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How Desirable is the Medium? Effect of Point Accumulation Scheme on Consumer Loyalty Toward Reward Program

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Abstract

An accruable point scenario study was applied to examine the effect of the point-accumulation trend (diminishing vs. increasing) and the nominal value (small vs. large) of a medium for repeated consumption on program loyalty. The results showed that both factors affect consumer loyalty toward a reward program. Consumers who received a medium with an increasing accumulation trend and a large nominal value perceived a reward to be more valuable than those who received a diminishing trend and a small nominal value. The results confirmed that a large nominal value or an increasing accumulation trend increased the perception of reward and program loyalty. However, when the desirability of the medium was controlled, the effect of trend was reduced to almost negligible whereas that of the nominal value remained the same. These findings suggest how consumer perceptions of loyalty programs can be practically managed through point accumulation processes.

Keywords: Medium, Nominal value, Improvement preference, Reward program, Program loyalty, Desirability

1. Introduction

Medium, being an arbitrary token, holds no inherent value in and of itself, but it can be exchanged for rewards, used to shape consumers' perception of the value of various reward options, and have a significant impact on consumer behavior (Hsee et al. 2003). Redeemable points or coupons, for example, are popular examples of medium by which consumers can achieve their desired outcomes (i.e., rewards) from various customer loyalty programs. Credit card or airline companies oftentimes provide more reward points at the launch of a rewards program to attract new consumers, but then decrease the amount given afterwards (i.e., diminishing incentives for returning visitors) to maintain profitability once a large number of consumers have joined. This is inevitable to stay profitable yet may lead to disappointment among consumers since they may prefer a pattern of growing point accumulation over decreasing point accumulation (i.e., a favor for a medium with greater return; Medium Maximization; Hsee

et al. 2003). Therefore, designing efficient medium plans is essential for increasing consumers' loyalty.

Although medium, a token to rewards program, has a critical influence on consumer loyalty, investigating a point accumulation scheme of consumer loyalty program itself has barely been done. Specifically, research on the influence of medium on money illusion has been extensively conducted (see Hsee et al. 2003) but the research on reward schemes has received far less attention. Hence, the current research tests the influence of a medium (i.e., a point accumulation scheme) on consumer loyalty program by investigating the two different medium schemes: (a) point accumulation trend (diminishing rewards for repeated consumption vs. increasing rewards for repeated consumption) and (b) nominal value (small vs. high). Consumers exhibited greater loyalty when a reward program had an increasing (vs. diminishing) accumulation trend or a large (vs. small) nominal value.

Furthermore, this research focuses on the influence of a novel causal input, a medium, on consumer

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loyalty by investigating the mechanism. Mediation analyses on existing service or customer loyalty research have investigated various types of mediators: e.g., perceived quality (Salanova, Agut, and Peiró 2005; Mahamad and Ramayah 2010; Francisco-Maffezzolli, Semprebón, and Prado 2014; Nyadzayo and Khajehzadeh 2016; Shankar and Jebarajakirthy 2019), brand credibility (Mathew and Thomas 2018), perceived lack of attractiveness (Picón, Castro, and Roldán 2014), brand relationship (Veloutsou 2015), positive labeling and brand-related constructs (Gulzira and Han 2019), and brand identification and trust (Namkung and Park 2021). In particular, the current research investigates the influence of medium on consumer loyalty through the consumer's perceived value towards a reward program.

This research also explores a moderator that affects the relationship between medium and consumer loyalty. Few studies in the literature have investigated moderators that affect the relationship between medium and loyalty: e.g., strength of brand relationship (Veloutsou 2015) and consumer involvement (Shankar and Jebarajakirthy 2019). The current research hence adds to the body of research by figuring out how consumers' desirability changes the influence of a medium (point accumulation trend or nominal value) on consumer loyalty: i.e., the moderating effect of consumers' desirability for the medium.

Practically, the current research is worthwhile as understanding how to design better reward programs that are appealing to consumers is of great interest to marketers, given the limited nature of available time and monetary resources. The research thus employed multiple coupon redemption scenarios for existing brands of amusement parks, department stores, and restaurants to investigate the effects of the trend and nominal value of the medium in practical settings. Building on previous research that focused on the effects of the mere presence of a medium, this research extends existing findings by examining the effects of different medium schemes on consumers' perceived value of a reward program.

2. Theoretical background

Three streams of theories support the core objectives of this study. First, research on improvement preference supports the notion that customers will favor a reward program with an increasing point accumulation trend to one with a diminishing trend. Second, medium maximization provides evidence for the idea that the program medium affects the perceived value of a reward program. Research on numerosity also suggests that nominal values may affect

how consumers perceive reward programs. Third, the mediating mechanism underlying the impact of a point accumulation scheme on consumer loyalty through perceived reward will positively impact the increasing accumulation trend and a large nominal value.

2.1. Improvement preference and medium maximization

Preference for improvement over consistent or deteriorating events seems apparent. From previous research, most subjects prefer an increasing wage profile to either a declining or flat one for an otherwise identical job (Loewenstein and Sicherman 1991). Controlling for the actual outcome, a stream of the medium that is dispensed in ascending sequence is likely to produce a different effect than a stream of the medium that is dispensed in descending sequence (Ariely 1998; Hsee and Abelson 1991; Loewenstein and Prelec 1991; Van Osselaer and Alba 2000). Hence, this research investigates the difference between the increasing and diminishing effects of points accumulation of a reward program.

