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Essays on the Effects of Social Identity on Market Outcomes, Competition, and Reciprocity: Analytical and Experimental Investigations

DISSERTATION

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by

Hyewon Park

Dissertation Committee:
Professor Rajeev K. Tyagi, Chair
Professor Imran Currim
Professor John Duffy

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DEDICATION

To

Tim (Hunjae) and Daniel (Hunjoon)

in recognition of
their tremendous love, support, and belief in me

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VITA

Hyewon Park

1993	Bachelor of Business Administration, Ewha Womans University
1995	M.A. in Business Administration, Ewha Womans University
2006	Ph.D. in Business Administration, Korea University
2020	Ph.D. in Management, University of California, Irvine

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ABSTRACT OF THE DISSERTATION

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Doctor of Philosophy in Management

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Professor Rajeev K. Tyagi, Chair

The dissertation investigated the effect of consumers' social identity on market outcomes, marketing strategies and consumers' reciprocities. It consists of two essays. The first essay is an analytical modeling study that investigated how consumers' social identity, ostracism imposed by peers, social group sizes, and identity difference between social groups affect consumer prices and competing sellers' profitabilities. The second essay is a laboratory experimental study that investigated how consumers' social identity increases consumers' valuation of identity-associated products and what outcomes identity-induced consumptions are brought into consumers' social and economic environments.

Essay 1

Social Identity, Ostracism, and Competition

Abstract

Consumers belong to various social groups and hold multiple social identities. For example, the same consumer could hold social identities of being an Asian-American, a professor, and an environmentally-conscious mom, etc. Situational cues, including firms' communication strategies, can activate one or more of these social identities, which can then affect consumer purchase decisions. In particular, by buying a product that is associated with its social group, a consumer can show to both its in-group and all out-group consumers which social group it belongs to. Furthermore, when a consumer chooses a product that is not associated with its social group, it may face some ostracism from those members of its social group that still buy the product associated with their group. This paper examines the strategic implications of these components of social identity in a duopoly model. We show how identity, ostracism, social group sizes, and identity difference between social groups affect consumer prices and competing sellers' profitabilities. We highlight circumstances in which competing firms in a market differ, and circumstances in which they do not differ, in whether they find it optimal to use identity-activating communication strategy. Crucially, firms' optimal communication strategies are shown to depend on whether such communication highlights the identity aspect, the ostracism aspect, or the perceived difference in groups' identities.

(**Keywords**: Consumer Behavior; Social Identity; Ostracism; Competition; Advertising; Game Theory.)

1 Introduction

Consumers belong to various social groups and hold multiple social identities, defined as a person's sense of self derived from perceived membership in a social group (Turner et al., 1987). For example, the same person could hold social identities of being an Asian-American, a professor, an environmentally-conscious mom, a Dodger's fan, and an athletic middle age person. It is well known that situational cues, including firms' communication strategies, can activate one or more of these social identities (Mercurio and Forehand 2011, Ellemers 2012), which can then affect consumer purchase decisions (Shavitt et al 2009). For example, an ad using an Asian spokesperson or American flag can activate two different identities for the same Asian-American person, while a product-based ad may not activate either of these two identities. An important question for marketing strategy is to then decide when a firm should use its advertising and communication strategy to activate some social identity of its target consumer.[1]

Identity-related research in marketing has generally taken a psychology-based approach to address this question, and shown a number of factors that determine how consumers react to firms' identity-activating communication. For example, this literature has shown that a firm's identity-activating communication yields better response in product categories that are associated with more public consumption (e.g., Johar and Sirgi 1991), with consumers who have high self-monitoring tendencies (Shavitt et al 1992), and in societies that are more collectivist (e.g., Zhang and Gelb 1996). The purpose of this paper is to add to these answers by adding competitive aspects in

[1]One can easily see variance in firms' use of identity-based versus product-based advertising in various markets. For example, while Chevrolet uses "Chevrolet, an American Revolution" tagline that can evoke American group identity, Honda has used "Technology You can Enjoy" line that focuses on product features. Chick-fil-A has used "Crazy mom morning" themed ads showing moms' busy morning without highlighting product features.

a market in which consumers may care about their social identity. The addition of competitive considerations allows us to show circumstances in which competing firms in the *same* market and product category differ, and circumstances where they do not differ, in whether they find it optimal to use identity-activating communication strategy. Importantly, this formal consideration of competition also allows us to relate various consumer identity-related behavioral constructs in a product category to market-level economic outcomes such as prices, sales, and profits.

In particular, we model a product category with two competing firms. Consumers belong to one of two identity groups of possibly different sizes, and each group associates itself with one of the two competing products. For example, these identity groups could be "athletic" versus "hip" teenagers, and the product associations may be clothing with sports-logos versus with hipster art; "techy" versus "cool" professionals, and the product associations may be android phones versus iPhones; "environmental-friendly" versus "sporty" moms, with product associations of Tesla versus BMW sports utility vehicle. Within each of these identity groups, consumers differ in their individual tastes for these products, and also care about product prices set by firms.

Consumers' group identities can also be activated through firms' communication strategies, in which case consumers also care about the effect their product choice has on their group identity. Following Akerlof and Cranton (2000), we consider two such possible effects of product choice on group identity. First, consuming a product identified with its group may yield a consumer an *identity* benefit in being able to show to both in-group and out-group consumers that she does follow the group norm.[2] Second, if a consumer deviates and chooses a product that is not identified with her identity group, she may suffer an *ostracism* cost from those members of her group who

[2]Or equivalently, she suffers an *identity* loss if she does not follow the group norm and not choose the product associated with her identity group.

buy the product associated with their identity group and do not deviate.

Using this simple formal model, we show conditions under which one firm benefits from activation of group identity while the competing firm does not, and conditions under which neither firm chooses this group-identity-activating communication strategy. These conditions depend on the relative sizes of identity groups, the difference between group identities, and the relative importances of identity and ostracism. Furthermore, we show that firms' ad strategies differ depending on whether it is the identity aspect, the ostracism aspect, or the perceived difference in groups' identities that gets highlighted by firms' communication strategies. For example, our results suggest that a firm should avoid using identity-based ads if the firm has a smaller (than its competitor) group of consumers that identifies with the firm. We also show that neither firm finds it optimal to use ads that evoke the ostracism aspect of social identity, irrespective of the difference in the sizes of the consumer groups that associate with these firms. Interestingly, ads that may highlight difference in group identities are also not optimal for either firm when the identity aspect is weak and the ostracism aspect is strong in a market, irrespective of the difference in the sizes of consumer groups that associate with these firms. On the other hand, such communications highlighting difference in group identities help the firm that the larger social group identifies with when the identity aspect is strong and the ostracism aspect is weak in a market.

Finally, our model shows how these different identity-related constructs have different effects on market prices, sales, and profits. Since the variations in these constructs may not be due to firms' communication or ad strategies, but rather due to variations across markets and societies (e.g., Los Angeles vs the midwest, or USA vs Japan), or over time with the increasing adoption of social media, an alternative role of our results is to help us understand the effects of these identity-related variations on market outcomes such as prices, sales, and profits.

In sum, this paper contributes to the marketing literature by disaggregating and incorporating one of the most important constructs from psychology and sociology literatures – social identity – into a formal economic model of competition. This allows one to provide richer explanations for market outcomes in terms of identity-related parameters, and also suggest some identity-based marketing strategies for firms in competitive markets.

1.1 Related Literature

Our paper is mainly related to the literatures on social identity and network externalities. Social identity theory posits that the social categories to which a person belongs can define the person in accordance with the distinctive features of those social categories (Turner et al. 1987). Thus, one's social identity can become a salient basis for self-regulation which leads one to follow in-group norms and stereotypes. These in-group norms and stereotypes not only prescribe members' behavior and attitudes but also evaluate other in-group members and out-group members. The evaluative function of social identity motivates one to conform to in-group behavior so as not to be excluded by other in-group members, while the prescribing aspect of social identity makes it a strong basis to draw one's self-esteem and value.

A large literature has used this social identity theory to show how social identity can be activated by situational cues and affect consumer behavior. Benjamin et al. (2010) use experiments to show that people's national identity can be primed, and that then makes them align their behavior more with the expected behavior of that social group. For example, priming of Asian American identity was shown to lead to more risk aversion in financial choices. Cooper et al. (2002) and Werch et al. (2003) show that alcohol use and exercise appeals were related to what

identity subjects were primed for. Han & Shavitt (1994) find that while European Americans were more attracted to a laundry detergent when it appealed to their individual value, Koreans were more likely to buy a detergent when it appealed to the family oriented value. Shavitt et al (1992), Mercurio and Forehand (2011), and Ellemers (2012) also show how advertising and other firm communication can prime or activate consumers' group identity, affect their preferences for identity-relevant products, and make social identity more predictive of their consumption. Thus, marketers can use marketing efforts such as advertising and other marketing strategies to influence whether and which social identity is evoked in a purchase situation.

Chan et al (2012) show experimental evidence in product categories such as toothpaste, cars, and sunglasses, that the desire to signal group identity makes consumers make product choices that confirm to their group. Oyserman (2009a, 2009b) and Chernev et al (2011) suggest that consumers may choose products to show "who they are" and "how they are different from others." Amaral and Loken (2016) show using experiments that whether use of counterfeit luxury product draws people to the genuine product depends on whether more in-group (rather than out-group) people use the counterfeit products. Berger and Heath (2008) show that consumers stop consuming a product when out-group members start using it (e.g., wristbands when they started being used by "geeks"). Chugani et al. (2015) show that if a product is consistent with one's identity, then the satiation effect (reduction in marginal utility with higher consumption) is lesser. Overall, there is ample evidence that consumers gain an identity-related utility by consuming products associated with their social groups to associate themselves with in-group members and differentiate themselves from out-group members.

Akerlof and Cranton (2000) and Carvalho (2013) suggest that when a consumer buys a product that its group does not identify with, this consumer's utility decreases owing to the "os-

tracism" or "punishment" by those of her in-group members who buy the product congruent to this group's identity. When people are ostracized by others, they feel loss of social connections and uncomfortable tension (Su et al., 2017). The penalty for the deviation occurs because when group members see the deviation from group norms, their own social identity is also threatened, and they are likely to restore their threatened identity by punishing the deviator in their group (Akerlof and Cranton 2000). Overall, the disutility from ostracism occurs to defectors from conformers in a group.

Our model extracts away a number of elements from the above-mentioned literature to examine their competitive implications. Namely, that consumer may belong to different social groups; consumption norms between social groups may differ; consumers may get positive utility from consuming what the norm in their own social group is; consumers may get ostracized and get negative utility if they do not consume per their social group norm; and situational cues may activate consumer social identity.

Our paper is also closely related to the literature on network externalities. There is a large literature on positive network externalities where a consumer's utility increases in the total number of other consumers using the same product. This could be due to technological reasons, for example a product such as a telephone becoming more useful the more other consumers own a telephone (e.g., Shapiro and Katz 1994) or social reasons such as bandwagon effect (e.g., Leibenstein 1950, Becker 1991). There is also a large literature on negative externalities where a consumer's utility decreases in the total number of other consumers using the same product. This could be due to technical reasons such as congestion (e.g., Vickrey 1969), or social reasons such as snob effect (e.g., Leibenstein 1950, Balachander and Stock 2009). Amaldoss and Jain (2005) combine both positive and negative externalities in a duopoly model by considering two consumer segments -

one with positive externality (conformist effect) and one with negative externality (snob effect). Their main result is that demand for the snob segment can increase in its price in the presence of the conformist segment. Consistent with prior work, they also find that negative externalities under competition lead to higher profits, while positive externalities under competition lead to lower profits.

The ostracism element of social identity phenomenon we model also generates positive externalities, but in a distinct fashion. In our setup, there are two social groups which differ in the product they associate with. However, consumers behave similarly in that, within each social group, the larger the number of consumers that buy the product associated with that group, the larger the ostracism effect for those consumers that buy the product associated with the other social group. Thus, within each social group, consumers have effectively a positive externality for the product associated with that group, but no externality for the other product. Furthermore, this ostracism effect is stronger when social groups differ more in their identities. Overall, at the market level, competing firms end up facing consumers with positive externalities that are moderated by sizes of social groups and differences in identities of social groups.

Finally, identity perspective has also been incorporated in the economics literature to study some substantive issues. For example, Bulte and Horan (2010) explore the effect of social identity on exploitation of common resources in a society, and Li et al. (2011) study the effect of group identity on matching among market participants in a market. Our paper focuses on firm-level pricing and communication strategies.

The rest of the paper is organized as follows. We setup the basic model in Section 2, explaining how social identity is incorporated in consumer utility and how firms compete. Section 3 derives the equilibrium outcomes, and presents the key results and their marketing implications.

Section 4 concludes with a summary and some ideas for future research.

2 The Model

We consider two competing firms that each produce one horizontally-differentiated product at a unit marginal cost $c \geq 0$. The firms are located at the end points of a line of unit length, and this horizontal dimension represents all product features on which the firms could differentiate from each other. There is a total unit mass of consumers, divided into two social groups of possibly different sizes (λ and $1-\lambda$, with $0 < \lambda < 1$). Product of firm 1 is associated with consumers in social group 1 (e.g., Tesla car and "environmental-friendly" professionals) and product of firm 2 is associated with consumers in social group 2 (e.g., BMW car and "sporty" professionals).

In making their purchase choice, consumers care about product prices and product features. Consumers in each social group are heterogeneous in their tastes for these product features. Specifically, we assume that consumer ideal points in each social group are distributed uniformly on a line of unit length between the two competing firms.

Figure 1 shows this setup.

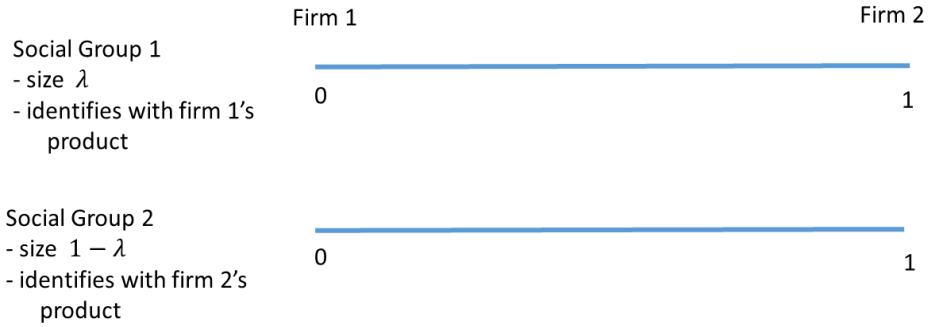

Figure 1: *The Setup.*

The reservation price for consumers when they buy their ideal products is v, which is

assumed to be sufficiently large such that all consumers are able to buy one of the two competing products. If a consumer buys a product located away from its ideal point, it incurs a disutility of $t.x$ where x is the distance between the consumer's ideal point and the product location on line [0,1], and parameter t represents the value of product fit to the consumer.

If consumers' social identity relevant to this product category gets primed by situational cues, then consumers also care about the effect of their product purchase on their social identity. Specifically, we follow Akerlof and Cranton (2000) to model the following two aspects of social identity:

1. *Identity*. If a consumer in social group 1 (social group 2) buys product 1 (product 2), it gets an identity gain proportional to the total number of in-group and out-group consumers, which in this case is unity. Further, this identity gain also depends on how inherently different the two social group identities are. For example, the larger the difference in the "environmental-friendly" and "sporty" professionals' identities, the more identity gain a consumer gets by consuming the product associated with its group.[3] We represent this group difference with parameter $\theta > 0$. Then, given that the normalized number of all consumers in our model is unity, the identity gain from consuming a product associated with one's social group $= I.\theta$, where the parameter I allows us to represent intensity of group identity, which could be affected by firms or by consumer cultures and value systems in different societies (e.g., US vs Korea; midwest vs Los Angeles; men vs women).

