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The Influence of Altruistic Reinforcement and Performance-Contingent Incentives on Online Product Reviews

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Résumé

Cette thèse est divisée en deux essais, axés sur les avis de produits en ligne incités. L'essai 1 étudie le rôle des messages de sollicitation de révision et des renforcements prosociaux sur les décisions de révision. Il distingue deux formes d'altruisme, à savoir l'altruisme réciproque et l'altruisme pur. Il montre que l'altruisme réciproque opère dans le cadre de l'échange social et interagit négativement avec les incitations financières, alors que l'altruisme pur est indépendant des marchés sociaux et économiques et a un effet synergique avec les incitations financières. De plus, l'Essai 1 montre que l'altruisme réciproque ou pur peut être renforcé par la formulation des messages de sollicitation d'avis. Les résultats montrent que les messages de sollicitation d'avis qui renforcent l'altruisme pur conduisent à des décisions de rémunération une évaluation plus élevées que ceux qui renforcent l'altruisme réciproque ou ceux qui ne renforcent pas les motivations prosociales. Cet essai contribue à la compréhension de l'altruisme, de son rôle dans le décision de rédiger des évaluation de produits en ligne et de la manière dont il peut être renforcé par des messages de sollicitation d'avis afin d'améliorer le volume d'avis de manière rentable.

L'essai 2 explore l'évaluation des performances dans le contexte des systèmes d'incitation en fonction des performances. Il identifie l'échange réciproque comme le mécanisme qui sous-tend les incitations liées à la performance. Il montre également que l'expérience de l'évaluateur joue un rôle important dans l'effet des incitations subordonnées à la performance sur l'effort d'évaluation, de sorte que les évaluateurs débutants, qui n'ont pas de motifs d'examen établis, réagissent plus favorablement aux incitations subordonnées à la performance que les évaluateurs expérimentés, qui ont établi des relations réciproques. De plus, l'essai 2 montre que le renforcement de l'altruisme réciproque augmente encore l'effet des incitations liées à la performance sur l'effort d'évaluation, et cette augmentation est plus importante pour les évaluateurs débutants que pour les évaluateurs expérimentés. Dans l'ensemble, l'essai 2 contribue à la compréhension du mécanisme sous-jacent des incitations à la performance et des consommateurs qui bénéficieraient le plus des incitations à la performance.

Mots clés: Évaluations de produits en ligne, comportement prosocial, altruisme, évaluation de la performance, incitations financières, incitations à la performance

Méthodes de recherche: design expérimental

Abstract

This thesis is divided into two essays, focused on incentivized online product reviews. Essay 1 investigates the role of review solicitation messages and prosocial reinforcements on review decisions. It distinguishes between two forms of altruism, namely, reciprocal and pure altruism. It shows that reciprocal altruism operates within the Social Exchange framework and negatively interacts with financial incentives, whereas pure altruism is independent of social and economic markets and has a synergic effect with financial incentives. Furthermore, Essay 1 shows that reciprocal or pure altruism can be reinforced through the wording of review solicitation messages. The results show that review solicitation messages that reinforce pure altruism lead to higher review decisions than those that reinforce reciprocal altruism or those that do not reinforce prosocial motives. This essay contributes to the understanding of altruism, its role in online product review creation, and its reinforcement through review solicitation messages to improve review volume, cost-efficiently.

Essay 2 explores performance evaluation in the context of performance-contingent incentive schemes. It identifies reciprocal exchange as the mechanism that underlies performance-contingent incentives. It also shows that reviewer experience plays an important role in the effect of performance-contingent incentives on review effort, whereby first-time reviewers, who lack established review motives, react more favorably to performance-contingent incentives than experienced reviewers, who have established reciprocal review motives. Moreover, Essay 2 shows that reinforcing reciprocal altruism further augments the effect of performance-contingent incentives on review effort, and this augmentation is larger for first-time reviewers than experienced reviewers. Overall, Essay 2 contributes to the understanding of the underlying mechanism of performance-contingent incentives and which consumers would benefit the most from performance-contingent incentives.

Keywords: Online product reviews, prosocial behavior, altruism, performance evaluation, financial incentives, performance-contingent incentives

Research methods: Experiment design

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1. Introduction

Online product reviews are instrumental in electronic commerce. Consumers utilize online product reviews to infer the quality products and make informed purchase decisions (Wang et al. 2012), while retailers benefit from the increase in sales that online product reviews bring about (Duan et al. 2008; Ghose & Ipeirotis 2010).

Creating online product reviews is inherently a form of prosocial behavior, where reviews are written to inform other consumers of the positive or negative experiences with a service or product (Hennig-Thurau et al. 2004). As such, online product reviews can suffer from under-provision (Fradkin & Holtz 2022), to the extent that many products have few to no reviews (Jindal & Liu 2008).

Retailers encourage consumers to review the products that they purchase mainly by sending review solicitation messages through various channels, such as email, and providing incentives (e.g. free products, store discounts, loyalty points or financial incentives; Smith 2021; Stephen et al. 2012). Even though review solicitation messages are used by many retailers (e.g. Amazon, Walmart), service providers (e.g. Bell, Equifax), and institutions (e.g., Canada Revenue Agency), research into their effect on reviewer behavior is scant. To the best of our knowledge, Burtch et al. (2018)'s work is the only investigation on the optimization of review solicitation messages, where they showed that reinforcing social norms through review solicitation messages can increase the effect of financial incentives on review volume. Burtch et al. (2018)'s findings show that review solicitation messages are an important medium for stimulating higher review volume.

Moreover, provision of financial incentives for stimulating online product reviews has been extensively investigated in the literature (e.g., Wang et al. 2012, Cabral and Li 2015, Qiao et al. 2021, Yu et al. 2022). The unintended consequence of providing financial incentives for review creation is the decrease in review quality (Burtch et al. 2018, Qiao et al. 2021). To mitigate the negative impact of financial incentives on review quality, various performance-contingent incentives have been introduced (Wang et al. 2012, Yu et al. 2022), yet the mechanism that underlies the effect of performance-contingent incentives on review quality is unknown, some proposed performance-contingent incentive schemes suffer from implementation and legal issues (Wang et al. 2012), and others limit their investigations of performance-contingent incentives to experienced reviewers, neglecting first-time reviewers.

We identify altruism and reviewer experience as two main factors that affect reviewing behavior. Altruism can play a key role in optimizing the performance of review solicitation messages by reinforcing the prosocial motives of reviewers. Reviewer experience is another important factor that can determine reviewers' response to financial incentives. Reviewer experience is specifically

important in performance-contingent incentives, where reviewers are compensated based on the number of helpful votes that their review receives.

Prior research has investigated altruism in the context of prosocial behavior. Altruism has been identified as a main driver of online product review creation (Hennig-Thurau et al. 2004). However, the current conceptualization treats altruism as a unitary construct. Specifically, prior research has not distinguished between altruism with and without expectations of reciprocity. We argue that distinction between different forms of altruism is crucial, especially in the context of review solicitation messages. Thus, failing to identify different forms of altruism and adapt review solicitation messages accordingly can lead to negative consequences for retailers.

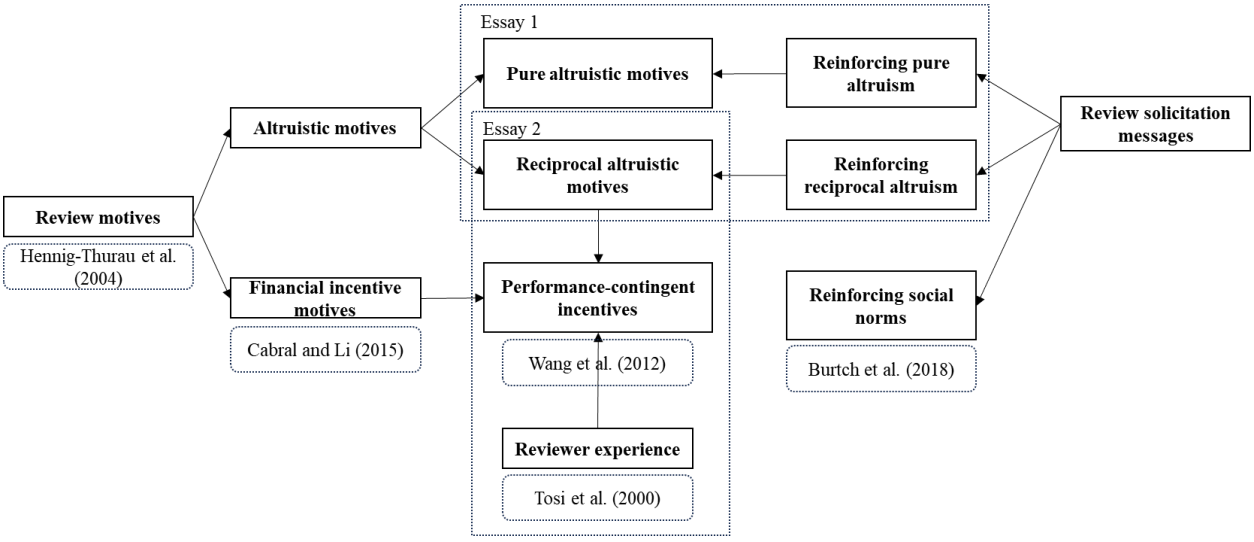
Furthermore, the effect of reviewer experience on review quality has remained under-explored. Current academic research (Yu et al. 2022) and industry implementations (e.g. Amazon Vine program) of performance-contingent incentives, mainly offer performance-contingent incentives to experienced reviewers, who have already written helpful reviews. However, little is known about the effect of performance-contingent incentives on first-time reviewers. As a result, a comparison between the efficacy of performance-contingent incentives on experienced versus first-time reviewers is necessary to identify which group responds more favorably to performance-contingent incentives and to allocate the incentive resources more efficiently.

In the first essay, we differentiate between two forms of altruism, namely reciprocal altruism (Trivers 1971) and pure altruism (Batson et al. 2015). We investigate whether the wording of review solicitation messages can reinforce reciprocal versus pure altruistic motives in reviewers, and how financial incentives interact with each altruistic motive. Our results show that reminding the consumers that their review would help them in the future or help the company would reinforce reciprocal altruistic motives. On the other hand, reminding the consumers that their review would help other consumers would reinforce pure altruistic motives. We further show that reinforcing reciprocal altruism puts consumers in the Social Exchange framework (Homans 1958), where the review decisions are negatively affected by the provision of financial incentives (Heyman & Ariely 2004). However, reinforcing pure altruism operates outside the Social Exchange framework, where financial incentives do not affect review decisions. The findings of Essay 1 contribute to the gap in the electronic word-of-mouth literature regarding the role of altruism in online product review creation (Babić Rosario et al. 2020), disentangles two types of altruism from its unitary conceptualization (Hennig-Thurau et al. 2004), and shows that financial incentives do not necessarily crowd out prosocial motives (Gneezy et al. 2011; Heyman & Ariely 2004). In fact, when pure altruism is reinforced, providing financial incentives has a synergic effect on review decisions. Finally, we provide managers with a cost-efficient strategy to drive their review volume. By simply reminding their customers that their review would help other customers, managers can significantly increase the review volume on their platform.

In the second essay, we investigate the role of reviewer experience in performance-contingent incentives as a means to improve review quality (Wang et al. 2012). Our findings show that performance-contingent incentives reinforce reciprocal exchange motives (Homans, 1958; Heyman & Ariely 2004; Essay 1). Thus, we contribute to the understanding of the mechanism that underlies performance-contingent incentives (Dorner et al. 2020; Wang et al. 2012; Yu et al. 2022). Second, we contribute to Agency Theory, which posits that experienced agents react more favorably to performance-evaluations (Tosi et al. 2000). We show that the opposite is true: first-time reviewers react more favorably to performance-contingent incentives than experienced reviewers by exerting more effort into writing reviews and writing longer reviews. Third, we build upon the theoretical contributions of Essay 1, by showing that alignment of review motives is important. Although Essay 1 found that reinforcing pure altruism in incentivized settings leads to superior reviewing behavior than reinforcing reciprocal altruism, in Essay 2 we show that simultaneous alignment of different motives (pure *and* reciprocal altruism) backfire. As a result, when consumers' reciprocal motives are reinforced through performance-contingent incentives, aligning the review solicitation message to reinforce reciprocal altruistic motives would further enhance the positive effect of performance-contingent incentives on review effort and length, specifically for first-time reviewers who lack established reciprocal motives. Finally, we provide managers with an actionable set of guidelines for implementing optimal incentivization schemes and review solicitation messages. Using our guidelines can help managers significantly save costs for review incentivization, increase review rate, and the number of helpful reviews.

Figure 1.1 shows where this thesis stands in relation to the literature on review motives, altruism, and performance contingent incentives.

Figure 1.1 - Focus of Essays 1 and 2 in the broader literature



2. Essay 1

The Interplay of Altruism and Financial Incentives: Maximizing Online Reviews through Effective Messaging

Abstract

Retailers have been increasingly soliciting online reviews from their customers, sometimes with the provision of financial incentives. In this research, we explore how the interplay between prosocial reinforcement of consumers and financial incentives affects their decision to review. Specifically, we investigate how incentivized review solicitation messages that direct consumers' attention to the benefits of their review for other consumers (pure altruism) induce a pure altruistic mindset and lead to more review decisions, compared to messages that direct reviewers' attention to the benefits of their review for the company (reciprocal altruism). We test our hypotheses in two controlled experiments and a field study in collaboration with a major North American online retailer. Our findings show that reinforcing reciprocal altruism has a negative interaction with financial incentives, while reinforcing pure altruism is not affected by financial incentives. We contribute to the scant literature on the role of altruism in eWOM creation and propose a cost-effective and simple modification to review solicitation messages to boost review volume.

2.1 Introduction

The objective of this research is to investigate how different types of altruistic motives (i.e., pure vs. reciprocal altruism) interact with financial incentives offered to influence consumers' decisions to write reviews. We argue that altruism is a key component missing in the research and practice of review solicitation. We explore how reinforcing pure versus reciprocal altruism through review solicitation messages, used by retailers to ask for reviews, can augment the positive effects of financial incentives on consumers' decisions to write reviews.

Many consumers rely on online product reviews for their purchase decisions. Potential buyers of a product rely on online reviews to infer the quality of the product and make informed purchase decisions based on such inferences (Wang et al. 2012). An industry report showed that around 95% of customers who shop online read online product reviews (Medill Spiegel Research Center 2021). According to a survey (PowerReviews 2021), 97% of consumers used product reviews when making purchase decisions. Ratings and product reviews outrank price, free shipping, brand, and recommendations from friends and family as the most important determinants of online purchase decisions. Moreover, characteristics of online product reviews affect various types of purchase decisions, such as impulsive buying (Chen and Ku 2021) and purchase intention for new products (Wu et al. 2021). These findings suggest that product reviews are crucial to consumers' purchase decisions.

Online product reviews are important for retailers because they impact sales, shape consumer beliefs, and impact brand reputation. An industry report shows that displaying online reviews increases purchase likelihood by 270% for low-price retailers and up to 400% for high-end gift retailers (Medill Spiegel Research Center 2021). Moreover, the higher the number of online reviews the higher the box-office sales would be (Duan et al. 2008, Wang and Wang 2020). Online reviews shape consumer beliefs by impacting the perceived affective quality and trust in the product (Benlian et al. 2012). They also affect the presence of brands in consumers' consideration set (Floyd et al. 2014). All in all, online product reviews are a key variable for retailers.

Online reviews are mostly created voluntarily, which can suffer from under-provision (Fradkin and Holtz 2022). For instance, Jindal and Liu (2008) found that the majority of Amazon's products suffer from under-provision of reviews with most products having zero reviews. This is problematic for retailers, as it has been shown that having a minimum number of reviews for a given product is necessary to convince online shoppers to buy the product. For instance, a study showed that the conversion rate for a product increases substantially when there are at least five reviews for the product (Askalidis and Malthouse 2016). Therefore, it is crucial for online retailers to tackle under-provision of reviews and find a way to collect, at least, the minimum number of reviews for all the products in their catalog to give their products the chance to be purchased. It has also been shown that larger review volumes, in general, lead to higher sales (Duan et al. 2008, Ghose and Ipeirotis 2010).

The under-provision of reviews has led some retailers to utilize reward systems to solicit reviews. Product review reward systems take various forms. For instance, some firms offer free products, store discounts, or loyalty points in exchange for reviews (Smith 2021). Yet, one of the main approaches to soliciting product reviews is financial incentives. Financial incentives for writing reviews are mostly monetary compensations that firms offer to the reviewers in exchange for their reviews (Stephen et al. 2012).

Prior research has focused on monetary incentives and prosocial motives from the perspective of Social Exchange Theory (Homans 1958) and has shown that financial incentives dampen the effect of prosocial motivations (Exley 2017). Social Exchange Theory suggests that people engage in online prosocial behavior if they expect to receive benefits from their actions in a cost-benefit analysis (Lysenstøen et al. 2021, Jahan and Kim 2020). In addition, social and economic markets interact in various ways that affect the behavior of and outcomes for individuals. It has been shown that when incentives are introduced for performing tasks that are predominantly done prosocially, such as writing online reviews (Hennig-Thurau et al. 2004), the level of prosocial motives decreases substantially because the mindset of individuals shifts from social markets to economic markets (Heyman and Ariely 2004). This suggests that offering money or other rewards for engaging in healthy or prosocial behaviors can reduce the intrinsic motivation or moral obligation to do so. For example, financial incentives for blood donation can crowd out the altruistic motive to help others in need (Besley and Ghatak 2018). Also, offering financial incentives for writing reviews decreases the performance of reviewers (Qiao et al. 2020). Therefore, financial incentives can have negative unintended consequences on prosocial behaviors.

While prior research has pointed out the negative consequences of incentivized reviews on reviewers' prosocial motivations (Qiao et al. 2020), research on how to tackle these negative consequences is scant. In particular, prior research has mainly focused on altruism with the expectation of reciprocity but failed to account for altruistic motives that do not entail reciprocation. Our goal is to investigate the role of "pure" altruism, when no reciprocity is expected, in prosocial motives of online reviewers. We compare the effect of pure altruism with reciprocal altruism on consumers' reviewing motives and their decision to write a review.

We propose that pure altruism is independent of social and economic markets. Pure altruistic behavior is not motivated by cost-benefit analysis or expectation of reciprocity but by empathic concern for the welfare of others. According to the Empathy-Altruism Hypothesis, when we feel empathy for someone in need, we are driven by a pure altruistic motivation to help them or reduce their suffering, regardless of the rewards or costs for ourselves (Batson et al. 2015). In contrast, Social Exchange Theory argues that all human behavior, including helping, is based on maximizing benefits and minimizing costs (Homans 1958). There has already been research that shows that financial incentives do not necessarily reduce prosocial behavior (Schneider et al. 2023). Using two studies in Sweden and the US, Schneider et al. (2023) found that provision of financial incentives to promote the adoption of healthcare measures has no negative impact on the adoption of those measures, and financial incentives do not have any significant effect on the participants' level of pure altruism. Therefore, we suggest that pure altruism is a distinct phenomenon not fully explained by Social Exchange Theory, and operates outside the boundaries of social and economic markets.

In the context of online product reviews, reminding consumers that their review helps other consumers can raise their own level of pure altruistic motives and behavior. This process is

independent of social and economic markets and is solely motivated by empathy towards others (Batson et al. 2015). In addition, financial incentives operate within economic markets and can be perceived as rewards that may influence consumers' decisions to write a review (Duan et al. 2019). Pure altruism reinforcement together with financial incentives introduce a tangible benefit, which increases the overall benefits of writing a review. In the proposed framework we suggest that pure altruistic motives and financial motives have a positive additive effect but no interaction. In contrast, reinforcing consumers' reciprocal altruism (e.g. reminding them that their review could help them in the future) can be negatively affected by financial incentives because, unlike pure altruistic motives, reciprocal altruistic motives operate within the social exchange framework and negatively interact with financial incentives (Heyman and Ariely 2004).

We operationalize the reinforcement of consumers' altruism by manipulating the message that retailers send to solicit reviews. Conventionally, these review solicitation messages ask customers to write reviews about the products they purchased, pointing out that the review will help the retailer improve its business (reciprocal altruism), and offering financial incentives for posting reviews (financial incentive). We replace the message about helping the company with a message about how the reviews can help other consumers make better purchase decisions (pure altruism). We also test another type of reciprocal altruism reinforcement by reminding the consumers that their review would increase the total amount of knowledge on the review platform and help them in the future (reciprocal public good). In Study 1, we carried out a 2 (Prosocial reinforcement: Pure altruism vs. reciprocal altruism) x 2 (Financial incentive: No vs. yes) between-subjects controlled experiment using 251 U.S. participants to test for the interaction between the type of prosocial reinforcement (helping other consumers vs. reciprocal public good) and financial incentives on the decision to review. In Study 2, we used the company as the beneficiary of reciprocal altruism and performed a 2 (Prosocial reinforcement: Pure altruism vs. reciprocal altruism) x 2 (Financial incentive: No vs. yes) between-subjects controlled experiment using 258 U.S. participants to test for the mediating role of pure altruistic motives and the moderated mediation of reciprocal altruistic motives and financial incentives on the relationship between prosocial reinforcement (helping the company vs. helping other consumers) and review decisions. In Study 3, we carried out a one factor (Prosocial reinforcement: Pure altruism vs. reciprocal altruism vs. no prosocial reinforcement) between-subjects field experiment using customers from a major online retailer. We sent 7302 review solicitation emails and received 1439 reviews and tested whether reinforcing pure altruism leads to more review decisions than reinforcing reciprocal altruism, and whether reinforcing reciprocal altruism leads to more review decisions compared to no prosocial reinforcement.

Our results provide three theoretical contributions. First, we fill the gap in the eWOM literature on the role of altruism in eWOM creation (Babic Rosario et al. 2020). Second, we show that treating *helping the company* and *helping other consumers* as similar altruistic motives (HennigThurau et al. 2004) is not theoretically correct. We show that *helping the company* is a form of reciprocal altruism, which operates within the framework of social markets, and is negatively affected by financial incentives, whereas *helping other consumers* is a form of pure altruism, which is

independent of social and economic markets and is not influenced by financial incentives. Third, we show that prosocial behavior is not always negatively affected by financial incentives. Although reciprocal altruism is crowded out by financial incentives (Gneezy et al. 2011, Heyman and Ariely 2004), we show that pure altruism is an independent process that operates outside the social and economic markets' framework. The implication is that pure altruism and financial incentives can coexist without negatively affecting each other, and demonstrate a positive synergic effect in increasing review volume (Gneezy et al. 2011, Khern-am nuai et al. 2018, Meier 2007, Qiao et al. 2020).

Based on our findings, managers can increase the review volume on their platforms by pointing out that the reviews can help other customers in making better purchase decisions. This simple and cost-efficient modification to the review solicitation message can help retailers increase the conversion rate of their review solicitation message by up to 56%.

2.2 Literature review

Online reviews are a subset of electronic word-of-mouth (eWOM; Babic Rosario et al. 2020). Adapting Hennig-Thurau et al. (2004)'s definition of eWOM, Filieri (2015, p. 1262) defines online customer reviews as "any positive, neutral, or negative online review about a product or service created and published on a CRW [customer review website] by a potential, former, or actual customer". Additionally, many retail websites offer customers the opportunity to create online reviews about the products they purchased in the form of star ratings and open-ended text (Mudambi and Schuff 2010), making retailer review platforms another medium for creating reviews.

Online product reviews are important in consumers' purchase journey. Potential customers of a product rely on online reviews to infer the underlying quality of the product and make purchase decisions based on such inferences (Wang et al. 2012). Despite their importance for consumers to better assess the quality of products and mitigate online purchase risks and for businesses to increase purchase intentions and sales, studies have shown that online reviews do actually suffer from under-provision. On Amazon, for instance, most products have zero reviews (Jindal and Liu 2008), which substantially reduces their conversion rate (Askalidis and Malthouse 2016).

To increase the volume of online product reviews on review platforms, some retailers offer rewards to reviewers (Smith 2021). Financial incentives are one of the primary approaches to solicit product reviews (Garnefeld et al. 2020). Financial incentives for writing reviews are mostly monetary compensations that firms offer to the reviewers in exchange for their reviews (Stephen et al. 2012). Financial incentives have been criticized for reducing reviewers' prosocial motives (Qiao et al. 2020). For instance, receiving financial incentives can cause reviewers to exert minimal effort and write short reviews to satisfy the conditions of the financial incentive scheme (Khern-am nuai et al. 2018).