From past experiments by Ross and Simonson (1991), participants are significantly more likely to prefer a segregated scenario if the positive event follows a negative event. A preference for improvement can also be predicted from loss aversion according to prospect theory (Kahneman and Tversky 1979), which suggests that losses are typically given more weight by individuals than gains because they are below a reference point. The assumption is that the most recent outcome affects the reference point (Kahneman and Tversky 1979; Loewenstein and Prelec 1991). Hence, improving processes should be considered more favorable than deteriorating processes.

Finally, a preference for improvement may occur because of the social norm that it is better to experience something bad before good rather than good before bad (Kahneman and Miller 1986). The literature on delayed gratification (Mischel 1966; Mischel and Gilligan 1964) proposes that this norm influences people's behavior in delaying gratification. Researchers also suggest that the demand for instant gratification is a sign of immaturity and that those who invest in their future are more likely to be successful (Funder, Block, and Block 1983). Several theories on self-control suggest this idea can only be effective if the delayed positive event is considered to be positive (Ainslie 1975; Strotz 1956; Thaler and Shefrin 1981). In a broader context, self-controlled individuals might prefer the negative experience first and delay the positive experience—gratification—until afterward (Ross and Simonson 1991).

In the study by Ross and Simonson (1991), a scenario is used where monetary incentives are provided for various exercises. In each exercise, participants could gain or lose and are given eight equal pairs of circumstances, each with the same net financial consequences. They evaluate each pair and select in which of the two choices they would feel happier (the “no difference” option is also available). It was highlighted that there are no right or incorrect answers, and participants should only take into account how they would feel in each circumstance. The study tested the preference for successful conclusions (or “preference for improvement” according to the current research’s definition). Each question had two versions that varied according to the order of outcomes in the segregated option; half of the subjects saw a version in which the loss came first and the gain second (“In the first, you lose \$15 and in the second you win \$85”) while half saw an opposing version (“In the first, you win \$85 and in the second you lose \$15”). However, both questions compared two situations with identical outcomes of earning \$70. The order of the two outcomes was the only distinction between the two scenarios. As a result, participants preferred the sequence with the financial reward that comes last; 73% of participants preferred a happy ending while only 14% preferred a happy beginning.

Following on from previous improvement preference research, the current study investigates the difference of preference between an increasing and a diminishing point accumulation trend by utilizing the accumulation trend as a variable that moderates the relationship between a nominal value of accruable points and the perceived value of a reward program.

The effect of a medium causes the difference in deciding between two consequentially equivalent conditions, one with a medium (a medium condition), and one without (a control condition, and to achieve the desired outcome, an effort is required and the pathway between effort and outcome is referred to as medium (Hsee et al. 2003). Medium maximization (Hsee et al. 2003) explains that a decision of what course of action to pursue will depend on both how much outcome A is superior to outcome B and how much Medium A is superior to Medium B; i.e., even if Outcome A is not any better than Outcome B, one may still pick the more labor-intensive action that results in Medium A and Outcome A if Medium A is considerably greater than Medium B. Medium is present in many decision contexts, such as the example provided by Hsee et al. (2003). Consumers can accrue miles through a frequent flyer program. However, miles are not what the consumers want. The miles are only a medium through which the desired outcome (i.e., free travel) can be obtained. Although members

of a loyalty program accumulate points by making goods purchases, the points are not what they want. They are simply a medium that can be exchanged for a gift (the desired outcome) at the end of the point accumulation process (for example, see Kivetz and Simonson 2002; Van Osselaer, Alba, and Manchanda 2001). The concept of conditioned reinforcers is similar to that of a medium. There is a wealth of research supporting the idea that a neutral stimulus may gain a reinforcement value by being linked to a primary reinforcer and can alter behavior even after the primary reinforcer is taken away (e.g., Armus 1982; Boysen, Bernstein, and Hannan 1996; Bugelski 1938; Herrnstein 1964; Mazur 1995; Williams and Dunn 1991).

Hsee et al. (2003) and other researchers (Van Osselaer, Alba, and Manchanda 2004) suggest that exaggerated perception of advantage outweighs the importance of reward for the consumer. Hsee et al. (2003) study entails selecting between a short and lengthy task. For the short assignment, a gallon of vanilla ice cream is awarded, and for the longer one, a gallon of pistachio ice cream. The amount of ice cream is kept constant. In the control condition, no point (medium) is required for the subjects to receive the ice cream (outcome). In the experimental conditions, however, participants earn either 60 points for a short task or 100 points for a long task. The results are unchanged (the points had no other value), but in the experimental condition, more participants select the lengthy task choice with pistachio ice cream than in the control condition, highlighting the importance of the medium. Consumers may overstate a medium’s function in the context of an incentive scheme, as they did in this research.

2.2. Effects of the point accumulation trend on the perceived value of a reward program and program loyalty

I hypothesize that a person will see a rewards program more favorably if the trend of accumulated points is increasing rather than diminishing. Increasing trends impose an image of a successful conclusion with no negative events appearing. Unlike an increasing trend, a diminishing trend gives an impression of deterioration.

The current research applies the concept of improvement preference to a reward program that contains a point accumulation process. It is expected but not obvious that when the number of accruable points per visit increases for a reward program, consumers will be more likely to select the program compared to when the number of accruable points per visit diminishes. It is obvious that when consumers with a given point accumulation trend perceive more

value in the reward program, they will be likely to have greater loyalty to the program.