2. *Ostracism.* When a consumer buys a product that is not associated with its social group (i.e., a consumer in social group 1 (group 2) buys product 2 (product 1)), it incurs an ostracism cost

[3]Carvalho (2013) shows that veiling by women of certain religious beliefs is most important when they interact with people in a secular group; thus identity gain is the highest when the focal identity group differs the most from the other identity group. Akerlof & Kranton (2010) also suggest that expressing social identity becomes more important when groups are more contrasted.

proportional to the proportion of in-group consumers who do not deviate and buy the product associated with their group. Thus, the ostracism to a deviator is not from those fellow group members who are themselves deviating by not buying a product congruent to the group identity. We model this ostracism cost as $= O.\theta$.(proportion of own group consumers who buy the product this group identifies with), where the parameter O allows us to represent intensity of ostracism, which, similar to parameter I, could be affected by firms or by consumer cultures and value systems in different societies.

Putting together all aspects of above-described consumer behavior, we can write consumer utility as follows.

1) Utility of a consumer in social group 1 with ideal point located at $x \in [0, 1]$. If this consumer buys the product associated with its group, i.e., product 1 located at $x = 0,$ that charges price $p_1,$ then its utility is

$$v - p_1 - tx + I\theta. \tag{1}$$

On the other hand, if it buys the product not associated with its social group, i.e., product 2 located at $x = 1,$ that charges price $p_2,$ then its utility is

$$v - p_2 - t(1 - x) - O\theta\overline{x}_1^e. \tag{2}$$

Here, $\overline{x}_1^e$ is the expected location of the consumer in group 1 who is indifferent between buying from firm 1 and firm 2, and is also the expected proportion of consumers in this group who do not deviate and buy the product congruent to the group identity.

2) Utility of a consumer in social group 2 with ideal point located at $x \in [0, 1]$. If this consumer

buys the product associated with its group, i.e., product 2 located at $x = 1$, that charges price p_2, then its utility is

$$v - p_2 - t(1 - x) + I\theta. \tag{3}$$

If, on the other hand, it buys the product not associated with its social group, i.e., product 1 located at $x = 0$, that charges price p_1, then its utility is

$$v - p_1 - tx - O\theta(1 - \overline{x}_2^e). \tag{4}$$

Here, $\overline{x}_2^e$ is the expected location of the consumer in group 2 who is indifferent between buying from firm 1 and firm 2, and $(1 - \overline{x}_2^e)$ is the expected proportion of consumers in this group who do not deviate and buy the product congruent to the group identity.

2.1 Consumer Demand

We first derive firms' demands in each social group separately.

Social group that identifies with firm 1. Using (1) and (2), and the rational expectation that $\overline{x}_1 = \overline{x}_1^e$, we get

$$\overline{x}_1 = \frac{1}{2} + \frac{1}{2t - O\theta}(p_2 - p_1) + \frac{(2I + O)\theta}{2(2t - O\theta)}. \tag{5}$$

In this group, the sales for firm 1 is $\lambda\overline{x}_1$, and that for firm 2 is $\lambda(1 - \overline{x}_1)$.

Social group that identifies with firm 2. Using (3) and (4) and the rational expectation that $\overline{x}_2 = \overline{x}_2^e$, we get

$$\overline{x}_2 = \frac{1}{2} + \frac{1}{2t - O\theta}(p_2 - p_1) - \frac{(2I + O)\theta}{2(2t - O\theta)}. \tag{6}$$

In this group, the sales for firm 1 is $(1-\lambda)\,\overline{x}_2$, and that for firm 2 is $(1-\lambda)\,(1-\overline{x}_2)$.

Total Demand. The total demand for firm 1 is $\lambda\overline{x}_1 + (1-\lambda)\,\overline{x}_2$, and that for firm 2 is $\lambda\,(1-\overline{x}_1) + (1-\lambda)\,(1-\overline{x}_2)$. Using (5) and (6), these demands become

$$q_1 = \frac{(p_2 - p_1) + t + [(\lambda - 1)\,O + (2\lambda - 1)\,I]\,\theta}{2t - O\theta}, \text{ and } q_2 = 1 - q_1. \tag{7}$$

To ensure an interior solution, $\overline{x}_1 \in (0,1)$ and $\overline{x}_2 \in (0,1)$, we need the following conditions:

$$t > (I+O)\theta, \text{ and} \tag{8a}$$

$$(I+O)\theta - t < (p_2 - p_1) < t - (I+O)\theta. \tag{8b}$$

Intuitively, conditions (8a) and (8b) require product differentiation parameter (t) to be high enough and the price difference ($p_2 - p_1$) to be not too extreme, so that both products can survive.

3 Equilibrium Outcomes

Firm 1's profit is $\pi_1 = (p_1 - c)q_1$ and firm 2's profit is $\pi_2 = (p_2 - c)q_2$, where the expression of q_1 and q_2 are given in equation (7). We set the constant marginal cost c to zero without loss of generality for our results.

Firms choose their prices to maximize their profit, knowing that their prices will affect sales in each of the two social groups and affect the magnitude of identity and ostracism effects. Solving

the first order conditions, $\partial\pi_1/\partial p_1 = 0$ and $\partial\pi_2/\partial p_2 = 0$, we get the equilibrium prices as[4]

$$p_1^* = t + \frac{1}{3}\theta\left[(\lambda-2)O + (2\lambda-1)I\right], \quad p_2^* = t - \frac{1}{3}\theta\left[(\lambda+1)O + (2\lambda-1)I\right]. \tag{9}$$

Using these expressions in (5)-(7), we get firm 1's equilibrium sales in own group, in the other group, and total sales as,

$$\overline{x}_1^* = \frac{3t + \theta\left[(1-2\lambda)O + (5-4\lambda)I\right]}{3\left(2t - O\theta\right)}, \;\; \overline{x}_2^* = \frac{3t - \theta\left[2(1+\lambda)O + (1+4\lambda)I\right]}{3\left(2t - O\theta\right)}, \tag{10}$$

$$q_1^* = \frac{3t + \theta\left[(-2+\lambda)O + (-1+2\lambda)I\right]}{3\left(2t - O\theta\right)}, \;\; q_2^* = \frac{3t - \theta\left[(1+\lambda)O + (-1+2\lambda)I\right]}{3\left(2t - O\theta\right)}. \tag{11}$$

Firm 2's equilibrium sales in own group and in the other group are $(1-\overline{x}_2^*)$ and $(1-\overline{x}_1^*)$, respectively.

Finally, using these equilibrium price and sales expressions in firm's profit functions, we get equilibrium profits as

$$\pi_1^* = \frac{\left[3t + \theta\left\{(-2+\lambda)O + (-1+2\lambda)I\right\}\right]^2}{9\left(2t - O\theta\right)}, \;\; \pi_2^* = \frac{\left[3t - \theta\left\{(1+\lambda)O + (-1+2\lambda)I\right\}\right]^2}{9\left(2t - O\theta\right)}. \tag{12}$$

Using the equilibrium expressions of prices, condition (8) needed for both firms to survive can be rewritten as $I < \overline{I}$ and $O < \overline{O}$, where:

$$\overline{I} = \frac{3t + 2(-2+\lambda)O\theta}{(5-4\lambda)\theta} \text{ and } \overline{O} = \frac{3t}{2\left(2-\lambda\right)\theta} \;\; \text{for } \lambda \leq \frac{1}{2}, \tag{13a}$$

$$\overline{I} = \frac{3t - 2(1+\lambda)O\theta}{(1+4\lambda)\theta} \text{ and } \overline{O} = \frac{3t}{2\left(1+\lambda\right)\theta} \;\; \text{for } \frac{1}{2} < \lambda < 1. \tag{13b}$$

[4]We check the second-order conditions throughout.

Intuitively, if identity or ostracism effects become too large, the firm that the smaller social group associates with cannot survive in the market. Note from (13) that the feasibility zone, in terms of I and O, for both firms to survive in the market becomes smaller as (i) misfit cost parameter, t, reduces (increasing ease of switching for consumers and hence increasing price competition); and (ii) asymmetry in consumer group sizes, $|\lambda - (1-\lambda)|$, or group difference, θ, increase (disadvantaging the firm associated with the smaller social group).

We are now in a position to examine the effects of various parameters on firms' prices and profits.

3.1 Effects of Identity, I

To examine the economic effects of identity, I, we first analyze its effects on demand shifts and price sensitivity in each social group.

The indifferent consumer in the standard Hotelling model is located at

$$\overline{x} = \frac{1}{2} + \frac{1}{2t}\left(p_2 - p_1\right), \tag{14}$$

while from equations (5) and (6), it is located in our model at:

(i) in social group that identifies with the focal firm (say, firm 1)

$$\overline{x} = \frac{1}{2} + \frac{1}{2t - O\theta}\left(p_2 - p_1\right) + \frac{(2I+O)\,\theta}{2\left(2t - O\theta\right)}, \text{ and} \tag{15}$$

(ii) in social group that identifies with the competing firm (firm 2)

$$\overline{x} = \frac{1}{2} + \frac{1}{2t - O\theta}\left(p_2 - p_1\right) - \frac{\left(2I + O\right)\theta}{2\left(2t - O\theta\right)}. \tag{16}$$

Then, given that the market share of the focal firm is $\overline{x}$, comparing (14), (15), and (16), we note that Identity I (i) shifts upwards the market share of the focal firm by $\frac{(2I+O)\theta}{2(2t-O\theta)} > 0$, and (ii) shifts downwards the market share of the focal firm by the same amount in the consumer group that identifies with its competing firm.

There is no effect of I on price sensitivity in either social group.

The reason for these demand shifts is simple: an increase in identity increases a consumer's willingness to pay for a product that its group identifies with and decreases its willingness to pay for a product that its group does not identify with. Thus, for any given price, market shares in the two groups shift in opposite directions. It then follows that the firm that the larger social group of consumers identity with will be able to increase its price and profit with an increase in I, while the other firm will have to decrease its price and earn lower profit with an increase in I.

We summarize this result in the first proposition.

Proposition 1: *An increase in identity, I, increases (decreases) the price, sales, and profit for the firm that the larger (smaller) social group identifies with.*

Thus, to the extent that the relevant social identity can be primed through firm communication, competing firms have opposing incentives. The firm that the larger social group identifies with wants to highlight the identity aspect, while the competing firm would benefit from focusing on other aspects, such as product features. This result also implies that, other things being the

same, we can expect to see larger gaps in competing firms' prices and profits when they operate in markets in which social identity is a stronger part of consumer behavior due to underlying social and cultural factors.

3.2 Effects of Ostracism, O

To examine the economic effects of ostracism, O, we again analyze its effects on demand shifts and price sensitivity in each social group.

Comparing (14), (15), and (16), we can see that Ostracism O (i) shifts upwards the market share of the focal firm by $\frac{(2I+O)\theta}{2(2t-O\theta)} > 0$ in the social group that identifies with this firm ($\partial \frac{(2I+O)\theta}{2(2t-O\theta)} / \partial O > 0$), and shifts downwards the market share of the focal firm by the same amount in the consumer group that identifies with its competing firm. Intuitively, an increase in group ostracism increases a consumer's willingness to pay for a product that its social group identifies with and decreases its willingness to pay for a product that its group does not identify with.

In addition, an increase in O increases the sensitivity of the focal firm's market share to its price ($2t - O\theta < 2t$) in *both* the social groups. The intuition is as follows. A price decrease by the focal firm has the following additional effect in the social group that identifies the focal firm: when this price cut gains it the marginal consumer, that also increases the proportion of consumers in this group who would ostracize consumers buying the competitor's product, which would in turn make it easier for the firm to gain further consumers. We can view this additional role of a price cut as the *offensive ostracizing role*. A price decrease by the focal firm has the following additional effect in the social group that identifies the competing firm: when this price cut gains it the marginal consumer, that also decreases the proportion of consumers who would ostracize consumers buying

the focal firm's product, which would in turn make it easier for the firm to gain further consumers. We can view this additional role of a price cut as the *defensive ostracizing role.*

Overall, in our model, while these above-mentioned effects lead to lower prices and profits for both firms, the firm that the larger social consumer group associates with does get an increased total sales.

Proposition 2: *An increase in ostracism, O, (i) decreases both firms' prices; (ii) increases (decreases) the sales for the firm that the larger (smaller) social group identifies with; and (iii) decreases both firms' profits.*

Thus, to the extent that firms' communications may prime the ostracism aspect of social identity, competing firms share the same incentives. Irrespective of the difference in the sizes of social groups that associate with these firms, both firms want to avoid priming ostracism, and benefit from focusing on other aspects, such as product features. Also, other things being the same, we can expect to see lower consumer prices and lower firm profits when competing firms operate in markets in which social ostracism is a stronger part of consumer behavior due to underlying social and cultural factors.

3.3 Effects of Group Difference, θ

To examine the economic effects of group difference, θ, we analyze its effects on demand shifts and price sensitivity in each social group.

Comparing (14), (15), and (16), we note that θ (i) shifts upwards the market share of the focal firm by $\frac{(2I+O)\theta}{2(2t-O\theta)} > 0$ in the social group that identifies with this firm ($\partial\frac{(2I+O)\theta}{2(2t-O\theta)}/\partial\theta > 0$), and shifts downwards the market share of the focal firm by the same amount in the social group

that identifies with its competing firm. Intuitively, an increase in group difference increases the magnitudes of *both* the identity and ostracism effects, *each* of which was shown earlier to lead to an increase in consumer willingness to pay for a product that its social group identifies with, and a decrease in consumer willingness to pay for a product that its group does not identify with.

In addition, an increase in θ increases the sensitivity of the focal firm's market share to its price ($2t - O\theta < 2t$) in *both* the social groups. Intuitively, an increase in θ increases the magnitude of both the *offensive* and *defensive* ostracizing roles of a price cut described earlier.

In summary, for the firm that the larger social group associates with, an increase in θ shifts the demand up owing to increased magnitudes of both identity and ostracism effects, but also increases the sensitivity of its demand to its price owing to increased magnitude of ostracism effect. These two forces work in opposite directions and can lead to increase or decrease in this firm's price and profit. However, for the firm that the smaller social group associates with, an increase in θ shifts the demand down owing to increased magnitudes of both identity and ostracism effects, and also increases the sensitivity of its demand to its price owing to increased magnitude of ostracism effect. These two forces work in the same direction for this firm, and lead to a decrease in its price and profit.

We summarize the formal results below.

Proposition 3: *An increase in group difference, θ,*

1. *decreases both firms' prices if $I < \frac{(2-\lambda)O}{2\lambda-1}$; otherwise, increases (decreases) the price of the firm that the larger (smaller) social group identifies with;*

2. *increases (decreases) the sales for the firm that the larger (smaller) social group identifies with;*

3. *decreases both firms' profits if* $I < \frac{3t-2(1+\lambda)O\theta}{(1+4\lambda)\theta}$ and $O > \frac{3t}{2(1+\lambda)\theta}$*; otherwise, increases (decreases) the profit of the firm that the larger (smaller) social group identifies with.*

Thus, when firms' communications may prime or accentuate the difference in identities of social groups, whether competing firms share an incentive to do so or not depends on the values of identity, I, and ostracism, O. When identity is low and ostracism is high, then both firms – irrespective of the difference in the sizes of social groups that associate with these firms – want to avoid priming social identity differences. When identity I is high and/or ostracism, O, is low, then firms' optimal communication strategy differs. Specifically, the firm that the larger social group identifies with wants to highlight social identity differences, while the competing firm would benefit from focusing on other aspects, such as product features.