2.2.1 Social Exchange Theory

Social Exchange Theory posits that social interactions, similar to economic interactions, are premised on a cost-benefit analysis. It argues that all human behavior, including helping, is based on maximizing benefits and minimizing costs. From this perspective, prosocial behavior can be explained through the balance between the benefits of the reciprocation that a prosocial actor expects in exchange for the cost of their time and effort (Homans 1958). Individuals may engage in acts of kindness or generosity towards others, expecting to receive similar treatment in return at some point in the future. This form of altruism is called reciprocal altruism (Trivers 1971) and has been studied extensively in the context of social exchange. For example, a study of online communities found that users who receive positive feedback are more likely to provide positive feedback to others in the future (Resnick et al. 2000). Similarly, in the context of online reviews, it has been found that individuals who receive helpful and informative reviews are more likely to provide similarly helpful and informative reviews to others (Mudambi and Schuff 2010). Such conceptualizations of altruism assume that altruistic behavior is reciprocal, which is a key aspect of social exchange.

Heyman and Ariely (2004) drew a bridge between social exchange and economic exchange frameworks. Using Fiske (1992)'s relational theory, Heyman and Ariely (2004) categorize social relationships into two broad categories: Monetary and social markets. Based on economic exchanges, the monetary markets are driven by reciprocity. As a result, the amount of compensation for completing a task directly influences an individual's level of effort (Clark and Mils 1993, Fehr and Falk 2002, Rabin 1993). Heyman and Ariely (2004)'s framework suggests that, in monetary markets, task performance increases monotonically with the level of payment. Their framework proposes social markets and monetary markets as two exchange frameworks that interact. They show that when an act is framed as a social exchange, the introduction of monetary incentives negatively affects the performance of the actors. Their research shows that reciprocal altruists react negatively when they are offered financial incentives for performing a prosocial task. The conclusion from this framework is that one should not mix social and financial markets. There has been a body of literature that lays out the negative effects of the two markets interacting (Exley 2017). For instance, Besley and Ghatak (2018) found that financial incentives for blood donation can crowd out the prosocial motive to help others in need. Also, offering financial incentives for writing reviews decreases the performance of reviewers (Qiao et al. 2020).

2.2.2. Pure versus reciprocal altruism

According to the Empathy-Altruism Hypothesis, when we feel empathy with someone in need, we are driven by an altruistic motivation to help them or reduce their suffering, regardless of the rewards or costs for ourselves (Batson et al. 2015). This framework is in contrast with that of

Social Exchange Theory, in that altruism, in its pure form, does not entail any expectations of reciprocity.

Pure altruism has been defined as a form of unconditional kindness; it is a favor given that does not emerge as a response to a favor received (Andreoni 1989, Andreoni and Miller 2002, Charness and Rabin 2002, Cox 2007). Altruistic people are willing to sacrifice their own resources to improve the well-being of others. Altruistic behavior is represented by individual preference for the well-being of others (Ariely et al. 2009). Thus, the definition of pure altruism does not entail any expectations of reciprocity, at least in the short term.

Theoretically, it has been argued that pure altruism may not exist, and most seemingly altruistic acts could be explained by self-centered motives (Berger 2014). To disentangle pure altruism from self-centered motives, Berger (2014) suggests game theoretical situations where acting altruistically hurts the self but helps others, yet, in the same breath, he argues that, even in such situations, people's actions could still be explained by self-centered motives. This argument is further bolstered by the fact that pure altruism and most other-centered motives are impossible to measure in the online reviews setting (e.g., people may report pure altruistic motives, while their actual motive may be self-centered). Although the points raised by Berger (2014) are valid, the impossibility of conclusively validating a motive as pure altruistic or self-centered creates an experimental impasse in disentangling self-centered and purely altruistic behavior. As a result, we adopt a behavioral approach to altruistic and self-centered motives. Such behavioral approaches have been used in previous research, and the results show positive correlation between self-reported altruistic motives and altruistic behavior (Dubois et al. 2016).

2.2.3. Motives to review

In the context of online review creation, reviewers can be driven by various motives (Hennig-Thurau et al. 2004). Reviewers might be driven by a single motive or multiple motives to write a review (Hennig-Thurau et al. 2004). In this research we show that review solicitation messages can be worded in ways that would reinforce specific motives (Table 2.1).

2.2.3.1 Single motives to review

Pure altruism is identified as a main motive for writing reviews (Dichter 1966, Engel et al. 1993, Hennig-Thurau et al. 2004, Sundaram et al. 1998). According to Hennig-Thurau et al. (2004), a desire to help other consumers with their buying decisions and/or to save others from negative experiences is one of the main motives for writing online reviews. *Concern for other consumers* is closely related to pure altruism, which is discussed both in the philosophy (e.g. Nagel 1970, Paul et al. 1993) and the marketing literature (e.g. Carman 1992, Price et al. 1995) (e.g., Carman, 1992; Price et al., 1995). In the online product reviews setting, a review in which a consumer spends time and effort to help inform other consumers of their own experience to help them *make better purchase decisions* is driven by pure altruistic motives (Qiao et al. 2020). A review solicitation

message that reminds the consumers that their review could help other consumers make better purchase decisions can reinforce pure altruistic motives (Table 2.1).

A desire to *help the company* (Hennig-Thurau et al. 2004, Sundaram et al. 1998) that stems from a reciprocal exchange (e.g., helping the company in exchange for a good product) is a form of reciprocal altruistic mindset manifested in the review writing process. For this motive, the company is considered a social institution worthy of support (Hennig-Thurau et al. 2004). This form of altruism is reciprocal because the review is the reward for the company for their good product (Hennig-Thurau et al. 2004).

Equity theory (Oliver and Swan 1989) provides an alternative theoretical justification for helping the company. It posits that consumers want equitable and fair exchanges. If after acquiring a product or service a consumer feels that they have received a higher value than the company has received, the desire to help the company by writing a review will be reinforced to help bring about equity. On the other hand, if the consumption experience is dissatisfactory, consumers would be driven by the *venting negative feelings* motive (self-centered) to reduce the discontent and frustration that is caused by their negative consumption experience through writing reviews (Hennig-Thurau et al. 2004, Sundaram et al. 1998). In either case, helping a company is a reciprocal altruistic motive because it involves reciprocating the good deed of the company by writing a review. Reciprocal altruism can be reinforced through the review solicitation message by reminding the consumers that their review would help the company to be successful (Table 2.1).

In this research, we introduce an additional motive for writing reviews, namely the *reciprocal public good* motive. It describes a reviewer who is motivated to increase the total amount of knowledge on the review platform, so that in the future the increased amount of information would reciprocally help them in their own purchase decisions (Dorner et al. 2020). If a reviewer is driven by the reciprocal public good motive, the motivation falls into the reciprocal altruism category. This is because the reviewer wishes to help the other actors by increasing the amount of information on the review platform (altruism), while simultaneously benefiting from this increase in the amount of information (reciprocity). We can reinforce the reciprocal public good motive by reminding the consumers that their review would help increase the amount of information on the platform and, in the future, help them back in their own purchase decisions (Table 2.1).

2.2.3.2 Multiple motives to review

The categorization of reviewer motives into self-centered and altruistic is not necessarily dichotomous. A given reviewer could have both self-centered and altruistic motives. For instance, a consumer might review a product because they want to gain financial rewards and also help the company to become successful (Table 2.1). In fact, Hennig-Thurau et al. (2004)’s multiple-motive reviewer segment provides empirical evidence for this claim.

In this research we are specifically interested in reviewers driven by a combination of financial incentives and altruistic motives when writing a review. For example, a reviewer can be driven to help other consumers with their review and, simultaneously, be driven by the firm's monetary compensation (Table 2.1). Given that the reviewers are already financially incentivized and, thus, have self-centered motives, our goal is to reinforce reviewers' pure altruistic motives, proposing that the heightened level of pure altruistic motives will increase review decisions. The literature on review incentives suggests a need for shifting the mindset of the reviewers from self-centered to altruistic (Babic Rosario et al. 2020). As a result, we attempt to reinforce altruistic motives in incentivized reviewers. In our context of incentivized online reviews, we are interested in reviewers motivated by a combination of financial incentives and one of pure altruistic or reciprocal altruistic motives (Table 2.1).

Table 2.1 - Motives and solicitation messages for writing product reviews

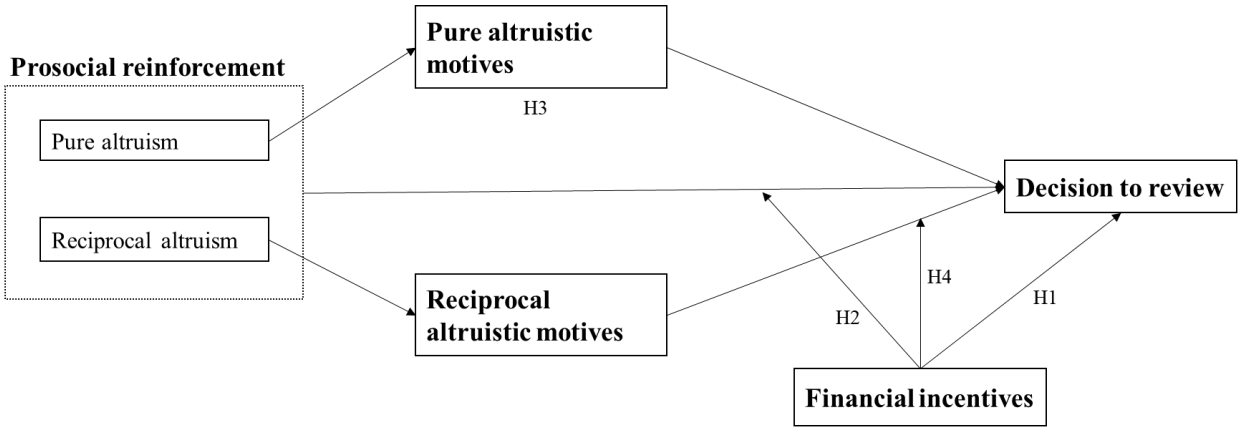
Psychological driver	Motive	Description	Example of Message
Pure altruism	- Concern for other consumers (Hennig-Thurau et al., 2004) - Altruism (Sundaram et al., 1998) - Other-involvement (Dichter Ernest, 1966)	Consumer feels a genuine need to help others make a better decision (or warn them against making a bad decision)	Your review helps **other customers**, like you, make better purchase decisions.
Reciprocal altruism	Helping the company (Hennig-Thurau et al., 2004; Sundaram et al., 1998)	To reward a company for a good product	Your review helps **us** improve our business.
	Reciprocal public good (This research)	Consumer writes a review to increase the total amount of information on the review platform, expecting this increase to later help them in their own purchases	Your review will increase the **total amount of knowledge** in the review community and will help you in your **future purchases**.

Financial incentives	Economic incentives (Hennig-Thurau et al., 2004)	Response to direct economic incentives offered by website for posting online reviews	You will receive **$10** credit for your effort after you submit your review.
Pure altruism + financial incentives	Concern for other consumers + Economic incentives (This research)	To help others make a better decision + earn rewards for writing the review	Your review helps **other customers**, like you, make better purchase decisions. You will receive **$10** credit for your effort after you submit your review.
Reciprocal altruism + financial incentives	Reciprocal public good + Economic incentives (This research)	Consumer writes a review to increase the total amount of information on the review platform, expecting this increase to later help them in their own purchases + earn rewards for writing the review	Your review will increase the **total amount of knowledge** in the review community and will help you in your **future purchases**. You will receive **$10** credit for your effort after you submit your review.
	Helping the company + Economic incentives (Cabral & Li, 2015)	To reward a company for a good product + earn rewards for writing the review	Your review helps **us** improve our business. You will receive **$10** credit for your effort after you submit your review.

2.3 Hypothesis development

Figure 2.1 shows our theoretical framework. In this section we develop our hypotheses on how prosocial reinforcement affects consumers' decisions to write a review through pure and reciprocal altruistic motives, and how financial incentives moderate the effects of prosocial reinforcement and reciprocal altruistic motives on review decisions.

Figure 2.1 - Theoretical framework



It has been shown that financial incentives increase review volume. Using a series of controlled experiments, Burtch et al. (2018) found that offering financial incentives significantly increases the decision to write a review. Thus, we hypothesize the following (Figure 2.1):

H1: Financial incentives increase review decisions.

Prior research has shown negative interactions between financial incentives (economic markets) and prosocial motives (social markets; Besley and Ghatak 2018, Qiao et al. 2020, Exley 2017). For instance, it has been shown that offering incentives to write reviews reduces the performance of reviewers (Khern-am nuai et al. 2018), and this negative effect persists even after incentives are removed (Qiao et al. 2020).

We propose that reinforcing pure altruism allows for circumventing this tension between social and economic markets. Supported by the Empathy-Altruism Hypothesis, pure altruistic motivations do not entail expectations of reciprocation. In other words, there is no expectation of an exchange in a pure altruistic action. This means that pure altruistic motives are outside the boundaries of social and economic markets. The implication is that financial and pure altruistic motives would have a positive synergic effect on the behavior of consumers.

The Empathy-Altruism Hypothesis posits that pure altruistic motives can be reinforced. We can reinforce pure altruistic motives by reminding the person that their action can benefit others by reducing their suffering or improving their welfare. For example, it has been shown that vaccination uptake can be increased by highlighting the social benefits of protecting others from infection (Schneider et al. 2023). Therefore, reminders can be an effective way to enhance empathic concern and pure altruism.

In the context of online product reviews, we can reinforce pure altruistic motives by reminding the reviewers, in the review solicitation message, that their review could help other consumers. Similarly, we can reinforce reciprocal altruistic motives by reminding the reviewers that their review could help the company or help themselves in the future (Table 2.1).

If the beneficiary of help is both other consumers and the reviewer (reciprocal public good; Table 2.1), the mindset of the reviewer would shift from the pure altruistic paradigm to the social exchange paradigm, where there is a reciprocal exchange and expectation of benefit. Therefore, the economic motives dampen the reciprocal altruistic motives when the review helps both other consumers and the reviewer. In contrast, reinforcing pure altruism is independent of social and economic markets and is unaffected by economic incentives.

H2: Financial incentives moderate the relationship between prosocial reinforcement and review decision whereas financial incentives have a stronger effect when pure altruism is reinforced than when reciprocal altruism is reinforced.

The process that drives the effect of prosocial reinforcement on the decision to review can be characterized by pure and reciprocal altruistic motives (Figure 1). Reinforcing pure altruism (vs. reciprocal altruism) as the stimulus for inducing empathy (Klimecki et al. 2016) in reviewers increases pure altruistic motives (vs. reciprocal altruistic motives; Batson et al. 1981), which increase review decisions (Hennig-Thurau et al. 2004). This increase is independent of any financial incentives that are offered because there is no expectation of reciprocity.

H3: Pure altruistic motives mediate the relationship between pure altruism reinforcement and review decision.

Reciprocal altruism, on the other hand, operates in the social markets where there are expectations of reciprocity. When financial incentives are provided, the mindset of reviewers shifts from the reciprocal altruistic paradigm to the economic exchange paradigm because a financial exchange is introduced. Therefore, economic motives crowd out the reciprocal altruistic motives (Babic Rosario et al. 2020). As a result, financial incentives moderate the effect of reciprocal altruistic motives on review decisions.

H4: Financial incentives moderate the indirect effect of reciprocal altruism and review decisions. Without financial incentives, reciprocal altruistic motives mediate the relationship between reciprocal altruism reinforcement and review decisions (**H4a**), but when financial incentives are provided, reciprocal altruistic motives no longer mediate the relationship between reciprocal altruism reinforcement and review decisions (**H4b**).

We performed two scenario-based controlled experiments by recruiting U.S. participants and presenting them with scenarios in which they make a purchase and receive a review solicitation message from an online retailer. In Study 1, we test H1 and H2 and in Study 2, we test H1-H4. Next, we carried out a field experiment on an online retailer to test the effect of reinforcing pure altruism versus reciprocal altruism on actual review decisions in a natural environment where financial incentives are offered (Study 3).

2.4 Study 1

2.4.1 Experiment design

In Study 1, the aim is to test the effect of financial incentives on review decisions (intention in this study; H1) and the moderating effect of financial incentives in the relationship between reinforcing pure versus reciprocal altruism and review decisions (H2). We carry out a 2 (Prosocial reinforcement: Pure altruism vs. reciprocal altruism) x 2 (Financial incentive: Yes vs. no) between-subjects experiment. The conditions and their corresponding review solicitation message are presented in Table 2.2.

Table 2.2 - Prosocial reinforcements, incentives, and their corresponding review solicitation messages

Prosocial reinforcement	Incentivized	Message
Pure altruism	No	**Other customers** would love to hear from you. Could you please take some time to write a review for the product you purchased? Your review helps **other customers, like you**, make better purchase decisions.
	Yes	**Other customers** would love to hear from you. Could you please take some time to write a review for the product you purchased? Your review helps **other customers, like you**, make better purchase decisions. You will receive a **$10 credit** for your effort after you submit your review.

Reciprocal altruism (public good)	No	Could you please take some time to write a review for the product you purchased? Your review will increase the **total amount of knowledge** in the review community and will help you in your **future purchases**.
	Yes	Could you please take some time to write a review for the product you purchased? Your review will increase the **total amount of knowledge** in the review community and will help you in your **future purchases**. You will receive a **$10 credit** for your effort after you submit your review.

2.4.2 Sample and procedure

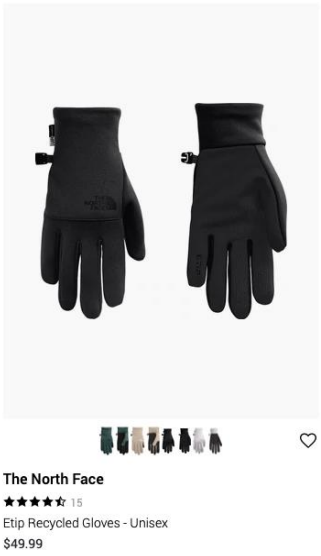
We recruited 251 U.S. participants from Prolific. The participants were limited to those who had 95% or higher satisfaction rate. They received 1.50 USD for participating in the study. During the experiment, we used an attention check that explicitly asked the participants to answer "Strongly disagree" for one item. After excluding participants who did not finish the experiment or failed the attention check, we were left with 226 valid participants (M_{age} = 33.34, SD_{age} = 11.29; 49.6% female).

Participants were asked to imagine an online retailer which they had previously bought products from. Next, they were shown the following scenario: "You order the product below [a pair of gloves] from their website. After your order is delivered, you receive the following email from the online retailer." Each participant was then randomly assigned to one of the 4 groups in Table 2.2 and saw their corresponding message. After reading the message, the participants expressed their review intention.

2.4.3 Stimulus development

To devise the scenarios, we ran a pretest to find a product that is gender neutral. We chose this criterion to ensure that the product in the scenarios appeals to participants regardless of their gender orientation. We pretested 9 products from an online retailer's catalog on gender orientation using 73 participants from Amazon Mechanical Turk. Forty-eight participants (25% female) passed the attention check. We selected the pair of gloves (Figure 2.2), which scores high on gender neutrality for our experiment.

Figure 2.2 - Product shown in the scenario in Study 1



2.4.4 Measures

For the main experiment, after seeing the review solicitation email, participants were asked their review intention ("Would you accept to write a review?") on a 5-point Likert scale.

2.4.5 Results

Table 2.3 shows the descriptive statistics of the four groups for review intention.

Table 2.3 - Means and Standard Deviations for Review Intention

	Financial incentive	
	No	Yes

Prosocial reinforcement	M	SD	M	SD
Pure altruism	2.75	0.97	4.32	0.72
Reciprocal altruism	3.17	0.88	3.90	1.09

Note. M and *SD* represent mean and standard deviation, respectively.

H1 suggests a positive relationship between financial incentives and review decisions. A two-way ANOVA shows a significant main effect of financial incentives on review intention ($F(1, 222) = 88.05$, $p<0.001$, $\eta^2_p = 0.284$; Table 2.3). A pairwise comparison shows that the main effect is positive ($B = 1.15$, $SE = 0.12$, $t = 9.384$, $p<0.001$), which supports H1. The results do not show any significant main effect of prosocial reinforcement on review intention ($F(1, 222) = <0.001$, $p=0.988$, $\eta^2_p = <0.001$; Table 2.3), but show significant interaction between prosocial reinforcement and financial incentives ($F(1, 222) = 11.415$, $p=0.001$, $\eta^2_p = 0.049$; Table 2.3).

Table 2.4 - Fixed-Effects ANOVA results using Review Intention as the criterion

Predictor	SS	df	Mean Square	F	p	partial η^2
Corrected Model	88.031[a]	3	29.344	34.604	<0.001	0.319
Intercept***	2811.656	1	2811.656	3315.692	<0.001	0.937
Prosocial reinforcement	0.000	1	<0.001	<0.001	0.988	<0.001
Financial incentive***	74.670	1	74.670	88.055	<0.001	0.284
Prosocial reinforcement x Financial incentive**	9.680	1	9.680	11.415	0.001	0.049

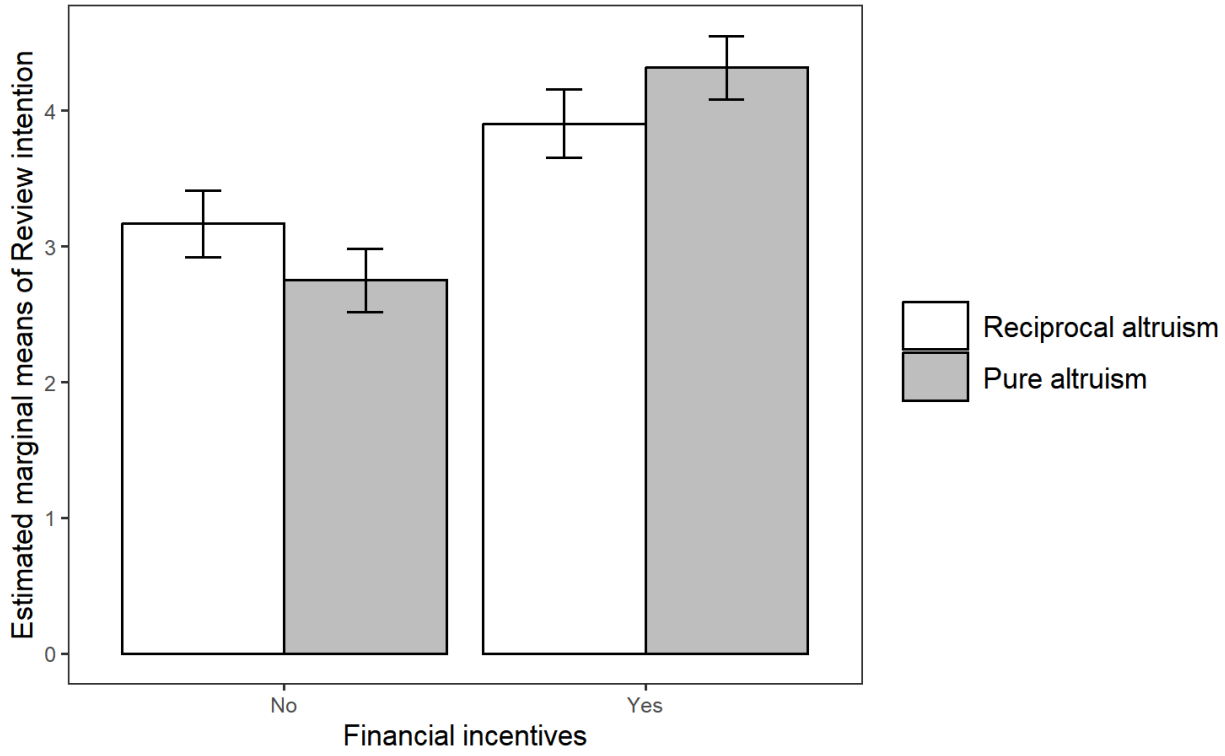
Error	188.253	222	0.848
Total	3094.000	226	
Corrected Total	276.283	225	

Note. [a] R Squared = 0.319 (Adjusted R Squared = 0.309)

** p < 0.01; *** p < 0.001

H2 suggests that financial incentives have a stronger effect when pure altruism is reinforced than when reciprocal altruism is reinforced. Results of a two-way ANOVA and pairwise comparisons of estimated marginal means (Holm-Bonferroni corrected) show that the increase in review intention due to financial incentives is significantly larger when pure altruism is reinforced than when reciprocal altruism is reinforced (Mean difference = 0.83, SE = 0.25, t = 3.38, p<0.001; Table 2.4; Figure 2.3). This supports H2.

