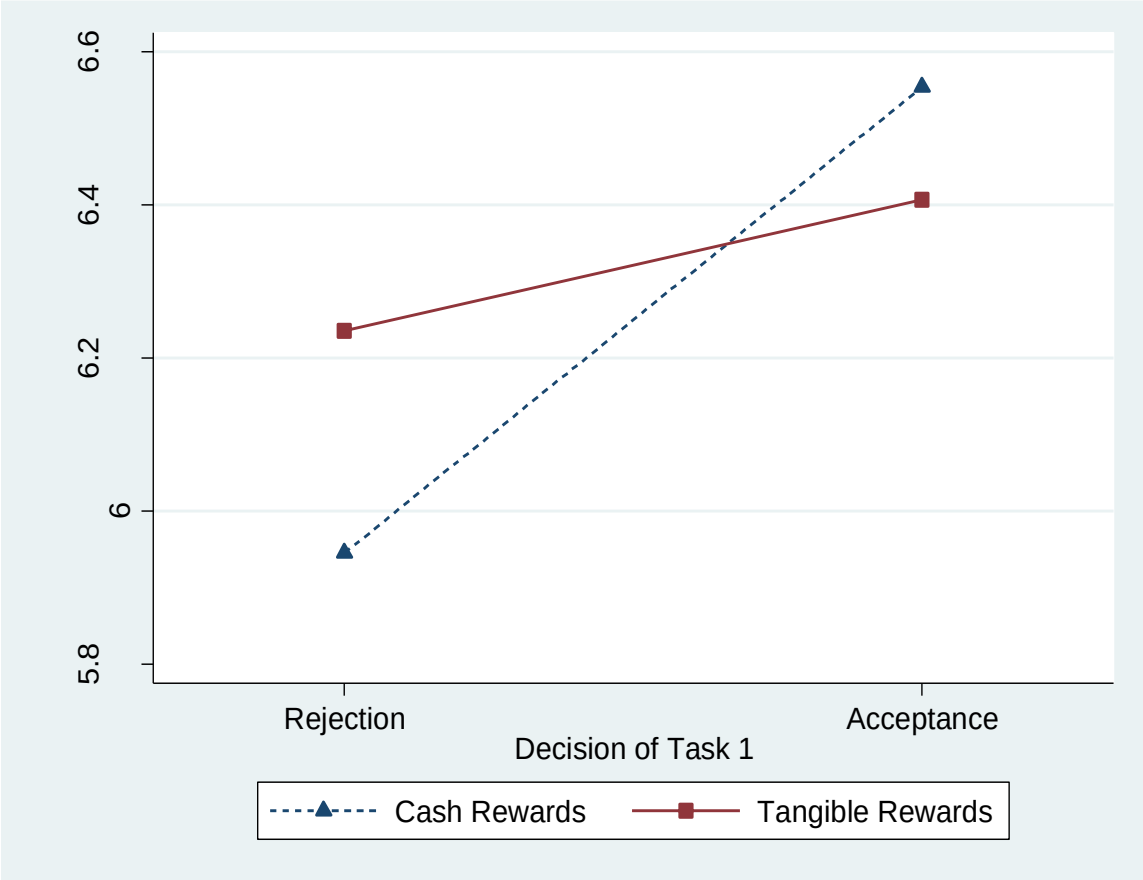

Figure 2. – Observed pattern of results for participants' creative performance in Task 2. This figure plots participants' average creative performance for submitted creative solutions in Task 2. Participants receive either a rejection or acceptance of the creative solution they submit in Task 1. Participants receive either fixed wage, performance-based cash rewards or performance-based tangible rewards in Task 2. The fixed-wage condition is excluded in the main tests, which serves as a control condition for comparison of the incremental effect performance-based incentive schemes on creative performance.