Figure 2 shows the profitability result from Proposition 3 graphically.

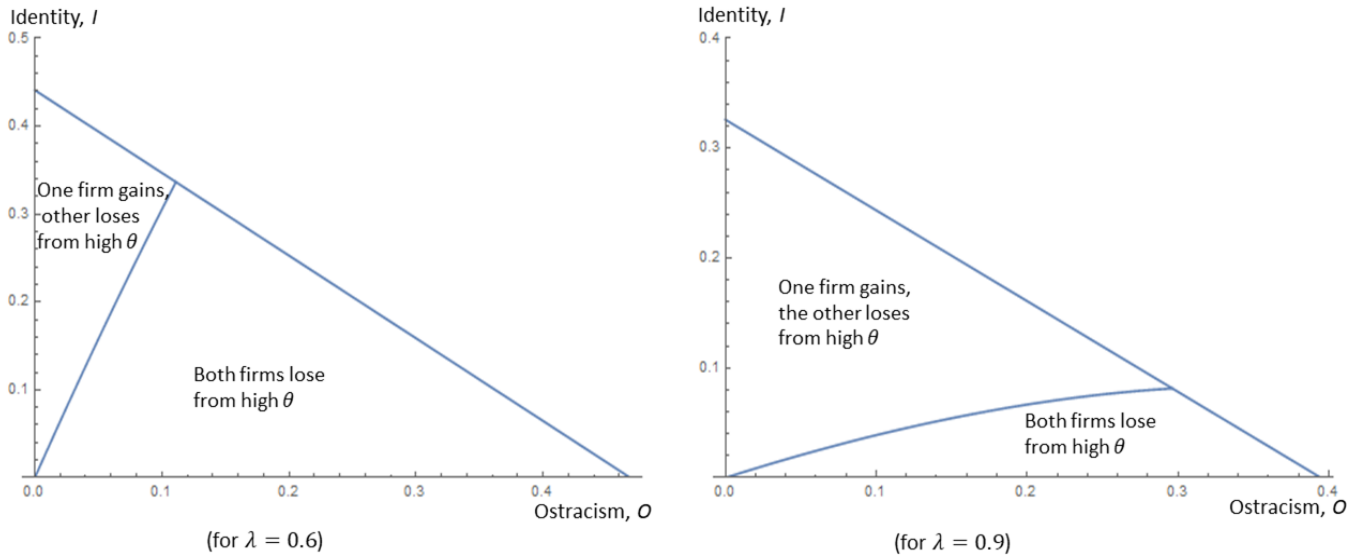

Figure 2: *Competing firms' preferences for highlighting differences in social identities,* θ.

The intuition is as follows. The firm that the smaller social group associates with always loses from an increase in social identity difference as that (i) increases the magnitude of its demand

shift down (through both I and O), and (ii) also increases the magnitude of increase in its price sensitivity (through O). The firm that the larger social group associated with can lose or gain from an increase in social identity difference as that (i) increases the magnitude of its demand shift up (through both I and O), but (ii) increases the magnitude of increase in its price sensitivity (through O). When O is sufficiently high and I is sufficiently low, the second effect dominates and this firm also loses from an increase in group difference.

The figure also shows that the smaller the differences in sizes of social groups (smaller λ), the larger the parametric zone where both firms lose from an increase in social identity differences. Finally, note the feasibility conditions for both firms to survive in the Figure. As shown earlier in equation (13), markets with sufficiently high values of ostracism and identity can not sustain both firms – the firm that the smaller social group associates with will be unable to stay in it profitably. Also, the figure shows how this feasible zone reduces as the asymmetry in group sizes increases.

Putting together results from Propositions 1-3, we can see that identity-based ads or other communications from firms can affect market competition and firms' profits differently depending on what particular aspect of consumer social identity these ads prime – identity, ostracism, or identity differences between groups. For example, these results show that a firm should avoid using identity-based ads if the firm has a smaller (than its competitor) group of consumers that identifies with the firm. Neither firm finds it optimal to use ads that evoke the ostracism aspect of social identity, irrespective of the difference in the sizes of the consumer groups that associate with these firms. Ads that may highlight difference in group identities are also not optimal for either firm when the identity aspect is weak and the ostracism aspect is strong in a market, irrespective of the difference in the sizes of consumer groups that associate with these firms. On the other hand, such communications highlighting difference in group identities help the firm that the larger

social group identifies with when the identity aspect is strong and the ostracism aspect is weak in a market.

In the above discussion, when we say that a firm wants to avoid identity-based communication, it pertains only to the purchase-relevant identity that consumers groups associated with the competing firms differ on (e.g., environmental-friendly versus sporty professionals). If these consumer groups share some other identity (e.g., loving moms), then firms can still use appeals built around those common identities. Or, they can stay away completely and focus on other aspects such as product features.

As we mentioned earlier, the variations in these different identity-related constructs may not be due to firms' communication or ad strategies, but rather due to variations across markets and societies (e.g., Los Angeles vs the midwest, or USA vs Japan), or over time with the increasing adoption of social media. Thus, our propositions can alternatively be used to help understand the effects of these identity-related variations on market outcomes such as prices, sales, and profits.

4 Conclusion and Future Research

This paper focused on understanding the competitive effects of consumers' social identity. We showed how identity, ostracism, social group sizes, and identity difference between social groups affect consumer prices and competing sellers' profitabilities. These results have implications for understanding price and profitability differences between firms in the same market, or across countries and cultures which may differ in the prevalence of group identity and ostracism behaviors. Furthermore, with the increasing adoption of social media over time, there may arguably be changes in group identity and ostracism aspects over time. We also used these results to

draw some implications for competing firms' communication strategies. Specifically, we showed circumstances in which competing firms in a market differ, and circumstances in which they do not differ, in whether they find it optimal to use identity-activating communication strategy. Crucially, firms' optimal communication strategies are shown to depend on whether such communication highlights the identity aspect, the ostracism aspect, or the perceived difference in groups' identities.

Our model can be extended in a number of directions to gain further insights into this important topic.

First, we considered a single-period game. Social influence (identity gain and ostracism loss) can however change consumers' subsequent behavior. It is therefore worth investigating the effect of social influence on firms' decisions over time (Carvalho 2013). For example, after being ostracized, it is unclear whether consumers are more likely to conform to group norm or more likely to defect from it (White et al. 2012). This dynamic aspect of consumer behavior may affect firms' optimal pricing strategy and marketing messages.

Second, our model considers the situation where competing firms move simultaneously. If competing firms move sequentially, there might be different implications about identity-based marketing strategies. For example, if the first mover has already established its own identity, what would be the best identity-based marketing strategy for the second mover? By exploring this question, dynamic aspects of identity-based competition can be understood better.

Third, we focussed on group level analysis, and ignored in-group properties such as hierarchies, subgroups and so on. According to Bhattacharjee et al. (2014), such in-group structures affect the desire for conformity and desire for individual uniqueness. For example, if there are subgroups in a group, consumers tend to express their uniqueness rather than conformity. It would

be interesting to develop a model to understand the effect of in-group dynamics on consumers' choices and firms' strategies.

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Essay 2

Social Identity, Willingness to Pay, and Social Preferences:

An Experimental Study

Abstract

Based on social identity theory, we conducted a series of laboratory experiments to explore: (i) the effect of social identity on consumers' willingness to pay (WTP) for identity-associated products; and (ii) the effect of identity-induced consumptions on social preferences. We find that participants' WTP for identity-associated products is higher when they expect future interactions with others, which cause social preferences, than when they merely reveal their identity-induced consumptions to ingroup members. Furthermore, we find that identity-induced consumptions make participants' identity more salient in the dictator game. However, identity-induced consumptions play a different role in the trust game as they increase owners' credibility and authenticity rather than merely make owners' identity more salient. Our findings are consistent with the hypotheses that participants show the most altruism, trust and reciprocity to ingroup members with group associated products. Contributions and limitations of the research are discussed.

(**Keywords**: Consumer Behavior; Social Identity; Identity Induced consumption; Willingness to Pay; Social Preferences; Dictator Game; Trust Game; Experimental Economics.)

1. Introduction

Recently, there has been a burgeoning interest to embrace social identity theory in consumer behavior and economics (Akerlof & Kranton, 2000; Benjamin et al., 2010; Chen & Li, 2009; Oyserman 2009a, 2009b; Reed et al., 2012; Shavitt et al, 2009). Chernev et al. (2011) claim that the most dramatic change in marketing in the past decade has been that social identity matters for consumers when they consume products or brands more than before. Oyserman (2009a) suggests that links between brands/products and identity have been a main research stream in consumer research. This research stream has identified that consumers tend to choose products to show "who they are" and "how they are different from others" (Oyserman, 2009a, 2009b). In addition, Akerlof and Kranton (2000) suggest that identity is a central concept in explaining consumers' choices. In particular, Benjamin et al. (2010) show that individual's social identity plays a major role in economic decision making.

While there are many studies that investigate how consumers' social identity affects their consumptions (Akers, 1968; Aaker, 1999; Oyserman, 2009a, 2009b; Coleman & Williams, 2015; Amaral & Loken, 2016; Trudel et al., 2016) and how identity-induced consumptions affirm consumers' social identity (Ding et al., 2017; Dommer et al., 2013; Chan et al., 2012; Shavitt et al., 2009), there have been few studies to explore how identity-induced consumptions affect consumers' social and economic interactions with other consumers. This research question is important as it would help us understand not only consequences of identity-induced consumption in consumers' social and economic environment but also motivations of identity-induced consumptions.

The motivation of investigating how identity-induced consumption works in social and economic environment raises several questions. The first question is what consumers look ahead to by selecting identity-associated products. According to past literature, identity-induced consumption is a natural cognitive or/and emotional consequences of allocating attention to favor or defend self-concept (Coleman & Williams, 2015; Oyserman, 2009a, 2009b; Oyserman et al, 2007). As a result, past literature has focused more on expressing, affirming and protecting "self" as roles of identity-induced consumptions. However, what has been overlooked in the literature is that consumers might intentionally buy products associated to a particular identity to seek benefits from other consumers or more likely to facilitate positive relationships with others. Hence, by investigating the contexts where consumers value identity-induced consumption the most, we can identify whether identity-induced consumptions provide more meaning to consumers than just self-affirmation or enhanced self-identity.

The next question is about what outcomes identity-induced consumptions bring into consumers' interactions with others. This question is actually about how identity-induced consumption affects social preferences. Past research has shown that social preferences play an important role in economic environment such as a determining factor in who we want to cooperate with and who we want to compete with (Fehr & Fischbacher, 2002; Camerer, 2003; Li et al., 2011). While past research has strongly agreed that social preferences come from group membership, researchers have not given much attention to the role of identity-induced consumption in social preferences. The most common type of social preferences is ingroup bias. People usually tend to treat in-group members better than out-group members (Charness et al., 2007; Tuner et al., 1987). This in-group bias is regarded to come from generalized reciprocity. That is to say that people have belief that if they treat in-group members well, then their goodness will be paid back some day by

any of group members (Yamagishi & Kiyonari, 2000). Having established the robustness of in-group bias across social and economic environments, the question may now be asked whether identity-induced consumption changes consumers' belief about the reciprocity toward in-group members and out-group members.

There are several challenges that may explain why there are few studies of measuring the value of identity-induced consumption and its effect on social preferences. First, when conducting empirical research in identity-induced consumption, it is hard to identify whether particular consumptions are triggered by consumers' social identity or not. Furthermore, it is hard to be sure which of various social identities each consumer has triggered that consumption. In order to make sure that the observed consumers' choice data is triggered by the particular social identity of interest, an experimental design is needed to associate consumers' choices to a particular social identity. A second challenge is that it is not an easy task to measure consumers' valuation of a particular product empirically. Consumers' valuations for the specific product may vary according to their outside options or their income level. Hence, it is not easy to attribute their valuation of specific products to social identity effect. The third challenge is that it is not easy to pin down the identity effect on consumers' interactions. This difficulty comes from two reasons. First, social identity is fluid, multiple and context constructed (Turner et al., 1987; Oyserman, 2009a, 2009b). As a result, it is hard to tell which social identity has been primed to cause specific decision making from mere observations. Secondly, reciprocities are also governed by various causes beyond social identity, such as cultures, ethics, and individual value systems and so on. Hence, we need to construct well controlled research environment to sort out various contaminating factors that might cause social identity effects or/and reciprocal behavior. The fourth challenge is that it is not easy to measure the direct benefits caused by identity-induced consumption during interactions from

mere observations or a survey. In order to attribute any benefit during interactions to identity-induced consumption, diverse factors that might cause biases during interactions, such as appearances, gender and so on, should be eliminated.

To answer our research questions while overcoming these above-mentioned challenges, we conducted a series of computer mediated lab experiments. The treatment session had four main rounds. First, subjects were assigned to one of two groups based on their choices between two types of paintings made by Kandinsky or Klee. Second, participants were allowed to engage in computer mediated group interactions to solve tasks. Third, we measured participants' values of identity-associated products, mugs in this case, with Becker-DeGroot-Marschak (BDM) auction method (Becker, DeGroot & Marschak, 1964). After purchases had been made by participants, they played one of two economic games -- Trust Game (Berg, Dickhaut, and McCabe 1995) or Dictator Game. In this round, participants' purchases and their group affiliations were revealed to their co-players.

We obtain four main findings. First, participants' willingness to pay for identity-associated products was strongly significantly higher in the treatment session where they expected to play economic games with other participants than the control group sessions where (i) participants' purchases were revealed to their group members without playing economic games, or (ii) participants purchased the products based on their tastes. The implication of the treatment sessions was that participants could expect that social preferences might happen in the next round.

Second, in terms of inequity aversion concern (dictator game), participants showed significantly stronger preferences to ingroup members who bought their own group mugs than others. Interestingly, there was a pattern that participants shared more money with outgroup members who did not buy their group mugs than with outgroup members who did buy the group

mugs. Third, in terms of trust (trust game), participants showed significantly more trust to ingroup members who bought the group mugs than to others. Unlike inequity aversion, participants showed more trust to outgroup members who bought the group mugs than to outgroup members who did not buy the group mugs. Fourth, trustees reciprocated more with ingroup members who bought group mugs. However, when they reciprocated with outgroup members, they showed more positive reciprocity with outgroup members who bought group mugs.

Our results have important theoretical and substantial implications. First, our results suggest that under some circumstances, identity-induced consumptions have more meanings than group affiliation in social preferences. In social psychology and economics literatures, social preferences have been mostly associated with group affiliations. This study identified that ingroup bias did not always happen when we considered identity-induced consumption. Moreover, identity-induced consumption triggers ingroup favoritism to work in the contexts where ingroup favoritism does not exist. Second, past literature has emphasized the benefit of identity-associated products in terms of identity confirmation or enhanced self-identity. However, we identified the contexts where identity-induced consumptions can give customers more benefits than identity confirmation or enhanced self-identity. This finding leads us to suggest that the benefits of identity-induced consumptions should be understood in the relationships with other consumers as well. Third, our study identified how people interpreted signals coming from identity-induced consumption according to the contexts. These findings lead us to understand diverse meanings of identity-induced consumptions. Generally, this research contributes to the marketing literature by showing the circumstances where consumers value identity-associated products more, and how identity-induced consumption plays an important role in social and economic environments.