Figure 2.3 - Interaction between Prosocial reinforcement and Financial Incentive on Review intention



Note. Error bars: 95% CI

2.4.6 Discussion

The results of Study 1 show that the consumers' intention to write reviews increases with financial incentives (H1). Prosocial reinforcement shows a significant interaction with financial incentives, such that the positive effect of financial incentives is amplified when the review solicitation message reinforces pure altruism versus reciprocal altruism (H2). In other words, the combination of financial incentives and the prosocial reinforcement of pure altruism has a positive synergic effect on review intention.

To gain a deeper understanding of the underlying process involved in the interaction between financial incentives and prosocial reinforcement of review solicitation messages in Study 2, we investigate consumers' review motives generated by prosocial reinforcement. We investigate how prosocial reinforcement affects the decision to review through pure altruistic motives (H3). Moreover, we investigate the second stage (Hayes and Rockwood 2020) moderating role of financial incentives in the indirect effect of reciprocal altruism reinforcement and the decision to review. Specifically, we explore the mediating effect of reciprocal altruistic motives when incentives are not provided (H4a) and when they are provided (H4b).

2.5 Study 2

2.5.1 Experiment design

In Study 2, the aim is to test the mediating effect of pure altruistic motives (H3) on the relationship between prosocial reinforcement and the decision to review (intention in this study), and the second-stage moderated mediation of reciprocal altruism reinforcement and review decision (intention in this study) through reciprocal altruistic motives. We test the indirect effect of reciprocal altruism reinforcement on review decision through reciprocal altruistic motives when financial incentives are not provided (H4a) and when incentives are provided (H4b).

We carry out a 2 (Prosocial reinforcement: Pure altruism vs. reciprocal altruism) x 2 (Financial incentive: Yes vs. No) between-subjects experiment. For the prosocial reinforcement of pure altruism, we use the same treatment as Study 1; for the prosocial reinforcement of reciprocal altruism, we use the company as the beneficiary of reciprocal altruism. We use the company in place of reciprocal public good because the consumer has already entered into a financial exchange with the company when they made their purchase. Therefore, there is a higher expectation of reciprocity. Since the expectation of reciprocity between the company and the reviewer is high (e.g., through future discounts and financial incentives), we expect the reciprocal altruism manipulation to lead to high reciprocal altruistic motives, even if the review solicitation message does not offer financial incentives. To reinforce the reciprocal altruism between the company and the reviewer, we use the phrase "Your review helps **us** improve **our** business" (Table 2.5).

Table 2.5 - Prosocial reinforcement, incentives, and their corresponding review solicitation messages

Prosocial reinforcement	Incentivized	Message
Pure altruism	No	**Other customers** would love to hear from you. Could you please take some time to write a review for the product you purchased? Your review helps **other customers, like you**, make better purchase decisions.
	Yes	**Other customers** would love to hear from you. Could you please take some time to write a review for the product you purchased? Your review helps **other customers, like you**, make better purchase decisions. You will receive a **$10 credit** for your effort after you submit your review.
Reciprocal altruism (helping the company)	No	**We** would love to hear from you. Could you please take some time to write a review for the product you purchased? Your review helps **us** improve **our** business.
	Yes	**We** would love to hear from you.

	Could you please take some time to write a review for the product you purchased? Your review helps **us** improve **our** business. You will receive a **$10 credit** for your effort after you submit your review.

2.5.2 Sample and procedure

We recruited 258 U.S. participants from Prolific. The participants had the same criteria and compensation as Study 1. After excluding participants who did not finish the experiment or failed the attention check (same as Study 1), we were left with 236 valid participants (M_{age} = 32.94, SD_{age} = 10.98; 47.0% female).

The participants were asked to imagine the same scenario as Study 1, were randomly assigned to one of the 4 groups in Table 2.5, and saw their corresponding message. After reading the message, the participants expressed their review intention, pure altruistic motives, and reciprocal altruistic motives.

2.5.3 Measures

For the main experiment, after seeing the review solicitation email, participants were asked their review intention ("Would you accept to write a review?") on a 5-point Likert scale, their altruistic reviewing motive (Packard & Berger, 2017), which is composed of 3 items (Cronbach's α = 0.794) on a 7-point Likert scale (Table 2.6), and their reciprocal altruistic motive towards the company (Hennig-Thurau et al., 2004), which is 1 item on a 7-point Likert scale (Table 2.6). We calculate the pure altruistic motive by taking the average of the response to the 3 items.

Table 2.6 - Motives measured in response to "If I write a review,"

Motive	Item
Pure altruistic reviewing motive	I am motivated by a desire to help people. I want to assist others who may be choosing a pair of gloves.

	I am concerned about being useful to other people.
Reciprocal altruistic reviewing motive	I am so satisfied with the company and its product that I want to help the company to be successful.

2.5.4 Results

Table 2.7 shows the descriptive statistics for review intention.

Table 2.7 - Means and standard deviations for Review Intention

	Financial incentive			
	No		Yes	
Prosocial reinforcement	M	SD	M	SD
Pure altruism	2.75	0.97	4.32	0.72
Reciprocal altruism	2.95	0.93	3.95	1.09

Note. M and *SD* represent mean and standard deviation, respectively.

As in Study 1, results show a positive relationship between financial incentives and review decision (H1). A two-way ANOVA does not show any significant direct effect of prosocial reinforcement on review intention ($F(1, 232) = 0.486$, $p=0.487$, $\eta^2_p = 0.002$; Table 2.8) but shows significant positive main effect of financial incentives on review intention ($B = 1.28$, $SE = 0.12$, $F(1, 232) = 110.654$, $p<0.001$, $\eta^2_p = 0.323$; Table 2.8). It also shows a significant interaction between prosocial reinforcement and financial incentives ($F(1, 232) = 5.352$, $p = 0.022$, $\eta^2_p = 0.023$; Table 2.8; Figure 2.4).

Table 2.8 - Fixed-Effects ANOVA results using Review Intention as the criterion

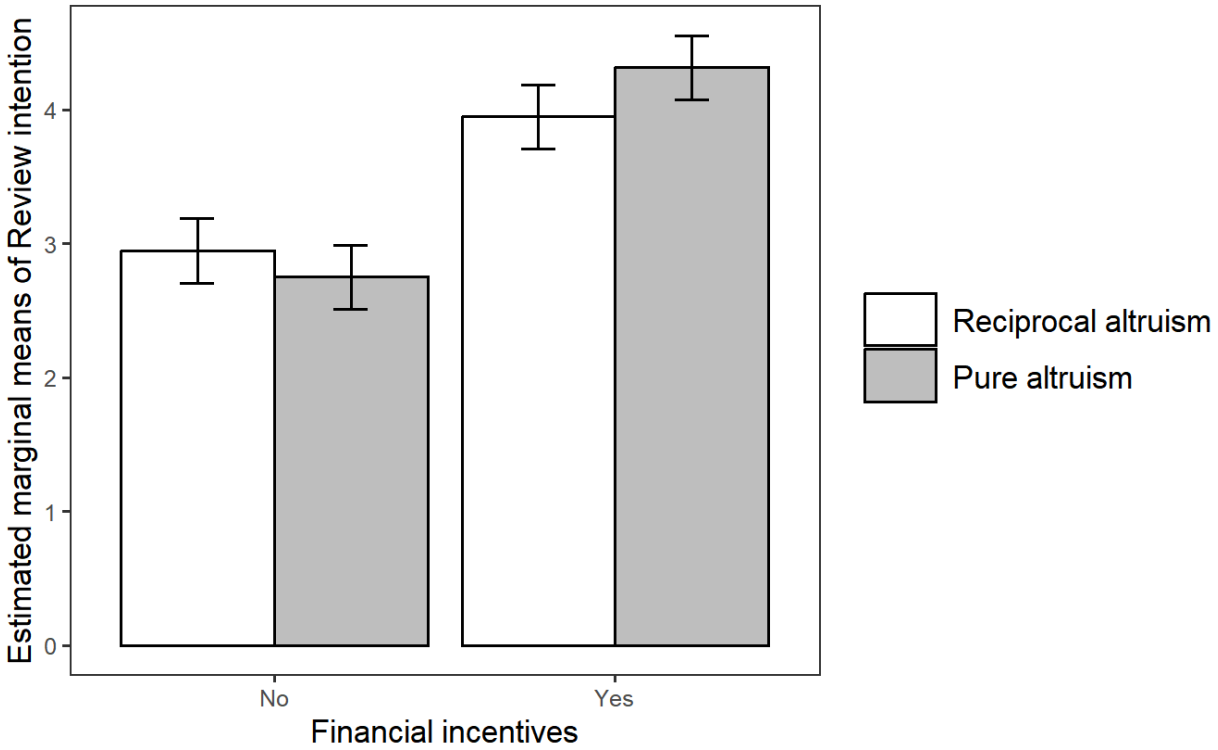
Predictor	SS	df	Mean Square	F	p	partial η^2
Corrected Model	103.073[a]	3	34.358	39.088	<0.001	0.336
Intercept***	2874.556	1	2874.556	3270.339	<0.001	0.934
Prosocial reinforcement[b]	0.427	1	0.427	0.486	0.487	0.002
Financial incentive***	97.262	1	97.262	110.654	<0.001	0.323
Prosocial reinforcement x Financial incentive***	4.705	1	4.705	5.352	0.022	0.023
Error	203.923	232	0.879			
Total	3191.000	236				
Corrected Total	306.996	235				

Note. [a] R Squared = 0.336 (Adjusted R Squared = 0.327); [b] Pure altruism reinforcement is helping other consumers, Reciprocal altruism reinforcement is helping the company.

*** $p < 0.001$

Again, as in Study 1, the results show a significant interaction between prosocial reinforcement and review decision (H2). Results of a two-way ANOVA and a pairwise comparison (Holm-Bonferroni adjusted) show that the increase due to financial incentives is significantly larger when pure altruism is reinforced compared to when reciprocal altruism is reinforced (Mean difference = 0.56, SE = 0.24, t = 2.31, p=0.022; Table 2.8; Figure 2.4). This further supports H2.

Figure 2.4 - Interaction between Prosocial reinforcement and Financial Incentive on Review intention



Note. Error bars: 95% CI

H3 suggests that the relationship between pure altruism reinforcement and review decision is mediated by altruistic motives. Setting reciprocal altruism as the reference group, parallel moderated mediation analysis using Process Model 14 (Hayes, 2022), based on 5,000 bootstrap samples, shows non-significant direct effect ($Effect_{pure\ altruism}$ = 0.089, SE = 0.12, t = 0.73, p = 0.468) of pure altruism reinforcement on review intention (Table 2.9). The test of highest order unconditional interactions shows that pure altruistic motives are not moderated by financial incentives (F(1, 229) = 0.589, p = 0.444), and pure altruism reinforcement shows significant indirect effect ($Effect_{pure\ altruism}$ = 0.099, Bootstrap SE = 0.044, 95% Bootstrap CI = [0.025, 0.195]) on review intention through pure altruistic motives. The significant effects are supported by the absence of zero within the 95% confidence interval, which shows full mediation effect of pure altruistic motives and supports H3.

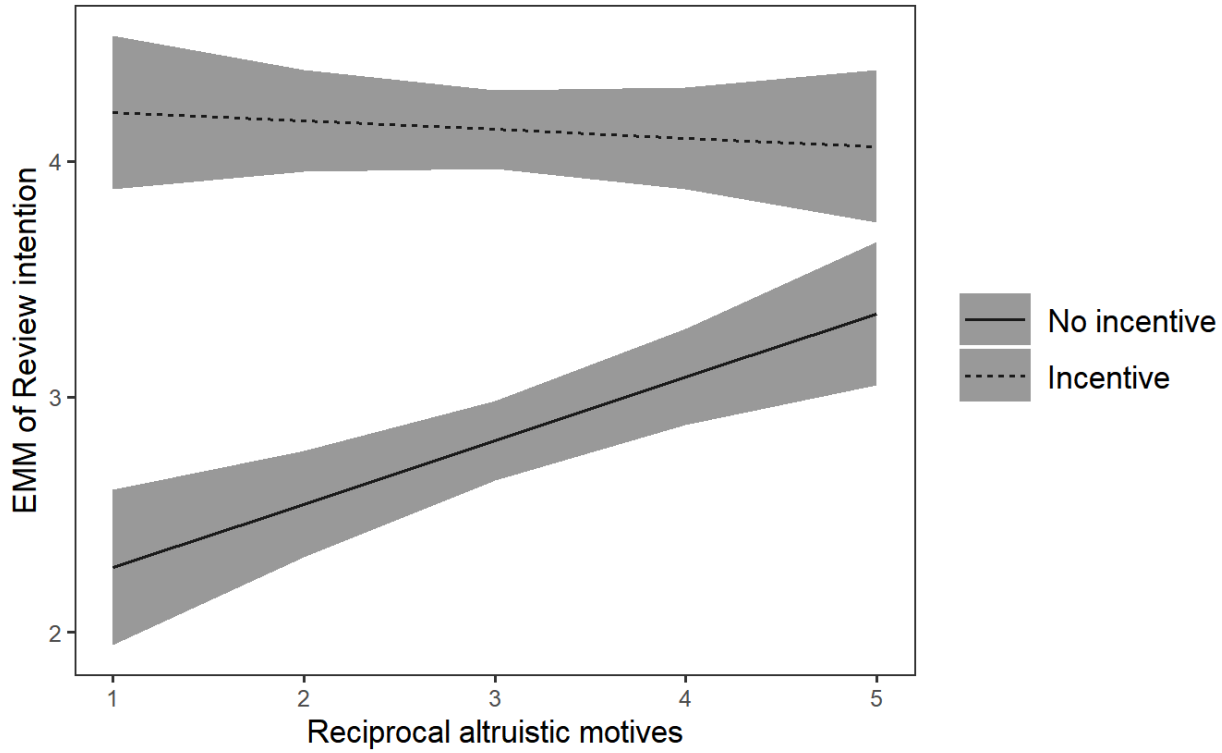
Table 2.9 - Direct and indirect effect of Prosocial reinforcement on Review intention

	Pure altruistic Motives			**Reciprocal altruistic motives**			**Review intention**		
Predictors	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
(Intercept)	5.30***	0.27	19.87	2.21***	0.24	9.06	1.41***	0.38	3.75
Prosocial reinforcement[a]	-0.47**	0.17	-2.76	0.57***	0.16	3.67	-0.09	0.12	-0.73
Financial incentives	—	—	—	—	—	—	2.06***	0.47	4.40
Pure altruistic motives	—	—	—	—	—	—	0.17*	0.06	2.58
Reciprocal altruistic motives	—	—	—	—	—	—	0.25***	0.07	3.69
Financial incentives x Pure altruistic motives	—	—	—	—	—	—	0.07	0.09	0.77
Financial incentives x Reciprocal altruistic motives	—	—	—	—	—	—	-0.35***	0.10	-3.66
Observations	236								
R^2	0.032			0.054			0.422		

Note. [a] Pure altruism is coded 0; Reciprocal altruism is coded 1
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

H4a suggests that without financial incentives, reciprocal altruistic motives mediate the relationship between reciprocal altruism reinforcement and review decisions, and H4b suggest that when financial incentives are present, reciprocal altruistic motives no longer mediate the relationship between reciprocal altruism reinforcement and review decisions. Setting pure altruism as the reference group, the test of highest order unconditional interactions shows that reciprocal altruistic motives are moderated by financial incentives ($F(1,229) = 13.423$, $p<0.001$). The analysis shows a significant negative index of moderated mediation (Index = -0.20, Bootstrap SE = 0.08, Bootstrap 95% CI = [-0.38, -0.07]). This shows that when financial incentives are provided, there is a significant negative interaction between financial incentives and the reciprocal altruistic motives on review intention (Figure 2.5). When incentives are not provided, reciprocal altruistic motives significantly mediate the relationship between reciprocal altruism reinforcement and review intention ($Effect_{reciprocal\ altruism}$ = 0.14, Bootstrap SE = 0.05, Bootstrap 95% CI = [0.05, 0.26]). The significant effect is supported by the absence of zero within the 95% confidence interval, supporting H4a. However, when incentives are provided, reciprocal altruistic motives do not show significant mediating effect on the relationship between reciprocal altruism reinforcement and review intention ($Effect_{reciprocal\ altruism}$ = -0.06, Bootstrap SE = 0.05, Bootstrap 95% CI = [-0.17, 0.02]), supporting H4b.

Figure 2.5 - The conditional effect of Reciprocal altruistic motives on Review intention



Note. The shaded bands show 95% CI

2.5.5 Discussion

The results of Study 2 show that the consumers' level of pure altruistic motives fully mediates the relationship between pure altruism reinforcement and the decision to review, and this mediation effect is not affected by financial incentives (H3). In other words, when reviewers are reminded that their review would help other consumers (vs. the company) they would have higher pure altruistic motives, which increases the decision to write reviews. Pure altruistic reinforcement operates independently of the economic and social markets because financial incentives do not interfere with this mediation.

In contrast, we found that the mediating role of reciprocal altruistic motives between reciprocal altruism reinforcement and the decision to review is moderated by financial incentives. Without financial incentives, reciprocal altruistic motives fully mediate the relationship between reciprocal altruism reinforcement and the decision to review (H4a), so that greater reciprocal altruistic motives lead to significantly higher decisions to review. When financial incentives are provided, however, the mediating role of reciprocal altruistic motives disappears and is no longer significant (H4b). In other words, financial incentives crowd out the effect of reciprocal altruistic motives on the decisions to review, which suggests that reciprocal altruism operates in a social market.

The combination of financial incentives and reciprocal altruism reinforcement (i.e., helping the company) has a negative synergic effect on the decision to review, as seen by the significant negative moderation effect between reciprocal altruistic motives and the decision to review. Changing incentivized review solicitation messages from helping the company–a common practice in the industry–to helping other consumers is beneficial to companies, as it would significantly increase pure altruistic motives of the reviewers and significantly increase review volume on their review platform.

Finally, the scenario-based nature of Studies 1 and 2 does not fully represent an actual purchase experience since no purchase or consumption takes place. In addition, the participants in Studies 1 and 2 could only express their intention to write a review as opposed to writing an actual review. Plus, the effect of financial incentives in review writing could be obfuscated due to the fact that every person who participated in Studies 1 and 2 was financially compensated for their participation (the compensation for taking the task on Prolific) and the financial incentive in the scenario was imaginary. We carried out Study 3 to test, in a natural setting where actual purchase decisions are made, the effect of pure (vs. reciprocal) altruism reinforcement on review decisions when financial incentives are provided.

2.6 Study 3

In this study, our objective is to test, in a real-life consumption environment, whether reinforcing pure altruism using the review solicitation message leads to higher review decisions compared to reinforcing reciprocal altruism when financial incentives are offered. In a context in which consumers are financially compensated for their review, we test whether reinforcing pure altruism by reminding the consumers that their review would help other consumers leads to higher reviews compared to reinforcing reciprocal altruism by reminding the consumers that their review would help the company. We also test whether reinforcing reciprocal altruism (i.e., helping the company) leads to higher review decisions compared to no prosocial reinforcement (i.e., just asking the consumers to write a review). This would show the transitive effect of reinforcing pure altruism, reciprocal altruism, and no prosocial altruism (review decision$_{\text{pure altruism}}$ > review decision$_{\text{reciprocal altruism}}$ > review decision$_{\text{no prosocial reinforcement}}$).

2.6.1 Experiment design

We study the effect of prosocial reinforcement through review solicitation messages in a one factor (Prosocial reinforcement: Pure altruism vs. reciprocal altruism vs. no prosocial reinforcement) between-subjects field experiment. We partnered with a major North American online retailer. The retailer already incentivizes its reviewers by sending them a review solicitation message after each purchase and offers them a $10 store credit after their review is published on the retailer's platform. The "No prosocial altruism" group serves as our control group since the platform is already using this review solicitation message. Both the control and treatment groups are incentivized based on the same incentive scheme. Since the retailer had already been using the control review solicitation message for years, we abstained from completely changing the retailer's message, as drastic changes could produce disruptions in the norm of the retailer's review-writing practice, which could lead to endogenous confounds.

For the reciprocal altruism group, we set the email title as "Help us and receive $10 credit". The email content includes two main sentences for this condition, i.e., "**We** love to hear from you" and "Your review helps **us** improve our business." The results of Study 2 show that these phrases reinforce the "*company"* as the target of reciprocal altruism. For the pure altruism group, we set the email title as "Help other customers and receive $10 credit". The email content includes "**Other customers** love to hear from you" and "Your review helps **other customers**, like you, to make better purchase decisions." The results of Studies 1 and 2 show that these phrases reinforce "*other customers"* as the target of pure altruism.

2.6.2 Sample and procedure

Due to technical challenges on the retailer side, sending different review solicitation messages concurrently was not possible. As a result, we sent the review solicitation message for each

condition sequentially (Table 2.10). Previous field studies have also used different days for different conditions (e.g., Cabral & Li, 2015). Note that the number of emails sent on each day is based on the number of orders that have been fulfilled on that day. Thus, we could not manipulate daily fluctuations of the number of emails sent.

We collected the review data 91 days after the first review solicitation email was sent, which means that each review solicitation message had at least 88 days and at most 91 days to lead to a review decision. It also means that for some cases a review was due to a reminder email, which was sent after the treatment period and did not include the manipulated review solicitation message. Thus, we excluded those reviews from all groups to compile the set of valid emails (Table 2.10).

For the "No prosocial reinforcement" group, of the 2160 valid emails sent, 486 reviews were written; for reciprocal altruism group, of the 1884 valid emails sent, 603 reviews were written; and for pure altruism group, of the 998 valid emails sent, 350 were written.

Table 2.10 - *Study 3 Data collection*

Prosocial reinforcement	Email title	Email content	Date	Emails sent	Valid emails[1]	Reviews written
No prosocial reinforcement	Review your purchase and receive $10 credit	Hello {customerName}, **You can receive a $10 credit, valid on your next purchase, by reviewing {productName}.** Once published, you will receive an email confirming this fact, and the $10 credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.24	2783	2160	486
Reciprocal altruism	Help us and receive $10 credit	Hello {customerName}, **We** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **us** improve our business. You can receive a **$10 credit** after your review of {productName} is published. Once published, you will receive an email confirming this fact, and the credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.25	2793	1884	603

Pure altruism	Help other customers and receive $10 credit	Hello {customerName}, **Other customers** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **other customers**, like you, make better purchase decisions. You can receive a **$10 credit** after your review of {productName} is published. Once published, you will receive an email confirming this fact, and the credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.27	1726	998	350
Total				7302	5042	1439

Note. [1] Excluding the emails that lead to reviews following future reminders.

2.6.3 Measures

The dependent variable in Study 3 is review decision. It is a binary variable that takes the value one (zero) when the customer receives a review solicitation message and writes (does not write) a review on that email.

We also measured a series of reviewer-level control variables that measure historical behavior of a given reviewer. *Average historical emails per order* measures how many review solicitation emails, on average, the retailer sent for each previous order that a given customer made. *Historical review count* measures how many reviews a given customer had already written before the experiment began. *Historical total emails* measures the total number of review solicitation emails that the retailer had sent to the customer before the experiment began. *Reviewer age* aims to approximate the age of the reviewer on the platform by measuring the difference between the date of data collection and the date when a given customer received their first review solicitation message, in days.

2.6.4 Results

Table 2.11 – Descriptive statistics for Review decision by Prosocial reinforcementshows the descriptive statistics for review decision by the three groups.

Table 2.11 – Descriptive statistics for Review decision by Prosocial reinforcement

Prosocial reinforcement	n	M	SD
No	2160	22.50%	41.77%
Reciprocal altruism	1884	32.01%	46.66%
Pure altruism	998	35.07%	47.74%

Note. n, M and SD represent sample size, mean, and standard deviation, respectively.