Here, it is of interest to claim that the effect of the trend on program loyalty is mediated by the perceived value of a reward program. In this mediation process, there are two pathways, consisting of a sequence of causal steps: the trend affects the perceived value of a reward program, which in turn causally influences program loyalty. This indirect effect quantifies the degree to which the perceived value of a reward program acts as the mechanism by which the trend affects program loyalty. A statistically significant indirect effect supports the claim of this mediation process.

It is assumed that subjects will have a greater perceived value of a reward program with an increasing point accumulation trend for the medium than with a diminishing point accumulation trend which, in turn, will increase the value of program loyalty. Hence:

H1. *Those assigned to an increasing point accumulation trend will gain greater program loyalty because of the increased perceived value of a reward program.*

The desirability of the medium scheme is assessed by consumers who will join the program. It is expected that those who have more positive feelings about the program will gain more from the perceived value of a reward program as well as program loyalty. It is also expected desirability will have a positive impact on the relationship between the trend and perceived value of a reward program, and the relationship between the trend and program loyalty. Hence, an additional hypothesis, controlling the desirability of the medium scheme corresponding **H1**, is proposed as follows:

H2. *Of those who feel the same desirability for the medium scheme, those assigned to the increasing point accumulation trend will gain greater program loyalty because of the increased perceived value of a reward program.*

2.3. Numerosity

Many studies on numerosity suggests how a concept of nominal value influences perception. Money illusion, as described by Fisher (1928), exemplifies the idea of numerosity; When doing transactions, the nominal worth of money is prioritized over its true value. Shafir, Diamond, and Tversky (1997) also argue that people make judgments based more on the nominal than the actual worth of money.

Recent literature on money illusion also shows that the nominal value of money affects consumers' perceptions. When the nominal value of a foreign

currency (Singapore \$1.70) is larger than the domestic currency (US\$1), consumers are likely to spend less when buying with the foreign currency (Singapore) than the domestic currency (Raghubir and Srivastava 2002). In a similar vein, providing customers with two movie renting alternatives: weekly basis (Plan A: seven movies/week for \$10/week; Plan B: nine movies/week for \$12/week) and yearly basis (Plan A: 364 movies/year for \$10/week; Plan B: 468 movies/year for \$12/week), Plan A is preferred over Plan B for the a weekly basis whereas Plan B is preferred over Plan A for the yearly basis, despite the fact that the amount of new movies in both programs remains the same.

Money illusion is not the only theory that shows the power of the nominal concept. Often, larger numbers are associated with larger sizes (Pelham, Sumarta, and Myaskovsky 1994). For example, a 10-bedroom house is likely to be larger in size than a 3-bedroom house. When exposed repeatedly to such joint stimuli, individuals ignore other cues and try to use numbers (3 vs 10) to infer size (Bagchi and Li 2011). Gallistel and Gelman (1991) suggest that our brain innately uses numerosity to infer quantity.

When presented with two reward program options—one with a large nominal value and another with a small nominal value—most consumers will choose the large nominal value. This is consistent with the arguments of Pelham, Sumarta, and Myaskovsky (1994) and Bagchi and Li (2011), which is at odds with the idea of the money illusion that argues that individuals spend less when the nominal value is high. This difference has an intuitive explanation; when offered something (points), we have higher expectations yet when it comes to payments, we want to spend less (money).

The work of Pelham, Sumarta, and Myaskovsky (1994) reaffirms the concept of numerosity heuristically. Students calculated the areas of two geometric figures: a single intact vs. an identical circle cut into nine different wedges. A “difficult reassembly” vs. “easy reassembly” condition was then created from the condition of the divided circle. The nine wedge-shaped parts were arranged in the difficult reassembly condition along a horizontal line, and in the simple reassembly condition they were arranged so that it was clear they could be put together to make a single circle. The area of a circle when it is divided into several smaller parts was underestimated by the participants, as was to be expected. Participants thought the split circle's area was bigger under both the simple and complex reassembly circumstances. Participants in the easy condition reported that the size of the intact circle was 1.85 and the divided circle was 1.99; in the difficult condition, they reported the divided

circle as 2.68 while the intact circle the same as in the easy condition.

Based on the existing literature, this study will examine how customers' perceptions of an outcome are influenced by the structure and design of a medium by utilizing a point accumulation process as the incentive program's medium (a reward program). However, in this study, the concept of medium is not the only one used. Two fundamental ideas are employed for a more complex medium: nominal value of point accumulation (small vs. large) and accumulation trend (increasing vs. diminishing). Depending on whether consumers pay attention to simply nominal trends or to both nominal and accumulation developments, inferences may vary. As a result, a comparison of a control choice (i.e., without medium) and a treatment choice (i.e., with medium) becomes a more complex model. The study scenario will be used to explore this in more depth.

2.4. Effects of nominal value on the perceived value of a reward program and program loyalty

From [Van Osselaer, Alba, and Manchanda \(2004\)](#) research, the value of points from a loyalty program is exaggerated. Different distributions of the same number of points across an identical number of purchases (100, 200, and 300 points for the first, second, and third purchase respectively vs. 200 for each first, second, and third purchase) lead to inconsequential results and cause participants to ignore loyalty points as a criterion for decision. In contrast, such decisions are impacted by points even when consumers are provided with other legitimately discriminating information (price), and the points' irrelevance is obvious. This study suggests that when additional, clearly justified choices are available, irrelevant information can impact decision-making and, as a result, can be influential.