1.1Social Identity and Consumption

Social identity is defined as a person's sense of self derived from perceived membership in a social group (Turner et al., 1987). Social identity theory explains that a social category where people belong defines who they are in accordance with the distinctive features of that social category. A social category usually describes and prescribes members' attributes with its distinctive characteristics. Hence, one's social identity becomes the salient basis for self-regulation which leads her behavior to follow in-group norms and stereotypes. These in-group norms and stereotypes not only prescribe members' behavior and attitudes but also evaluate other in-group members and out-group members. Due to the evaluative function of social identity, in-group members are strongly motivated to conform to in-group behavior so that they are not excluded by other in-group members. Due to these prescribing and evaluating functions of social identity, social identity is the strong basis to draw one's self-esteem and value from. As a result, it drives consumers to conform to in-group norms and stereotypes in order to achieve their utility.

Consumers usually choose brands or products congruent with their identity especially when the identity issue is evoked (Aaker, 1999; Oyserman, 2009b). In other words, consumers show who they are by consuming specific products and brands. Products inspire consumers to make identity-congruent choices to the degree to which the products symbolize specific values, represent social classes or reference groups, express higher status and show opinions in public (Oyserman, 2009b). Chae et al. (2017) suggest that consumers even feel their social identity threatened when they get negative information concerning a product or brand that represents their social group. Oyserman et al. (2007) find that subjects primed as minority tended to undermine health related information. Alcohol use and exercise appeals were also related to what identity subjects were primed to (Cooper et al., 2002; Werch et al., 2003; Oyserman, 2009b). Ahluwalia et al. (2002)

claim that urban African Americans showed a particular pattern of smoking: these smokers usually tend to choose menthol cigarettes and like to smoke within 10 mins after wake-up. Also, Han & Shavitt (1994) find that while European Americans were more attracted to a laundry detergent when it appealed to their individual value, Koreans were more likely to buy a detergent when it appealed to the family-oriented value. In brief, these examples demonstrate that consumers' choices are likely to reflect their social identity which is related to group's attributes and normative behavior.

When consumers' choices are identity-based, consumers' choices are congruent with group norms or group attributes. When their choices are not congruent with their identity, they feel uncomfortable or anxious with their choices or even undermining their welfare (Akerlof & Kranton, 2000). More than that, there is punishment for in-group members who deviate from group norms in order to maintain in-group members' identity distinctive from out-group members. This penalty for the deviation happens because other in-group members' behavior matters for one's social identity. When group members see the deviation from group norms, those group members' social identity is also threatened. As a result, in-group members are likely to restore their threatened identity by punishing the deviator in their group (Akerlof & Kranton, 2000; Carvalho, 2013). Based on these arguments, we anticipate that the one with identity congruent consumption will be rewarded by group members but the one with identity incongruent consumption will be punished especially where the consumptions are tightly associated with group norms.

While these findings and speculations show how identity-induced consumptions play within groups, and how identity-induced consumptions are associated with self, there are few studies that have explored the consequences of identity-induced consumptions in the context where consumers interact with in-group members as well as out-group members. Hence, it is an important

question to explore how consumers show social preferences to outgroup members as well as ingroup members based on their identity-induced consumptions.

1.2 Social Identity and Social Preferences

Summarizing 15 years of social identity research, the most common findings in social identity literature is ingroup favoritism and discrimination against the outgroup (Tajfel & Turner, 1986; Akerlof & Kranton, 2000; McLeish & Oxoby, 2007). Ingroup bias or favoritism can take various forms: increased cooperation and altruistic behavior (Goette et al., 2006; Schram & Charness, 2015; Wichardt, 2008), increased reciprocities in markets (Li et al., 2011), and decreased or increased punishment according to group norm's characteristics (Chen & Li, 2009; McLeish & Oxoby, 2007; Butler et al., 2013). Also, ingroup favoritism has been found in various type of groups ranging from tribes to societies (Butler et al., 2013). These omnipresent phenomena imply that group affiliation is the main channel to direct social preferences. As a result, social identity affects consumers' economic outcomes through social preferences (Akerlof & Kranton, 2000).

Social preference is referred to other-regarding preferences. It is well proven in the economic research that other-regarding preferences play an important role in individual economic decision making (Fehr & Fischbacher, 2002; Li et al., 2011). Consumers exhibit social preferences if the consumer not only cares about her payoffs but also cares about other consumers' payoffs (Fehr & Fischbacher, 2002). Among many types of social preferences, three types of social preferences have generally been focused on to draw economic implications of consumers' social preferences on their decision making (Fehr & Fischbacher, 2002; Galizzi & Navarro-Martinez, 2019). First type of social preference is inequity aversion. Inequity averse consumers want to achieve an equitable distribution of their exclusive resources. This means that they show altruistic

tendency toward relevant referent others. Second type of social preference is reciprocity or reciprocal fairness. Reciprocal consumers tend to respond to others' favors with favors. It is a propensity to be kind or unkind, conditional on referent others' past behavior. Reciprocity and inequity aversion are different from the next type of social preferences, which is trust, in that both types are not driven by the expectation of future material benefit (Fehr & Fischbacher, 2002). However, the third type of social preferences, trust, usually is driven by the future positive reciprocities (Berg et al., 1995; Fehr & Schmidt, 1999; Pech & Swicegood, 2013). Consumers are willing to share their resources with referent others by whom they expect to be paid back. This is a risky decision for consumers to make because they need to move first to share their resources to build a virtual circle of positive reciprocities (Camerer, 2003). These three types of social preferences play important roles in economic environments by affecting competition and cooperation based on consumers' social identity (Fehr & Fischbacher, 2002).

In marketing literature, it is well established that consumers tend to express who they are with their consumptions (Oyserman, 2009a, 2009b). Consumers craft their identity by their consumptions to present self in terms of their preferences and values (Dolfsma, 1999). In other words, consumptions signal how one perceives herself and how one wants to be perceived by others. Hence, consumptions represent social, interpersonal, and moral dimension in consumers' lives (Starr, 2004). According to Starr (2004), In order for consumptions to work this way, two aspects of consumptions are needed. First, using consumption to signal consumers' identity depends on visibility of the consumption. The symbolic meaning of the consumption should be delivered to others in visibility. Second, the symbolic value of the consumption should be shared with other consumers. This shared notion of the meanings of consumptions crafts consumers'

identity in terms of preferences, values, even morality. As a result of these conditions, consumers form their perceptions about others based on their consumptions.

This pattern has more significant meaning on social preferences if the consumptions are induced by consumers' social identity. These identity-induced consumptions make their social identity more salient to themselves and to others so that those consumptions lead to affect both parties' decision making. According to McLeish & Oxoby (2011), as social identity is salient, social preferences plays more important role in social preferences. Also, by choosing group-associated products, consumers increase consistency between their identity and their behavior. By doing so, they can create authenticity and credibility which lead others to form an impression of owners' personality. While it is well established that consumers craft their social identity with their consumptions to signal consumers' identity to others, there has been no research to explore what kind of consequences the identity-induced consumptions bring into social preferences.

The remainder of this paper is organized as follows. We present the experimental design and hypotheses in Section 2 and discuss the data and analyses in Section 3. We then conclude with some remarks in Section 4.

2. Experimental Design and Hypotheses

2.1 Overview of the Experimental Design

There are two purposes of our experimental design. First, this design is for investigating whether social identity increases consumers' willingness to pay for identity associated products and if so, under what circumstances consumers value the identity associated products most. The second purpose of our experimental design is for investigating how identity-induced consumption affects social preferences towards ingroup members and outgroup members. To the best of our

knowledge, this experimental design with these research purposes is the first attempt in the marketing literature or the experimental economic literature.

The experiment consisted of 4 types of sessions: 1 type of treatment and 3 types of controls. In the treatment sessions, there are 5 stages. The first stage was a hypothetical round of buying one of two products with BDM auction method (Becker, DeGroot & Marschak, 1964). The second stage was a round of group assignment. Participants were assigned to one of two groups based on their choices of five pairs of paintings made by two modern artists, Klee and Kandinsky, with one painting within each pair by Klee and the other by Kandinsky (Chen & Li, 2009). The third stage is a round of group interactions to solve problems with ingroup members. The fourth stage is a real buying round to purchase the group associated products with BDM method. The last stage is a round of two-person economic game. In this stage, participants were engaged in one of two economic games: Dictator Game or Trust Game. In the next section, the details about the treatment session will be addressed.

We had three types of control sessions. These control sessions addressed the following objectives. First, control session 1 (WTP with Identity Only) was for isolating identity revealing effect on willingness to pay from what might occur in the full interactions in the treatment session. The past literature has suggested that consumers get satisfaction by making a choice that is congruent with their social identity and by presenting identity-congruent self to others (Akers, 1968; Aaker, 1999; Oyserman, 2009a, 2009b; Coleman & Williams, 2015). To investigate the instrumental value of identity-induced consumption expected from social preferences, it is necessary to isolate the identity revealing satisfaction from the expected benefit from the interactions with others. Otherwise, it is hard to tell whether an increase of consumers' willingness to pay for the identity-associated product comes from the identity revealing satisfaction or from

expected benefit from others during the interactions with them. For this purpose, we kept everything the same but the last stage in the treatment session and replaced an economic game with the identity revealing stage.

Second, control session 2 (WTP Only) was for measuring participants' willingness to pay for the products without group association. In this session, we measure consumers' willingness to pay for the products as a base line to compare with the willingness to pay for the identity-induced consumption. For this purpose, participants reviewed the same 5 pairs of paintings as in the treatment session to match the condition where the purchase happened in the treatment session. While reviewing the paintings, participants knew the paintings made by Klee and Kandinsky but did not know which one was painted by whom to prevent themselves from self-assigning into one of two groups. After that, they had a round where they bid on one of the same two products with the treatment session.

Third, control group 3 (Economic Game Only) was for investigating ingroup favoritism and outgroup discrimination without identity-induced consumption. The purpose of this session was to investigate whether ingroup favoritism and outgroup discrimination actually happened in this experimental setting without identity-induced consumptions so that we were convinced that identity-induced consumption changed the pattern of ingroup favoritism and outgroup discrimination. In order to do so, we kept every stage the same with the treatment sessions except the purchase stages.

2.2 Stages of Treatment Sessions and Hypotheses

***Stage 1. Hypothetical Round of inducing willingness to pay (WTP)*:** Since inducing consumers' valuation is one of the key parts of our experiments, we chose the Becker-DeGroot-Marschak (BDM) mechanism (Becker et al., 1964) instead of hypothetical statement for revealing WTP (details about BDM will be addressed in the stage 4). It is well known that the rules of BDM are complicated for participants to understand, and that many practices are necessary for them to succeed in playing this method right (Bushong et al., 2010; Plott & Zeiler, 2005). In order to do this, the participants were told to play 7 periods of the BDM auction. Before starting to practice the BDM, they were informed that those periods were hypothetical so that they did not buy the products actually. Also, they were well aware of the purpose of those periods that they should learn how to buy a product for next round. For this round, we used the same category of the products (mugs) that we used for the real buying round (stage 4); but not the same products to prevent the participants from growing their taste for or from getting tired of the products during 7 periods of the BDM. This ensured that this grown taste or satiety couldn't affect their WTP for the products in the real buying round. Figure 1 shows the products used in the hypothetical round of the BDM.

Figure 1: *Mugs used for the hypothetical round*

***Stage 2. Group Assignment*:** In social psychology research, minimal group paradigm has been usually used for social identity research. The minimal group paradigm is called "equal but different group", which means that every condition in groups is the same but group names. According to Tajfel & Turner (1986), the minimal group paradigm has several unique features in terms of group formation and maintenance. First, participants are assigned to each group randomly. Second, group membership is completely unknown to group members and outgroup members. Third, any type of social interactions is not allowed including computer mediated interactions. However, according to previous literature, the minimal group paradigm did not work well in many cases of economic games because players' economic stakes are usually higher in economic games such as dictator game, ultimatum game and trust game than in games used in social psychology such as other-other allocation (Chen & Li, 2009; Butler, 2014; Charness et al, 2007; Eckel & Grossman, 2005; McLeish & Oxoby, 2011). Moreover, our experiment was designed to induce demands for the group associated products. Hence, for the group assignment, we followed the group assignment process and maintenance employed by Chen & Li (2009) to induce stronger group identity than minimal group paradigm.

All sessions where group assignment was needed employed the same methods as follows. Participants reviewed five pairs of paintings by Klee and Kandinsky who are modern artists: One painting is by Klee and the other is by Kandinsky in each pair. Participants were told to choose one painting that they preferred in each pair. During this process, they were not informed about who painted which paintings. Based on their preferences in 5 pairs of the paintings, each participant was assigned into either "Klee group" or "Kandinsky group" and this information was provided to each participant privately. As a result, group membership was preserved anonymously.

However, after group assignment, they were informed about the size of their own group and outgroup which was 50:50 of ingroup versus outgroup.

***Stage 3. Computer mediated group interactions*:** right after the group assignment, the participants were engaged in computer mediated ingroup interactions. They were told to solve two quizzes on whether Klee or Kandinsky made each of two additional paintings. Before they started the quizzes, they received an answer key that illustrated five paintings made by Klee and five paintings made by Kandinsky used in the group assignment. Based on this answer key, they solved two questions about two additional paintings. They were told that they will get additional payoffs for the correct answers (10 points for each, $1). Also, they were allowed to get help from only in-group members for 7 minutes before starting to solve questions. Their interactions occurred only via a chat box online and all messages were shared among only ingroup members.

***Stage 4. Real Buying Round*:** After the group interactions, the participants were asked to bid on one of two identity-associated mugs. In this round, participants had only one shot to bid on one of two products.

Regarding the evaluation of valuation for the product, there is strong evidence of discrepancies between stated valuation and actual behavior (Tebbe & von Blanckenburg, 2018; Miller et al., 2011; Wertenbroch & Skiera, 2002). Thus, in order to measure consumers' real valuation for the product, economic incentive compatible auctions are preferred over hypothetical methods. A key feature of auction methods is "incentive compatibility". The purpose of the incentive compatible auction method is that If participant's true value is "x", the auction method should lead her to bid exactly "x" on the product. Among various incentive compatible valuation eliciting mechanisms, BDM auction method is well known for being suitable for eliciting

consumers' real WTP and being close to actual shopping behavior (Wertenbroch & Skiera, 2002; Miller et al., 2011).

The core features of BDM are as follows. First, participants are asked to bid on a particular product with a certain range of prices. And then, a random price is selected by an experimenter or a third party within the range of the prices. If a participant's bid is higher than the random price, she will get the product at the random price, but if a participant's bid is lower than the random price, she won't get the product but keep the money (Kahneman et al., 1990). The key feature of BDM that makes it incentive compatible is that market price for the product is set at random. Hence, by bidding lower than her true valuation, she cannot lower the market price for the product but increases the chances to lose the product. By this logic, if her valuation of the product is high, then bidding high price on the product is the only way to get the product (Miller et al., 2011).