Pearson correlation of the reviewer-level variables (Table 2.12) shows high correlation for *historical total emails* and *historical review count* (0.79) and *historical total emails* and *reviewer age* (0.70), which could lead to multicollinearity in regression analyses. We use Variance Inflation Factor to identify and discard variables that show high multicollinearity.

Table 2.12 - Means, standard deviations, and correlations with confidence intervals for Reviewer-level variables

Variable	*M*	*SD*	1	2	3

1. Reviewer age	348.73	236.19	—	—	—
2. Historical review count	4.20	8.75	0.48**	—	—
			[0.46, 0.50]		
3. Historical total emails	9.09	11.69	0.70**	0.79**	—
			[0.69, 0.71]	[0.78, 0.80]	
4. Average historical emails per order	1.32	0.64	0.55**	0.28**	0.42**
			[0.54, 0.57]	[0.26, 0.30]	[0.40, 0.44]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014).

** $p < .01$.

We use logistic regression to model review decision because review decision is a binary variable. Prosocial reinforcement is the independent variable, with historical review count, historical total emails, average historical emails per order, and the base-10 logarithm of reviewer age (review $age_{min} = 87$, review $age_{max} = 716$, $\log(\text{review age})_{min} = 1.94$, $\log(\text{review age})_{max} = 2.85$) as control variables.

In Model 1, the logistic regression shows high Variance Inflation Factor (VIF) for historical review count (4.020) and historical total emails (5.280), which indicates multicollinearity, so we remove these two covariates and re-run the test (Model 2). Model 2 shows that *average historical emails per order* has a significant positive effect on review decision (B = 0.878, Wald(1) = 109.996, p<0.001), such that for a unit increase in *average historical emails per order*, the odds of review decision increases by 140.7%. It also shows that the base-10 logarithm of *review age* has a significant positive effect on review decision (B = 1.509, Wald(1) = 162.970, p<0.001), meaning a 10x increase in reviewer age leads to a 352.4% increase in the odds of review decision. Controlling for review age and average historical emails per order, reinforcing reciprocal altruism significantly increases the odds of review decision compared to no prosocial reinforcement (B = 0.471, Wald(1) = 37.787, p < 0.001, odds ratio = 1.601; Table 2.13, Model 2).

Table 2.13 - Prosocial reinforcement with reviewer-level covariates on Review decision - logistic regression

	Model 1							Model 2						
Source	B	SE	Wald	df	p	Odds ratio	VIF	B	SE	Wald	df	p	Odds ratio	VIF
Prosocial reinforcement=No prosocial reinforcement	—	—	26.44	2	<0.001	—	1.01	—	—	84.67	2	<0.001	—	1.014
Prosocial reinforcement=reciprocal altruism	0.38***	0.09	16.05	1	<0.001	1.46		0.47***	0.08	37.79	1	<0.001	1.60	
Prosocial reinforcement=pure altruism	0.52***	0.11	21.46	1	<0.001	1.68		0.81***	0.09	77.78	1	<0.001	2.24	
Average historical emails per order	1.15***	0.12	97.59	1	<0.001	3.17	1.21	0.88***	0.08	110.00	1	<0.001	2.41	1.193
log(Reviewer age)	1.26***	0.17	56.34	1	<0.001	3.51	1.93	1.51***	0.12	162.97	1	<0.001	4.52	1.195
Historical review count	0.38	0.01	617.78	1	<0.001	1.47	4.02[1]	—	—	—	—	—	—	—
Historical total emails	-0.20	0.01	271.06	1	<0.001	0.82	5.28[1]	—	—	—	—	—	—	—
Constant	-5.96***	0.38	247.92	1	<0.001	<0.01	—	-6.41***	0.29	486.64	1	<0.001	<0.01	—

Note. [1]. Variance Inflation Factor (VIF) is high, suggesting multicollinearity.

*** $p < 0.001$

Reinforcing pure altruism significantly increases the odds of review decision compared to no prosocial reinforcement (B = 0.809, Wald (1) = 77.778, p < 0.001, odds ratio = 2.245; Table 2.13, Model 2). Next, we compare reinforcing pure altruism with reinforcing reciprocal altruism to test the comparative efficacy of each method for prosocial reinforcement.

Table 2.14 - Reinforcing the pure vs. reciprocal altruism with reviewer-level covariates on review decision - logistic regression

Source	B	SE	Wald	df	p	Odds ratio	VIF
Prosocial reinforcement[1,]	0.35***	0.09	14.36	1	<0.001	1.42	1.01
Average historical emails per order	0.80***	0.10	68.87	1	<0.001	2.23	1.19
log(Reviewer age)	1.78***	0.14	149.45	1	<0.001	5.91	1.19
Constant	-6.50	0.36	323.99	1	<0.001	<0.00	—

Note. [1]. Reciprocal altruism is coded as 0, Pure altruism is coded as 1.
*** p < 0.001

Controlling for average historical emails per order and reviewer age, logistic regression shows that reinforcing pure altruism significantly increases the odds of review decision compared to reinforcing reciprocal altruism (B = 0.348, Wald(1) = 14.361, p < 0.001, odds ratio = 1.416; Table 2.14).

2.6.5 Discussion

In Study 3, we used a real-life field experiment to address the limitations of Study 1 and Study 2. We found that, when financial incentives are offered, reinforcing pure altruism through the review solicitation message, by reminding the reviewers that their review would help other customers make better purchase decisions, significantly increases the odds of writing a review compared to reinforcing reciprocal altruism by reminding the reviewers that their review would help the company improve its business. We also found that reinforcing reciprocal altruism by reminding the reviewers that their review would help the company improve its business significantly increases the odds of writing a review compared to no prosocial reinforcement (i.e., simply asking them to write a review).

2.7 General Discussion

In this research, we found that prosocial reinforcement through review solicitation messages strongly impacts the decision to review. We investigated two types of prosocial reinforcement, namely, pure altruism and reciprocal altruism. We showed that the type of altruism (pure vs. reciprocal) in prosocial reinforcement matters. The common practice of reminding the incentivized reviewers that their review will help the company is suboptimal. We showed that reminding the incentivized reviewers that their review would help other similar consumers leads to a higher level of review decisions compared to reminding them that their review would help the company (Study 3). In other words, reinforcing pure (vs. reciprocal) altruism significantly increases review decisions.

Furthermore, we showed the process for the effect of prosocial reinforcement and review decisions. We found that reinforcing pure altruism indirectly increases the intention to write reviews through pure altruistic motives and this indirect effect is not affected by financial incentives. In other words, pure altruistic motives are independent of the social and economic markets. In addition, we found that reinforcing reciprocal altruism indirectly increases the intention to write reviews through reciprocal altruistic motives, only in the absence of financial incentives. However, when financial incentives are introduced, this mediation effect disappears. The results show that when financial incentives are offered, they negatively affect the intention to write reviews by dampening the effect of reciprocal altruistic motives on the intention to write reviews (Study 2).

Finally, we showed that there is a positive synergic effect between financial incentives and pure altruism reinforcement, such that when pure altruism is reinforced, offering financial incentives increases the decision to review (Study 1).

2.7.1 Theoretical Contributions

Our work makes 3 main contributions to the theory of incentives, prosocial behavior, and electronic word-of-mouth. First, our findings fill the absence of the role of altruism in eWOM creation (Babic Rosario et al. 2020) by studying the role of two altruistic motives (i.e., pure vs. reciprocal) in online product review creation.

Second, although prior research has categorized *helping the company* and *helping other consumers* as similar altruistic motives for writing reviews (Hennig-Thurau et al. 2004), we differentiate between these two altruistic motives and show that they are inherently distinct motives that lead to different behaviors. We show that *helping the company* is a form of reciprocal altruism, which operates within the framework of social markets, and, as such, is negatively affected by financial incentives. In contrast, *helping other consumers* is a form of pure altruism, which is independent of social and economic markets and is not influenced by financial incentives.

Third, we contribute to the theory of incentives and prosocial behavior, which claims that provision of financial incentives for completing a task negatively affects prosocial behavior by shifting the mindset of people from prosocial to transactional (Gneezy et al. 2011, Heyman and Ariely 2004). We show that this theory is partly true. We show that if reciprocal altruism is reinforced, its effect on the decision to review is negatively affected by financial incentives. However, we show that pure altruism, as a form of prosocial behavior, does not suffer from the crowding out effect of financial incentives. We find that pure altruism is independent of the social and economic markets. As a result, financial incentives can coexist with pure altruism without reducing the effect of pure altruism.

2.7.2 Managerial Implications

Many retailers ask their consumers for reviews. Some provide incentives for posting reviews, while others do not. Our research provides insights that can help managers better formulate how they ask for reviews. We find that firms can increase their review volume by a simple rewording of their review solicitation message to bring the reviewers' attention to other customers instead of themselves. Based on our field experiment results, by mentioning how reviews can help other, similar customers, managers can potentially increase review rate by more than 46%. Compared to simply asking the customers to write a review, reminding them that their review would help the company improve its business increases the odds of writing a review by 60.1%, while reminding the reviewers that their review would help other consumers make better purchase decisions increases the odds of writing a review by 124.5%. Thus, we encourage the companies to ask their customers for reviews by reminding the customers that their review would help other, similar customers. This costless method would significantly increase the likelihood of writing a review and significantly increase review volume.

2.7.3 Limitations and Future Research

Our research focused on the effect of reinforcing pure (vs. reciprocal) altruism on consumers' decisions. The scope of this research was in a specific context (i.e., product review solicitation message) using a specific product category (i.e., apparel). In order to further test the external validity of our findings, future work should investigate the effect of pure versus reciprocal altruism in other contexts and for other product or service categories. Influencer marketing is a context that could benefit from pure altruism reinforcement, since influencers are mostly incentivized, and their reviews have been shown to be biased (Gerrath & Usrey, 2021). Future research should investigate how reinforcing pure altruistic motives in influencers could help mitigate such biases.

Another context for the study of pure altruism reinforcement is donations. It has been shown that the majority of blood donors have altruistic motives (Kasraian & Maghsudlu, 2012), and incentives could crowd out their prosocial motives and reduce their contributions (Goette et al., 2010). Future research should incorporate reinforcing pure altruism into incentivized donations as a means to mitigate the negative impact of incentives.

Finally, in this research we investigated pure and reciprocal altruism separately. Future research could combine pure and reciprocal altruism reinforcement (multiple motives) and investigate the effect of pure and reciprocal altruism combination on consumption behavior.

References

Andreoni J (1989) Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy* 97(6):1447–1458, ISSN 0022-3808, URL https://www.jstor.org/stable/ 1833247, publisher: University of Chicago Press.

Andreoni J, Miller J (2002) Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism. *Econometrica* 70(2):737–753, ISSN 0012-9682, URL https://www.jstor.org/ stable/2692289, publisher: [Wiley, Econometric Society].

Ariely D, Bracha A, Meier S (2009) Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially. *American Economic Review* 99(1):544–555, ISSN 0002-8282, URL http://dx.doi.org/10.1257/aer.99.1.544.

Askalidis G, Malthouse EC (2016) The value of online customer reviews. *Proceedings of the 10th ACM Conference on Recommender Systems*, 155–158.

Babi´c Rosario A, De Valck K, Sotgiu F (2020) Conceptualizing the electronic word-of-mouth process: What we know and need to know about eWOM creation, exposure, and evaluation. *Journal of the Academy of Marketing Science* 48(3):422–448, publisher: Springer.

Batson CD, Duncan BD, Ackerman P, Buckley T, Birch K (1981) Is empathic emotion a source of altruistic motivation? *Journal of personality and Social Psychology* 40(2):290, publisher: American Psychological Association.

Batson CD, Lishner DA, Stocks EL (2015) The empathy—Altruism hypothesis. *The Oxford handbook of prosocial behavior*, 259–281, Oxford library of psychology (New York, NY, US: Oxford University Press), ISBN 978-0-19-539981-3, URL http://dx.doi.org/10.1093/oxfordhb/9780195399813.013.023.

Benlian A, Titah R, Hess T (2012) Differential Effects of Provider Recommendations and Consumer Reviews in E-Commerce Transactions: An Experimental Study. *Journal of Management Information Systems* 29(1):237–272, ISSN 0742-1222, URL http://dx.doi.org/10.2753/MIS0742-1222290107, publisher: Routledge eprint: https://doi.org/10.2753/MIS0742-1222290107.

Berger J (2014) Word of mouth and interpersonal communication: A review and directions for future research. *Journal of Consumer Psychology* 24(4):586–607, ISSN 1532-7663, URL http://dx.doi.org/10.1016/j.jcps.2014.05.002, eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1016/j.jcps.2014.05.002.

Besley T, Ghatak M (2018) Prosocial Motivation and Incentives. *Annual Review of Economics* 10(1):411–438, URL http://dx.doi.org/10.1146/annurev-economics-063016-103739, eprint: https://doi.org/10.1146/annurev-economics-063016-103739.

Burtch G, Hong Y, Bapna R, Griskevicius V (2018) Stimulating online reviews by combining financial incentives and social norms. *Management Science* 64(5):2065–2082, publisher: INFORMS.

Cabral L, Li L (2015) A dollar for your thoughts: Feedback-conditional rebates on eBay. *Management Science* 61(9):2052–2063, publisher: INFORMS.

Carman JM (1992) Theories of Altruism and Behavior Modification Campaigns. *Journal of Macromarketing* 12(1):5–18, publisher: Sage Publications Sage CA: Thousand Oaks, CA.

Charness G, Rabin M (2002) Understanding Social Preferences with Simple Tests. *The Quarterly Journal of Economics* 117(3):817–869, ISSN 0033-5533, URL https://www.jstor.org/stable/4132490, publisher: Oxford University Press.

Chen CD, Ku ECS (2021) Diversified Online Review Websites as Accelerators for Online Impulsive Buying: The Moderating Effect of Price Dispersion. *Journal of Internet Commerce* 20(1):113–135, ISSN 1533-2861, URL http://dx.doi.org/10.1080/15332861.2020.1868227, publisher: Routledge eprint: https://doi.org/10.1080/15332861.2020.1868227.

Clark MS, Mils J (1993) The difference between communal and exchange relationships: What it is and is not. *Personality and social psychology bulletin* 19(6):684–691, publisher: Sage Publications Sage CA: Thousand Oaks, CA.

Cox JC (2007) Trust, Fear, Reciprocity, and Altruism: Theory and Experiment. Oda SH, ed., *Developments on Experimental Economics: New Approaches to Solving Real-world Problems*, 75–90, Lecture Notes in Economics and Mathematical Systems (Berlin, Heidelberg: Springer), ISBN 978-3-540-68660-6, URL http://dx.doi.org/10.1007/978-3-540-68660-6_5.

Cumming G (2014) The New Statistics: Why and How. *Psychological Science* 25(1):7–29, ISSN 0956-7976, URL http://dx.doi.org/10.1177/0956797613504966, publisher: SAGE Publications Inc.

Dellarocas C, Narayan R (2006) What motivates consumers to review a product online? A study of the product-specific antecedents of online movie reviews. *Statistical Science, C* 21:277–285, publisher: Cite-seer.

Dichter E (1966) How word-of-mouth advertising works. *Harvard business review* 44:147–166.

Dorner V, Giamattei M, Greiff M (2020) The Market for Reviews: Strategic Behavior of Online Product Reviewers with Monetary Incentives. *Schmalenbach Business Review* 72(3):397–435, ISSN 2194-072X, URL http://dx.doi.org/10.1007/s41464-020-00094-y.

Duan W, Gu B, Whinston AB (2008) Do online reviews matter?—An empirical investigation of panel data. *Decision support systems* 45(4):1007–1016, publisher: Elsevier.

Duan Y, Chen C, Huo J (2019) The impact of monetary rewards for online reviews. *Asia Pacific Journal of Marketing and Logistics* 31(5):1486–1515, ISSN 1355-5855, URL http://dx.doi.org/10.1108/ APJML-02-2018-0082, publisher: Emerald Publishing Limited.

Dubois D, Bonezzi A, De Angelis M (2016) Sharing with friends versus strangers: How interpersonal closeness influences word-of-mouth valence. *Journal of Marketing Research* 53:712–727, ISSN 1547-7193, URL http://dx.doi.org/10.1509/jmr.13.0312, place: US Publisher: American Marketing Association.

Engel JF, Blackwell RD, Miniard PW (1993) *Consumer behavior*. Dryden Press series in marketing (Chicago: Dryden Press), 6th ed edition, ISBN 978-0-03-076751-7, URL http://www.gbv.de/dms/bowker/toc/ 9780030767517.pdf, oCLC: 27329922.

Exley C (2017) Incentives for Prosocial Behavior: The Role of Reputations. *Management Science* 64, URL http://dx.doi.org/10.1287/mnsc.2016.2685.

Fehr E, Falk A (2002) Psychological foundations of incentives. *European economic review* 46(4-5):687–724, publisher: Elsevier.

Filieri R (2015) What makes online reviews helpful? A diagnosticity-adoption framework to explain informational and normative influences in e-WOM. *Journal of business research* 68(6):1261–1270, publisher: Elsevier.

Fiske AP (1992) The four elementary forms of sociality: framework for a unified theory of social relations. *Psychological review* 99(4):689, publisher: American Psychological Association.

Floyd K, Freling R, Alhoqail S, Cho HY, Freling T (2014) How Online Product Reviews Affect Retail Sales: A Meta-analysis. *Journal of Retailing* 90(2):217–232, ISSN 0022-4359, URL http://dx.doi.org/10. 1016/j.jretai.2014.04.004.

Fradkin A, Holtz D (2022) Do incentives to review help the market? Evidence from a field experiment on Airbnb URL https://open.bu.edu/handle/2144/43663, accepted: 2022-01-21T19:20:00Z.

Garnefeld I, Helm S, Gr¨otschel AK (2020) May we buy your love? psychological effects of incentives on writing likelihood and valence of online product reviews. *Electronic Markets* 30(4):805–820, ISSN 1019-6781, 1422-8890, URL http://dx.doi.org/10.1007/s12525-020-00425-4.

Gerrath MH, Usrey B (2021) The impact of influencer motives and commonness perceptions on follower reactions toward incentivized reviews. *International Journal of Research in Marketing* 38(3):531–548, ISSN 01678116, URL http://dx.doi.org/10.1016/j.ijresmar.2020.09.010.

Ghose A, Ipeirotis PG (2010) Estimating the helpfulness and economic impact of product reviews: Mining text and reviewer characteristics. *IEEE transactions on knowledge and data engineering* 23(10):1498– 1512, publisher: IEEE.

Gneezy U, Meier S, Rey-Biel P (2011) When and why incentives (don't) work to modify behavior. *Journal of economic perspectives* 25(4):191–210.

Goette L, Stutzer A, Frey BM (2010) Prosocial Motivation and Blood Donations: A Survey of the Empirical Literature. *Transfusion Medicine and Hemotherapy* 37(3):149–154, ISSN 1660-3796, URL http://dx. doi.org/10.1159/000314737.

Hayes A (2022) *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (Guilford Press).

Hayes AF, Rockwood NJ (2020) Conditional Process Analysis: Concepts, Computation, and Advances in the Modeling of the Contingencies of Mechanisms. *American Behavioral Scientist* 64(1):19–54, ISSN 0002-7642, URL http://dx.doi.org/10.1177/0002764219859633, publisher: SAGE Publications Inc.

Hennig-Thurau T, Gwinner KP, Walsh G, Gremler DD (2004) Electronic word-of-mouth via consumer opinion platforms: what motivates consumers to articulate themselves on the internet? *Journal of interactive marketing* 18(1):38–52, publisher: Elsevier.

Heyman J, Ariely D (2004) Effort for payment: A tale of two markets. *Psychological science* 15(11):787–793, publisher: SAGE Publications Sage CA: Los Angeles, CA.

Homans GC (1958) Social Behavior as Exchange. *American Journal of Sociology* 63(6):597–606, ISSN 0002-9602, URL http://dx.doi.org/10.1086/222355, publisher: The University of Chicago Press.

Jahan N, Kim SW (2020) Understanding online community participation behavior and perceived benefits: a social exchange theory perspective. *PSU Research Review* 5(2):85–100, ISSN 2399-1747, URL http: //dx.doi.org/10.1108/PRR-12-2019-0036, publisher: Emerald Publishing Limited.

Jindal N, Liu B (2008) Opinion spam and analysis. *Proceedings of the 2008 International Conference on Web Search and Data Mining*, 219–230, WSDM '08 (New York, NY, USA: Association for Computing Machinery), ISBN 978-1-59593-927-2, URL http://dx.doi.org/10.1145/1341531.1341560.

Kasraian L, Maghsudlu M (2012) Blood donors' attitudes towards incentives: influence on motivation to

donate. *Blood Transfusion* ISSN 1723-2007, URL http://dx.doi.org/10.2450/2011.0039-11.

Khern-am nuai W, Kannan K, Ghasemkhani H (2018) Extrinsic versus intrinsic rewards for contributing reviews in an online platform. *Information Systems Research* 29(4):871–892, publisher: INFORMS.

Klimecki OM, Mayer SV, Jusyte A, Scheeff J, Sch¨onenberg M (2016) Empathy promotes altruistic behavior in economic interactions. *Scientific reports* 6(1):31961, publisher: Nature Publishing Group UK London.

Lysenstøen C, Bøe T, Hjetland G, Skogen J (2021) A Review of the Relationship Between Social Media Use and Online Prosocial Behavior Among Adolescents. *Frontiers in Psychology* 12:579347, URL http://dx.doi.org/10.3389/fpsyg.2021.579347.

Medill Spiegel Research Center (2021) How Online Reviews Influence Sales Medill Spiegel Research Center. URL https://spiegel.medill.northwestern.edu/how-online-reviews-influence-sales/.

Meier S (2007) *A survey of economic theories and field evidence on pro-social behavior*. (Mit Press).

Mudambi SM, Schuff D (2010) What makes a helpful online review? A study of customer reviews on Amazon.com. *MIS quarterly* 185–200, publisher: JSTOR.

Nagel T (1970) *The Possibility of Altruism* (Oxford Clarendon Press).

Oliver RL, Swan JE (1989) Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach. *Journal of Marketing* 53(2):21–35, ISSN 0022-2429, URL http://dx.doi. org/10.2307/1251411, publisher: American Marketing Association.

Packard G, Berger J (2017) How Language Shapes Word of Mouth's Impact. *Journal of Marketing Research* 54(4):572–588, ISSN 0022-2437, URL http://dx.doi.org/10.1509/jmr.15.0248, publisher: SAGE Publications Inc.

Paul EF, Miller FD, Paul J (1993) *Altruism* (Cambridge: Cambridge University Press), ISBN 978-0-521-44759-1, oCLC: 859680986.

PowerReviews (2021) Survey: The Ever-Growing Power of Reviews. URL https://www.powerreviews.com/ insights/power-of-reviews-survey-2021/, section: Insights.

Price LL, Feick LF, Guskey A (1995) Everyday Market Helping Behavior. *Journal of Public Policy & Marketing* 14(2):255–266, ISSN 0743-9156, URL https://www.jstor.org/stable/30000133, publisher: American Marketing Association.

Qiao D, Lee SY, Whinston AB, Wei Q (2020) Financial incentives dampen altruism in online prosocial contributions: A study of online reviews. *Information Systems Research* 31(4):1361–1375, publisher: INFORMS.

Rabin M (1993) Incorporating fairness into game theory and economics. *The American economic review* 1281–1302, publisher: JSTOR.

Resnick P, Kuwabara K, Zeckhauser R, Friedman E (2000) Reputation systems. *Communications of the ACM* 43(12):45–48, ISSN 0001-0782, URL http://dx.doi.org/10.1145/355112.355122.

Schneider FH, Campos-Mercade P, Meier S, Pope D, Wengstrom E, Meier AN (2023) Financial incentives for vaccination do not have negative unintended consequences. *Nature* 613(7944):526–533, ISSN 1476-4687, URL http://dx.doi.org/10.1038/s41586-022-05512-4, number: 7944 Publisher: Nature Publishing Group.

Smith A (2021) How the Right Incentive Can Help You Generate More Reviews. URL https://www. powerreviews.com/blog/what-incentives-generate-reviews/, section: Blog.

Stephen A, Bart Y, Du Plessis C, Goncalves D (2012) Does paying for online product reviews pay off? The effects of monetary incentives on content creators and consumers. *ACR North American Advances* .