The influence of points is due to a low-level associative process that influences choice independent from more deliberative processes ([Van Osselaer, Alba, and Manchanda 2004](#)). [Van Osselaer, Alba, and Manchanda \(2004\)](#) label these low-level associative processes as myopic to the degree that they are analogous to other low-level processes, such as the intuitive processes defined by [Loewenstein \(1996\)](#). [Loewenstein \(1996\)](#) argues that intuitive processes focus on the present. Additionally, models of classical or evaluative conditioning do not consider the effects of stimuli beyond the current trial. Animals and humans tend to disregard the impact of current behavior on future outcomes in distributed choice ([Herrnstein 1997](#)). Consequently, [Van Osselaer, Alba, and Manchanda \(2004\)](#) suggest that consumers are largely

unconcerned with irrelevant points and instead concentrate on those that are relevant to their current choice (medium).

A large amount (large nominal value) provides the impression that the quality is superior (greater program value). Small nominal values, on the other hand, will give the sense that they are of relatively lower worth. Thus, it is expected that when the nominal value of accruable points is high, one will perceive a rewards scheme favorably. Gaining points is only a method, a vehicle for a reward with no real intrinsic worth yet maximizing the medium will cause consumers to ignore information other than the process. The results are supported by prior research on consumers' value perceptions of reward programs.

According to [O'Briend and Jones \(1995\)](#) research, a reward program should be seen as helpful for increasing loyalty. According to [Dowling and Uncles \(1997\)](#), a loyalty program should improve the total value proposition of the good or service to have the highest chance of succeeding in a competitive market. This will encourage consumers to make their next purchase of the good or service. In terms of consumer–firm interaction, consumers' impression of a loyalty program's worth may be influenced by the procedures used to manage the reward program ([Bowman and Narayandas 2001](#); [Yi and Jeon 2003](#)).

For low-involvement products compared to high-involvement ones, value perception is more strongly associated with program loyalty. People who buy high-involvement items are not primarily interested in the value produced through rewards ([Yi and Jeon 2003](#)). By contrast, deals induce brand choice and are more likely to be reinforcing than low-involvement products ([Rothschild and Gaidis 1981](#)). As a result, program loyalty is a must for customers' value perception to result in brand loyalty for low-involvement items since value perception through incentives is largely focused on the loyalty program.

It is of interest to claim a mediation process whereby the effect of the nominal values on program loyalty is mediated by the perceived value of a reward program. The literature has revealed that there is interest in the indirect impact of nominal value on program loyalty through a medium ([Hwang and Choi 2020](#); [Khan 2019](#); [Ma, Li, and Zhang 2017](#); [Melnyk and Bijmolt 2015](#); [Septianto et al. 2019](#)). However, the between-subject frame of the study is dominant, and the within-subject frame is rare. For each subject, in this research, the within-subject frame for the point accumulation type (nominal) measuring the perceived value for a reward program and program loyalty is used, whereas the between-subject frame is used for the accumulation trend.

In the mediation process, there are two paths consisting of a sequence of causal steps: the nominal value affects the perceived value of a reward program, which in turn causally influences program loyalty. This indirect effect of the nominals quantifies the degree to which the perceived value of a reward program acts as the mechanism by which the nominal affects program loyalty. A statistically significant indirect effect supports the claim of a mediation process.

It is expected that subjects will have a greater perceived value of a reward program with large nominals of the medium than with small ones, and large nominals of the medium will increase the value of program loyalty. Hence:

H3. *Those assigned to a large nominal value will gain greater program loyalty because of the increased perceived value of a reward program.*

During the fulfillment of the point accumulation program, consumers will feel either fondness or reluctance for the program by assessing the desirability of the medium scheme. Such feelings will also affect the perceived value of a reward program as well as program loyalty. Therefore, the assessed program desirability was measured. The assessed program desirability may therefore serve as a controller of the effect of the nominal value on program loyalty in addition to the perceived worth of a reward program. The psychological logic can be stated as follows: "When the medium is offered at the time of purchase, consumers will assess its desirability. Bearing such desirability in mind, they will perceive the value of the reward program and then show program loyalty." It is plausible that, with better program desirability, there is likely to be a greater perceived value of a reward program which, in turn, will result in a greater value of program loyalty. Hence, an additional hypothesis, controlling the desirability of the medium scheme corresponding to H3, is proposed as follows:

H4. *Of those who feel the same desirability for the medium scheme, those assigned to a large nominal value will gain greater program loyalty because of the increased perceived value of a reward program.*

3. Research methodology

3.1. Overview

The experiment employs an experimental design with within-subject variables (nominal: large vs. small, the perceived value of a reward, program loyalty) and between-subject (accumulation trend:

increasing vs. diminishing) variables scenarios. Discount coupons are used as a process medium for amusement parks, department stores, and restaurants. Each participant is allocated randomly to one of the two accumulation trends (increasing and diminishing), and then each one responds to the perceived value of a reward and program loyalty for given two nominal values (large and small). The interests mentioned above are hypothesized in the previous section.