In our experiment, BDM bidding trials were structured as follows: First, participants received an endowment of 50 points ($5) to bid on one of the identity-associated products. Two identity associated products were used: a green mug with letters of Kandinsky and a blue mug with letters of Klee. Figure 2 shows the two identity-associated mugs. Two photos of the identity-associated mugs were shown to participants first. Then participants bid on one of two products, a green mug with Kandinsky or a blue mug with Klee. After the participants finished bidding on the products, the computer automatically selected a random price from 0 to 50 points with the same probability. If a participant's bid was lower than the random price, she received the message that she will not get the product, but she will keep the money. If a participant's bid was the same or greater than the random price, she received the message that she will get the product at the random price and she will keep the rest of the endowment (if any). Especially, in this round, before starting to bid on the products, the participants were informed that their purchases and group affiliations

will be revealed to co-payers in the next round. However, they were not informed at all about what kind of activities they will be engaged in at the stage of the bidding round.

To compare the participants' willingness to pay for the identity-associated mugs, we had two types of control sessions as mentioned earlier. In control session 1 (WTP with Identity Only), the same BDM procedures were employed. However, in this session, before starting to bid on the products, participants were informed that their purchases will be revealed to ingroup members automatically at the end of the experiment. In control session 2 (WTP Only), the same BDM procedure for the same products were also employed without the group assignment. In this session, participants were induced to bid on the product based on their tastes.

Hypothesis 1: *Participants' WTP for the mugs will be higher in the treatment session than in control session 1 (WTP with Identity Only) and in control session 2 (WTP Only).*

Figure 2: *Mugs used for the real buying round and control sessions*

Stage 5a. Dictator game: After bidding on one of two identity-associated mugs, the participants engaged in 10 periods of the dictator game or 10 periods of the trust game. In the dictator game, the sender decided how much of her endowment will be sent to the receiver. However, the receiver simply received the amount sent by the sender. As a result, the senders' payoffs were the rest of the initial endowment after sending the money to the receiver, if any, and the receiver's payoffs were whatever amount the senders sent. The Nash equilibrium in the dictator game is that sender sends "0" and receiver gets nothing. However, empirical research shows a different result from this theoretical prediction such that, on an average, only about 20% of the offers are zero (Camerer, 2003; Falk & Fischbacher, 2006). The motivation to share money with co-payers is regarded as inequity aversion or altruism that cannot be explained by the Nash Equilibrium.

In our experiment, only senders received an endowment of 50 points ($5), and then they could send the receivers between 0 to 50 points. Senders were informed about co-players' group affiliations and their purchases. However, receivers were not informed about any of this information about their co-players. Roles and co-players were randomly assigned newly in each period. To minimize learning over periods, the participants were never informed of the outcomes of any game in any period until the end of the experiment. Finally, they were told that one period out of 10 will be selected randomly for their payoffs.

One reason why the dictator game has been used so often in experiments is the non-strategic nature of this game (Krupka & Weber, 2013). The players in the dictator game do not need to be concerned about their co-player's responses, unlike in the ultimatum game. Senders simply send (or do not send) money to receiver without thinking about receivers' next move. For this reason, the dictator game reflects senders' clear and simple attitude to receivers, which is

whether “I want to share my money with her or not”. The other reason is the simplicity of this game. The dictator game is so straight forward for even naïve participants to understand and to play. Also, it allows researchers simple explanations for their results. The dictator game was employed in our experiments because it could show participants’ straight forward attitude to the identity-induced consumption without complicated interpretations.

Dictator game appears somewhat extreme to even researchers. However, the implications of the dictator game are not as extreme as they appear. The contexts where the dictator game is applied are not different from what we confront every day. Imagine the situation where we have to decide whether we want to share some exclusive information with our co-workers who are possibly not much around us, or where we are asked to introduce somebody to a very important person who we exclusively know. These are some examples that consumers confront often, and in which their payoffs decrease by sharing exclusive information or access to an important person with others. Hence, it is important to know how identity-induced consumption plays a role in consumers’ decision making in these contexts by investigating the dictator game.

The main prediction in this game is that the participants care about fairness or altruism more for the ingroup members with an identity-associated product than for ones without an identity-associated product because identity-induced consumption makes their social identity more salient. However, it is not clear how the participants behave with outgroup members based on their identity-induced consumptions. They might show fairness concern more to outgroup members without their identity-associated products because that does not make outgroup identity salient. Or the participants might show fairness concern more to outgroup members with identity-associated products because identity-associated products increase owners’ authenticity and credibility.

Hypothesis 2a: *Participants will send more money to ingroup members who bought their own group mug than to ingroup members who did not buy their own group mug.*

Hypothesis 2b: *Participants will send more money to outgroup members who bought their own group mug than to outgroup members who did not buy their own group mug.*

Hypothesis 2c: *Participants will send more money to outgroup members who did not buy their own group mug than to outgroup members who bought their own group mug.*

Stage 5b. Trust game**:** While only the sender engages in an active role to allocate money in the dictator game, both parties are engaged in allocating money with each other with sequential moves in the trust game. In this game, a sender receives an amount of money S from the experimenter, and then can send any amount, s, between zero and S to the receiver. After that, the experimenter triples the amount sent by the sender, 3s, and then gives the receiver 3s. The receiver can then give some amount y, between 0 and 3s, back to the sender. As a result, the sender will get (S – s + y) as her payoff and the receiver will get (3s – y) as her payoff. The amount sent by the sender is a measure of "trust", while the amount of sent back from the receiver is a measure of "reciprocity" or "trustworthiness". The trust game is similar to the dictator game in a way that the receiver is the final player to decide whether she shares her money with her co-player or not. However, the difference in her move is that her endowment came from her co-player. This part makes a big difference from the dictator game because giving it back is more complicated than splitting an endowment. In the trust game, giving it back is not just allocating the money but

deciding how to respond to the person who gave the money. Hence the receivers' move is regarded as trustworthiness or reciprocity rather than inequity aversion or altruism.

The unique subgame-perfect equilibrium in this game is that the sender will send nothing to the receiver expecting the receiver to not give anything back to the sender. However, empirical evidence has shown that on an average, senders send around 50% of their endowment and receivers repay less than half of whatever they received from the senders. Moreover, the amounts receivers repay usually increase with the amount that senders sent (Berg et al., 1995; Camerer, 2003; Johnson & Mislin, 2011). This means that receivers, on an average, tend to respond to senders with positive reciprocity.

Trust game has important implications on economic outcomes. First, positive reciprocity has an important implication on economic transactions. A lot of economic transactions depend on informal agreements or incomplete contracts. Even under explicit contracts, the terms are rarely complete and so there are always some parts of transactions that depend on agents' good will such as trustworthiness or positive reciprocities. Second, trust is a good indicator of how effective a society or an institute works. Higher level of trust is an indicator of higher level of social capital and is associated with more efficient judicial systems, higher quality government bureaucracies, lower corruption, and greater financial development (Johnson & Mislin, 2011). However, decision to trust someone is risky because this decision is made based on the expectation of the future reciprocity, which is not certain at the moment. Hence, who to trust is an important decision for consumers. Usually consumers trust those who look trustworthy, which is one of the reasons why ingroup bias occurs (Simpson, 2006). Since it is well established that consumers signal who they are with their consumptions, we can anticipate that consumers take into account others' identity-induced consumptions as a basis to decide who to trust and how to respond to trustor.

In our experiment, the senders received 50 points of the endowment. They could send any amount between 0 to 50 points. Unlike the dictator game, senders and receivers were informed about co-players' group affiliations and purchases before they started to make a decision. They played 10 periods of the trust game. In this game, co-players were randomly assigned newly in each period. However, their roles remained the same during 10 periods because unlike senders, the receivers could find how much money the sender sent to them and this information might cause attitude change that we did not intend when the receivers came to play senders. Hence, the role was fixed through the periods. Once again, to minimize learning over periods, the participants were never informed of the outcomes of any game in any period until the end of the experiment. Finally, they were told that one period out of 10 will be selected randomly for their payoffs.

The main prediction in this game is that the participants will trust more ingroup members with their own identity-associated products than ingroup members without identity-associated products. The insight under this prediction is that the identity-associated product makes their group more salient and this salience gives the participants higher expectation of the future reciprocity. In other words, identity-induced consumptions play an important role in reducing uncertainty involved in the decision making on who to trust. Likewise, receivers will show higher level of positive reciprocity to the ingroup members with their own identity-associated products than ingroup members without identity-associated products since identity-induced consumptions make their identity salient. However, like the dictator game, it is not clear how participants respond to outgroup members based on their identity-induced consumptions. They might show more trust or positive reciprocity to outgroup members without their identity-associated products because that doesn't make outgroup identity salient. Or the participants might show more trust or positive reciprocity to outgroup members with identity-associated products because identity-induced

consumption increase owners' authenticity and credibility, which is more important in the trust game since receivers have a chance to think about the senders' intentions before they decide how much they repay to senders (Charness & Rabin, 2005; Falk & Fischbacher, 2006).

Hypothesis 3a.a: *Senders will send more money to ingroup members who bought their own group mug than to ingroup members who did not buy their own group mug.*

Hypothesis 3a.b: *Receivers will show higher reciprocity to ingroup members who bought their own group mug than to ingroup members who did not buy their own group mug.*

Hypothesis 3b.a: *Senders will send more money to outgroup members who bought their own group mug than to outgroup members who did not buy their own group mug.*

Hypothesis 3b.b: *Receivers will show higher reciprocity to outgroup members who bought their own group mug than to outgroup members who did not buy their own group mug.*

Hypothesis 3c.a: *Senders will send more money to outgroup members who did not buy their own group mug than to outgroup members who bought their own group mug.*

Hypothesis 3c.b: *Receivers will show higher reciprocity to outgroup members who did not buy their own group mug than to outgroup members who bought their own group mug.*

Figure 3 shows the flow of the treatment session and Table 1 shows features of the experimental sessions. The instruction for the treatment session is attached to the Appendix A.

Figure 3: *The flow of the treatment session*

Table 1: *Features of the experimental sessions*

	Treatment	Control 1 WTP with Identity Only	Control 2 WTP Only	Control 3 Economic Game Only
Hypothetical Bids with BDM	✓	✓	✓	
Group Assignment	✓	✓		✓
Group Discussion	✓	✓		✓
Real Bid with BDM	✓	✓	✓	
Revealing the Purchase to Ingroup		✓		
Dictator Game or Trust Game	✓			✓

2.3 Summary of the Experiments

We conducted one treatment group and three controls groups as the features of each session are shown in Table 1. We have a total of 8 independent sessions. At the end of each session, a post-experiment survey was administered to check if participants were manipulated into the right groups and to ask about their game strategies and demographical characteristics. The survey is attached to the Appendix B. Table 2 summarizes the number of sessions and participants. Experimental participants were recruited from among undergraduates through the ESSL

(Experimental Social Science and Laboratory) at University of California, Irvine. Each subject participated in exactly one session. All sessions in the experiment were conducted in the ESSL at University of California, Irvine from October 2019 to February 2020. We used o-Tree (Chen et al., 2016) to program our experiments. Each treatment session lasted around one hour, while each control session lasted about 30-45 minutes. The exchange rate was set to 10 points for $1. Each participant was paid a $7 show-up fee. Average earnings for the participants in the treatment sessions were $17.7. and $13.2 for those in the control sessions. Females were 98 and males were 60 in all sessions.

Table 2: *Summary of the experimental sessions*

	No. Sessions	No. Participants (A)
Treatment Session	4	80 (80)
Control 1 (WTP with Identity Only)	1	20 (20)
Control 2 (WTP Only)	2	38 (38)
Control 3 (Economic Game Only)	1	20 (20)
Total	8	158 (158)

Note: (A) Indicates the number of participants used in data analysis

3. Results

In this section, we first investigate how group identity affects participants' willingness to pay for identity-associated products. And then we examine how identity-induced consumption affects social preferences by analyzing the dictator game and the trust game.

3.1 Group Identity and Consumers' Willingness to Pay for Identity-Associated Products

As explained in the earlier section, in order to investigate the effect of participants' group identity on the identity-associated products, we categorized conditions into three groups. In the first group (treatment), before starting to bid on the mugs, participants were aware that they will move on to the next stage where their group affiliations and purchases will be revealed when they play the game. In the second group (WTP with Identity Only), participants were told that their purchases will be revealed to ingroup members before starting to bid on the mugs. In the third group (WTP only), participants bid on the mugs based on their tastes without group affiliation.

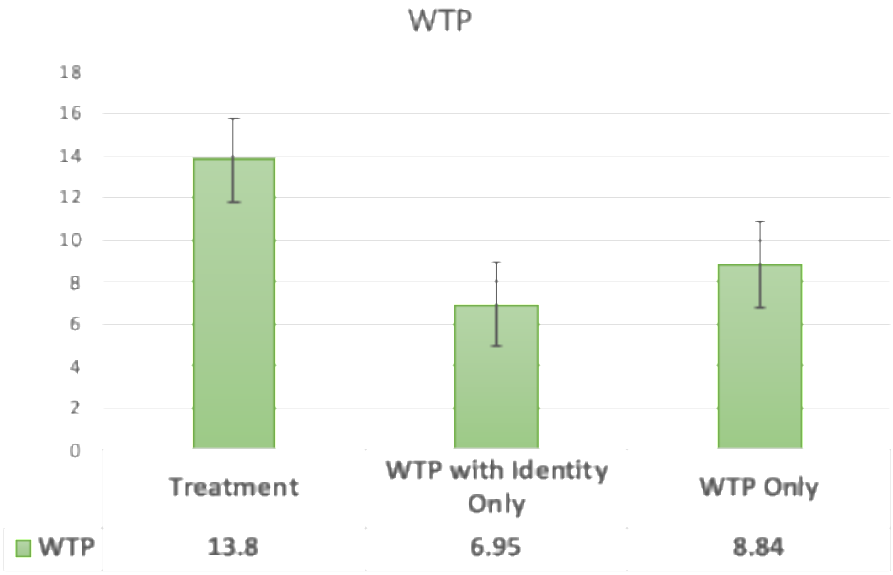


Figure 4: *Means of WTP by group*

Figure 4 shows that the participants' WTP for the identity-associated mugs in the treatment session was higher than the ones in WTP with Identity Only and in WTP Only. This is the pattern we anticipated about the group identity effect on identity-induced purchase. In order to investigate the statistical significance of this pattern, we ran a regression with robust standard errors. Table 3 shows that the participants' WTP in the treatment session is significantly higher than ones in WTP with Identity Only and WTP Only.

Table 3: *OLS regression with robust std. err.: WTP*

	Dependent Variable: WTP
	Coef. (Robust Std. Err.)
WTP with Identity Only	-6.649 (2.025)***
WTP Only	-4.856 (2.102)**
Gender (Base: Male)	-5.366 (2.218)**
Constant	17.087 (2.313)***
N	138
R^2	0.1

Base Group: WTP with Games
** indicates $p \leq 0.05$; *** indicates $p \leq 0.01$

This result shows that participants valued identity-associated products most when they expected to have later interactions with other participants. The only difference between the treatment session and WTP with Identity Only was whether participants could expect the social preferences in the next round. WTP with Identity Only induced the participants to reveal their purchases to other ingroup members. This session allowed participants' subjective satisfaction by revealing their identity-induced consumptions to others. However, this session did not allow the

participants any chance of further benefits that the identity-induced consumptions might bring into the interactions with others. The result confirmed our prediction that participants valued identity-induced consumption when they expected instrumental benefits from identity-induced consumptions.