Sundaram DS, Mitra K, Webster C (1998) Word-Of-Mouth Communications: a Motivational Analysis. *ACR North American Advances* NA-25, URL https://www.acrwebsite.org/volumes/8208/volumes/v25/ NA-25/full.

Trivers RL (1971) The evolution of reciprocal altruism. *The Quarterly review of biology* 46(1):35–57, publisher: Stony Brook Foundation, Inc.

Wang H, Wang Y (2020) A Review of Online Product Reviews. *Journal of Service Science and Management* 13(1):88–96, URL http://dx.doi.org/10.4236/jssm.2020.131006, number: 1 Publisher: Scientific Research Publishing.

Wang J, Ghose A, Ipeirotis P (2012) Bonus, disclosure, and choice: what motivates the creation of high-quality paid reviews? *ICIS* Publisher: Citeseer.

Wu Y, Liu T, Teng L, Zhang H, Xie C (2021) The impact of online review variance of new products on consumer adoption intentions. *Journal of Business Research* 136:209–218, ISSN 0148-2963, URL http://dx.doi.org/10.1016/j.jbusres.2021.07.014.

3. Essay 2

Be careful what you pay for: The effect of performance contingent incentives for online product reviews

Abstract

With increasingly more customers basing their purchase decisions on online product reviews, many retailers have adopted various incentivization methods to attract higher-quality reviews for their products. Prior research has studied different incentivization schemes to promote the creation of high-quality reviews. This research investigates a performance-contingent incentive that incentivizes the entire review community using a fixed incentive budget. We test our hypotheses in a controlled experiment and a field study in collaboration with a major North American online retailer. We find that performance-contingent incentives increase review length, but the increase is moderated by reviewer experience. Experienced reviewers have established reciprocal exchange motives and are not affected by performance-contingent incentives. In contrast, first-time reviewers lack well-established motives to write reviews and show significant improvement in their review length when exposed to performance-contingent incentives. Finally, given that performance-contingent incentives reinforce reciprocal motives, we find that reinforcing other motives, such as pure altruism, backfires and reduces review length. Our findings show that the efficacy of providing performance-contingent incentives and reinforcing pure versus reciprocal altruism depends on the percentage of first-time reviewers on a given platform and the outcome of interest (i.e., review rate, helpful review rate, or cost per helpful review) to the retailer. We provide managers with a concrete set of guidelines to choose the appropriate incentivization scheme and altruism reinforcement based on their platforms' reviewer experience and their outcome of interest. Our guidelines can help managers save costs and increase helpful reviews on their platform.

3.1 Introduction

Online product reviews are important for consumers and retailers. According to multiple surveys, consumers expect a product to have at least 112 reviews for them to trust the product (Chevalier, 2022), 89% of consumers read product reviews before buying a product (Trustpilot, 2020), and

79% of consumers trust online reviews as much as personal recommendations (Pitman, 2022). Moreover, it has been shown that larger review volumes lead to higher sales (Duan et al., 2008; Ghose & Ipeirotis, 2010). These statistics and findings support the common belief among retailers that online reviews are an integral part of consumers' decision-making journey, and efforts must be made to attract high-quality online customer reviews cost-efficiently.

Given the importance of online reviews for business performance, many retailers have adopted different incentivization schemes to entice their customers to write reviews for the products that they purchase. Prior research has investigated various ways to better incentive reviewers to write high quality reviews and proposed different incentivization schemes. The nature of the incentive for writing reviews has been investigated at the lowest level. Some platforms and prior research utilize non-monetary reward schemes, such as "top reviewer badge" (Babić Rosario et al., 2020), while others use different monetary incentives. Examples of monetary incentives include store credit (e.g., Burtch et al. 2018) and cash rebates (e.g., Cabral and Li, 2015).

The quality of online product reviews is essential for consumers and retailers. High-quality reviews are helpful to consumers' decision-making process and affect purchase decisions (Dorner et al., 2020). High-quality reviews also increase product sales (Li et al., 2019). While incentivized reviews are beneficial for increasing the volume and valence of reviews (Khern-am-nuai et al., 2018) and diluting the effect of self-selection, under-reporting, and social influence biases (Askalidis et al., 2017), they can have negative consequences on review quality (Khern-am-nuai et al., 2018). Prior research has shown that financial incentives decrease review quality (e.g., shorter length) compared to organic reviews (Gneezy et al., 2011; Meier, 2007). As a result, it is important to address the detrimental effect of financial incentives on review quality.

Prior research has explored various incentivization schemes that help mitigate the negative effect of financial incentives on review quality. On the academic front, several platform-level reward schemes have been proposed that account for various platform-wide variables and use concepts from mathematics and game theory to incentivize reviewers to write high-quality reviews (e.g., Jurca and Faltings, 2007; Miller et al., 2005). Nonetheless, major review platforms or retailers have yet to adopt these platform-wide incentive schemes.

An incentivization scheme that has been implemented on review platforms and has shown promising effects on review quality is a performance-contingent incentive. The performance-contingent incentive is an incentive scheme that incentivizes reviewers if they write helpful reviews (Yu et al., 2022). It is contrasted with completion-contingent incentives that incentivize reviewers to write a review, regardless of its quality. Although prior research has shown that performance-contingent incentives can increase review volume, quality, and helpfulness for those who receive the incentive (i.e., the winners), there are several major issues with current implementations of performance-contingent incentives. It has been shown that the structure of

performance-contingent incentives is crucial (Dorner et al., 2020). Winner-takes-all tournament-style performance-contingent incentives, which have been used in practice by retailers, such as Amazon Vine program, and investigated academically (e.g., Yu et al., 2022), tend to cause a systemic reduction in the signaling power of helpfulness votes by introducing bias (Dorner et al., 2020). This is due to the strategic interest of reviewers in downvoting competing reviews due to the tournament style of the performance-contingent incentives. As a result, winner-takes-all tournament-style performance-contingent incentive schemes are suboptimal means for eliciting high-quality reviews, which lead to unintended negative consequences.

Another performance-contingent scheme that has been explored offers performance-contingent incentives to all consumers on the review platform. Wang et al. (2012) devised a scheme that would pay the reviewers a fixed completion-contingent amount in addition to performance-contingent rewards for every helpful vote that the review receives. They showed that compared to a purely completion-contingent scheme, combining performance-contingent and completion contingent leads to higher review quality and helpfulness. Nevertheless, their implementation of performance-contingent incentives is not practically feasible as it leads to implementation and legal issues. Pledging to reward each reviewer without constraints on the time to receive the performance-contingent incentive and the amount of performance-contingent incentive leads to unrealistic scenarios that prevent review platforms from implementing such schemes. Furthermore, the design of Wang et al. (2012)'s study does not allow us to isolate the effect of performance-contingent incentives on review quality. Therefore, there remains the issue of a performance-contingent incentive that can be implemented in real-world settings, limits the amount of incentive for each review, and determines the optimal proportion of the total incentive to be offered in a performance-contingent manner. To tackle the shortcomings of the prior research, we investigate a performance-contingent incentive scheme that operates on a fixed budget, offers the incentive regardless of reviewer experience, and rewards the performance-contingent incentive if a review receives one helpful vote within 90 days.

Prior research has focused on *how* reviewers should receive performance-contingent incentives. We argue that the question of *who* should receive them is equally important. Using Agency Theory, we propose that retailers and reviewers are principals and agents whose interests should be aligned (Fama & Jensen, 1983; Jensen & Meckling, 1976; Ross, 1973). Assuming that retailers are interested in high-quality reviews, we claim that performance-contingent incentives align the interests of retailers and reviewers by reinforcing the reciprocal motives of the reviewers and increasing their review effort. The reinforcement of the reciprocal motives of first-time reviewers would be stronger than experienced reviewers because experienced reviewers already operate within the social and economic exchange framework (Heyman & Ariely, 2004). Finally, we propose that reinforcing other motives than reciprocal, such as pure altruism, would clash with the reciprocal motive reinforcement of performance-contingent incentives, and this clash is stronger

for first-time reviewers because their review motives are less established and more susceptible to reinforcements.

We operationalize the performance-contingent incentive scheme by setting the total (i.e., completion-contingent and performance-contingent) incentive budget as $10. To investigate the effect of the amount of performance-contingent incentives, we vary the performance-contingent amount as the proportion of the fixed total incentive budget ($0 to $10). In Study 1, we carried out a one-factor (Performance-contingency percentage: 0% vs. 20% vs. 50% vs. 80% vs. 100%) between-subjects controlled experiment using 109 U.S. participants to test the effect of offering performance-contingent incentives, reviewer experience, their interaction, and the proportion of performance contingent incentives on reviewer effort. In Study 2, we performed a 2 (Performance-contingence: Yes vs. no) x 2 (Reciprocal altruism reinforcement: Yes vs. no) between-subjects field experiment using customers from a major online retailer. We sent out 9555 review invitations, which led to 1660 reviews. We tested the main effects of performance-contingence, reviewer experience, and reciprocal altruism reinforcement, and their interactions on review length.

Our results make three theoretical contributions. First, we show that performance-contingent incentives reinforce reciprocal exchange motives (Homans, 1958; Heyman & Ariely, 2004). This finding contributes to our understanding of how performance-contingent motives influence reviewer behavior, which has not been investigated before (Dorner et al., 2020; J. Wang et al., 2012; Yu et al., 2022). Second, we contribute to Agency Theory by showing that, contrary to prior research (Tosi et al., 2000), first-time reviewers (agents) react more positively than experienced reviewers (agents) to performance-contingent incentives. We find that this strong positive reaction of first-time reviewers is due to their lack of well-established review motives (interests) and their susceptibility to reciprocal motive reinforcement. Third, we show that reinforcing multiple conflicting motives can backfire. Although prior research has shown that various review motives, such as pure or reciprocal altruism, can be reinforced to increase reviewing behavior (Wadi et al. 2023), we show that simultaneous reinforcement of different motives (i.e., pure altruism *and* reciprocal exchange) decreases reviewer effort, especially for first-time reviewers who have less established reciprocal motives.

Our findings provide managers with concrete and actionable guidelines for implementing performance-contingent incentives on their review platforms. Our results show that 80% performance-contingent and 20% completion-contingent leads to higher review effort and length than a fully completion-based incentive scheme. Moreover, we devise a decision tree that managers can use to determine the type of incentive scheme (i.e., performance-contingent vs. completion-contingent) and prosocial reinforcement message (i.e., pure vs. reciprocal altruism) that would optimize the review rate, helpful review rate, and cost per helpful review, based on the percentage of first-time reviewers on the platform. This allows managers to design performance-

contingent incentive schemes based on their own specific review incentive budget and review outcomes of interest.

3.2 Literature Review

Online product reviews are a form of eWOM (Hennig-Thurau et al., 2004) and have been distinguished from other types of eWOM, such as User-Generated Content (UGC) or consumer-generated ads (Babić Rosario et al., 2020). They are "peer-generated product evaluations posted on company or third-party websites" (Mudambi & Schuff, 2010, p. 186). The quality of online product reviews is essential for consumers and retailers. High-quality reviews are helpful to consumers by affecting purchase decisions (Dorner et al., 2020) and important to retailers by increasing product sales (Li et al., 2019).

Retailers have devised various incentive schemes to increase the number of product reviews, such as offering free products, early access to new products, store discounts, loyalty points (Smith, 2021), financial incentives (Woolley & Sharif, 2021), and non-monetary incentives (Greene, 2021). These incentives can have different effects on the quantity and quality of reviews. For instance, it has been shown that if the amount of financial incentives is high enough, the decision to write a review increases (Klein et al., 2018).

Completion-contingent financial incentives are one of the most common schemes among retailers and have been the primary focus of academic research. Such schemes financially reward reviewers contingent on writing a review (Yu et al., 2022). Completion-contingent incentives are useful for eliciting higher volumes of reviews, yet the resulting reviews lack quality. Burtch et al. (2018) showed that completion-contingent financial incentives increase the volume of reviews, but the created reviews are shorter. Similarly, Qiao et al. (2020) showed that providing completion-based financial incentives decreases the length and the linguistic effort exerted in writing reviews. As a result, there is a need to devise an incentive scheme that increases the quality of incentivized reviews.

3.2.1 Performance-contingent incentive schemes

Performance-contingent incentives have been proposed to improve the quality of online product reviews (Dorner et al., 2020; J. Wang et al., 2012; Yu et al., 2022). Performance-contingent incentives are contrasted with completion-contingent incentives, for which the reviewers receive financial rewards for writing a review, regardless of their performance. On the other hand, performance-contingent incentives provide rewards (partly or wholly) contingent on the review meeting quality certain requirements. In incentivized settings, agents show poor performance if the monetary compensation is completion-contingent (Gneezy & Rustichini, 2000). This is because agents perceive the incentive as payment for task participation (Gneezy & Rustichini,

2000). In contrast, in a performance-contingent incentive scheme, the agents' performance significantly increases (Gneezy & Rustichini, 2000). Moreover, performance-contingent incentives may be more efficient investments for retailers since the scheme rewards only high-quality reviews.

While performance-contingent incentives can increase review quality for the experienced reviewers who win the performance-contingent reward (Yu et al., 2022), prior research does not address how performance-contingent incentives affect first-time reviewers and experienced reviewers who fail to win the reward (i.e., the majority of the reviewers). Moreover, some performance-contingent schemes developed so far suffer from implementation and legal issues. One of the first performance-contingent review incentive schemes studied in research used a combination of completion-contingent and uncapped linear performance-contingent incentives (Wang et al., 2012). Wang et al. (2012) devised this scheme to study the effect of completion-contingent and performance-contingent incentives on two levels. In the completion-contingent group, the participants received a fixed amount for writing a review, whereas in the performance-contingent group, the participants received the same fixed amount for completing the review, plus an extra reward for each helpful vote their review received. The authors found that the performance-contingent reward increases review helpfulness and quality. There are two major issues with this incentive scheme. First, pledging to pay each reviewer indefinitely creates a legal binding for the retailer to perpetually track each review and compensate the reviewer each time their review receives a helpful vote. Second, this incentive scheme poses an uncapped budget for incentivizing reviewers. For instance, if a review receives 1000 helpful votes, the retailer must pay the reviewer $1000. This makes the incentive scheme practically infeasible because most retailers have a preset budget for incentivizing each review. Finally, from a theoretical perspective, this incentive scheme does not isolate the effect of performance-contingent incentives and any interactions they might have with completion-contingent incentives.

Furthermore, the effect of performance-contingent incentives on reviews is highly dependent on the structure of the performance-contingent scheme (Wang et al., 2012; Yu et al., 2022; Dorner et al., 2020). Performance-contingent schemes that reward reviewers and any existing completion-contingent incentives show increased review volume (Yu et al., 2022). However, the consequences for review volume have not been explored for retailers who wish to maintain their current review incentive budget and replace their completion-contingent incentive scheme (partly or wholly) with a performance-contingent scheme.

Moreover, prior research has not investigated how performance-contingent incentives would affect those reviewers who do not receive the incentive. In particular, some studies have investigated performance-contingent incentives in a winner-takes-all tournament scheme (Yu et al., 2022; Dorner et al., 2020), where only one review among all the reviews posted on the platform receives the performance-contingent reward. Yu et al. (2022) investigated performance-contingent

incentives in this winner-takes-all tournament incentive scheme (Dorner et al., 2020), where experienced reviewers compete for a single reward contingent on their performance. They found that this performance-contingent tournament incentive scheme increases review quality and quantity. Dorner et al. (2020) investigated the downsides of such tournament-style incentive schemes. They found that these schemes do not improve review quality and reduce the signaling power of helpfulness ratings. They cite the case of the Amazon Vine program in which the platform selects a limited number of helpful, experienced reviewers to receive extra rewards in exchange for their helpful reviews. Dorner et al. (2020) argue that tournament-style incentive schemes lead to a strategic interest in reviewers to downvote other reviewers' reviews, which makes helpfulness ratings biased and meaningless. In addition, although the winners in Yu et al. (2022)'s study showed a higher willingness to write reviews and review quality, the effect of performance-contingent incentives on the losers, who comprise the majority of the review platform, is unknown. Finally, we know little about the effect of performance-contingent incentives when offered to the entire reviewer community, without competition, instead of a select few.

In this research, we suggest a fixed-budget incentive scheme and vary the proportion of the performance-contingent incentive. We also limit the requirement for the performance-contingent incentive to only one helpful vote and the amount of time that a review has to receive a helpful vote to 90 days. Thus, we fix the issue of uncapped performance-contingent liability of the firm, facilitate the tracking of the helpful votes by limiting the amount of time, and isolate the effect of performance-contingent incentives to see if the percentage of performance-contingent incentives to the overall incentive budget influences reviewer behavior.

Moreover, we look at performance-contingent incentives when offered to the whole community of consumers without the competitive element. Each reviewer can receive performance-contingent incentives if they receive one helpful vote within 90 days of posting the review. Such a performance-contingent incentive does not suffer from strategic downvoting of other reviewers (Dorner et al., 2020) and enables us to investigate the impact of performance-contingent incentives on both the first-time and experienced reviewers on the platform. Furthermore, we investigate the effect of introducing performance-contingent incentives on a platform that is currently using completion-contingent incentives. This setting allows us to identify the differential effects of performance-contingent incentives on different types of reviewers, specifically those who have previously reviewed on the platform, were incentivized using the completion-contingent incentive, and have established expectations regarding the previous incentive scheme versus those who are new to the platform and have no anchor point concerning the performance-contingent incentive.

We propose that performance-contingent (vs. completion-contingent) incentives are a principal-agent problem, in which the principal (i.e., the retailer) tries to align the interest of the agents (i.e, the reviewer) with its own. Therefore, we use Agency Theory (Ross, 1973) as our theoretical foundation.

3.2.2 Agency Theory

We employ Agency Theory (Ross, 1973) to explain the relationship between an incentivizing retailer and incentivized reviewers. Agency Theory has been commonly used to explain corporate governance. Still, its applications have extended to a broader set of domains, such as the relationship between politicians and voters, lawyers and clients, and brokers and investors, to name a few (Payne & Petrenko, 2019).

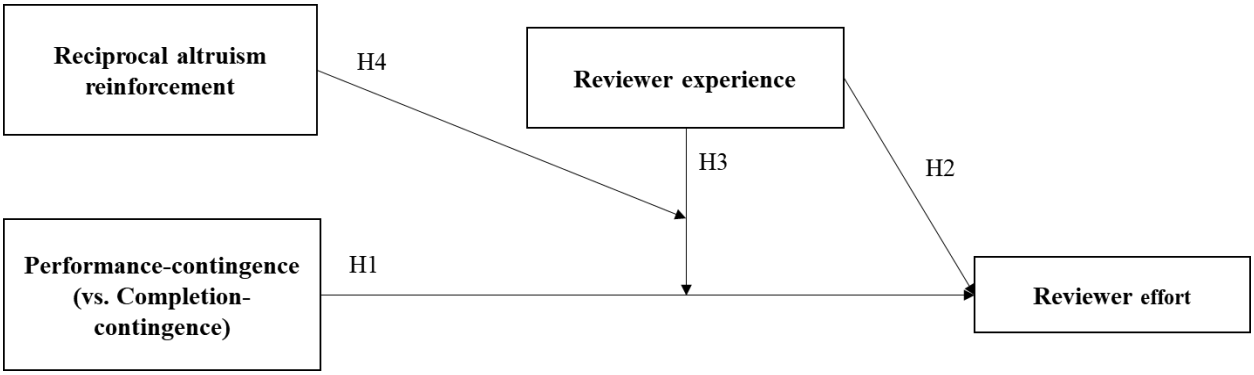
Agency Theory focuses on aligning the interests of principals and agents (Fama & Jensen, 1983; Jensen & Meckling, 1976; Ross, 1973). Principals are the buyers of a good or service and agents are the good or service providers. In the context of online product review creation, the retailer that pays its customers for reviews is the principal, while the reviewer who receives financial incentives is the agent. Interest alignment is done through agency controls, such as incentive alignment or monitoring (Fong & Tosi, 2007). In a performance-contingent review incentivization scheme, financial incentive based on performance outcomes of the review is the agency control that aims to align the interest of the retailer (i.e., high quantity and quality reviews) with the interest of the reviewer (i.e., review writing motives; Hennig-Thurau et al., 2004) through incentive alignment (Fong & Tosi, 2007, p.163).

According to Agency Theory, agents' experience is key to effort and task performance (Tosi et al., 2000). Agents' experience could affect their feeling of control over whether they can meet the performance requirements set by performance-contingent incentives and receive them (Fong & Tosi, 2007). The interaction between agency controls and agents' experience determines the effort the agents would put into the task and their task performance (Fong & Tosi, 2007).

3.3 Hypothesis development

Figure 3.1 shows our theoretical framework. In this section, we develop our hypotheses on the effects of performance-contingent (vs. completion-contingent) incentives, reviewer experience, and reciprocal altruism reinforcement on reviewer effort.

Figure 3.1 - Theoretical framework



Agency Theory frames performance-contingent incentives as a contract that makes the payment of agents contingent on the outcomes desirable to the principal (Baiman, 1990; Riordan & Sappington, 1987). In such contracts, assuming that the agents' utility is a function of their compensation (Groff & Wright, 1989), the agents should maximize their compensation by maximizing the principals' outcomes of interest (Stroh et al., 1996). Since writing a helpful review requires time and effort (Khern-am-nuai et al., 2018), reviewers should maximize their effort in writing their reviews to ensure that they would receive a helpful vote and the performance-contingent incentive.

H1: Performance-contingent (vs. completion-based) incentives increase the amount of effort exerted by reviewers.

According to Agency Theory, the interests of the principal (i.e., the retailer) and the agents (i.e., the reviewers) should be aligned. The interests of reviewers are their review motives (e.g., financial incentives, reciprocal altruism, and social status), which are extensively discussed in the eWOM literature (Hennig-Thurau et al., 2004). The retailer's interests can be signaled to the reviewers and align the reviewers' motives with the retailer's. Wadi et al. (2023) showed that the wording of the review solicitation messages signals to the reviewers the retailer's interest and reinforces the motive that the review solicitation message signals. For instance, when the retailer asks for reviews to help other consumers, it reinforces the pure altruistic motives (i.e., the desire to help others without expectations of reciprocity) in reviewers, which makes them write more reviews.

We argue that performance-contingent incentives do not have a uniform effect on different types of reviewers. Specifically, interest alignment through performance-contingent incentives would affect first-time and experienced reviewers differently. On a given retailer review platform, reviewers can be segmented into first-time and experienced reviewers, based on their review-writing experience. First-time reviewers write a review on the platform for the first time, while experienced reviewers have already written reviews on the platform. Because of their past experience with the review platform, experienced reviewers have been exposed to the retailer's interest signals through the review solicitation message or incentive scheme and have shown their

alignment of motives with the retailer by writing a review before. Thus, it is more likely for experienced reviewers' motives to be aligned with the retailer's interests. On the other hand, since first-time reviewers do not have prior experience with the review platform and its interests, there is a higher chance that their review motives would not be aligned with the retailer's interest. Therefore, experienced reviewers would be inclined to exert more effort in writing reviews.

H2: When comparing experienced reviewers to first-time reviewers, experienced reviewers demonstrate greater effort in their reviews.

Performance-contingent incentives introduce a reciprocal exchange, where performance-contingent payments are given in exchange for helpful reviews. Therefore, performance-contingent incentives would reinforce the reciprocal motives of reviewers. Since experienced reviewers have previously written reviews in exchange for financial incentives, they are already driven by reciprocal motives. First-time reviewers, however, could be driven by motives (e.g., social status, reciprocal altruism, pure altruism; Hennig-Thurau et al. 2004; Wadi et al. 2023) that are different from reciprocal motives. As a result, the reinforcement of reciprocal motives by performance-contingent incentives for first-time reviewers would be stronger than for experienced reviewers, and this larger increase in reciprocal motives would lead to a larger increase in the amount of effort exerted by first-time (vs. experienced) reviewers.

H3: Performance-contingent incentives have a larger effect on the amount of review effort for first-time reviewers than experienced reviewers.

We posit that performance-contingent incentives reinforce reciprocal motives in reviewers. If, in addition to reciprocal motives that are reinforced using performance-contingent incentives, the retailer reinforces other motives, such as pure altruism, the retailer would signal conflicting motives, because pure altruism is an independent motive from reciprocal motives (Wadi et al. 2023). We propose that reinforcing conflicting motives in reviewers can backfire. This conflicting motive reinforcement would be more effective for first-time reviewers because they do not have established reciprocal motives, and their review motives are more susceptible to reinforcement. Experienced reviewers, in contrast, would be less affected by conflicting motive reinforcement because their reciprocal motives are more established and, thus, less susceptible to reinforcements.