3.2. Method

One hundred ninety undergraduates and graduates from major universities in Seoul, Korea were recruited to take part in a survey. Ten participants with missing values were excluded. The analyses below then used the remaining 180 respondents (Mage = 23.6, 66.1% female).

The scenario is designed to simulate real-world decisions in a marketing context (Park 2012). From the theory of improvement and medium maximization, as mentioned above, consumers are likely to select a reward program with an increasing-accumulation trend and a large nominal rather than that with a diminishing-accumulation trend and small nominal since enhancement and largeness give an impression of greater value. Three different types of reward programs for a diminishing trend (discount coupons for amusement parks at a café, department stores at a restaurant, and restaurants at an advance ticket purchase site), each with two nominal values of medium (small and large), are answered by half of the participants. Another three types of reward programs for an increasing trend, designed the same as the previous one except for the trend, are answered by the other half of the participants. Each type of reward program was implemented at its location which each participant was assumed to visit.

For the increasing point-accumulation trend, more points are given as the consumer repeats his/her visit to the store. For the diminishing point-accumulation trend, on the contrary, fewer points are given as the consumer repeats his/her visit to the store.

The two nominal values (small and large) are designed as one with small total accumulation points and a discount coupon for a single place, and another with large total accumulation points and a discount coupon for multiple places. An option with a large nominal value does not yield a better reward than an option with a small nominal.

Required visits for the termination of point accumulation are different depending on the cases (5 for the café; 4 for the restaurant; 2 for the advance show ticket office).

Table 1. Summary of survey methods for the increasing point-accumulation trend. (Method for the diminishing point-accumulation trend is the reverse order of Point-accumulation in the table).

Program	Location	Method	Nominal		
			Small	Large	
A	Cafe	Required visits	5	5	
		Total accumulation points	150	1500	
		Point-accumulation (points per visit)	1st	10	100
			2nd	20	200
			3rd	30	300
			4th	40	400
			5th	50	500
Coupon (amusement park)	Everland	Everland or Lotte World			
B	Restaurant	Required visits	4	4	
		Total accumulation points	1000	10,000	
		Point-accumulation (multiple of purchase amount)	1st	1 x	10 x
			2nd	1 x	10 x
			3rd	2 x	20 x
			4th	2 x	20 x
		Coupon (department store)	Shinsegae	Shinsegae or Lotte or Hyundai	
C	Advance show ticket site	Required visits	2	2	
		Total accumulation points	1,000	10,000	
		Point-accumulation (multiple of purchase amount)	1st	1 x	10 x
			2nd	2 x	20 x
		Coupon (family restaurant)	Outback	Outback or VIPS	

The three discount coupon programs for amusement parks, department stores, and restaurants are represented by characters A, B, and C, respectively, throughout this article. The scenario is summarized in Table 1 for the increasing point-accumulation trend. The scenario for diminishing point-accumulation trend is the reverse order of the increasing trend.

3.3. Measures

O'Brien and Jones (1995) propose five elements of a loyalty program that measure the value perception toward a loyalty program: The cash value of redemption rewards (cash value), the range of choice of these rewards (redemption choice), the aspirational value of rewards (aspirational value), the perceived likelihood of achieving rewards (relevance), and the scheme's ease of use (convenience).

Questions from Yi and Jeon (2003) research are adopted and modified, which built on the five elements of O'Brien and Jones (1995): The perceived value of reward for two nominals (small: option 1; and large: option 2) was measured for each subject using six questions: "The reward of option 1 have high cash value"; "The reward of option 2 have high cash value"; "It is highly likely to get the reward of option 1", "It is highly likely to get the reward of option 2"; "The reward of option 1 is what I have wanted"; "The reward of option 2 is what I have wanted." A 7-point

scale is used where 1 = "not at all" and 7 = "quite a lot".

Slightly modified from Yi and Jeon's work (Yi and Jeon 2003), to adapt to the proposed scenario, the program loyalty for two nominal values (small: option 1; large: option 2) was measured for each subject using six questions: "I like the reward program of option 1 more so than other reward programs"; "I like the reward program of option 2 more so than other programs"; "I have a strong preference for the reward program of option 1"; "I have a strong preference for the reward program of option 2"; "I would recommend the reward program of option 1 to others"; "I would recommend the reward program of option 2 to others." A 7-point scale is used where 1 = "not at all" and 7 = "quite a lot".

In addition to questions about the perceived value of a reward program and the program loyalty, three measurements about the consumers' attitude towards the medium program - willingness to finish the program, achievement for prospective completion of the program, and fatigue from undergoing the program process - are taken from participants for two nominal values (small: option 1; large: option 2). The willingness to finish for two nominal values was measured for each subject using two questions: "I have the intention to finish option1 program", and "I have the intention to finish option2 program". The achievement for completion of the program was measured

for each subject using six questions: “I will be filled with joy upon completion of the option 1 program”, “I will be filled with joy upon completion of the option 2 program”, “I will feel a sense of accomplishment upon completion of the option 1 program”, “I will feel a sense of accomplishment upon completion of the option 2 program”, “I will think that I have done a right thing upon completion of the option 1 program”, and “I will think that I have done a right thing upon completion of the option 2 program”. The fatigue for the program process was measured for each subject using four questions: “The option 1 program makes me tired”, “The option 2 program makes me tired”, “The option 1 program is time-consuming”, and “The option 2 program is time-consuming”. For all these questions about the impression of undergoing the process, a 7-point scale is used where 1 = “not at all” and 7 = “quite a lot”.