This result provides an important insight to the marketing literature and to marketing practitioners by showing that the instrumental value of identity-induced consumptions can generate higher WTP than that generated by the self-confirmation or enhanced self-identity benefit of identity-induced consumptions. In this finding, we can see consumers who actively exploit identity-associated purchases to seek further benefits from others rather than just confirming their identities to others with their consumptions. In addition, we tested if the WTP in the WTP Identity Only and the one in WTP Only were statistically different. According to the results, WTP in the WTP with Identity Only was not significantly different from the WTP in the WTP Only (prob > F = 0.35). This result shows that social identity effect on consumption might be as trivial as nothing if consumers do not expect any further benefit from identity-induced consumptions. Another interesting finding is that gender effect was statistically significant in a way that female participants' WTP is lower than male participants' one.

Result 1: *Participants' WTP for identity related products are significantly higher in the treatment than the ones in WTP with Identity Only and in WTP Only.*

Result 2: *There is no significant difference of WTP in between WTP with Identity Only and WTP Only.*

3.2 Identity-Induced Consumptions and Inequity Aversion (Dictator Game)

In the dictator game, only senders were informed about their co-players' group affiliations and their purchases before they decided to send money or not. The frequency of distribution of senders' offers in the dictator game is shown in Figure 5. The red line in X-axis is marked at the half amount (25 points) of a sender' endowment. Normal density distribution was superimposed. 42% of the participants sent "0" to receivers.

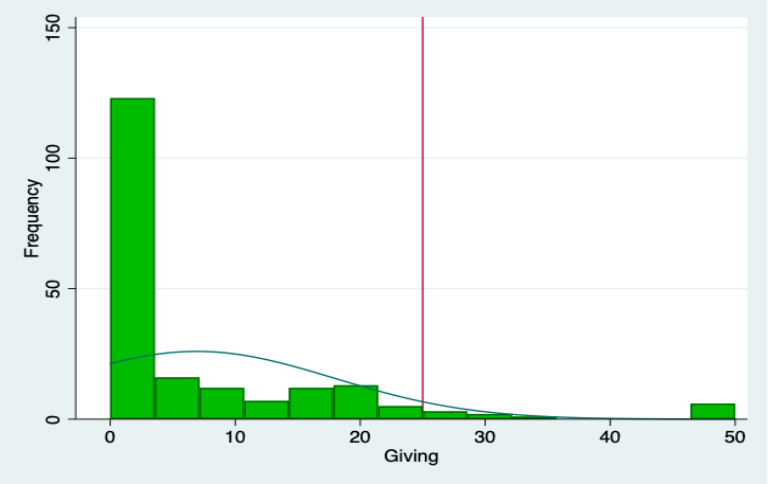


Figure 5: *Frequency distribution of senders' offers in the dictator game*

Table 4 shows the mean of offers made by the participants who bought the group associated mugs (P-I) and the participants who did not buy the group associated mugs (P-N). The result shows that P-I sent more money to their co-players than P-N. In addition, it shows that the amount sent to receivers varies according to their group affiliations and purchases. We could find that the highest amount was sent to ingroup members with group mugs and the least amount was sent to outgroup members with group mugs.

Table 4: *Mean of offers made by senders and sent to receivers*

Sender	Mean (Giving)
P-I	9.704
P-N	4.906

P-I: Participants with group mugs
P-N: Participants without group mugs

Receiver	Mean (Giving)
I-I	10.88
I-N	7.601
O-I	3.169
O-N	5.836

I-I: Ingroup members with group mugs
I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs
O-N: Outgroup members without group mugs

Table 5 shows the mean of the amount sent in pairs. The interesting finding is that senders with group mugs sent more money to outgroup members without group mugs (6) than to outgroup members with group mugs (5) and this amount is similar to the one sent to the ingroup members without group mugs (2). This shows that the participants treated outgroup members without group mugs as their ingroup members without group mugs. Considering ingroup favoritism being played, it is surprising that they treated some of outgroup members (evidently, those without group mugs) at the ingroup level.

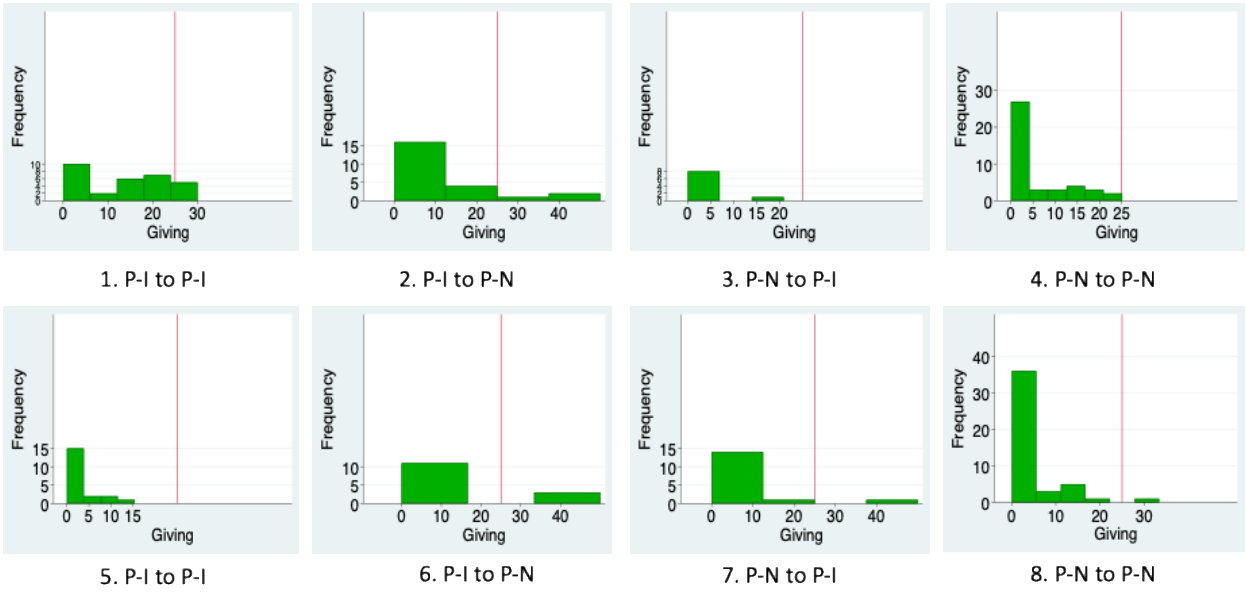
Table 5: *Mean of offers in pairs ("Sender to Receiver")*

Sender	Mean (Giving)
P-I	9.704
P-N	4.906

P-I: Participants with group mugs
P-N: Participants without group mugs

Receiver	Mean (Giving)
I-I	10.88
I-N	7.601
O-I	3.169
O-N	5.836

I-I: Ingroup members with group mugs
I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs
O-N: Outgroup members without group mugs



1-4: pairs in the same group, 5-8: pairs in the different groups
P-I: Participants with group mugs, P-N: Participants without group mugs

Figure 6: *Frequency distribution of senders' offers in pairs ("Sender to Receiver")*

In order to investigate senders' behavior statistically, we ran panel Tobit regression with bootstrapped standard errors. The reasons why the panel Tobit regression with bootstrapped standard errors were used are as follows. As aforementioned, 42% of observations made "0" offers

to receivers. As a result, our data shows a spike at "0" and is highly skewed positive. In this case, Tobit regression is favored over other types of regressions. Although Tobit regression has a strong assumption on homoskedasticity, when the residuals are heteroskedasticity in Tobit model, the robust standard error version is not allowed in Tobit estimates. In this case, bootstrapping standard errors can solve this problem (Amore & Murtinu, 2019). Another concern for the regression is that each participant played 10 periods of the dictator game. As a result, observation dependence occurs across 10 rounds. To account for this observation dependence, we used panel Tobit model. In brief, in order to account for observation dependence, left censored data, and heteroskedasticity, we used panel Tobit regression with bootstrapped standard errors.

Table 6: *Panel Tobit Regression with bootstrapped standard errors: Amount sent*

	Dep. Var. : Amount sent
	Coef. (Bootstrap Std. Err.)
Sender, P-N	-3.48 (7.54)
Receiver, I-N	-7.44 (3.75)**
Receiver, O-I	-16.29 (4.86)***
Receiver, O-N	-10.03 (5.51)*
Sender (P-N) x Receiver (I-N)	-.25 (8.79)
Sender (P-N) x Receiver (O-I)	7.12 (13.46)
Sender (P-N) x Receiver (O-N)	-2.98 (10.39)
Gender (Female)	-8.84 (4.50)*
Constant	17.22 (4.19)***
N	200
Censored Obs.	84
Pseudo R^2	0.036

Base: Sender (P-I), Receiver (I-I), *indicates $p \leq 0.1$; ** indicates $p \leq 0.05$; *** indicates $p \leq 0.01$
I-I: Ingroup members with group mugs, I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs, O-N: Outgroup members without group mugs

As Table 6 shows, whether senders bought group mugs or not doesn't affect the amount sent significantly. However, whether receivers bought group mugs or not and their group affiliations affects the amount sent significantly. Compared to ingroup receivers with group mugs, outgroup receivers with group mugs received significantly less money than any other types of receivers. Also, ingroup receivers without group mugs received significantly less money than ingroup receivers with group mugs. However, compared to ingroup receivers with group mugs, outgroup receivers without group mugs received only marginally significantly less money ($p \leq 0.1$). We also tested if there is any statistical difference in the amount of money sent to between ingroup receivers without group mugs and outgroup receivers without group mugs. We found there is no statistically difference between ingroup receivers without group mugs and outgroup receivers without group mugs (prob > chi2 = 0.647). In other words, they treated outgroup members without group mugs the same as ingroup members without group mugs. Considering that this data shows ingroup favoritism, treating some of outgroup members as the same as ingroup members is an interesting finding caused by identity-induced consumptions. However, the participants treated outgroup members with group mugs marginally significantly more harshly than ingroup members without group mugs (prob > chi2 = 0.07). In the session of Economic Game Only (control session 3), strong ingroup favoritism was found (P > |z|= .009).

Result 3: *Senders' identity-induced purchases did not affect the amount of money sent significantly.*

Result 4: *Highest amount of money was sent to ingroup receivers with group mugs.*

Result 5: *Lowest amount of money was sent to outgroup receivers with group mugs.*

Result 6: *There is no statistical difference in the amount of money sent to between ingroup receivers without group mugs and outgroup receivers without group mugs.*

In terms of inequity aversion, we found two important implications. First, participants showed the strongest favoritism to ingroup members with group mugs and discrimination over outgroup members with group mugs. This result occurred because identity-induced consumption makes social identity more salient. Second, participants treated outgroup members without group mugs with the same level of favoritism as ingroup members without group mugs. Considering, ingroup favoritism still worked in this context, this result shows that identity-induced consumptions play more important role in inequity aversion than the actual group affiliation compared to the Economic Game Only. In other words, identity-induced consumption had stronger impact on the decision than the actual group affiliation.

3.3 Identity-Induced Consumption and Trust and Reciprocity (Trust Game)

Unlike in the dictator game, both senders and receivers in the trust game were informed about their co-players' group affiliations and their purchases before they decided to send money or not. Given that receivers knew the amount their co-players sent to them, roles remained the same through 10 rounds of the game. However, pairs were newly matched randomly in each period. In this game, since both senders and receivers sent money to their co-players, we first investigate how identity-induced consumption affects senders' behavior (trust). And then we identify how identity-induced consumption affect receivers' behavior (trustworthy or reciprocity).

Senders' Behavior (Trustor)

The frequency of distribution of senders' offers is shown in Figure 7. The red line in X-axis is marked at the half amount (25 points) of the endowment that senders received. 35% of the participants sent "0" to receivers. Compared to the dictator game, participants sent more money to their co-players.

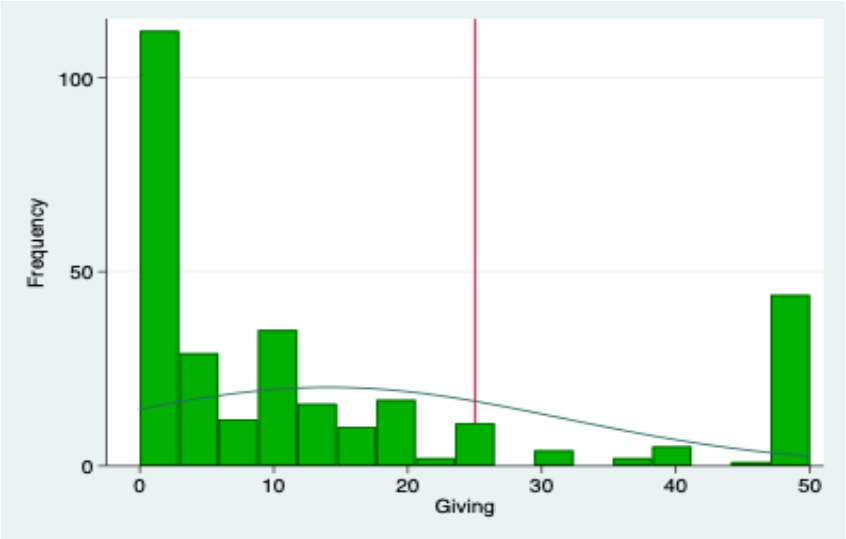


Figure 7: *Frequency distribution of senders' offers in the trust game*

Table 7 shows the breakdown of amount of money sent according to features of senders and receivers. On an average, senders in this game offered more money to receivers than in the dictator game. Although there is not much difference in the amount of money sent by senders with group mugs and ones without group mugs, there is noticeable differences in the amount of money sent to receivers according to receivers' purchases and group affiliations. First, ingroup members with group mugs received the highest level of trust. Second, we found stronger ingroup favoritism being played in the trust game than in the dictator game. Third, unlike the dictator game, outgroup members with group mugs received more trust than outgroup members without group mugs.

Table 7: *Mean of offers made by senders and sent to receivers*

Sender	Mean (Giving)
P-I	14.796
P-N	13.356

P-I: Participants with group mugs
P-N: Participants without group mugs

Receiver	Mean (Giving)
I-I	25.193
I-N	13.34
O-I	11.317
O-N	6.78

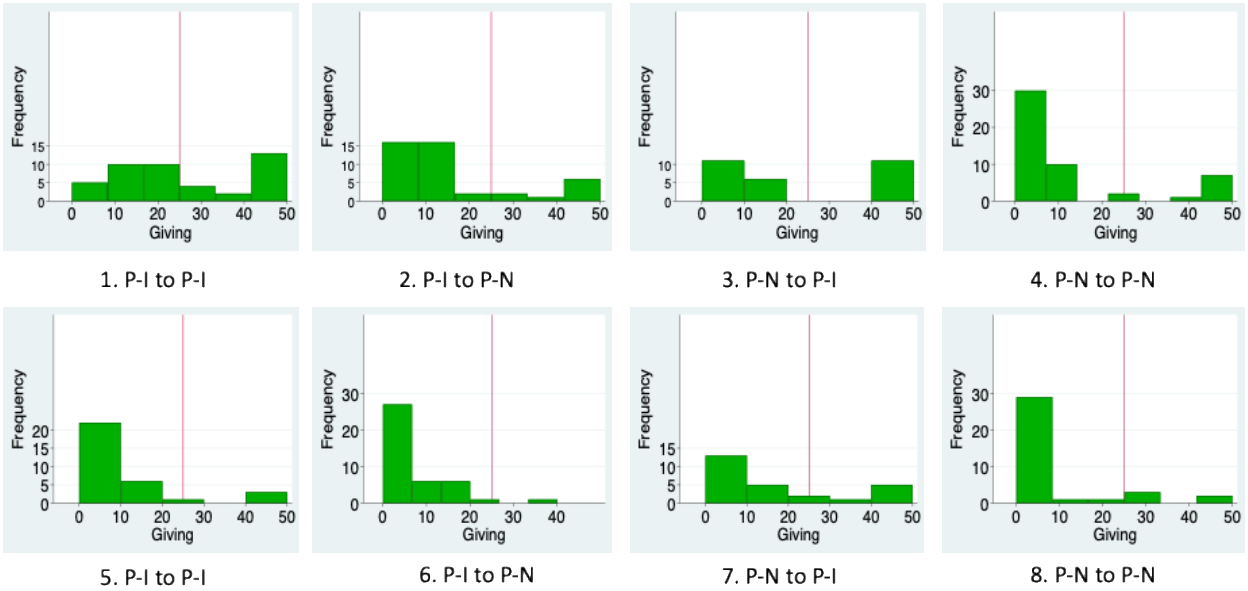
I-I: Ingroup members with group mugs
I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs
O-N: Outgroup members without group mugs

Table 8 shows the mean of offers made in pairs. The interesting finding is that higher offers were consistently made to receivers with group mugs versus to receivers without group mugs: higher offers in 1 vs. 2; higher offers in 3 vs. 4; higher offers in 5 vs. 6; higher offers in 7 vs. 8. This consistent pattern tells us that identity-induced consumptions represent trustees' credibility and authenticity so that trustors are willing to trust them more.