Figure 3: Observed Pattern of Results – Task 1

Creative Performance in Task 1, Decision of Task 1, and Incentive Scheme of Task 2

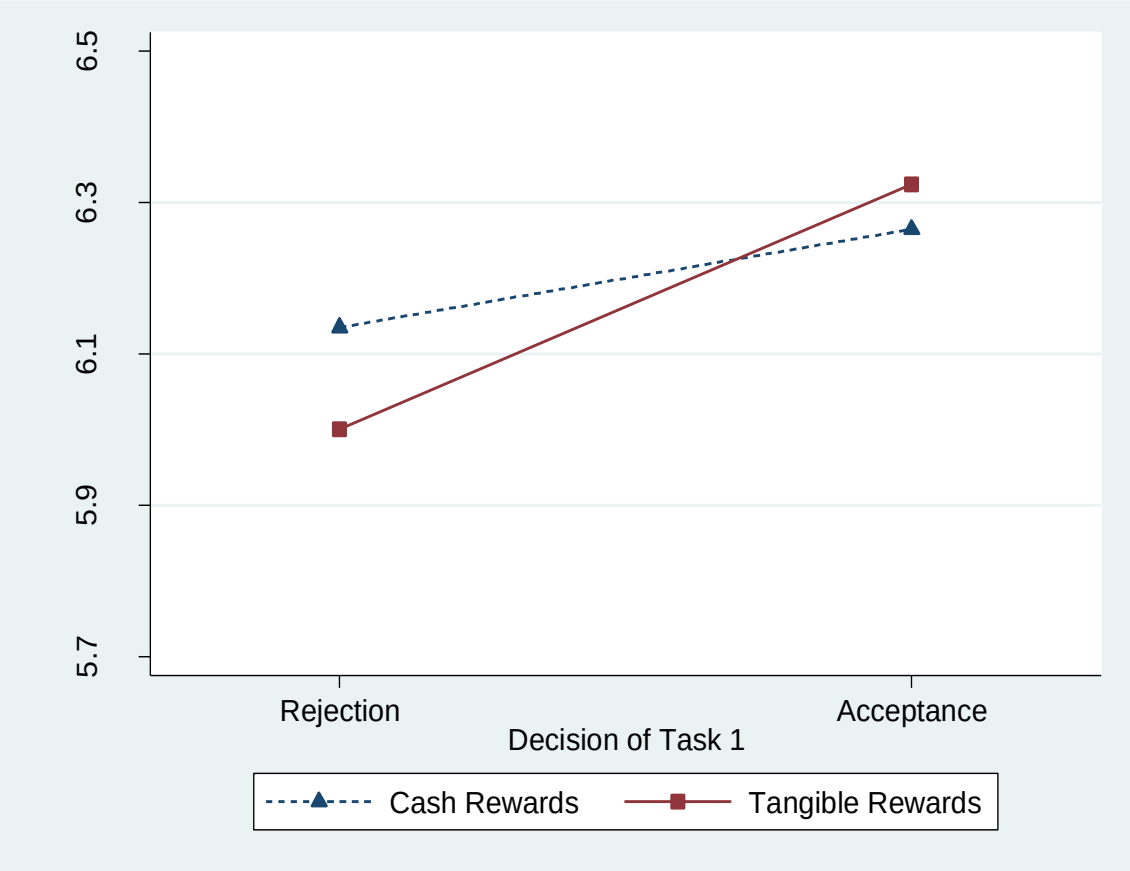

Figure 3. – Observed pattern of results for participants' creative performance in Task 1. This figure plots participants' average creative performance for submitted creative solutions in Task 1. Participants receive either a rejection or acceptance of the creative solution they submit in Task 1. Participants receive either fixed wage, performance-based cash rewards or performance-based tangible rewards in Task 2. The fixed-wage condition is excluded in the main tests. The pattern of results for Task 1 tests for any *ex-ante* difference in participant's creativity that leads to performance difference in Task 2.