H4: When performance-contingent payment is offered for first-time reviewers, there is a positive impact of reinforcing reciprocal altruism (vs. other motives) on review effort that is stronger than for experienced reviewers.

To test H1-H3, we performed a scenario-based controlled experiment with U.S. participants. We presented them with a scenario in which they made a purchase and received an incentivized

invitation to review from an online retailer (Study 1). Next, we conducted a field experiment with the collaboration of an online retailer to test H1-H4 in a real-life consumption setting (Study 2).

3.4 Study 1

3.4.1 Experiment design

In Study 1, we test the effects of performance-contingence (H1), reviewer experience (H2), and the differential effects of performance-contingent incentives for first-time and experienced reviewers (H3) on review effort (self-reported effort in this study). We also investigate whether offering different percentages of performance-contingent (vs. completion-contingent) incentives to write reviews lead to any significant difference in review effort (self-reported effort in this study).

We study performance-contingent review incentivization in a one-factor (Performance-contingency percentage: 0% vs. 20% vs. 50% vs. 80% vs. 100%) between-subjects experiment. Table 3.1 shows different performance-contingent incentive scheme levels and their corresponding message to the customers, given a maximum incentive of $10.

Table 3.1 – Performance-contingency percentage of the groups and their corresponding review solicitation message

Contingent percentage	Message	Participants
0% (completion-contingent)	Could you please take some time to write a review about the product you purchased? You will receive **$10 credit** after you submit your review.	23
20%	Could you please take some time to write a review about the product you purchased? You will receive **$8 credit** after you submit your review and **$2 credit** if your review receives **1 helpful vote**.	21
50%	Could you please take some time to write a review about the product you purchased? You will receive **$5 credit** after you submit your review and **$5 credit** if your review receives **1 helpful vote**.	21

80%	Could you please take some time to write a review about the product you purchased? You will receive **$2 credit** after you submit your review and **$8 credit** if your review receives **1 helpful vote**.	23
100%	Could you please take some time to write a review about the product you purchased? You will receive **$10 credit** if your review receives **1 helpful vote**.	21

3.4.2 Sample and Procedure

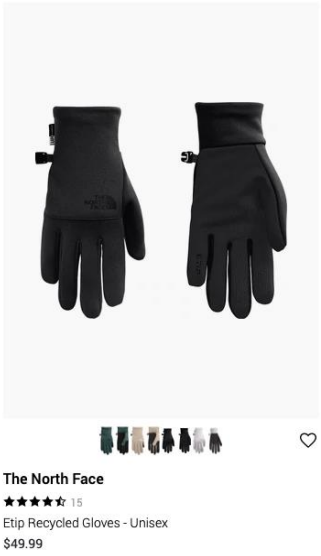
We recruited 125 US participants from Prolific. The participants were limited to those who had a 95% or higher satisfaction rate. They received 1.50 USD for participating in the study. One participant did not finish the survey, and 15 participants failed the attention check, explicitly asking them to select "Strongly disagree" for one question. This left us with 109 valid participants (M_{age} = 33.66, SD_{age} = 12.24; 47.7% female).

The participants were asked to imagine an online retailer which they have previously bought products from, saw the product image (Figure 3.2), and were shown the following scenario: "You ordered the product below [a pair of gloves] from their website. After your order is delivered, you receive the following email from the online retailer." Then, they were shown one of the messages from Table 1, randomly assigned to each participant. After reading the email, the participants expressed their review effort.

3.4.3 Manipulation checks

To verify the manipulation of our treatment conditions in Table 1, we previously recruited 105 participants from Prolific. One participant did not finish the survey, and 3 failed the attention check. This left 101 valid participants (m_{age} = 37.63, SD = 14.02; 48.5% female). The participants were shown the product in Figure 3.2. We ran a pretest to verify that the pair of gloves is gender neutral.

Figure 3.2 - Product shown in the scenario - Study 1



After being shown the review solicitation message, the participants answer 4 items on a 7-point Likert scale (Table 3.2), to check the manipulation of our 5 groups. Item 1 checks the manipulation of financial incentives. Since all groups are offered a type of financial incentive, all treatment groups must score above the scale's midpoint, i.e., 4. Item 2 checks the manipulation for the completion-contingent incentive group. Item 3 checks the manipulation of the performance-contingent incentive groups. Finally, Item 4 checks the manipulation of the completion-contingent, 20% performance-contingent, and 50% performance-contingent groups versus the 80% performance-contingent and 100% performance-contingent groups. We run a one-tailed one-sample t-test for the first item and one-tailed independent samples t-tests for the rest of the items in Table 3.2 to check the manipulation of our groups. The results of our manipulation check experiment show successful manipulation of the incentive and different levels of performance-contingent incentive. Table 3.2 shows different groups, the expected manipulation check effects, and test results.

Table 3.2 - Study 1 - Manipulation check items and results

Number	Item	Expected effect	t	df	p
1	I can receive a reward for writing the review.***	All groups >= 4	13.526	100	<0.001
2	I will receive a reward regardless of how helpful my review is.***	Completion-contingent group > other groups	10.482	46.536[1]	<0.001

3	I need to write a helpful review to receive more rewards.***	Performance-contingent groups > completion-contingent group	8.266	99	<0.001
4	I will receive most of the rewards after my review receives a helpful vote.***	100% and 80% groups > 0%, 20%, and 50% groups	5.553	82	<0.001

Note. [1] Equal variances not assumed.
Note. *** $p < 0.001$.

3.4.4 Measures

For the main experiment, after seeing the review solicitation email, the participants were asked their review intention ("Would you accept to write a review?") on a 5-point Likert scale and expected review effort (adapted from Yin et al., 2017; items in appendix). We used the arithmetic mean of the three items in the expected review effort to derive self-reported effort. Afterward, we asked participants about their review experience (Wang et al., 2012) and manipulation check questions (Table 3.2).

We derived *performance-contingent binary* as a binary variable that takes the value 1 when the incentive scheme is performance-contingent and 0 when it is completion-contingent. We also derived *first-time reviewer* as a binary variable that takes the value 0 when a participant reports that they have previously written online product reviews (i.e., experienced reviewer) and 1 (i.e., first-time reviewer) otherwise to measure reviewer experience. Finally, we derived the *performance-contingent amount* as a discrete variable that represents the amount of performance-contingent incentive offered to the participants ($0 to $10), allowing us to control for the effect of the performance-contingent incentive on review effort.

3.4.5 Results

The 80% contingent group has the highest mean for review intention and the second-highest mean for self-reported effort. In comparison, the 100% contingent group has the highest mean for self-reported effort (Table 3.3). Controlling for *performance-contingent amount*, we regress self-reported effort against *performance-contingent binary* (manipulated) and *first-time reviewer* (measured; Table 3.4, Model 1). We do not see a significant main effect of *performance-contingent binary* ($B = 0.08$, $SE = 0.55$, $t(1) = 0.15$, $p = 0.879$; Table 3.4, Model 1) on self-reported review effort. Thus, we do not find support for H1.

Table 3.3 – Sample sizes, means, standard deviations, and percentages of first-time reviewers for Review intention and Self-reported effort by Performance-contingent amount and First-time reviewer

Performance -contingent amount ($)	First-time reviewer	n	Review intention		Self-reported effort		First-time (%)[a]
			M	SD	M	SD	
0	Yes	6	3.50	1.38	4.11	1.49	26.09
	No	17	4.29	0.77	7.04	1.45	---
2	Yes	6	3.83	1.17	6.39	2.02	28.57
	No	15	3.93	1.03	6.80	1.83	---
5	Yes	6	4.00	1.10	5.33	2.25	28.57
	No	15	4.13	1.25	6.13	2.01	---
8	Yes	6	3.83	1.17	5.17	2.07	26.09
	No	17	4.65	0.49	7.29	1.17	---
10	Yes	4	3.25	0.96	6.00	2.37	19.05
	No	17	3.94	1.14	7.02	1.00	---

Note. [a] Percentage of first-time reviewers to total reviewers in the group. n, M and SD represent sample size, mean, and standard deviation, respectively.

The results do not show any significant main effect of *performance-contingent amount* (B = 0.03, SE = 0.06, t(1) = 0.46, p = 0.645; Table 3.4, Model 1) on self-reported review effort. In other words, the data observed does not allow us to state that the proportion of the performance-contingent incentive affects true reviewer effort. However, we see a significant main effect of *first-time reviewer* (B = -1.51, SE = 0.37, t(1) = -4.07, p<0.001; Table 3.4, Model 1) on self-reported effort, which shows that experienced reviewers put significantly more effort into writing reviews than first-time reviewers, supporting H2.

Table 3.4 - Multiple linear regression results using Self-reported effort as the criterion

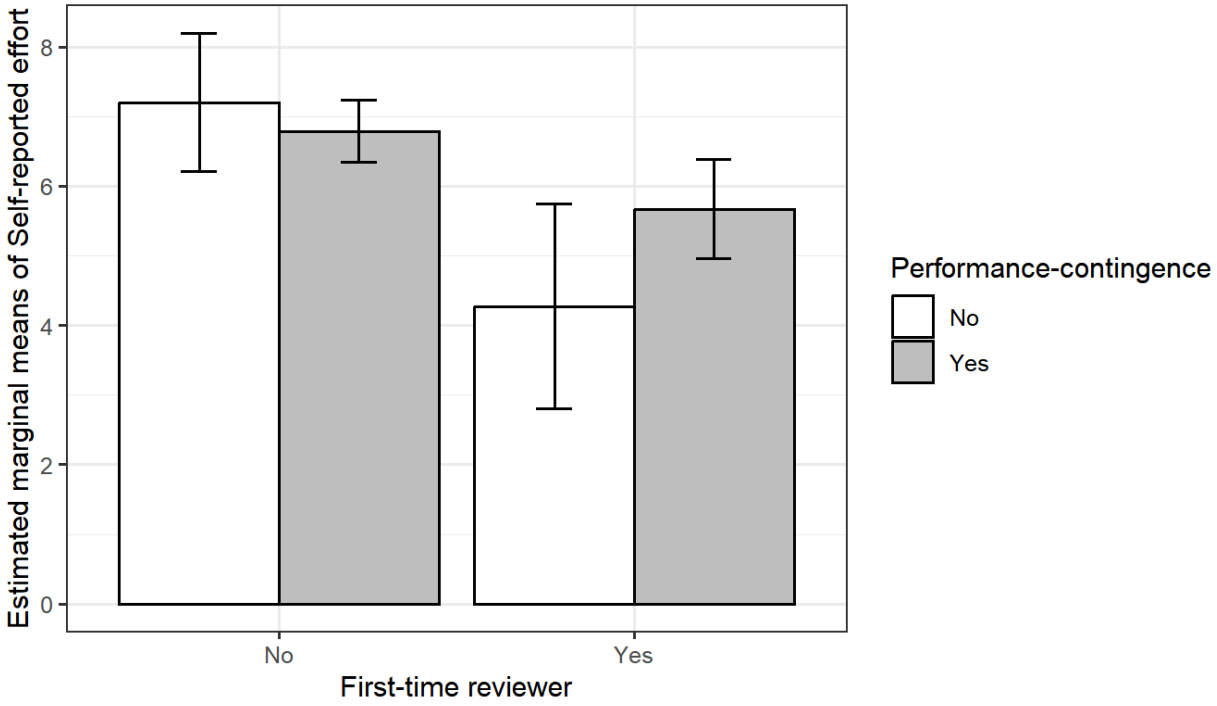
	Model 1		Model 2	
Predictors	*B*	*t*	*B*	*t*
(Intercept)	6.67***	18.30	7.04***	17.48
Performance-contingent binary	0.08	0.15	-0.41	-0.69

Performance-contingent amount	0.03	0.46	0.03	0.54
First-time reviewer[a]	-1.51***	-4.07	-2.93***	-3.71
Performance-contingent binary x First-time reviewer	—	—	1.81*	2.03
R^2 / R^2 adjusted	0.143 / 0.119		0.176 / 0.144	

Note. Observations = 109. [a] Experienced reviewer is 0, and first-time reviewer is 1.
* $p < 0.05$. *** $p < 0.001$.

We next run multiple linear regression on the effects of *performance-contingent binary, first-time reviewer,* and their interaction on self-reported effort while controlling for *performance-contingent amount* (Table 3.4, Model 2). The results show that the interaction between *performance-contingent binary* and *first-time reviewer* on self-reported effort is significant (B = 1.81, SE = 0.89, t(1) = 2.03, p = 0.045; Table 3.4, Model 2; Figure 3.3), showing that first-time (vs. experienced) reviewers have a larger increase in their review effort when performance-contingent incentives are offered (H3 supported).

Figure 3.3 - Estimated marginal means of Self-reported effort by Performance-contingent binary



Note. Error bars: 95% CI.

3.4.6 Discussion

The results of Study 1 do not show a significant effect of offering performance-contingent incentives on self-reported review effort (H1 not supported), which could be because we measured the self-reported effort of reviewers as opposed to actual effort in writing a review, and the participants did not write actual reviews in the experiment. The results show that experienced reviewers have a higher review effort (H2) than first-time reviewers, which shows the need to increase first-time reviewers' review effort. We see that first-time reviewers' review efforts can be increased by using performance-contingent incentives. The results show that first-time reviewers react more favorably to performance-contingent incentives by reporting a significantly greater increase in their reviewing effort (H3). This suggests that experienced reviewers have established review motives, which are not susceptible to reinforcement, while first-time reviewers do not. Thus, performance-contingent can be a useful scheme for increasing the effort of first-time reviewers.

Moreover, the effect of the performance-contingent amount on review effort is not significant but shows a positive pattern. As a result, to save money and pay only for helpful reviews, the retailers can set a large percentage of the total incentive budget as performance-contingent. Specifically, we see that 80% performance-contingent incentive has the highest average review intention (M =

4.43, SD = 0.79) and the second-highest self-reported effort (M = 6.74, SD = 1.70; Table 3.3). This pattern suggests that providing a small percentage (20% in this study) of the incentive budget for the completion of the task and the remaining budget (80% in this study) after the review receives a helpful vote could lead to higher review behavior while saving the retailer significant amounts of money.

Finally, there are several limitations to Study 1. It is based on a purchase scenario, which does not reflect an actual purchase experience. Also, the participants do not write an actual review but, instead, report their self-reported expected review effort, which is not the effort they put into writing an actual review. Finally, we know little about the participants' review experience except whether they have previously written reviews. Specifically, we do not know if they have received financial incentives in exchange for their reviews before, and, if so, what the financial incentive structure was.

3.5 Study 2

We performed Study 2 to address the limitations of Study 1 and test H4 in a natural setting where actual reviews are written, and the length of the reviews can measure review effort. For the performance-contingent incentive, we use the 80% performance-contingent incentive scheme because it shows the highest review intention and the second-highest review effort. We test, in a real-life consumption environment, whether performance-contingent incentives lead to higher review effort (H1), experienced reviewers show more review effort than first-time reviewers (H2), performance-contingent incentives have a larger effect on the review effort of first-time (vs. experienced) reviewers (H3), and when performance-contingent payment is offered for first-time reviewers, there is a positive impact of reinforcing reciprocal altruism (vs. other motives) on review effort that is stronger than for experienced reviewers (H4).

3.5.1 Experiment design

We study the effects of performance-contingent (vs. completion-contingent) incentives and prosocial reinforcement in a 2 (Performance-contingence: Yes vs. no) x 2 (Reciprocal altruism reinforcement: Yes vs. No) between-subjects field experiment. We collaborated with a major North American online retail store. The retailer already incentivizes its reviewers by sending them a review solicitation message after each purchase and offers them a $10 store credit after their review is published on the retailer's platform. Thus, we know that experienced reviewers have already received financial incentives in exchange for their reviews. For the "no reciprocal altruism reinforcement" groups, we used pure altruism, defined as altruistic behavior without expectations of reciprocity (Wadi et al. 2023), as the reinforced motive.

3.5.2 Sample and Procedure

We sent the review solicitation emails (Table 3.5) for each condition in different time windows. We could not manipulate the number of review solicitation emails sent for each group since the number of emails sent depends solely on the number of orders placed on each particular date. We collected the review data 91 days after the first review solicitation email was sent. Thus, each review solicitation email had between 85 and 91 days to lead to a review decision and receive helpful votes. As a result, in some cases, a review was due to a reminder email, which was sent after the treatment period and did not include the manipulated review solicitation message. Thus, we excluded those reviews from all groups to compile the set of valid emails (Table 5). Additionally, for all groups, we told the customers that the financial incentive would expire 90 days after it was granted. Thus, for the performance-contingent groups, the reviewer had 90 days to receive a helpful vote to receive and use the performance-contingent incentive. This solves the technical and legal issues of Wang et al. (2012)'s scheme.

For the performance-contingent groups, the retailer told their customers that they would receive $2 in store credit after their review was published (completion-contingent) and $8 in store credit after their review received a helpful vote (performance-contingent). For the completion-contingent groups, the retailer told their customers that they would receive $10 in store credit after their review was published (the retailer's default incentive scheme). No incentive for receiving a helpful vote was offered. For the reciprocal and the pure altruism groups, the retailer told the customers that their review would help the retailer "improve its business" and help "other customers make better purchase decisions," respectively. These phrases were shown to reinforce reciprocal and pure altruistic motives (Wadi et al. 2023).

For the performance-contingent reciprocal altruism group, out of the 1727 valid emails sent, 401 reviews were written; for the performance-contingent pure altruism group, out of the 981 valid emails sent, 306 reviews were written; for the completion-contingent reciprocal altruism group, out of the 1884 valid emails sent, 603 reviews were written; and for the completion-contingent pure altruism group, out of the 998 valid emails sent, 350 reviews were written.

Table 3.5 - Study 2 - Data collection

Performance -contingence	Reciprocal altruism reinforcement	Email Title	Email Content	Date	Emails sent	Valid emails[1]	Reviews written

Yes	Yes	Help us and receive $10 credit	Hello {customerName}, **We** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **us** improve our business. You can receive a **$2 credit** after your review of {productName} is published, and an **$8 credit** after your review receives **1 helpful vote**. Once published, you will receive an email confirming this fact, and the credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.28 2022.10.29	2923	1727	401
	No	Help other customers and receive $10 credit	Hello {customerName}, **Other customers** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **other customers**, like you, make better purchase decisions. You can receive a **$2 credit** after your review of {productName} is published, and an **$8 credit** after your review receives **1 helpful vote**. Once published, you will receive an email confirming this fact, and the credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.31	2113	981	306
No	Yes	Help us and receive $10 credit	Hello {customerName}, **We** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **us** improve our business. **You can receive a $10 credit, valid on your next purchase, by reviewing {productName}.** Once published, you will receive an email confirming this fact, and the $10 credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.25	2793	1884	603

No	Help other customers and receive $10 credit	Hello {customerName}, **Other customers** love to hear from you. Could you please take some time to write a review about {productName}? Your review helps **other customers**, like you, make better purchase decisions. **You can receive a $10 credit, valid on your next purchase, by reviewing {productName}.** Once published, you will receive an email confirming this fact, and the credit will be added directly to your account. Please note, the credit will expire in 90 days from the date of the confirmation email.	2022.10.27	1726	998	350
Total				9555	5590	1660

Note. [1] Excluding the emails that lead to reviews following future reminders

3.5.3 Measures

In this study, we measure *review length* by counting the number of characters in each review. Counting the number of characters to measure review length has been previously used in literature (Burtch et al. 2018). Review length positively affects review helpfulness (Pan & Zhang, 2011) and represents the amount of effort the reviewer has put into writing the review. Therefore, we use review length to assess the effort a reviewer has put into writing their review. Also, to measure reviewer experience, we derive *first-time reviewer* as a binary variable that takes the value 0 if the reviewer has previously written reviews on the platform, and 1 otherwise.

3.5.4 Results

Table 3.6 shows the descriptive statistics for the dependent variable, review length, by the three factors in the study, namely performance-contingence, reciprocal altruism reinforcement, and reviewer experience, and the proportion of first-time reviewers to the total number of reviewers.

Table 3.6 - Descriptive statistics for Review length by Performance contingence, Reciprocal altruism reinforcement, and First-time reviewer

Performance contingence	Reciprocal altruism reinforcement	First-time reviewer	n	M	SD	First-time (%)[a]
No	No	No	428	159.57	141.40	57.11
		Yes	570	130.88	90.81	
	Yes	No	905	161.44	143.72	51.96
		Yes	979	109.98	141.98	

Yes	No	No	378	180.94	169.38	61.47
		Yes	603	153.54	184.93	
	Yes	No	597	169.32	129.31	65.43
		Yes	1130	192.34	179.65	

Note. [a] Percentage of first-time reviewers to total reviewers in the group. n, M and SD represent sample size, mean, and standard deviation, respectively.

To model *review length* as a function of *performance-contingence*, *reciprocal altruism reinforcement*, and *first-time reviewer*, we use the Box-Cox method to find the appropriate transformation parameter, *lambda* (Box & Cox, 1964). The Box-Cox test shows square root is the optimal transformation for *review length* (lambda = 0.22).

Multiple linear regression of *sqrt(review length)* by *performance-contingence*, *reciprocal altruism reinforcement*, and *first-time reviewer* shows significant main effects of *performance-contingence* (B = 0.67, t = 2.58, p = 0.01; Table 3.7, Model 1) on the square root of review length, which shows that performance-contingent incentives increase review length (H1 supported). The results show a significant main effect of *first-time reviewer* (B = -1.04, t = -2.91, p = 0.004; Table 3.7, Model 1) on the square root of review length, showing that experienced reviewers write significantly longer reviews than first-time reviewers (H2 supported). The results show a significant two-way interaction between *performance-contingence* and *first-time reviewer* (B = 1.55, t = 2.11, p = 0.035; Table 3.7, Model 2), showing that performance-contingent incentives have a larger positive impact on first-time reviewers (H3 supported).