Table 8: *Mean of money offered in pairs ("Sender to Receiver")*

Sender-Receiver	Mean (Giving)
1. P-I to P-I	26.48
2. P-I to P-N	15.504
3. P-N to P-I	23.171
4. P-N to P-N	11.476
5. P-I to P-I	8.566
6. P-I to P-N	6.382
7. P-N to P-I	15.138
8. P-N to P-N	7.044

1-4: pairs in the same group, 5-8: pairs in the different groups
P-I: Participants with group mugs, P-N: Participants without group mugs



1-4: pairs in the same group, 5-8: pairs in the different groups
P-I: Participants with group mugs, P-N: Participants without group mugs

Figure 8: *Frequency distribution of senders' offers in pairs ("Sender to Receiver")*

In order to investigate senders' behavior statistically, we ran panel Tobit regression with bootstrapped standard errors. In this case, panel Tobit accounts for censoring when \$ sent ≤ 0 and

$≥ 50. Again, panel Tobit regression with bootstrapped standard errors was employed to account for observation dependence across 10 periods of the game, double censored data, and heteroskedasticity.

As Table 9 shows, whether senders bought group mugs or not does not affect the amount sent significantly. However, receivers' purchases and their group affiliations affect the amount sent significantly. Compare to ingroup receivers with group mugs, other types of receivers received significantly less money from senders. In other words, ingroup receivers with group mugs received the highest level of trust. However, unlike the dictator game, ingroup favoritism played significantly in this game. Ingroup receivers without group mug received significantly more money than both types of outgroup receivers. Also, unlike the dictator game, there is marginally statistical difference in the money sent to ingroup receivers without group mugs and outgroup receivers with group mugs (Prob > chi2 = 0.06). However, outgroup receivers without group mugs received significantly less money than ingroup receivers without group mugs (Prob > chi2 = 0.01). In brief, even though the ingroup favoritism is in play in this game, the participants treated outgroup receivers with group mugs as almost same as with ingroup receivers without group mugs. Surprisingly, in the trust game in the Economic Game Only, there was no ingroup favoritism (P > |z|= 0.133). Given this result, we suggest that identity-induced consumptions made group identity more salient, which means that identity-induced consumptions provided the ground that ingroup favoritism played.

Table 9: *Panel Tobit Regression with bootstrapped standard errors: Amount sent*

	Dep. Var. : Amount sent
	Coef. (Bootstrap Std. Err.)
Sender, P-N	-16.77 (14.99)
Receiver, I-N	-13.04 (6.49)**
Receiver, O-I	-24.40 (7.75)***
Receiver, O-N	-24.98 (8.86)***
Sender (P-N) x Receiver (I-N)	3.80 (8.93)
Sender (P-N) x Receiver (O-I)	22.95 (14.61)
Sender (P-N) x Receiver (O-N)	9.68 (11.30)
Gender (Female)	-5.85 (11.13)
Constant	31.36 (10.77)**
N	300
Left-Censored Obs.	105
Right-Censored Obs.	43
Pseudo R^2	0.036

Base: Sender (P-I), Receiver (I-I), *indicates $p \leq 0.1$; ** indicates $p \leq 0.05$; *** indicates $p \leq 0.01$
I-I: Ingroup members with group mugs, I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs, O-N: Outgroup members without group mugs

Result 7: *Senders' purchases did not affect amount of money sent significantly.*

Result 8: *Highest amount of money was sent to ingroup receivers with group mugs.*

Result 9: *Lowest amount of money was sent to outgroup receivers without group mugs.*

Result 10: *There is only marginally statistical difference in amount of money sent to between ingroup receivers without group mugs and outgroup members with group mugs.*

In terms of trust, we found three important implications. First, like the dictator game, participants showed the strongest trust to ingroup members with group mugs. However, unlike the dictator game, the participants showed the least trust to outgroup receivers without group mugs. Second, ingroup favoritism being played, there is only marginally significant difference in money

sent to ingroup receivers without group mugs and outgroup receivers with group mugs. This result shows that having own group mugs gives similar credit as the ingroup affiliation to outgroup members in terms of trust. Third, in general, the participants showed more trust to receivers with group mugs across pairs regardless of group affiliations. This result shows that identity-induced consumption played a role in increasing trustee's credibility beyond making social identity salient. Based on this result, we suggest that group-induced consumptions are important to increase consumers' credibility in the context where reciprocal behavior is expected.

Receivers' Behavior (Trustee)

While senders' behavior is regarded as trust, receivers' payback is regarded as trustworthiness or reciprocity. Receivers' reciprocity is calculated as return ratio that is $\frac{\$\ Returned}{\$\ Sent}$. As a result, the reciprocity has a value from 0 to 3, considering the experimenter tripled the amount of money that senders sent. If reciprocity is equal to 1, it is regarded that receivers pay back the exact amount that senders sent. However, if reciprocity is equal to 3, it is regarded that receivers pay back all the money that has been tripled by experimenter to senders. With the same logic, if reciprocity is less than 1, receivers pay back less money than what their co-players sent. The frequency of distribution of receivers' payback is shown in Figure 9. The red line in X-axis is marked at 1. 35.38% of the participants pay back "0" to senders. The mean of payback is 0.59. As commonly seen in previous literature, reciprocity is strongly responsive to their endowment, which means they pay back more to higher endowment from senders (Berg, et al., 1995; Butler, 2014). Hence, the breakdown of reciprocity by sub-group can lead us to misunderstand the implications of receivers' behavior.

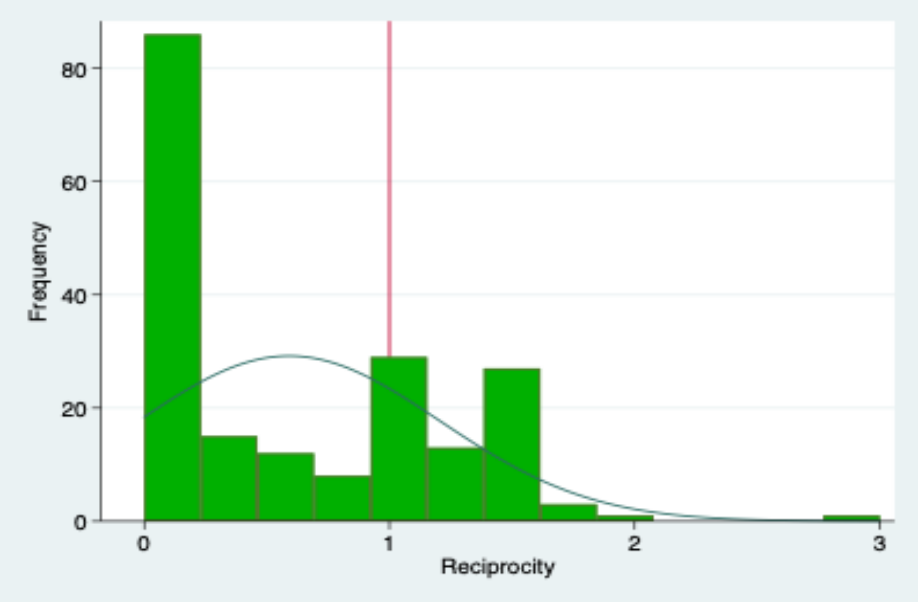


Figure 9: *Frequency distribution of receivers' payback in the trust game*

In order to examine receivers' behavior statistically, we ran panel Tobit regression (left censored). In this case, we could not find heteroscedasticity: Breusch-Pagan test, Prob > chi2 = 0.71. Hence, we did not correct standard errors. Panel Tobit regression was used to account for observation dependence and left censored data. As Table 10 shows, the endowment effect is significantly strong on reciprocity. As the previous literature identified, receivers showed positive reciprocity to senders. Receivers' purchases did not affect the level of reciprocity. However, senders' affiliations and their purchases marginally significantly affect receivers' decision on the level of reciprocity. In the reciprocity decision, there was not much ingroup favoritism. Rather, we found that receivers showed the least reciprocity to outgroup senders without their group mugs. Given that ingroup favoritism was not found in the Economic Game Only ($P > |z| = 0.782$), identity-induced consumption played a role only in lowering or increasing senders' credibility. In terms of receivers' behavior in the trust game, evidently group affiliation per se is less important than identity-induced consumption.

Table 10: *Panel Tobit Regression: Reciprocity*

	Dep. Var. : Reciprocity, $\frac{\$\ Returned}{\$\ Sent}$
	Coef. (Std. Err.)
Receiver, P-N	.06 (.34)
Sender, I-N	-.22 (.21)
Sender, O-I	-.08 (.18)
Sender, O-N	-.35 (.19)*
Receiver (P-N) x Sender (I-N)	-.22 (.31)
Receiver (P-N) x Sender (O-I)	-.19 (.25)
Receiver (P-N) x Receiver (O-N)	.27 (.30)
Endowment	.007 (.001)***
Gender (Female)	.17 (.34)
Constant	-.08 (.32)
N	195
Censored Obs.	69
Pseudo R^2	0.06

Base: Trustee(P-I), Trustor(I-I), *indicates $p \leq 0.1$; ** indicates $p \leq 0.05$; *** indicates $p \leq 0.01$
I-I: Ingroup members with group mugs, I-N: Ingroup members without group mugs
O-I: Outgroup members with group mugs, O-N: Outgroup members without group mugs

Result 11: *Receivers' purchases did not affect amount of payback significantly.*

Result 12: *There is marginally statistical evidence that receivers paid back the least to outgroup senders without group mugs.*

According to Falk & Fischbacher (2006), reciprocity is a behavioral response to perceived kindness and unkindness, where kindness consists of both distributional fairness and underlying intentions. Several experiments supported that perceived intentions play a major role in reciprocity, which means that trustees decide how to reciprocate with trustors based on their evaluations on perceived intentions (Charness & Rabin, 2005; Falk & Fischbacher, 2006). In line with this argument, receivers in our experiments tended to evaluate the intentions of receivers with

group mugs more positively. There was marginally statistically significant evidence that outgroup members without group mugs paid back the least. Given the fact that there was no ingroup favoritism in Economic Game Only session, identity-induced consumptions only gave an important meaning to receivers to decide the reciprocity in the treatment sessions.

What led receivers' evaluation of senders' intentions this way? In our study, participants weigh more on identity-induced consumption than group affiliation per se because identity-induced consumptions reflect credibility and authenticity beyond group affiliation does. In other words, in terms of evaluating sender's kindness or fairness, receivers took identity-induced consumption as their credibility and authenticity especially for outgroup senders. Hence, in this context, identity-induced consumptions play a more important role than group affiliations in evaluating co-players' intentions.

In general, the results of receivers' behavior give three important implications. First, receivers show the least level of reciprocity to outgroup senders without group mugs. Second, although ingroup favoritism did not play much role in receivers' reciprocity, they weighed on senders' purchases in their decision of reciprocity. Third, considering the past literature suggesting that perceived kindness or fairness plays a major role in reciprocity, identity-induced consumption is regarded to increase owners' authenticity and credibility which lead receivers to reciprocate more positively.

4. Conclusion

Since social identity theory has been extensively applied to marketing recently, scholars have shown that consumers' social identity affects consumers' decisions in a broad array of consumptions. Although a large literature has explained how consumers' social identity affects

their consumption, research has not given much attention to the meaning of identity-induced consumptions in consumers' social and economic environments. In our experiments, firstly, we investigated under what circumstances customers valued identity-associated products. In order to do this, we considered two contexts where participants could show their identity by revealing their identity-induced choices to ingroup members and where consumers could expect to involve in interactions with others. Second, we investigated how identity-induced consumption affected social preferences such as inequity aversion, trust and reciprocity.

Our main findings are as follows. First, when participants expected to be involved in interactions with others (social preferences), their WTPs were significantly higher than when they could merely get satisfaction from revealing their identity with their consumption. Second, in all social preferences, consistent with our hypotheses, ingroup members with group mugs received highest money from their co-players. Third, for the inequity aversion in the dictator game, we found that identity-induced consumptions play a role in making participants' identity more salient. As a result, participants treated outgroup members without group mugs the same as ingroup members without group mugs, given ingroup favoritism being in play. Fourth, in terms of trust, we found that identity-induced consumptions play a role in increasing owners' credibility and authenticity beyond making the group identity salient. As a result, participants treated outgroup members with group mugs the same as ingroup members without group mugs. Again, in this context, ingroup favoritism was still in play. Fifth, in terms of reciprocity in the trust game, ingroup favoritism was not found. Rather, we found that identity-induced consumptions played an important role in interpreting outgroup members' intentions. Participants paid back least to outgroup members without group mugs.

Overall, we learned that identity-induced consumptions play different roles in social preferences according to the contexts. In the context where consumers care for fairness or altruism without thinking about getting paid back, ingroup salience is more important and identity-induced consumptions help consumers to make their social identity salient. However, when consumers can anticipate future reciprocity and benefits from future interactions, identity-induced consumptions play a more important role in increasing owners' credibility and authenticity. Although, in the decision about who to trust, group affiliation is an important factor, when it comes to perceived kindness or fairness, the group affiliation effect was not significant, but the identity-induced consumption effect lasted representing owners' credibility.

This research contributes to the marketing literature by identifying the contexts where consumers value identity-induced consumptions and how identity-induced consumptions play a role in different aspects of social preferences. Moreover, our findings suggest that identity-induced consumptions not only make consumers' identity salient but also serve as a way to increase owners' credibility and authenticity that surpass their actual group affiliation. According to our findings, Identity-induced consumption gives more instrumental values to consumers than merely affirming consumers' identity or seeking satisfaction from presenting who they are. Consumers actively cultivate the advantage of identity-induced consumptions and decide how to interact with others based on their identity-induced consumptions. Moreover, in some cases, the inconsistency between the group affiliation and identity consumption can help increase consumers' benefit. This implication has not been much recognized in the marketing literature. However, this inconsistency can harm consumers in the continuous reciprocal behavior even when they interact with outgroup people. In brief, our findings identified the roles of identity-induced consumptions. To the best of

our knowledge, this research is the first attempt to identify the roles of identity-induced consumptions in diverse contexts of economic interactions.

