

# Measuring Consumers' Willingness-to-Pay for Socially Responsible Products: The Roles of Information Uncertainty and Reciprocity

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Consumer demand for socially responsible products has increased significantly in the past decade. To meet these demands, many firms have invested to improve the Social Responsibility practices within their supply chains. At the same time, firms have also attempted to improve their communication to consumers regarding such activities. Yet, the success of these communication strategies is questionable. According to a 2013 survey, 91% of consumers would like to know more about firms' Social Responsibility efforts, but 70% are confused by the messages employed by companies (Cone Communications, Echo Global 2013). Contributing to this confusion, the precision of the information about Social Responsibility that can be found in products packages varies widely. For example, "ethically sourced" and "sweatshop free" are claims that are commonly presented to consumers without any further information about their meaning or associated impact. On the other end of the spectrum, Nestlé recently introduced QR codes on their *Kit Kat* multi-packs, containing detailed information about its environmental and social impacts.<sup>1</sup>

The purpose of our study is to measure consumers' Willingness-to-Pay (WTP) for socially responsible products and how it is impacted by: (1) the effort a company exerts toward ensuring socially responsible practices within their supply chains; and (2) the uncertainty of

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<sup>1</sup>[www.nestle.com/Media/NewsAndFeatures/global-qr-codes](http://www.nestle.com/Media/NewsAndFeatures/global-qr-codes)

the information the company presents regarding its associated benefits for workers and/or suppliers. In addition, we also examine the role indirect reciprocity (e.g., Engelmann and Fischbacher 2009) plays in determining consumers' WTP, as well as how this role is affected by information uncertainty. We define indirect reciprocity as a consumer's willingness to reward (or punish) a firm for the effort exerted. Hereafter, we will refer to it simply as reciprocity. Our research adds to the literature on reciprocity in Experimental Economics, as well as to the growing stream of work on Behavioral Operations Management (e.g., Bolton and Katok 2008, Cui et al. 2007). We contribute to this literature by studying the effect of information uncertainty and reciprocity on consumers' WTP, via an incentivized three-person human-subject experiment. Similarly, we also study the effect of information uncertainty on indirect reciprocity; to the best of our knowledge, this has not been studied in the existing literature.

We design our experiment as a sequential 3-player game with the following roles: Firm, Consumer, and Worker. At the beginning of the game, players are presented with the following hypothetical scenario: the Worker helped the Firm create a product, which the Firm wants to sell to the Consumer. The Firm (she) is initially endowed with 160 tokens, the Consumer (he) is endowed with 120 tokens, and the Worker is endowed with only 20 tokens. The Firm receives an additional *provisional* payment of 120 tokens, which will materialize *only if* she manages to sell the hypothetical product to the Consumer. The Firm begins by selecting the amount from the provisional payment of 120 tokens that she is willing to use to generate a payment to the Worker. We refer to the Firm's selected amount as her *effort*  $e$ , with the potential values of  $e$  ranging from 0 to 120 in increments of 20. Then, the Consumer is asked to state the maximum price he is willing to pay the Firm for the product, given the Firm's effort  $e$ . We denote the Consumer's decision as his *willingness-to-pay* (WTP). The Worker does not make any decisions; if the product is sold, then the Worker receives a payment  $w$  that is a function of  $e$ . After the Firm and the Consumer make their decisions, the price of the product  $P$  is randomly generated according to a Uniform distribution between 1 and 120 tokens. If the price  $P$  is lower than or equal to the Consumer's WTP, then the product is sold. In this case, the final payoffs to all players (including initial endowments) are as follows: (i) the Worker receives the payment from the Firm and earns a payoff of  $\pi_W = 20 + w$ ; (ii) the Consumer pays the price of the product to the Firm and earns a payoff of  $\pi_C = 120 - P$ ; and (iii) the Firm receives the additional payment of 120 tokens plus the price of the product minus her effort, earning a total payoff of  $\pi_F = 160 + 120 + P - e$ . Otherwise, if the price of the product is strictly greater than the Consumer's WTP, then the product is not sold and

all players receive only their initial endowments. We apply the strategy method to measure willingness-to-pay: Consumers are asked to state their WTP for each of the seven values of  $e$  that the Firm may choose, *before* knowing the actual effort  $e$  chosen by the Firm.

We manipulate the above game in two dimensions. First, to study the effect of information uncertainty on Consumers' WTP, we modify the relationship between the Firm's effort  $e$  and the payment to the Worker  $w$  as follows. For any strictly positive value of  $e$ , we define  $w$  to be uniformly distributed,  $w \sim U(e - i, e + i)$ , with  $i$  representing the level of information uncertainty. We examine three values for  $i$ , leading to three Information Uncertainty conditions:  $i = 0$  (*No Uncertainty*),  $i = 10$  (*Low Uncertainty*), and  $i = 20$  (*High Uncertainty*). Note that regardless of the values of  $i$  and  $w$ , if the product is sold, then  $e$  tokens are subtracted from the Firm's payoff. Also, if  $e = 0$ , then  $w = 0$  and the Worker receives only his initial endowment.