These three measurements of the consumers’ attitude towards the medium program are concerned with the desirability of the medium scheme. Thus, all three measurements are put together and named ‘the desirability’ of the medium program.

3.4. Analysis

In this analysis, each of the three types of reward programs (A, B, C) was studied separately, and then those results are compared to each other. In each reward program, the effects of the nominal and the point-accumulation trend on the perceived value of reward were studied first.

The medium size was expressed by the nominal value (Nominal), either small or large. From each person, the three variables such as the perceived value of a reward program (PR), program loyalty (PL), and the assessed value of desirability (Desire), are measured by each participant for small and large nominal values. The survey questionnaire corresponding to the point-accumulation trend (Trend), either diminishing or increasing, was assigned to the participants randomly. In the analysis, functions in the R language were used (version 4.2.0).

The measurements in this experiment correspond to a 2 (Trend) × 2 (Nominal) mixed design where Trend is a between-subject variable and Nominal is a within-subject variable. The main effects of Trend and Nominal as well as their interaction term on PR were tested for the three programs (A, B, C). The results were obtained using the R function `aov()` for the mixed ANOVA model and summarized in Table 2.

From the results in Table 2, the main effects of Trend on PR are significant for all programs (A: $p = .04$; B: $p = .03$; C: $p = .05$), but the main effects of Nominal on PR are significant in programs A and C, but not

Table 2. ANOVA result for the 2×2 mixed design by Trend and Nominal.

Program	Effect	F	P-value
A	Trend	4.34	.04
	Nominal	3.90	.05
	Trend*Nominal	0.45	.50
B	Trend	4.81	.03
	Nominal	2.36	.13
	Trend*Nominal	0.42	.52
C	Trend	4.04	.05
	Nominal	7.59	.01
	Trend*Nominal	.50	.48

in program B (A: $p = .05$; B: $p = .13$; C: $p = .01$). On the other hand, the interaction effects between Trend and Nominal are not significant in any of the three programs. This result justifies the effect of Trend on PR can be analyzed separately without considering the effect of Nominal, and vice versa. Thus, we analyze the effect of Trend and the effect of Nominal separately on the PL values directly and indirectly through PR.

In analyzing the indirect effect of Trend and Nominal on PL through PR, a tool for the mediation model which can handle the mixed design should be considered. The most widely used tool for the mediation analysis is the PROCESS macro by Hayes (see <https://www.processmacro.org>), but this is designed only for the between-subject model. The MEMORE macro by Montoya and Hayes (see <https://www.akmontoya.com/spss-and-sas-macros>) is designed for the within-subject model, but this does not allow mediators in the model. Thus, a structural equation modeling (SEM) approach was used for the analysis of the between-subject (Trend) and the within-subject (Nominal) mediation models with moderators. The SEM approach was implemented using the function `sem()` of the package {lavaan} in the R language. In testing the effects in the mediation model using the function `sem()`, p-values were used for single effects and 95% bootstrap confidence intervals (BootCI) with 5,000 replications were used for indirect effects. The reason for using the BootCI is that the indirect effect is a product of two effects and no product of two normal variables follows a normal distribution.

3.4.1. Effect of trend

Since Trend is a between-subject variable, the measures for two Nominal values are averaged in analyzing the effect of Trend on them. Let $\{PR_1, PR_2\}$ and $\{PL_1, PL_2\}$ denote the PR and PL values corresponding to the two values of Nominal values, respectively. Then the averages of PR and PL are defined:

$$PR_{avg} = (PR_1 + PR_2)/2$$

$$PL_{avg} = (PL_1 + PL_2)/2$$

The effect of Trend on the average of the two PR values (PR_{avg}) for small and large Nominal values was tested by a Welch two-sample t-test (increasing vs. diminishing) for the three types of reward program (A: $t = 2.09, p = .04$; B: $t = 2.20, p = .03$; C: $t = 2.02, p = .05$). These results show that the increasing point-accumulation trend has a positive effect on the perceived values of the reward program than the diminishing point-accumulation trend.

Now, consider a path model where the effect of Trend on the average of the two PL values (PL_{avg}) is mediated by PR_{avg} . For each subject, then, PR_{avg} and PL_{avg} are expressed as the two regression equations:

$$PR_{avg} = i_{PR} + a \cdot Trend + \varepsilon_{PR} \tag{1}$$

$$PL_{avg} = i_{PL} + c' \cdot Trend + b \cdot PR_{avg} + \varepsilon_{PL}, \tag{2}$$

where i_{PR} and i_{PL} are intercepts, and ε_{PR} and ε_{PL} are error terms. The constant a in equation (1) is the effect of Trend on PR, representing the change in PR values when shifting from the diminishing Trend to the increasing Trend. The constant b in equation (2) is the effect of PR on PL when the effect of Trend is accounted for, representing the change in PL when PR increases one unit. The constant c' in equation (2) is the direct effect of Trend on PL when the effect of PR on PL is accounted for, representing the change in PL when Trend is shifting from diminishing to increasing.

The two equations (1) and (2) represent a mediation model, corresponding to PROCESS model 4 of Hayes (Hayes 2018). Fig. 1 shows the statistical path diagram of the mediation model (ignoring errors) with corresponding hypotheses and effects. Note that the indirect effect corresponds to $a \cdot b$, which is the product of coefficient a in equation (1) and coefficient b in equation (2). The direct effect is the coefficient c' in equation (2), and the total effect is the sum of the indirect and direct effects, $a \cdot b + c'$. The results of the two-condition mediation model for Trend are summarized on the left side of Table 3.