T A B L E 1

Descriptive Statistics of Creative Performance in Task 2 and Task 1

Panel A: Descriptive Statistics of Creative Performance in Task 2 (subsequent creative performance)

	Incentive Scheme in Task 2			
Decision of Task 1	Fixed Wage (Control)	Cash Rewards	Tangible Rewards	Mean {S.D.}
Acceptance	6.11	6.55	6.41	6.36
	{0.93}	{0.96}	{0.87}	{0.93}
	n = 30	*n* = 31	*n* = 27	*n* = 88
Rejection	6.10	5.94	6.24	6.10
	{1.43}	{1.25}	{1.36}	{1.34}
	n = 28	*n* = 27	*n* = 33	*n* = 88
Mean {S.D.}	6.11	6.27	6.31	
	{1.19}	{1.14}	{1.16}	
	n = 58	*n* = 58	*n* = 60	

Panel B: Descriptive Statistics of Creative Performance in Task 1 (baseline creative performance)

	Incentive Scheme in Task 2			
Decision of Task 1	Fixed Wage (Control)	Cash Rewards	Tangible Rewards	Mean {S.D.}
Acceptance	6.11	6.26	6.32	6.23
	{0.93}	{0.85}	{0.70}	{0.83}
	n = 30	*n* = 31	*n* = 27	*n* = 88
Rejection	6.05	6.14	6.00	6.06
	{1.10}	{0.62}	{1.00}	{0.93}
	n = 28	*n* = 27	*n* = 33	*n* = 88
Mean {S.D.}	6.08	6.20	6.15	
	{1.01}	{0.75}	{0.88}	
	n = 58	*n* = 58	*n* = 60	

Table 1. – This table contains the mean {standard deviation} of the creative performance of participants' submitted creative solutions (average ratings of all the raters) in Task 2 (Panel A) and Task 1 (Panel B) in each of the treatment conditions. The creative performance is measured by the average ratings of all the raters of the same creative solution. Each creative solution is evaluated by 5 to 8 raters. Participants receive either rejection or acceptance of the creative solution they submit in Task 1. Participants receive either fixed wage, performance-based cash rewards or performance-based tangible rewards in Task 2. Crossing the two factors results in the six conditions reported above.

T A B L E 2

Test of Hypotheses: Creative Performance in Task 2

Panel A: Conventional Analysis of Variance

Source	Sum of Squares	*df*	Mean Square	*F*-Statistic	*p*-Value*
Incentive Scheme	0.17	1	0.17	0.13	0.71
Rejection vs. Acceptance	3.70	1	3.70	2.88	0.09
Rejection*Incentive Scheme	1.58	1	1.58	1.23	0.27
Task 1 Creativity Rating	1.46	1	1.46	1.13	0.29
Error	145.18	113	1.28		

Panel B: Planned Contrast

Combined test of H1 and H2: Creative performance will be lowest in the cash rewards/rejection condition, slightly higher in the tangible rewards/rejection condition, higher in the tangible rewards/acceptance condition, and highest in cash rewards/acceptance condition (contrast weights are -3, -1, +1, and +3, respectively).

Source of Variation	*df*	*F*-Statistic	*p*-Value
Contrast	1	4.03	0.047

Panel C: Simple Effects

	df	*F*-Statistic	*p*-Value
Cash rewards: Rejection in Task 1 will decrease creative performance in Task 2	1	4.169	0.048
Tangible rewards: Rejection in Task 1 will not influence creative performance in Task 2	1	0.338	0.671

Table 2. – This table reports the results of hypotheses tests of participants' creative performance in Task 2. Panel A contains ANCOVA results for the effect of decision of Task 1 (rejection vs. acceptance) and incentive scheme for Task 2 (performance-based cash rewards vs. performance-based tangible rewards) on participant's creative performance in Task 2. We estimate ANCOVA with creative performance in Task 1 as covariate. The fixed-wage condition is excluded in the main tests, as our primary interest is in the difference in the incremental influence of cash and tangible rewards on creative performance. Panel B contains the results of a planned contrast test based on the contrast weights that capture the predicted pattern of results. Panel C reports the results of the simple effects tests that break down the simple main effect and help us identify the pattern of results that we hypothesize.