Second, to test for the existence of reciprocity we compare two Reciprocity conditions by manipulating the process by which the effort  $e$  is determined. In the *Decision condition*, the Firm chooses the value of the effort  $e$  as previously explained. In the *Random condition*, the Firm's decision is replaced by a random device that selects a value of  $e$  uniformly from the set of possible Firm effort,  $e \in \{0, 20, 40, 60, 80, 100, 120\}$  tokens. Since the Firm is not responsible for the selection of  $e$  in the Random condition, high or low values of  $e$  cannot be interpreted by the Consumer in this condition as a sign of kindness or unkindness from the Firm toward the Worker. Therefore, differences observed in willingness-to-pay between these two treatment conditions can be attributed to reciprocity. The use of an experimental condition where a player's decision is replaced by a random device is a common technique for measuring reciprocity in the experimental economics literature (e.g., Charness 2004, Falk et al. 2008).

The three Information Uncertainty conditions combined with the two Reciprocity conditions yield a  $3 \times 2$  factorial between-subject design and a total of six treatments. This factorial design allows us to not only isolate the effect of information precision and reciprocity on willingness-to-pay, but to also study their interaction effect. In addition, we also include a control task consisting of a variation of the Dictator Game to measure Consumers' prosocial behavior, where each Consumer is assigned the role of the Dictator. We define prosocial behavior as the extent to which an individual cares about others' (pecuniary) well-being. Based on this control task, we define *low prosocial* Consumers as those who transfer less than or equal to the median transfer observed in the task. The remaining participants are considered

to be *high prosocial* Consumers.

Figure 1 provides a visual representation of our main results. To ensure a minimum number of observations in each unit of analysis, we aggregate our WTP results by the following effort levels: No Effort:  $e = 0$ ; Low Effort:  $e \in \{20, 40\}$ ; Medium Effort:  $e \in \{60, 80\}$ ; and High Effort:  $e \in \{100, 120\}$ . First, our results show that the Consumers' average WTP is increasing in the Firm's effort level. Information uncertainty, on the other hand, has a detrimental effect on Consumers' WTP: *under the Decision condition*, the higher the uncertainty, the lower the average WTP. The differences in average WTP between No Uncertainty and High Uncertainty are statistically significant ( $p < 0.05$ ), except for the No Effort level. With respect to reciprocity, we observe that *under the No Uncertainty condition*, the difference in average WTP between the Decision and Random conditions not only increases with the effort level, but it also increases in statistical significance, going from non-significant at the No Effort level to significant ( $p < 0.05$ ) at the High Effort level. This finding proves the existence of positive reciprocity when there is no uncertainty in the information presented to Consumers. However, this result does not hold when the information presented is uncertain: no significant reciprocity is observed under the Low Uncertainty and High Uncertainty conditions. All our results are formally supported by a two-sided Tobit random-effects regression model that captures the effects of effort, information uncertainty, and reciprocity on Consumers' WTP.

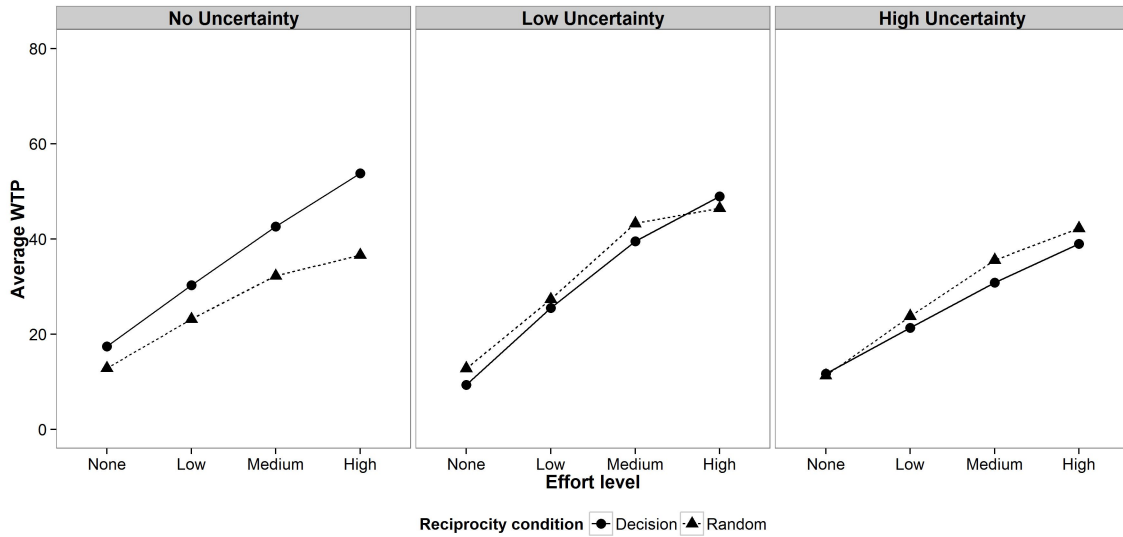


Figure 1: Effects of Information Uncertainty and Reciprocity on Average Willingness-to-Pay: All Consumers