Table 3.7 - Multiple linear regression with sqrt(Review length) as criterion

	Model 1		***Model 2***		***Model 3***	
Predictors	*B*	*t*	*B*	*t*	*B*	*t*
(Intercept)	11.61***	49.20	11.84***	41.96	11.72***	40.81
Performance-contingence[a]	0.67*	2.58	0.23	0.55	0.52	1.18
Reciprocal altruism reinforcement[b]	-0.02	-0.09	-0.26	-0.73	-0.06	-0.16
First-time reviewer[c]	-1.04**	-2.91	-2.28**	-3.09	-0.93	-0.98
Performance contingence × First-time reviewer	—	—	1.55*	2.11	-0.52	-0.44
Performance contingence × Reciprocal altruism reinforcement	—	—	0.36	0.69	-0.12	-0.21

Reciprocal altruism reinforcement × First-time reviewer	—	—	0.59	0.80	-1.45	-1.24
Performance contingence × First-time reviewer × Reciprocal altruism reinforcement	—	—	—	—	3.38*	2.25
Observations	1660		1660		1660	
R^2 / R^2 adjusted	0.008/0.006		0.010/0.008		0.014/0.010	

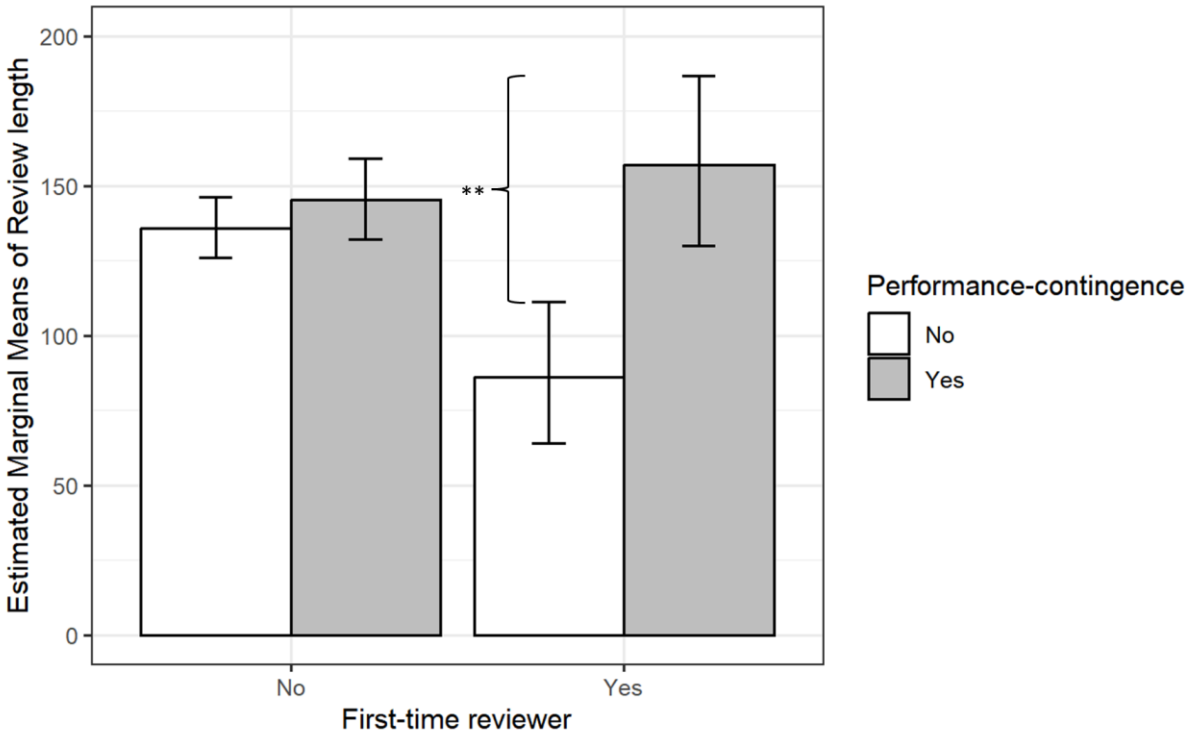
Note. [a] *No* is coded 0, and *Yes* is coded 1. [b] *Pure altruism reinforcement* is set as the reference group. [c] *Experienced reviewer* is coded 0, and *First-time reviewer* is coded 1.
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

The results show a significant three-way interaction among *performance-contingence*, *reciprocal altruism reinforcement*, and *first-time reviewer* (B = 3.38, t = 2.25, p = 0.025; Table 3.7, Model 3; Figure 3.4), which shows that when performance-contingent incentives are provided, the interaction between reciprocal altruism reinforcement and first-time reviewer increases and becomes positive. A pairwise comparison (Holm-Bonferroni adjusted) shows that when contingent incentive is provided for first-time reviewers, there is a positive impact of reinforcing reciprocal altruism (vs. other motives) on review length that is significantly stronger than for experienced reviewers (B = 1.93, SE = 0.95, t = 2.04, p = 0.042; H4 supported). Figure 3.4.a shows that when reciprocal altruism is reinforced, first-time reviewers who receive performance-contingent (Mean $length_{performance\text{-}contingent}$ = 157.05; SE = 14.44) versus completion-contingent (Mean $length_{completion\text{-}contingent}$ = 86.04; SE = 11.97) incentives put significantly more effort in writing their reviews by writing longer reviews. Figure 3.4.b shows that when pure altruism is reinforced, first-time reviewers who receive performance-contingent (Mean $length_{performance\text{-}contingent}$ = 116.34; SE = 13.11) versus completion-contingent (Mean $length_{completion\text{-}contingent}$ = 116.31; SE = 19.52) incentives do not show any significant increase in their review-writing effort through review length. Furthermore, Figures 3.4.a and 3.4.b show that experienced reviewers do not show any difference in their review length regardless of the altruism reinforcement or performance-contingent incentive.

Figure 3.4 - Estimated marginal means of sqrt(Review length) by First-time reviewer and Performance-contingent payment for Reciprocal altruism (a) and Pure altruism (b) reinforcement

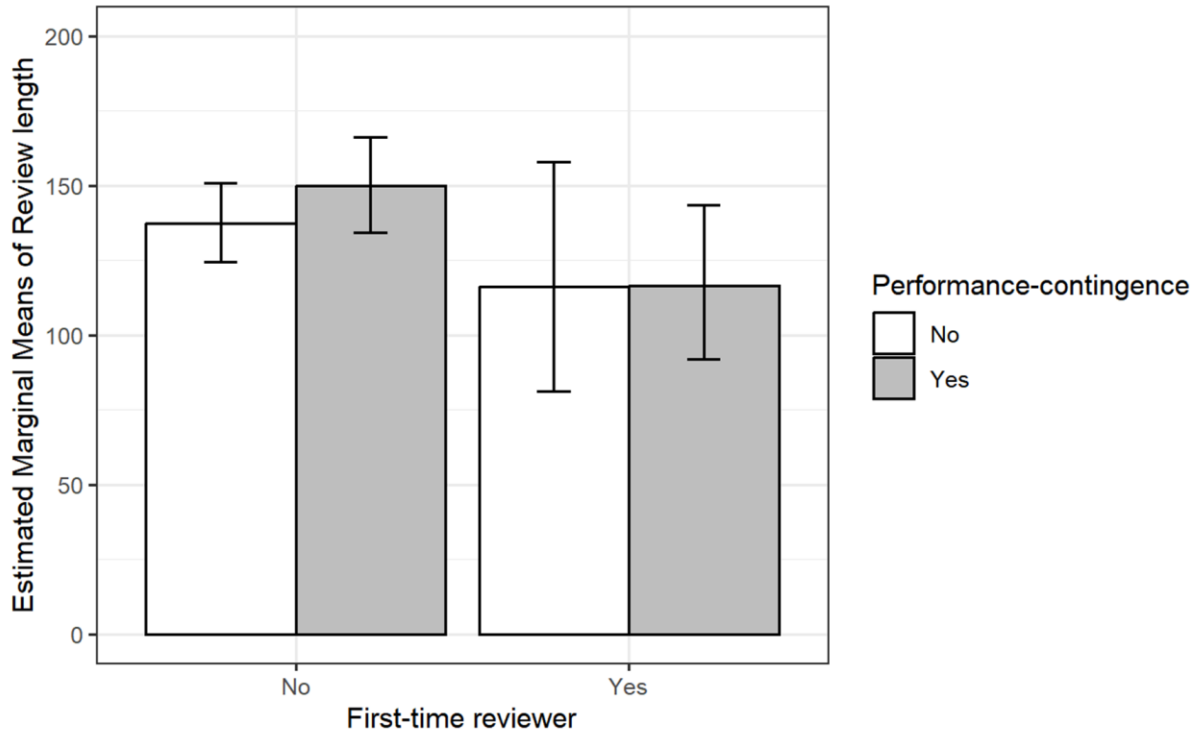
a

Reciprocal altruism



b

Pure altruism



Note. Error bars: 95% CI.
** $p < 0.01$.

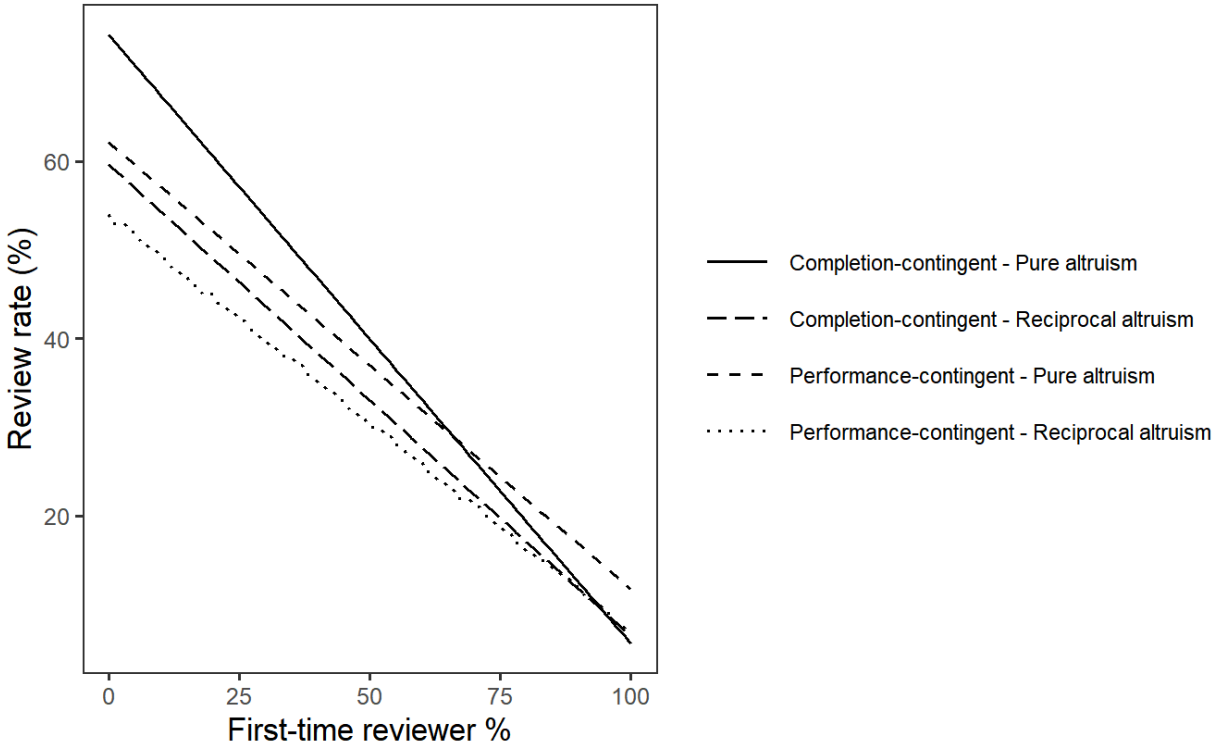
3.5.4.1 Post-hoc analysis

We performed a simulation on the data to optimize various managerial outcomes of interest. Since experienced and first-time reviewers react differently to different review incentivization schemes and altruism reinforcements, we simulated *review rate*, *helpful review rate*, and *cost per helpful review* for different percentages of first-time reviewers on a given platform. We focused on review helpfulness because research has shown that review helpfulness is an important predictor of product sales (Lee and Choeh 2020), making it important for managerial decisions. We measured *Review rate* as the percentage of the total review solicitation messages sent by the retailer that led to a review. *Helpful review rate* shows the percentage of helpful reviews to the total number of reviews written. *Cost per helpful review* measures the total incentive (performance-contingent and completion-contingent) that the retailer should pay to receive one helpful review.

Using the two factors in Study 2 (Performance-contingence: Yes vs. no x Reciprocal altruism reinforcement: Yes vs. no), we constructed four incentive schemes and altruism reinforcements groups (Completion-contingent/Pure altruism reinforcement, Performance-contingent/Pure altruism reinforcement, Completion-contingent/Reciprocal altruism reinforcement, and Performance-contingent/Reciprocal altruism reinforcement). Next, we calculated the *review rate*, *helpful review rate*, and *cost per helpful review* of first-time and experienced reviewers for each group from the data. Then we simulated for different percentages of first-time reviewers (i.e. 0% to 100%) the overall *review rate*, *helpful review rate*, and *cost per helpful review*, by taking the linear combination of the *review rate*, *helpful review rate*, and *cost per helpful review* for each group's first-time and experienced reviewers.

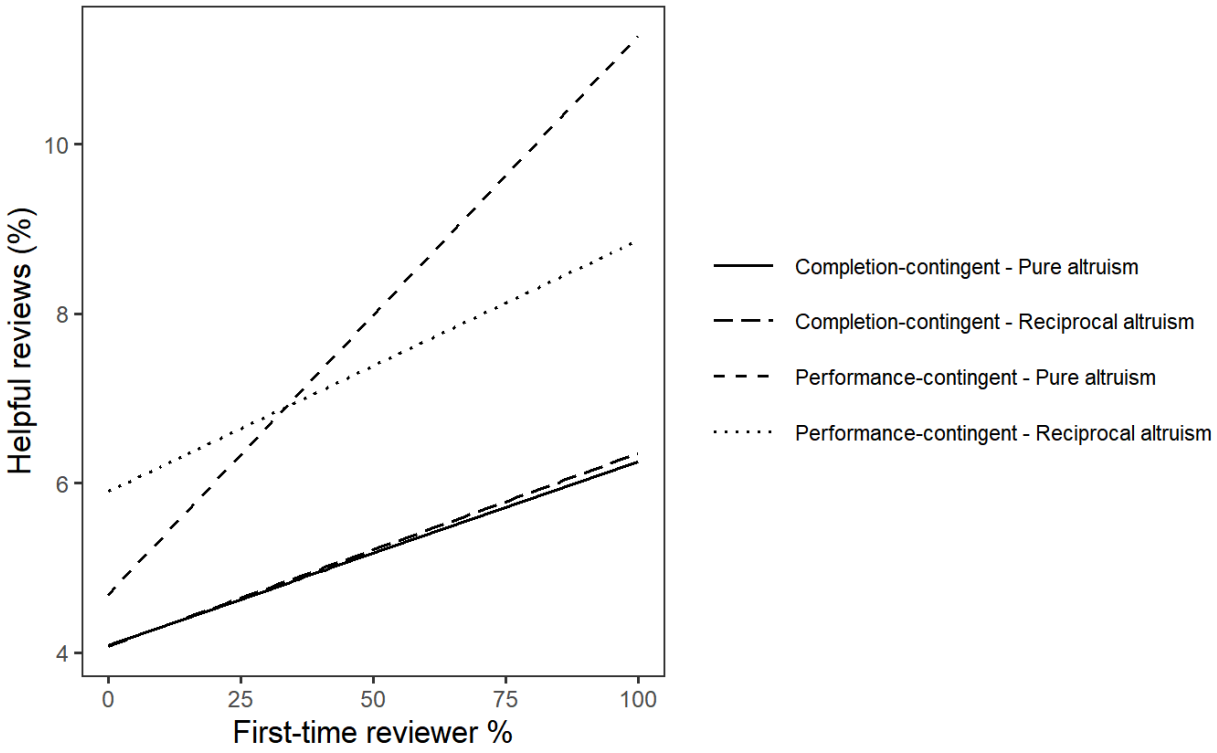
For retailers interested in maximizing their review rate, Figure 3.5 shows that reinforcing pure altruism is the optimal strategy. In terms of incentive scheme, if less than 65% of the review platform consists of first-time reviewers, a completion-contingent incentive is the optimal scheme. Still, if more than 65% of the platform consists of first-time reviewers, performance-contingent incentive leads to a higher review rate.

Figure 3.5 – Review rate against first-time reviewer percentage



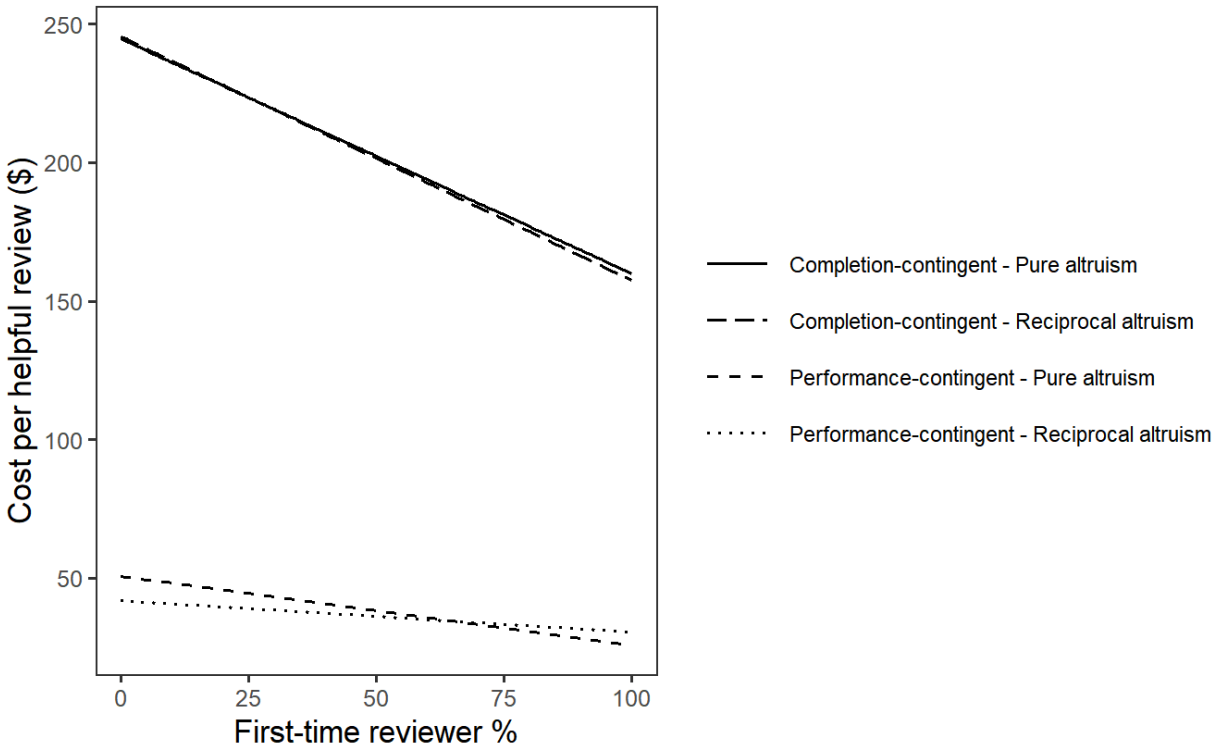
For retailers who want to maximize the percentage of helpful reviews on their platform, Figure 3.6 shows that a performance-contingent incentive is the optimal incentive scheme, regardless of the percentage of first-time reviewers. Platforms with under 34% first-time reviewers should use reciprocal altruism reinforcement in their review solicitation messages because, for these platforms, experienced reviewers are the main determinants of helpful votes, and they are driven by established reciprocal motives. Pure altruism should be reinforced for platforms with over 34% first-time reviewers. The data shows that when performance-contingent incentives are offered, even though first-time reviewers have a lower average review length when pure (vs. reciprocal) altruism is reinforced (153.54 vs. 192.32 words), reinforcing pure altruism leads to higher average percentage of helpful votes than reciprocal altruism (11.27% vs. 8.86). This pattern suggests that longer reviews are not necessarily more helpful.

Figure 3.6 – Helpful review percentage against first-time reviewer percentage



For retailers who wish to minimize the cost per helpful review, Figure 3.7 shows that completion-contingent incentive schemes ($Mean_{cost}$ = \$201.89, SD_{cost} = \$25.16) are far more expensive than performance-contingent schemes ($Mean_{cost}$ = \$37.24, SD_{cost} = \$5.76). The optimal altruistic reinforcement if the percentage of first-time reviewers is less than 64% is reciprocal altruism. In contrast, pure altruism is optimal if the percentage of first-time reviewers is greater than 64%.

Figure 3.7 – Cost per helpful review against first-time reviewer percentage



3.5.5 Discussion

In Study 2, we used a real-life field experiment to address the limitations of Study 1. We carried out the experiment with a retailer that incentivizes all of its customers in a completion-contingent fashion. Thus, for experienced reviewers, we know that they have already entered a reciprocal exchange paradigm by writing reviews in exchange for financial incentives. In Study 2, we found that offering performance-contingent (vs. completion-contingent) incentives increases the length of the reviews on the platform (H1). Experienced reviewers write longer reviews than first-time reviewers (H2). Thus, the results show a need to improve the review length for first-time reviewers, which can be achieved through performance-contingent incentives. We found that first-time (vs. experienced) reviewers are more strongly affected by performance-contingent incentives, demonstrating a larger increase in their review length when they receive performance-contingent incentives (H3). As a result, a performance-contingent incentive is an effective method to tackle the issue of low review effort and length for first-time reviews. The results showed that when performance contingent incentive is provided, reinforcing reciprocal altruism, which is aligned with the reciprocal nature of performance-contingent incentives, leads to a positive impact on review length for first-time reviewers, which is stronger than the impact of experienced reviewers (H4). As a result, we showed that reciprocal motive is the process through which performance-contingent incentive affects review effort and length.

In a post-hoc analysis, we ran a simulation to find the optimal strategies for maximizing the review rate and the percentage of helpful reviews and minimizing the cost per helpful review (Figure 8). We found that the optimal incentive scheme for maximizing helpful review percentage and minimizing cost per helpful review is performance-contingent incentives. The only scenario where the retailer should use completion-based incentives is when it is interested in maximizing its review rate and the percentage of first-time reviewers on its platform is less than 65%. We also found that to achieve the optimal review rate, helpful review percentage, and cost per helpful review, retailers should choose an appropriate type of altruism reinforcement in their review solicitation message. If the retailer is interested in maximizing its review rate, it should reinforce pure altruism, regardless of the percentage of first-time reviewers on its platform. The comparative advantage of pure altruism reinforcement over reciprocal altruism reinforcement in increasing review decisions is also shown in Wadi et al. (2023). However, suppose the retailer is interested in optimizing the percentage of helpful reviews or the cost per helpful review. In that case, it should reinforce pure or reciprocal altruism based on the percentage of first-time reviewers. We found that when the percentage of first-time reviewers is higher than 34% and 64% (experienced reviewers are lower than 34% and 64%), the retailer should reinforce pure altruism to maximize helpful review percentage and minimize cost per helpful review. Otherwise, the retailer should reinforce reciprocal altruism because the effect is primarily driven by experienced reviewers driven by established reciprocal motives.

3.6 General Discussion

In this research, we explored an actionable and realistic performance-contingent incentive scheme that retailers can implement to improve the quality of their reviews. We used a fixed budget for total review incentives and varied the proportion of performance-contingent incentives over the total amount of the incentive budget. We found that the proportion of performance-contingent incentive does not affect reviewer effort, indicating that performance-contingent incentive is a step function (Study 1). We found that performance-contingent incentives significantly improve review length (Study 2), which leads to higher review effort.

Furthermore, we segmented the reviewers on review platforms into first-time and experienced reviewers and showed that review experience plays an important role in the review effort (Study 1). We found that reciprocal exchange motives drive experienced reviewers, put more effort into writing reviews, and write longer reviews (Studies 1 and 2). In contrast, we found that first-time reviewers put relatively low effort into writing reviews, and performance-contingent incentive is an effective way to encourage first-time reviewers to exert more effort into writing reviews and write longer reviews. Our findings show that performance-contingent incentives have a stronger positive effect on review effort and length for first-time reviewers than for experienced reviewers (Studies 1 and 2). In other words, experienced reviewers show no significant change in their review effort and length in response to performance-contingent incentives. As a result, the common

practice of using performance-contingent incentives only for experienced reviewers, such as the Amazon Vine program, is suboptimal and a misallocation of resources. Instead, retailers should use performance-contingent incentives for first-time reviewers, as they show the strongest positive reaction to performance-contingent incentives.

Moreover, we showed that the process that underlies the effect of performance-contingent incentives on review effort and length is reciprocal exchange motives. When reciprocal altruism is reinforced, the effect of performance-contingent incentives is augmented for first-time reviewers (Study 2). These findings show that performance-contingent incentives reinforce the reciprocal motives of reviewers, and the reinforcement is stronger for first-time reviewers because they lack established review motives.

Finally, we devised an actionable decision tree for managers to optimize several outcomes of interest (i.e., the review rate, percentage of helpful reviews, cost per helpful review) that helps them choose the optimal incentive scheme (performance-contingent vs. completion-contingent) and altruism reinforcement (pure vs. reciprocal) based on the percentage of first-time reviewers on their platform.

3.6.1 Theoretical Contributions

Our work makes three contributions to performance-contingent incentive schemes (Dorner et al., 2020; Wang et al., 2012; Yu et al., 2022), the Agency Theory of performance evaluation and monitoring (Fong & Tosi, 2007; Tosi et al., 2000), and altruism in eWOM creation (Babić Rosario et al., 2020; Hennig-Thurau et al., 2004; Wadi et al., 2023).

First, prior research has not empirically investigated the underlying psychological mechanism that drives performance-contingent incentives and focused primarily on the managerial aspects (Dorner et al., 2020; J. Wang et al., 2012; Yu et al., 2022). We contribute to the theory of performance-contingent incentives for online product reviews by showing that the mechanism through which performance-contingent incentives affect review effort and quality is reciprocal motives (Homans, 1958; Heyman & Ariely, 2004).