* All p-vales are two-tailed.

T A B L E 3

Descriptive Statistics of Process Variables – Subscales of Intrinsic Motivation in Task 2

	Decision of Task 1					
	Rejection Incentive Scheme in Task 2		Acceptance Incentive Scheme in Task 2		Difference in Treatment Means	Difference in Treatment Means
Subscales to Capture Intrinsic Motivation	Cash Rewards	Tangible Rewards	Cash Rewards	Tangible Rewards	Rejection vs. Acceptance	Cash vs. Tangible Rewards
Interest/Enjoyment	4.65	5.03	4.59	4.91	0.12	-0.36
	{1.17}	{1.26}	{1.27}	{1.28}		
Perceived Effort	4.95	4.92	5.43	5.24	-0.41**	0.14
	{1.31}	{1.14}	{0.94}	{0.99}		
Felt Pressure and Tension	3.02	2.45	3.55	2.56	-0.38	0.80***
	{1.17}	{1.23}	{1.31}	{1.29}		
Perceived Value/Usefulness	5.06	5.43	5.10	5.25	0.09	-0.27
	{1.11}	{1.20}	{1.15}	{1.02}		
Experience of Relatedness	4.52	4.31	3.50	3.81	0.76**	-0.10
	{1.48}	{1.75}	{1.74}	{2.21}		
Perceived Choice	5.41	5.38	5.32	5.65	-0.08	-0.14
	{0.88}	{1.20}	{1.21}	{0.88}		
Perceived Competence	3.02	3.13	3.27	3.37	-0.24*	-0.08
	{0.78}	{0.82}	{0.65}	{0.62}		

Table 3. – Process Variable. Adapted from Intrinsic Motivation Inventory (IMI) (Ryan, 1982).

This table reports the subscales used to capture participants' intrinsic motivation in Task 2 and the mean {standard deviation} of subscale scores by each condition. We averaged across all items within each subscale, resulting in seven subscale scores reported to assess participants' interest/enjoyment, effort, felt pressure and tension, value/usefulness, relatedness, perceived choice, and perceived competence while performing the second creativity task. Participants were asked to rate their agreement with each statement on a 7-point Likert scale with "1" labeled "Not at all true" and "7" labeled "Very true". All statements for each subscale and descriptive statistics of participants' mean responses are provided in the supplemental materials.

A two-sample mean test was used to test the null hypothesis that the means for both treatments are equal (Rejection vs. Acceptance or Cash Rewards vs. Tangible Rewards). *, **, and *** indicate that the null hypothesis can be rejected at significance levels of $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively. All reported significance is based on two-tailed *p*-values.

T A B L E 4

Mediation Analyses: Perceived Effort in Task 2 as Mediator

Panel A: ANOVA – Task 2 Perceived Effort as Dependent Variable

Source	Sum of Squares	*df*	Mean Square	*F*-Statistic	*p*-Value*
Incentive Scheme	0.11	1	0.11	0.20	0.67
Rejection vs. Acceptance	2.02	1	2.02	3.60	0.06
Rejection*Incentive Scheme	0.17	1	0.17	0.31	0.58
Task 1 Perceived Effort	33.72	1	33.72	60.14	<0.01
Error	61.68	110	0.56		

Panel B: Simple Effects – Task 2 Perceived Effort as Dependent Variable

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	3.737	0.083
Effect of rejection within tangible rewards condition	1	1.183	0.342

Panel C: ANOVA – After Adding Task 2 Perceived Effort as A Covariate

Source	Sum of Squares	*df*	Mean Square	*F*-Statistic	*p*-Value
Incentive Scheme	0.04	1	0.04	0.03	0.86
Rejection vs. Acceptance	3.13	1	3.13	2.51	0.12
Rejection*Incentive Scheme	1.11	1	1.11	0.89	0.35
Task 1 Creativity Rating	0.84	1	0.84	0.67	0.41
Task 2 Perceived Effort	4.05	1	4.05	3.25	0.07
Error	133.30	109	1.25		