With respect to prosocial behavior, as expected, high prosocial Consumers exhibit on average a higher WTP for the product than low prosocial Consumers. However, high prosocial Consumers *do not* punish information uncertainty but instead demonstrate a similar WTP across all Information Uncertainty conditions. Furthermore, they do not display positive reciprocity toward the Firm’s effort under either Information Uncertainty condition. Interestingly, this means that our results regarding Consumers’ higher Willingness-to-Pay and reciprocity toward the firm when information is not uncertain are driven by low prosocial Consumers. As can be seen in Figure 2, low prosocial Consumers’ average WTP decreases as the information uncertainty increases. The reciprocity results are also similar to the ones observed with the entire sample, *except* for the High Uncertainty condition. In this case, the entire Decision condition is penalized, with an average WTP that is lower than under the Random condition across all effort levels. Since this result holds regardless of the effort chosen by the Firm, it is hard to attribute it to negative reciprocity: there is no reason for the Consumer to punish the Firm if she decides to exert her highest possible effort. Instead, we attribute this to the fact that in the Random condition, the only player making a decision is the Consumer. In the Decision condition, on the other hand, final payoffs depend on both the Consumer’s and the Firm’s decisions, thus decreasing the Consumer’s perception of sole responsibility (see, e.g., Charness 2000, Dana et al. 2007).

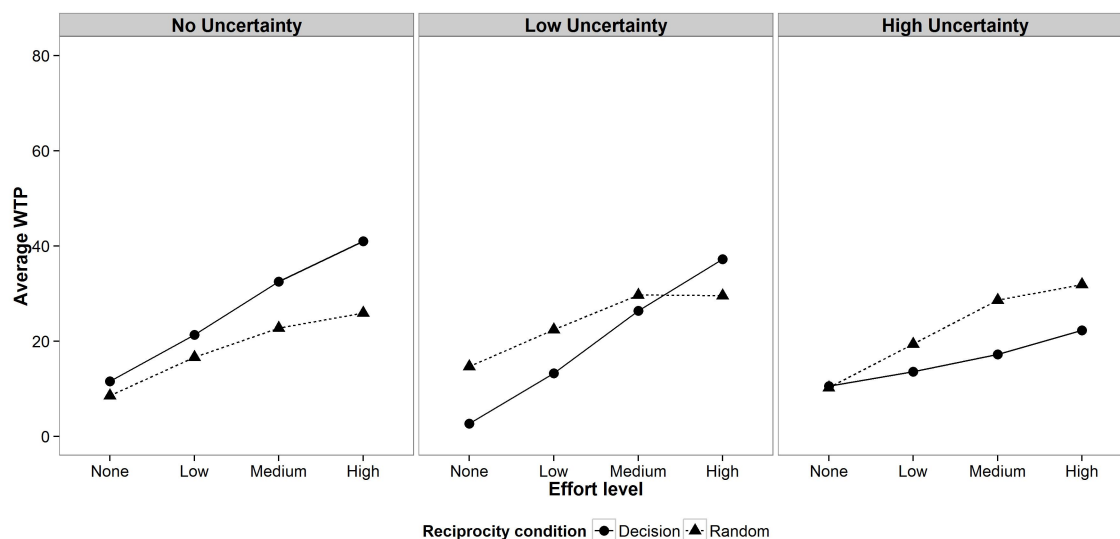


Figure 2: Effects of Information Uncertainty and Reciprocity on Average Willingness-to-Pay: Low Prosocial Consumers

Our work provides valuable insights that can guide firms as they decide on the best strategy to communicate their Social Responsibility efforts to consumers. First, we find that consumers are willing to pay a higher price for higher levels of Social Responsibility. Furthermore, firms that present precise information about the benefits of their socially responsible practices will be able to obtain a higher premium for these practices than firms that provide only imprecise or vague information. However, only firms that present precise information should expect consumers to reciprocate them for the effort exerted. Interestingly, the positive effect of information precision on Willingness-to-Pay and reciprocity is likely to be mostly driven by consumers with a relatively lower concern for Social Responsibility. Therefore, providing more precise information will have the potential of attracting consumers that would otherwise have a very low (or zero) Willingness-to-Pay for the socially responsible characteristics of a product.

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