The effect estimates of Trend on PR were positive for all three programs (A: $a = 0.41, p = .04$; B: $a = 0.37, p = .03$; C: $a = 0.37, p = .04$), meaning that subjects are more to get PR values with an increasing Trend relative to those with a diminishing Trend. The effect estimates of PR on PL, were all positive for all three programs (A: $b = 0.77, p < .001$; B: $b = 0.87, p < .001$; C: $b = 0.81, p = .00$), meaning that as the PR increases, subjects are more to have the PL values.

The indirect effect estimates of Trend on PL were all positive (A: indirect = .32 BootCI = [0.02, 0.62]; B: indirect = 0.32 BootCI = [0.03, 0.63]; C: indirect = 0.30 BootCI = [0.01, 0.60]). This result means that the subjects are more to have PL with an increasing Trend relative to a diminishing Trend through the process of PR. H1 is supported.

The total effects of Trend on PL were variable depending on programs (A: total = 0.62 $p = .00$; B: total = 0.47 $p = .01$; C: total = 0.26 $p = .15$). The direct effects of Trend on PL were also variable depending on programs (A: $c' = 0.30, p = .03$; B: $c' = 0.15, p = .21$; C: $c' = -0.05, p = .74$). Comparing the direct, indirect, and total effects, it can be stated: No matter how the point-accumulation trend affects the program loyalty in total, the increasing point-accumulation trend makes the program loyalty larger through the enhancement of the perceived value of a reward program when compared to diminishing point-accumulation trend.

To study the effect of Desire in the medium scheme, a two-condition between-subject mediation model where Desire is moderating the relation from Trend to PR was considered. The two Desire values corresponding to the two Nominal values are averaged in this analysis because Desire is a within-subject variable:

$$Desire_{avg} = (Desire_1 + Desire_2)/2$$

where $Desire_1$ and $Desire_2$ are two Desire values corresponding to the two Nominal values.

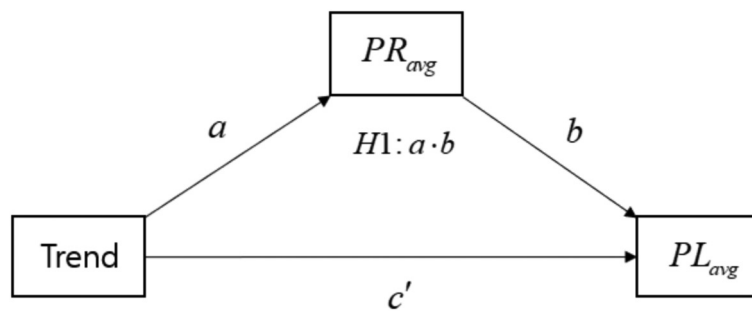


Fig. 1. Statistical path diagram of two-condition (Trend) between-subject mediation model with corresponding hypotheses. (indirect effect = $a \cdot b$, direct effect = c')

Table 3. Results of a two-condition (Trend) between-subject mediation model.

Program	Effect	Mediation without desire			Mediation with desire		
		B	SE	P(BootCI)	B	SE	P(BootCI)
A	<i>a</i>	0.41	0.20	.04	0.20	0.14	.15
	<i>b</i>	0.77	0.05	<.001	0.54	0.07	<.001
	<i>c'</i>	0.30	0.14	.03	0.30	0.13	.02
	<i>d</i>				0.81	0.06	<.001
	<i>e</i>				0.36	0.08	<.001
	indirect total	0.32	0.15	[0.02, 0.62]	0.11	0.08	[-0.34, 0.26]
B	<i>a</i>	0.37	0.17	.03	0.25	0.11	.03
	<i>b</i>	0.87	0.05	<.001	0.64	0.08	<.001
	<i>c'</i>	0.15	0.12	.21	0.19	0.12	.11
	<i>d</i>				0.75	0.05	<.001
	<i>e</i>				0.32	0.08	<.001
	indirect total	0.32	0.15	[0.03, 0.63]	0.16	0.09	[0.01, 0.35]
C	<i>a</i>	0.37	0.18	.04	0.20	0.11	.08
	<i>b</i>	0.81	0.04	.00	0.66	0.07	.01
	<i>c'</i>	-0.04	0.11	.74	-0.02	0.11	.84
	<i>d</i>				0.87	0.05	.00
	<i>e</i>				0.21	0.08	.01
	indirect total	0.30	0.15	[0.01, 0.60]	0.13	0.08	[-0.02, 0.28]
	total	0.26	0.18	.15	0.11	0.13	.40

Now, consider a regression model with an interaction between Trend and *Desire_{avg}*:

$$PR_{avg} = i_{PR} + a \cdot Trend + d \cdot Desire_{avg} + h \cdot Trend * Desire_{avg} + \epsilon_{PR}$$