Second, we contribute to Agency Theory (Ross, 1973) applied to performance evaluation and monitoring (Fong & Tosi, 2007; Tosi et al., 2000) by posing the review incentivization process as an agency problem. We identified the incentivizing retailers as principals whose interest is high quantity and quality reviews, and the reviewers as agents whose interests are review writing motives, such as financial incentives and altruism (Hennig-Thurau et al., 2004). Prior research has shown that in performance-contingent incentive settings, agents' experience plays a key role in task performance by affecting their feeling of control over whether they can meet task requirements and obtain performance-contingent rewards (Tosi et al., 2000). Tosi et al. (2000) proposed that

experienced reviewers perceive higher control and, thus, would exert more effort in completing the task. We find that the opposite is true. Experienced reviewers show no significant improvement when faced with performance-contingent (vs. completion-contingent) incentives because their review motives (i.e., interests) are already aligned with the retailer's (principal's) interests. In contrast, we find that performance-contingent incentives are particularly effective in enhancing the performance of first-time reviewers (i.e., those who lack experience) because their interests are not established and are more susceptible to the influence of performance-contingent incentives.

Third, we contribute to the theory of altruism in creating online product reviews by showing that altruistic motive alignment is important. Wadi et al. (2023) find that reinforcing pure altruism is more effective than reinforcing reciprocal altruism in increasing review decisions but do not explore the effect of reinforcing both pure and reciprocal altruism and mention that as a limitation of their research and an avenue for future research. We investigate the simultaneous reinforcement of both pure altruism and reciprocal motives and find that when reciprocal motives are reinforced through performance-contingent incentives, reinforcement of pure altruism backfires. This shows that reinforcing both pure and reciprocal motives negatively interacts.

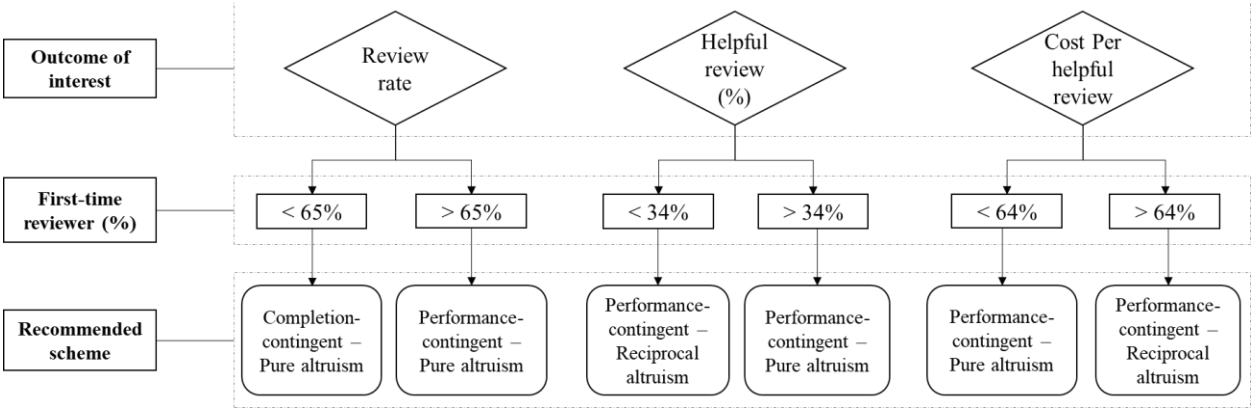
3.6.2 Managerial Implications

Many retailers have allocated a substantial budget to incentivizing reviewers. Our research provides insights on how to utilize this budget better. We find that retailers can increase the length of the reviews on their platform by providing only 20% of the incentive budget for the completion of the review and the remaining 80% only after the review receives a helpful vote. Our results show that this performance-contingent incentive scheme reduces the cost paid for each review by 80.19%. Furthermore, each of these reviews will be 16.81% more helpful.

For managers who are interested in targeted incentivization, we find that performance-contingent incentives show a significant increase in review length for first-time reviewers but show no significant improvement for experienced reviewers. Therefore, managers could offer performance-contingent incentives only to first-time reviewers to increase the amount of effort and review quality for first-time reviewers who generally write shorter reviews and react more favorably to performance-contingent incentives.

Finally, we provide a decision tree (Figure 3.8) for retailers to optimize their review rate, the percentage of helpful reviews on their platform, and the cost of a helpful review. The decision tree recommends concrete incentivization schemes (performance-contingent vs. completion-contingent) and altruism reinforcement (pure vs. reciprocal) through the review solicitation message based on the percentage of first-time reviewers on a given review platform.

Figure 3.8 - Decision tree for selecting the optimal incentive scheme and altruism reinforcement based on the outcome of interest



3.6.3 Limitations and Future Research

In this research, we investigated the effect of performance-contingent incentives on reviewer effort for one product (a pair of gloves) in Study 1 and 3291 unique products across 269 different brands in Study 2. In Study 2, the demography was limited to the customers of one retailer. Future research should study the effectiveness of performance-contingent incentives across a wider range of products, brands, and services and on multiple retailers to ensure the external validity of our findings.

Moreover, we varied the amount of performance-contingent incentives as a proportion of a fixed total incentive of $10 and found no effect of the proportion of performance-contingent incentives on reviewer effort. However, the amount of an incentive can have an effect on reviewer effort (Falk 2007, Gneezy and Rustichini 2000). Thus, future research should investigate the effect of varying the total incentive amount on the efficacy of performance-contingent incentives.

Finally, in our analysis, we did not account for various customer profiles and product types. Research has shown that online product reviews interact with different product types (Hong, Chen, and Hitt 2014). Future research should study the effect of the customer profile (e.g., impulsive buyers; Sojka and Giese 2003), product type (e.g., search vs. experience), and their interaction with performance-contingent incentives to see whether different customer profiles respond differently to performance-contingent incentives and if the effect is moderated by product type.

References

Askalidis, Georgios, Su Jung Kim, and Edward C. Malthouse (2017), “Understanding and Overcoming Biases in Online Review Systems,” *Decision Support Systems*, 97, Elsevier, 23–30.

Babić Rosario, Ana, Kristine De Valck, and Francesca Sotgiu (2020), "Conceptualizing the Electronic Word-of-Mouth Process: What We Know and Need to Know about EWOM Creation, Exposure, and Evaluation," *Journal of the Academy of Marketing Science*, 48 (3), Springer, 422–48.

Baiman, Stanley (1990), "AGENCY RESEARCH IN MANAGERIAL ACCOUNTING: A SECOND LOOK.," *Accounting Organizations and Society*, 15, 341–71.

Box, G. E. P. and D. R. Cox (1964), "An Analysis of Transformations," *Journal of the Royal Statistical Society: Series B (Methodological)*, 26 (2), 211–43, doi:10.1111/j.2517-6161.1964.tb00553.x.

Burtch, Gordon, Yili Hong, Ravi Bapna, and Vladas Griskevicius (2018), "Stimulating Online Reviews by Combining Financial Incentives and Social Norms," *Management Science*, 64 (5), INFORMS, 2065–82.

Cabral, Luis and Lingfang Li (2015), "A Dollar for Your Thoughts: Feedback-Conditional Rebates on EBay," *Management Science*, 61 (9), INFORMS, 2052–63.

Chevalier, Stephanie (2022), "U.S. Digital Shoppers Product Review Expectation by Age 2019," *Statista*, https://www.statista.com/statistics/1019495/online-shoppers-expectations-product-reviews-in-the-us/.

Dorner, Verena, Marcus Giamattei, and Matthias Greiff (2020), "The Market for Reviews: Strategic Behavior of Online Product Reviewers with Monetary Incentives," *Schmalenbach Business Review*, 72 (3), 397–435, doi:10.1007/s41464-020-00094-y.

Duan, Wenjing, Bin Gu, and Andrew B. Whinston (2008), "Do Online Reviews Matter?—An Empirical Investigation of Panel Data," *Decision Support Systems*, 45 (4), Elsevier, 1007–16.

Falk, Armin (2007), "Gift Exchange in the Field," *Econometrica*, 75 (5), 1501–11, doi:10.1111/j.1468-0262.2007.00800.x.

Fama, Eugene F. and Michael C. Jensen (1983), "Separation of Ownership and Control," *The Journal of Law and Economics*, 26 (2), The University of Chicago Press, 301–25.

Fong, Eric A. and Henry L. Tosi (2007), "Effort, Performance, and Conscientiousness: An Agency Theory Perspective," *Journal of Management*, 33 (2), SAGE Publications Inc, 161–79, doi:10.1177/0149206306298658.

Gagné, Marylène and Edward L. Deci (2005), "Self-Determination Theory and Work Motivation," *Journal of Organizational Behavior*, 26 (4), Wiley Online Library, 331–62.

Ghose, Anindya and Panagiotis G. Ipeirotis (2010), "Estimating the Helpfulness and Economic Impact of Product Reviews: Mining Text and Reviewer Characteristics," *IEEE Transactions on Knowledge and Data Engineering*, 23 (10), IEEE, 1498–1512.

Gneezy, Uri, Stephan Meier, and Pedro Rey-Biel (2011), "When and Why Incentives (Don't) Work to Modify Behavior," *Journal of Economic Perspectives*, 25 (4), 191–210.

Gneezy, Uri and Aldo Rustichini (2000), "Pay Enough or Don't Pay at All," *The Quarterly Journal of Economics*, 115 (3), MIT Press, 791–810.

Greene, Jessica (2021), "14 Proven Ways to Encourage Customers to Write Reviews," *Databox*, https://databox.com/how-to-encourage-customers-to-write-reviews.

Groff, James E and Charlotte J Wright (1989), "The Market for Corporate Control and Its Implications for Accounting Policy Choice," *Advances in Accounting*, 7, 3–21.

Hennig-Thurau, Thorsten, Kevin P. Gwinner, Gianfranco Walsh, and Dwayne D. Gremler (2004), "Electronic Word-of-Mouth via Consumer-Opinion Platforms: What Motivates Consumers to Articulate Themselves on the Internet?," *Journal of Interactive Marketing*, 18 (1), Elsevier, 38–52.

Heyman, James and Dan Ariely (2004), "Effort for Payment: A Tale of Two Markets," *Psychological Science*, 15 (11), SAGE Publications Sage CA: Los Angeles, CA, 787–93.

Homans, George C. (1958), "Social Behavior as Exchange," *American Journal of Sociology*, 63 (6), The University of Chicago Press, 597–606, doi:10.1086/222355.

Hong, Yili, Pei-Yu Chen, and Lorin M. Hitt (2014), "Measuring Product Type with Dynamics of Online Product Review Variances: A Theoretical Model and the Empirical Applications," SSRN Scholarly Paper, Rochester, NY, doi:10.2139/ssrn.2506328.

Jensen, Michael C. and William H. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," SSRN Scholarly Paper, Rochester, NY, doi:10.2139/ssrn.94043.

Jurca, Radu and Boi Faltings (2007), "Collusion-Resistant, Incentive-Compatible Feedback Payments," in *Proceedings of the 8th ACM Conference on Electronic Commerce*, 200–209.

Khern-am-nuai, Warut, Karthik Kannan, and Hossein Ghasemkhani (2018), "Extrinsic versus Intrinsic Rewards for Contributing Reviews in an Online Platform," *Information Systems Research*, 29 (4), INFORMS, 871–92.

Klein, Nadav, Ioana Marinescu, Andrew Chamberlain, and Morgan Smart (2018), "Online Reviews Are Biased. Here's How to Fix Them," *Harvard Business Review*, , March 6, https://hbr.org/2018/03/online-reviews-are-biased-heres-how-to-fix-them.

Lee, Sangjae and Joon Yeon Choeh (2020), "Using the Social Influence of Electronic Word-of-Mouth for Predicting Product Sales: The Moderating Effect of Review or Reviewer Helpfulness and Product Type," *Sustainability*, 12 (19), Multidisciplinary Digital Publishing Institute, 7952, doi:10.3390/su12197952.

Li, Xiaolin, Chaojiang Wu, and Feng Mai (2019), "The Effect of Online Reviews on Product Sales: A Joint Sentiment-Topic Analysis," *Information & Management*, Social Commerce and Social Media: Behaviors in the New Service Economy, 56 (2), 172–84, doi:10.1016/j.im.2018.04.007.

Meier, Stephan (2007), *A Survey of Economic Theories and Field Evidence on Pro-Social Behavior.*, Mit Press.

Miller, Nolan, Paul Resnick, and Richard Zeckhauser (2005), "Eliciting Informative Feedback: The Peer-Prediction Method," *Management Science*, 51 (9), INFORMS, 1359–73.

Mudambi, Susan M. and David Schuff (2010), "What Makes a Helpful Online Review? A Study of Customer Reviews on Amazon. Com," *MIS Quarterly*, JSTOR, , 185–200.

Pan, Yue and Jason Q. Zhang (2011), "Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews," *Journal of Retailing*, 87 (4), 598–612, doi:10.1016/j.jretai.2011.05.002.

Payne, G. Tyge and Oleg V. Petrenko (2019), "Agency Theory in Business and Management Research," in *Oxford Research Encyclopedia of Business and Management*, doi:10.1093/acrefore/9780190224851.013.5.

Pitman, Jamie (2022), "Local Consumer Review Survey 2022: Customer Reviews and Behavior," *BrightLocal*, https://www.brightlocal.com/research/local-consumer-review-survey/.

Qiao, Dandan, Shun-Yang Lee, Andrew B. Whinston, and Qiang Wei (2020), "Financial Incentives Dampen Altruism in Online Prosocial Contributions: A Study of Online Reviews," *Information Systems Research*, 31 (4), INFORMS, 1361–75.

Riordan, Michael H. and David E. M. Sappington (1987), "Awarding Monopoly Franchises," *The American Economic Review*, 77, 375–87.

Ross, Stephen A. (1973), "The Economic Theory of Agency: The Principal's Problem," *The American Economic Review*, 63 (2), American Economic Association, 134–39.

Smith, Andy (2021), "How the Right Incentive Can Help You Generate More Reviews," *PowerReviews*, https://www.powerreviews.com/blog/what-incentives-generate-reviews/.

Sojka, Jane Z. and Joan L. Giese (2003), "Using Individual Differences to Detect Customer Shopping Behaviour," *The International Review of Retail, Distribution and Consumer Research*, 13 (4), Routledge, 337–53, doi:10.1080/0959396032000129462.

Stroh, Linda K., Jeanne M. Brett, Joseph P. Baumann, and Anne H. Reilly (1996), "Agency Theory and Variable Pay Compensation Strategies," *Academy of Management Journal*, 39, 751–67.

Tosi, Henry L., Steve Werner, Jeffrey P. Katz, and Luis Gomez-Mejia (2000), "How Much Does Performance Matter? A Meta-Analysis of CEO Pay Studies," *Journal of Management*, 26 (2), 301–39, doi:10.1177/014920630002600207.

Trustpilot (2020), "The Critical Role of Reviews in Internet Trust - Trustpilot Business Blog," *Trustpilot*, https://business.trustpilot.com/guides-reports/build-trusted-brand/the-critical-role-of-reviews-in-internet-trust.

Wadi, Davood, Renaud Legoux, Marc Fredette, and Sylvain Sénécal (2023), "The Interplay of Altruism and Financial Incentives: Maximizing Online Reviews through Effective Messaging," *working paper*.

Wang, Jing, Anindya Ghose, and Panos Ipeirotis (2012), "Bonus, Disclosure, and Choice: What Motivates the Creation of High-Quality Paid Reviews?," *ICIS*, Citeseer.

Woolley, Kaitlin and Marissa A. Sharif (2021), "What Happens When Companies Pay Customers to Write Reviews?," *Harvard Business Review*, , June 25, https://hbr.org/2021/06/what-happens-when-companies-pay-customers-to-write-reviews.

Yin, Dezhi, Samuel D. Bond, and Han Zhang (2017), "Keep Your Cool or Let It Out: Nonlinear Effects of Expressed Arousal on Perceptions of Consumer Reviews," *Journal of Marketing Research*, 54 (3), SAGE Publications Inc, 447–63, doi:10.1509/jmr.13.0379.

Yu, Yinan, Warut Khern-am-nuai, and Alain Pinsonneault (2022), "When Paying for Reviews Pays Off: The Case of Performance-Contingent Monetary Rewards," doi:10.25300/MISQ/2022/15488.

4. Conclusion

In these two essays, we investigated how firms can optimize review solicitation messages and performance-contingent incentives to improve review outcomes. We showed that reinforcing pure altruism is a more optimal means than reciprocal altruism for increasing review decisions. We also showed that performance-contingent incentives need to be properly allocated to maximize reviewer effort and review length. We found that first-time reviewers respond more favorably to performance-contingent incentives and should be targeted by the firms that deploy performance-contingent incentive schemes.

The findings from our research opens up numerous new avenues for future research. In Essay 1, we investigated pure and reciprocal altruism as two types of review writing motives that can be reinforced to increase review decisions. Altruistic motives are a subset of other-oriented electronic word-of-mouth (eWOM) motives, meaning that the reviewer is motivated to benefit others (Hennig-Thurau et al. 2004). In contrast, literature has identified self-oriented eWOM motives, such as product involvement (Dichter 1966), self enhancement (Engel et al. 1993; Sundaram et al. 1998), message involvement (Dichter 1966; Engel et al. 1993), and social benefits (Hennig-Thurau et al. 2004), whereby the reviewer acts for personal gains (Hennig-Thurau et al. 2004). It would be fruitful to investigate the effect of reinforcing self-oriented motives on reviewing behavior.

Product involvement motive drives reviews when the consumer feels strongly about the product, and writing a review to recommend the product to others satisfies this strong feeling (Dichter 1966). Future research should study how reinforcing the product involvement motive, by reminding the consumers that their review can help express their joy about the product, affects consumers' reviewing behavior. Future research should explore the interaction between the consumers' involvement with the product and the reinforcement of the product involvement motive to the see how this form of reinforcement affects reviewing behavior of consumers with high versus low product involvement.

The self-enhancement motive concerns with garnering attention and showing expertise about a product (Dellarocas et al. 2006). This motive can be reinforced through the review solicitation message in two ways. The message can remind the consumers that their review would show their expertise about the product. Alternatively, the retailers can implement status signals on their platform (e.g. top reviewer badge; Babić Rosario et al. 2020) and remind the reviewers that they can obtain the status signals by writing a review. Future research that studies the effect of reinforcing the self-enhancement motive can provide insights for managers and companies that use status signals on their platforms (e.g. Amazon's Top Reviewer) and how they can improve the efficacy of these status signals.

The message involvement motive is driven by the discussion of advertisements and marketing messages (Dellarocas et al. 2006). Reinforcing the message involvement motive can be done simultaneously with the advertisement, that is, the company asks for feedback in the same email as the advertisement (simultaneous reinforcement). Alternatively, the company can reinforce the message involvement motive in a follow up email to ask for feedback (separate reinforcement). Future research should study the effects of simultaneous and separate reinforcement of the message involvement motive on reviewing behavior and the effectiveness of the advertisement. The findings can provide insights on optimal advertising strategies.

Moreover, the social benefits motive can be reinforced by reminding the consumers that they can enjoy the benefits of engaging in the online review community. This particular motive would depend on the size and engagement level of the reviewer community of the platform. As a result, future research should investigate the social benefits reinforcement and the moderating role of the online reviewer community on reviewing behavior.

In Essay 2, we studied the effect of performance-contingent financial incentives and the moderating role of reviewer experience and reciprocal altruism reinforcement on reviewing behavior. Nonetheless, financial incentives are not the only instrument for performance-contingent incentives. An area that future research should investigate is performance-contingent gamified incentives for writing helpful reviews. Gamification is the use of game elements in non-game contexts (Aparicio et al. 2021). When applied to e-commerce, gamification has shown positive effects on desirable outcomes, such as engagement, profitability, and purchase intention (Aparicio et al. 2021; Azmi et al. 2021). The literature suggests that badges and leaderboards are the most commonly used gamification elements in e-commerce (Azmi et al. 2021). Thus, future research should study performance-contingent gamified incentives, whereby the retailer rewards the consumers for writing helpful reviews by offering them badges. This performance-contingent incentive scheme is compatible with the self-enhancement review motive (Engel et al. 1993; Sundaram et al. 1998) and can be studied in conjunction with the reinforcement of self-enhancement motive through review solicitation messages. Furthermore, a gamified performance-contingent incentive scheme can be devised in a way that the performance evaluation and incentive components are integrated into a unified system. For instance, in a leaderboard incentive scheme, where reviewers improve their rankings based on the number of helpful reviews they receive, performance evaluation (i.e., the number of helpful votes) and the reward (i.e., leaderboard ranking) are integrated into the leaderboard system. Such gamification incentives that reward reviewers based on their performance could have significantly lower operation costs because no financial incentive needs to be paid. Moreover, the increase in engagement due to gamification can have a synergic effect with the performance-contingent nature of the incentive system.

References

Aparicio, Manuela, Carlos J. Costa, and Rafael Moises (2021), "Gamification and Reputation: Key Determinants of e-Commerce Usage and Repurchase Intention," *Heliyon*, 7 (3), e06383, doi:10.1016/j.heliyon.2021.e06383.

Azmi, Lina Fatini, Norasnita Ahmad, and Noorminshah A. Iahad (2021), "Gamification Elements in E-Commerce – A Review," in *2021 International Congress of Advanced Technology and Engineering (ICOTEN)*, 1–5, doi:10.1109/ICOTEN52080.2021.9493475.

Babić Rosario, Ana, Kristine De Valck, and Francesca Sotgiu (2020), "Conceptualizing the Electronic Word-of-Mouth Process: What We Know and Need to Know about EWOM Creation, Exposure, and Evaluation," *Journal of the Academy of Marketing Science*, 48 (3), Springer, 422–48.

Dellarocas, Chrysanthos and Ritu Narayan (2006), "What Motivates Consumers to Review a Product Online? A Study of the Product-Specific Antecedents of Online Movie Reviews," *Statistical Science, C*, 21, Citeseer, 277–85.

Dichter, Ernest (1966), "How Word-of-Mouth Advertising Works," *Harvard Business Review*, 44, 147–66.

Engel, James F., Roger D. Blackwell, and Paul W. Miniard (1993), *Consumer Behavior*, . 6th ed, Chicago: Dryden Press, http://www.gbv.de/dms/bowker/toc/9780030767517.pdf.

Hennig-Thurau, Thorsten, Kevin P. Gwinner, Gianfranco Walsh, and Dwayne D. Gremler (2004), "Electronic Word-of-Mouth via Consumer-Opinion Platforms: What Motivates Consumers to Articulate Themselves on the Internet?," *Journal of Interactive Marketing*, 18 (1), Elsevier, 38–52.

Sundaram, D. S., Kaushik Mitra, and Cynthia Webster (1998), "Word-Of-Mouth Communications: A Motivational Analysis," *ACR North American Advances*, NA-25, https://www.acrwebsite.org/volumes/8208/volumes/v25/NA-25/full.

Appendix

A1. Scales

Altruistic reviewing motive (Packard & Berger, 2017)
If I write a review,

1. I am motivated by a desire to help people.
2. I want to assist others who may be choosing a pair of gloves.
3. I am concerned about being useful to other people.

Expected review effort (Adapted from Yin et al., 2017)
If you write a review,

- How much effort would you put into writing this review?
- How much thought would you give to this review?
- How much time would you spend writing this review?

Unpaid and paid review experience (Wang et al., 2012),

- Have you written a review online before? (Yes/No)
- Have you been paid to write a review on any website before? (Yes/No)

Experience with the product
I have bought gloves online before (Yes/No)

Experience with the brand
I have bought the North Face products before (Yes/No)

Involvement (Mittal, 1989); 7 point Likert scale

- In selecting from the many types and brands of gloves available in the market, I would care a great deal as to which one I would buy. (Strongly disagree/Strongly agree)
- How important would it be to you to make a right choice of gloves? (Not at all important/Extremely important)
- In making your selection of gloves, how concerned would you be about the outcome of your choice? (Not at all concerned/Very much concerned)

Manipulation check questions (Hennig-Thurau et al., 2004); 5-point Likert scale (Strongly disagree/Strongly agree)
In the email, the retailer mentions that if I write a review…

- I can help others buy the right product
- I am so satisfied with the company and its product that I want to help the company be successful.

- I can receive a reward for writing the review.

Demographics

What is your age?

What is your annual household income?

- Under $50,000
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 and above

What is your gender?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

What is your highest level of education?

- High school or less
- Undergraduate or technical degree
- Graduate degree
- Prefer not to say