As with any research, our study has several limitations. First, our arguments and findings are limited only to the products that can be shown to other consumers. As a result, there are limitations that apply to all types of identity-induced consumptions. Second, we tested the effect of identity-induced consumptions on limited aspects of social preferences. Future research needs to explore the effect of identity-induced consumptions on more diverse aspects of social preferences. Third, we used mugs to induce participants' identity-induced consumptions. More tests will be needed with diverse products to increase external validity.

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Appendix A: Experimental Instructions for Treatment Sessions

I. General introduction

[New Screen]

This is an experiment in decision-making. The amount of money you earn will depend on the decisions you make, and, on the decisions, other people make. Your earnings are given in tokens.

This experiment has 6 rounds and 20 participants. Your total earnings will be the sum of your earnings in each part. At the end of the experiment you will be paid IN CASH based on the exchange rate $1 = 10 tokens.

In addition, you will be paid $7 for participation. Everyone will be paid in private and you are under no obligation to tell others how much you earn.

Please do not communicate with each other during the experiment. If you have a question, feel free to raise your hand, and an experimenter will come to help you.

II. Hypothetical Rounds of WTP (7 Periods)

[New Screen]

Now, we start Part 1 of the experiment. This is an experiment in individual decision making about consumption. We will conduct 7 periods of hypothetical round. In these rounds, you will

learn how to buy one of two mugs by paying money for it. For this actual purchase, you will be given hypothetical 50 credits.

[New Screen]

In round 1, everyone will be shown two mugs. You have the option of buying one of two mugs.

(1) You have to choose one of mugs that you prefer to buy

(2) You have to indicate amount of money you are willing to pay on the price list below.

After you have finished, one of the prices listed below will be selected at random and any exchanges will take place at that price.

If the price you indicated on the price list is **more than or the same** as the randomly chosen price, then you buy the item and take it home. You do not pay the amount you indicated on the price list. Instead, you pay the randomly chosen price, an amount equal to or less than your offer.

Example: if you offer $4.5 and the randomly chosen price is $3.5, then you have the high offer. You buy the item but pay only $3.5.

If your offer is **less than** the randomly chosen price, then you do not buy the item. Instead, you keep your money.

Example: if you offer $2 and the randomly chosen price is $4, you do not have the high offer. Therefore, you do not buy the item. You keep your money.

As a buyer, you should offer exactly the **maximum amount you would be willing to pay** in exchange for the item being sold.

Remember, there are no advantages to strategic behavior. Your best strategy is to determine your personal value for the item and record that value as your offer. There is not necessarily a "correct" value. Personal values can differ from individual to individual.

Notice the following two things:

(1) Your decision can have no effect on the actual price because the price will be selected at random

(2) It is in your interest to indicate your true preferences at each of possible prices listed below

[New Screen]

Now, choose which product you want to buy.

I will choose product A [Yes or No radio button]

I will choose product B [Yes or No radio button]

Please indicate your maximum price to pay for the product you chose by moving the slider below.

III. Group Assignment

[New Screen]

Now, everyone will be shown 5 pairs of paintings by two artists. You will be asked to choose which painting in each pair you prefer. You will then be classified into one of two groups based on which artist you prefer. Then, the next round, you will be asked to answer questions on two other paintings. Each correct answer will bring you additional tokens. You may get help from or help other members in your own group while answering the questions.

The participants you are grouped with will be the same for the rest of the experiment. After this round has finished, we will give you instructions for the next part of the experiment.

[New Screen]

Now please choose which painting you prefer by clicking on either A or B from each pair. After everyone submits answers, you will be privately informed of which group you are in.

Pair 1. Picture 1A Picture 1B

Pair 2. Picture 2A Picture 2B

Pair 3. Picture 3A Picture 3B

Pair 4. Picture 4A Picture 4B

Pair 5. Picture 5A Picture 5B

[New Screen]

Based on your choices, you prefer the paintings by _____ (Kandinsky or Klee).

You are assigned to the _____ (Kandinsky or Klee) group.

IV. Group Interactions

[New Screen]

Before starting this round, we remind you of which group you are belong to.

Your group is _____ (Kandinsky or Klee)

As you are in _____ group, we want you to know about paintings made by the artist.

You will now receive two paintings, painting #6 and #7. Please select the artist who you think made the paintings, respectively. For each correct answer, you will be rewarded with an additional 10 tokens. You may see the answer key to recall 5 pairs of paintings you have seen when you were assigned to the group.

Meanwhile, **you can use a group chat program to get help from or offer help to other members in your own group**. Except for the following restrictions, you can type whatever you want in the lower box of the chat program. **Messages will be shared only among all the members**

from <u>your own group</u>. You will not be able to see the messages exchanged among the other group. People in the other group will not see the messages from your own group either.

You will be given 7 minutes to communicate with your group members.

Please raise your hand if you have any questions.

Restrictions on messages

1. Please do not identify yourself or send any information that could be used to identify you (e.g. age, race, professional background, etc.).

2. Please refrain yourself from using obscene or offensive language.

My answers are:

Painting #6 is made by Klee [button] Kandinsky [button]

Painting #7 is made by Klee [button] Kandinsky [button]

[New Screen]

You got _ correct answers

V. Real Buying Round (1 Period)

[New Screen]

Now, we are starting round 4 (real buying round). In this round, you will buy one of two mugs like the previous round. Here is **information** to help you make a buying decision.

Now, we assign **the group mug to each group**. The group mug represents your group affiliation. **Your purchase and your group affiliation will be shown to your co-player the next round where you play the decision-making task with co-players.** Your co-players would be either your group member or an out-group member. Your co-player will be randomly chosen.

Lastly, you will have only one-shot buying round.

WTP instruction is the same with the hypothetical round.

VI. The Dictator Game (10 Periods)

[New Screen]

Now, we start a decision task round. The amount of money you earn will depend on the decisions you make or on the decisions other people make. Your payoffs will be paid in private and in cash at the end of the session.

It is important that you do not talk, or in any way try to communicate, with other people during the round. If you have a question, raise your hand and an experimenter will come over to where you are sitting and answer your question in private.

The experiment will consist of several independent periods. In each, you will face a specific decision task. Tasks will be explained in detail before you have to make your decision.

In each period, you will be randomly matched with one other participant. This matching will change each round.

[New Screen]

We will now ask you to complete a task which involves real money. In this task, you will be assigned randomly to a sender or to a receiver and your role will remain same during the session.

Once your role is randomly assigned to a sender or to a receiver, you will be asked to make an allocation in every round **only if you are assigned to a sender**. As a sender, you will be asked to allocate 50 tokens (=$5) between yourself and a co-payer who is randomly chosen from your group or out-group. As a sender, your earnings will be the leftover of the allocation to the co-payer.

If you are assigned to a receiver, your earnings will be the amount that a sender will allocate to you.

This process will be repeated until all the 10 rounds are completed. Your co-payer will be randomly selected newly every round. At the end of the last round, you will be informed the

experiment has ended. After all rounds is done, one round out of 10 rounds will be randomly selected to determine your payoffs.

Your participation in the experiment and any information about your payoffs will be kept strictly confidential. Your payment-receipt and participant form are the only places in which your name and ID number are recorded.

You will never be asked to reveal your identity to anyone during the course of the experiment. Neither the experimenters nor other participants will be able to link you to any of your decisions. In order to keep your decisions private, please do not reveal your choices to any other participant.

Please do not talk with anyone during the experiment. We ask everyone to remain silent until the end of the last round.

[New Screen]

Instructions for a Sender

You are assigned to a sender. Your task is simply to decide how much of 100 tokens send the co-payer who are randomly assigned from your group or out-group. you can only see the affiliation of the co-payer and what product the person purchased last round but the co-payer cannot see anything about you.

[New Screen]

Your co-payer is from _____ (your group or out-group)

The co-payer bought (or did not buy anything) _____ (group product or non-group product)

Now, your will simply decide how much of the 50 tokens you want to send to the co-payer. You will get to keep the rest of the money for yourself. What amount would you like to give to the co-payer? Please indicate the amount by moving the slide below.

[New Screen]

Instructions for a Receiver

You are assigned to a sender. You will not be asked to make any decision. Your payoffs will be determined by the amount that your co-payer will allocate to you.

VII. The Trust Game (10 Periods)

[New Screen]

Now, we start a decision task round. The amount of money you earn will depend on the decisions you make or on the decisions other people make. Your payoffs will be paid in private and in cash at the end of the session.

It is important that you do not talk, or in any way try to communicate, with other people during the round. If you have a question, raise your hand and an experimenter will come over to where you are sitting and answer your question in private.

The experiment will consist of several independent periods. In each, you will face a specific decision task. Tasks will be explained in detail before you have to make your decision.

In each period, you will be randomly matched with one other participant. This matching will change each round.

[New Screen]

You will be assigned randomly to a sender or to a receiver and your role will be assigned randomly in each round.

In this game, both a sender and a receiver can see each other's group affiliation and whether the other player bought the group product or not.

Role of Sender: The Sender will be given 50 points and may choose to send any amount of this money to the Receiver. The amount chosen by the Sender will be tripled and given to the Receiver

Role of Receiver: The Receiver, upon learning how much money is available to him or her, will be able to send any amount of that money back to the Sender.

Earnings per round:

The **Sender** earns 70 - (points sent to Receiver) + (points sent back by Receiver).

The **Receiver** earns 3 X (points sent by Sender) – (points sent back to Sender).

The earnings in each round will not be informed until the experiment ends.

When you've read and understand the instructions, click on the button to proceed to the game.

[New Screen]

The final payoff in each round will not be informed to anybody until the experiment ends.

Your participation in the experiment and any information about your payoffs will be kept strictly confidential. Your payment receipt and participant form are the only places in which your name and ID number are recorded.

You will never be asked to reveal your identity to anyone during the course of the experiment. Neither the experimenters nor other participants will be able to link you to any of your decisions. In order to keep your decisions private, please do not reveal your choices to any other participant.

Please do not talk with anyone during the experiment. We ask everyone to remain silent until the end of the last round.

[New Screen]

You have been assigned to be a **Sender** in this round.

Your task is to decide how much of your 70 points you want to send to the other player who has been randomly assigned to you. Whatever you do not send, you will get to keep for yourself.

Remember, you are in the **Klee Group**.

The other player assigned to you in this round is from the **KLEE (or Kandinsky)** Group.

The other player bought **her/his group** mug (**non-group** mug) or **did not** by any mug in the previous part of the experiment.

What amount would you like to give to the Receiver?

[New Screen]

You have been assigned to be a **Receiver** in this round.

Your task is to decide how much of your points you want to send back to the Sender who has been randomly assigned to you. Whatever you do not send, you will get to keep for yourself.

Your points are _____

Remember, you are in the **Klee Group**.

The other player assigned to you in this round is from the **KLEE (or Kandinsky)** Group.

The other player bought **her/his group** mug (**non-group** mug) or **did not** by any mug in the previous part of the experiment.

What amount would you like to give back to the Sender?

The Final Page

[New Screen]

Period _ was chosen for the paying round.

In that round, you received a payoff of _ points.

This converts to $_ in US dollars. In addition, you earned $_from the painting-match task.

This brings your total earnings to $_.

Finally, you will receive $7 participation fee

Appendix 2: Post-Experiment Survey

Please answer the following survey questions. Your answers will be used for this study only. *Individual data will not be exposed.*

1. What is your age? _____
2. What is your gender?
   (a) Female
   (b) Male
3. What is your major at UCI? _____
4. Are you an undergraduate or graduate student?
   (a) Undergraduate student
   (b) Graduate student
5. Which year are you in your program? _____
6. Have you ever participated in any economics or psychology experimental studies before?
   (a) Yes
   (b) No
7. What do you consider your racial or ethnic background to be?
   (a) White
   (b) Black
   (c) Hispanic
   (d) Asian
   (e) Other, please specify _____

8. In the past twelve months, have you donated money to or done volunteer work for charities or other nonprofit organizations?

   (a) Yes. Please specify the amount $_____ or the number of hours _____

   (b) No

9. You were assigned to the _____ group during the experiment.

   (a) Klee

   (b) Kandinsky

10. Did you choose your group mug?

    (a) Yes

    (b) No

11. Did you buy your group mug?

    (a) Yes (Go to Question 12)

    (b) No (Go to Question 13)

12. Why did you buy the group mug? *Please choose the closer statement to your attitude*

    (a) Because the mug was the one to show my group affiliation.

    (b) Because I wanted to avoid any punishment that I would have got in the next games.

    (f) Other, please specify _____

13. On a scale from 1 to 10, please rate how much you think communicating with your group members helped solve the two extra paintings questions. _____

14. On a scale from 1 to 10, please rate how closely attached you felt to your own group throughout the experiment. _____

15. In part 5 (Game 1), when you were asked to decide the amount of money you sent to your co-player, how would you describe the strategies you used? *Please select all that apply.*

(a) Try to earn as much money as possible for myself.

(b) Try to earn as much money as possible for me and my co-player.

(c) Try to earn more money than my co-player.

(d) Reward those who bought the group mug and punish those who did not regardless of their group affiliation.

(e) Reward those who bought the group mug and punish who did not only if they are in my group.

(f) Reward those who were in my group regardless of their buying the group mug.

(g) Other. Please specify _____

16. In part 6 (Game 2), as a sender, when you were asked to decide the amount of money you sent to your co-player, how would you describe the strategies you used? *Please select all that apply*.

(a) Try to earn as much money as possible for myself.

(b) Try to earn as much money as possible for me and my co-player.

(c) Try to earn more money than my co-player.

(d) Reward those who bought the group mug and punish those who did not regardless of their group affiliation.

(e) Reward those who bought the group mug and punish who did not only if they are in my group.

(f) Reward those who were in my group regardless of their buying the group mug.

(g) Other. Please specify _____

17. In part 6 (Game 2), as a receiver, when you were asked to decide the amount of money you sent back to your co-player, how would you describe the strategies you used? *Please select all that apply*.

    (a) Try to earn as much money as possible for myself.

    (b) Try to earn as much money as possible for me and my co-player.

    (c) Try to earn more money than my co-player.

    (d) Punish the co-player who did not send money as much as I expected.

    (e) Reward the co-player who sent the amount of money I expected or more.

    (f) Reward those who bought the group mug and punish those who did not regardless of their group affiliation.

    (g) Reward those who bought the group mug and punish who did not only if they are in my group.

    (h) Reward those who were in my group regardless of their buying the group mug.

    (i) Other. Please specify _____

18. Overall, during playing two games, do you think that your co-players' group affiliations affect your decision?

    (a) Yes

    (b) No

19. Overall, during playing two games, do you think that whether your co-player bought the group mug or not affects your decision?

    (a) Yes (Go to Question 20)

    (b) No (Go to Question 21)

20. Please tell us how whether your co-players bought the group mug or not affects your decision.
    (a) I was more likely to be nice to the co-player who bought the group mug only if they are in my group.
    (b) I was more likely to punish the co-player who did not buy the group mug only if they are in my group.
    (c) I was more likely to be nice to the co-player who bought the group mug regardless of their group affiliation.
    (d) I was more likely to punish the co-player who did not buy the group mug regardless of their group affiliation.
    (e) Other. Please specify _____
21. On a scale from 1 to 10, please rate how familiar you were with the paintings made by Klee and Kandinsky, respectively, before this experiment.
    (a) Klee _____
    (b) Kandinsky _____