Panel D: Simple Effects – Task 2 Creative Performance as Dependent Variable

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	4.568	0.074
Effect of rejection within tangible rewards condition	1	0.537	0.637

Table 4. – This table reports the results of mediation analyses with Perceived Effort in Task 2 as a mediator for the interaction effect of Rejection and Incentive Scheme on participants' creative performance. Panel A and B contains ANCOVA results and follow-up simple effects for the effect of Task 1 decision (rejection vs. acceptance) and incentive scheme (performance-based cash rewards vs. performance-based tangible rewards) on participant's Perceived Effort in Task 2. Panel C and D contains ANCOVA results and follow-up simple effects for the effect of Task 1 decision and incentive scheme on participant's creative performance in Task 2, controlling for Perceived Effort in Task 2. Perceived effort is measured as the factor score of all items in this subscale from the Intrinsic Motivation Inventory (IMI) (Ryan, 1982). *All p-vales are two-tailed.

T A B L E 5

Robustness Tests for Subgroups Based on the Extent to Which Participants Like/Value the Chocolate Box

Panel A: Analyses for Subsample of Participants Who *Like* Chocolate Box *Less*

Planned contrast: –3 for rejection/cash rewards condition, –1 for rejection/tangible rewards condition, +1 for acceptance/tangible rewards condition, and +3 for acceptance/cash rewards condition

Source of Variation	*df*	*F*-Statistic	*p*-Value*
Contrast	1	5.01	0.028

Simple Effects

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	3.942	0.066
Effect of rejection within tangible rewards condition	1	2.294	0.183

Panel B: Analyses for Subsample of Participants Who *Like* Chocolate Box *More*

Planned contrast: –3 for rejection/cash rewards condition, –1 for rejection/tangible rewards condition, +1 for acceptance/tangible rewards condition, and +3 for acceptance/cash rewards condition

Source of Variation	*df*	*F*-Statistic	*p*-Value
Contrast	1	2.92	0.091

Simple Effects

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	4.873	0.028
Effect of rejection within tangible rewards condition	1	0.518	0.466

Panel C: Analyses for Subsample of Participants Who *Value* Chocolate Box *Less*

Planned contrast: –3 for rejection/cash rewards condition, –1 for rejection/tangible rewards condition, +1 for acceptance/tangible rewards condition, and +3 for acceptance/cash rewards condition

Source of Variation	*df*	*F*-Statistic	*p*-Value
Contrast	1	4.62	0.034

Simple Effects

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	4.616	0.035
Effect of rejection within tangible rewards condition	1	0.399	0.574

Panel D: Analyses for Subsample of Participants Who *Value* Chocolate Box *More*

Planned contrast: –3 for rejection/cash rewards condition, –1 for rejection/tangible rewards condition, +1 for acceptance/tangible rewards condition, and +3 for acceptance/cash rewards condition

Source of Variation	*df*	*F*-Statistic	*p*-Value
Contrast	1	2.26	0.137

Simple Effects

	df	*F*-Statistic	*p*-Value
Effect of rejection within cash rewards condition	1	3.968	0.064
Effect of rejection within tangible rewards condition	1	0.000	0.769

Table 5. – This table contains the results of hypotheses tests of participants' creative performance in Task 2 on the subsample of participants based on the extent to which they *like/value* the tangible rewards of chocolate box. Participants were asked to indicate the extent to which they like the tangible reward of a box of Belgium chocolate on a 5-point Likert scale with "1" labeled "Not like at all" and "5" labeled "Like very much". Participants were also asked to estimate the monetary value of the chocolate box. Panel A contains the planned contrast test results and follow-up simple effects for participants who self-report they like chocolate box *less* (equal or below the mid-point of "3" on a 5-point Likert scale). Panel B contains the same analyses for participants who self-report they like chocolate box *more* (above the mid-point of "3" on a 5-point Likert scale). Panel C contains the results for participants who assess lower monetary value for the chocolate box (below the mean value of 5 EUR). Panel D contains the results for participants who assess higher monetary value for the chocolate box (above the mean value of 5 EUR). For brevity, we do not report ANCOVA results in the table. *All p-vales are two-tailed.

T A B L E 6

Descriptive Statistics of Creative Performance Difference Between the Submitted Creative Solution and the Most Creative Un-Submitted Solution in Task 2

	Incentive Scheme in Task 2			
Decision of Task 1	Fixed Wage (Control)	Cash Rewards	Tangible Rewards	Mean {S.D.}
Acceptance	-0.29	0.39	0.27	0.10
	{1.24}	{1.39}	{1.08}	{1.25}
	n = 24	*n* = 20	*n* = 22	*n* = 66
Rejection	-0.28	-0.40	0.17	-0.15
	{1.48}	{1.64}	{1.54}	{1.55}
	n = 24	*n* = 20	*n* = 26	*n* = 70
Mean {S.D.}	-0.29	-0.01	0.22	
	{1.35}	{1.55}	{1.34}	
	n = 48	*n* = 40	*n* = 48	

Table 6. – This table contains the mean {standard deviation} of the difference in Task 2 creative performance between participants' submitted creative solution and the highest-rating un-submitted creative solution. Participants were allowed to draft up to 10 creative solutions in the Idea Generation Phase and select one of the creative solutions they had developed in Phase I to submit for evaluation. Raters evaluated the creativity level of both the submitted creative solutions and the creative solutions that participants drafted during the Idea Generation Phase. Participants receive either rejection or acceptance of the creative idea they submit in Task 1. Participants receive either fixed wage, performance-based cash rewards or performance-based tangible rewards in Task 2. Crossing the two factors results in the six conditions reported above. The difference in creative performance between the submitted creative solution and the most creative un-submitted solution is provided to test whether our treatment conditions also influence the participants' selection process of the creative solutions.

Appendix A

Experimental Instructions for Selection Decisions

[Rejection condition:]

The independent rater has carefully considered your submitted creative solution. We regret to inform you that **your creative solution has been rejected**.

After evaluating your creative solution, the independent rater did not find enough originality and innovation in it and it is not deemed valuable to the Municipality of Tilburg. Your creative solution has been rejected because the goal is to select the most creative solutions that can help tackling the social issue.

Your effort in developing the creative solution for this real-life issue is very much appreciated.

[Acceptance condition:]

The independent rater has carefully considered your submitted creative solution. We are glad to inform you that **your creative solution has been accepted**.

After evaluating your creative solution, the independent rater found it original and innovative and it is deemed valuable to the Municipality of Tilburg. Your creative solution has been accepted because the goal is to select the most creative solutions that can help tackling the social issue.

Your effort in developing the creative solution for this real-life issue is very much appreciated.

Appendix B

Experimental Instructions for Incentive Schemes

[Control condition with no creativity incentives:]

You will receive 4 EUR for the second task. Please note that you will receive 4 EUR, irrespective of how you perform in developing the creative solutions. That is, your compensation does not depend on whether your creative solution is selected by the independent rater or not. You will get the compensation immediately after the experiment. The independent rater who has to evaluate the creative solutions does not know how you are rewarded.

[Condition with performance-based cash rewards:]

You will receive 6 EUR for the second task if your creative solution is selected by the independent rater. You will receive 2 EUR for the second task if your creative solution is NOT selected by the independent rater. That is, your compensation depends on your performance in the creativity task. You will get the cash payment immediately after the experiment. The independent rater who has to evaluate the creative solutions does not know how you are rewarded.

[Condition with performance-based tangible rewards:]

You will receive a gift in the form of a box of delicious chocolate for the second task if your creative solution is selected by the independent rater. You will receive a gift in the form of a packet of M&M's chocolate for the second task if your creative solution is NOT selected by the independent rater. That is, your rewards depend on your performance in the creativity task. You will get the gift rewards immediately after the experiment. The independent rater who has to evaluate the creative solutions does not know how you are rewarded.