The regression results showed that the interaction term between Trend and Desire was not significant at all, but Desire itself was highly significant to PR for all three programs. Thus, Desire was included in the medium scheme as a covariate rather than a moderator by deleting the interaction term in the regression model. For each subject, then, PR and PL values are expressed as the two regression equations with the

covariate Desire:

$$PR_{avg} = i_{PR} + a \cdot Trend + d \cdot Desire_{avg} + \epsilon_{PR} \tag{3}$$

$$PL_{avg} = i_{PL} + c' \cdot Trend + b \cdot PR_{avg} + e \cdot Desire_{avg} + \epsilon_{PL} \tag{4}$$

Fig. 2 shows the statistical path diagram of the two-condition (Trend) between-subject mediation model with a covariate (Desire). The results were summarized on the right side of Table 3. The indirect and direct effects are *a · b* and *c'*, respectively, which are the same as those of the model without a covariate

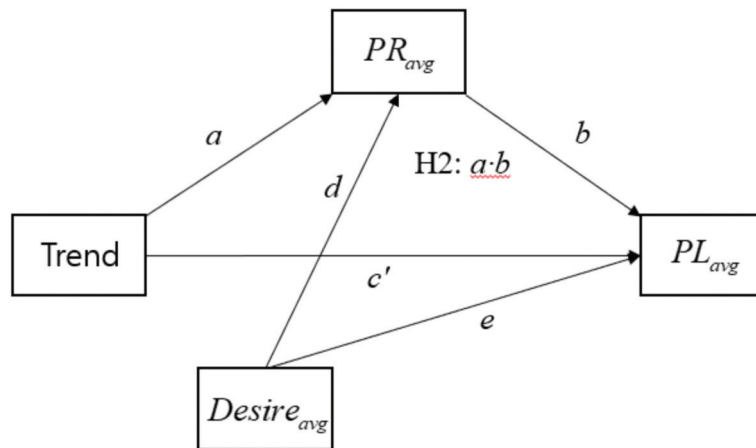


Fig. 2. Statistical path diagram of the two-condition (Trend) between-subject mediation model with a covariate (Desire) with corresponding hypotheses (ignoring errors). (indirect effect = *a · b*, direct effect = *c'*)

because the existence of covariates in the mediation model does not affect their formulas.

When Desire was accounted for in the medium scheme, the effect of Trend on PR became partly significant (A: $a = 0.20$ $p = .15$; B: $a = 0.25$ $p = .03$; C: $a = 0.20$ $p = .08$) whereas the effect of Desire on PR was highly significant (A: $d = 0.81$ $p < .001$; B: $d = 0.75$ $p < .001$; C: $d = 0.87$ $p = .00$) in all three programs. This result implies that Trend contributes partly to explaining PR values when Desire was accounted for. On the other hand, the effect of PR on PL when Desire was accounted for was still significant (A: $b = .54$ $p < .001$; B: $b = .64$ $p < .001$; C: $b = .66$ $p = .01$) in all three programs.

Since the effect of Trend on PR was partly significant despite the significance of the effect of PR on PL, the indirect effect of Trend on PL through PR was also partly significant (A: indirect = .11 BootCI = [-0.34, 0.26]; B: indirect = 0.16 BootCI = [0.01, 0.35]; C: indirect = 0.13 BootCI = [-0.02, 0.28]). Thus, H2 was partly supported.

3.4.2. Effect of nominal value

The situation in this research corresponds to the two-condition (two Nominal values) within-subject mediation model with or without moderation. Differences between two PR and two PL values within each subject are used in analyzing the effect of Nominal on PR as well as on PL.

Consider a two-condition within-subject mediation model without moderation first. Let PR_1 and PR_2 denote the PR values for small and large Nominal values at each subject, respectively. Then, for two Nominal values, the difference of PR values (PR_{diff}) for each subject is expressed as (Montoya and Hayes 2017)

$$PR_{diff} = PR_2 - PR_1 = a + \varepsilon_{PR_{diff}} \tag{5}$$

where $\varepsilon_{PR_{diff}}$ is an error term. The constant a in equation (5) is the average effect of Nominal on PR, representing the difference between the two PR measurements.

Let PL_1 and PL_2 denote the PL values for small and large Nominal values at each subject, respectively. Also let PR_{avg} be the average of the two PR values, $(PR_1 + PR_2)/2$, and \overline{PR}_{avg} be the sample mean of PR_{avg} . Then, for two Nominal values, the difference of the PL values (PL_{diff}) for each subject is expressed as (Montoya and Hayes 2017):

$$PL_{diff} = PL_2 - PL_1 = c' + b \cdot PR_{diff} + b^* \cdot (PR_{avg} - \overline{PR}_{avg}) + \varepsilon_{PL_{diff}} \tag{6}$$

where $\varepsilon_{PL_{diff}}$ is an error term.

The constant b in equation (6) is the effect of PR on PL across the two Nominals. This means the effect of the difference between the two PR measurements on the difference of the two PL measurements. The constant c' implies the direct effect of Nominal on the difference of PL. Note that the average of PR values (PR_{avg}) at each subject is generated when the difference in the responses is taken as a function of the difference in mediators (Montoya and Hayes 2017; Judd, Kenny, and McClelland 2001). The constant b^* implies the effect of average of the two PR values on the difference of the two PL values.

Fig. 3 shows the statistical path diagram of the two-condition within-subject mediation model, representing the effect of Nominal on PR (a), the effect of the difference between the two mediator values on the difference of two responses (b), and the direct effect of Nominal on PL (c'). Note that the difference of two Nominal values is always 1, and the indirect effect of Nominal on PL corresponds to $a \cdot b$.

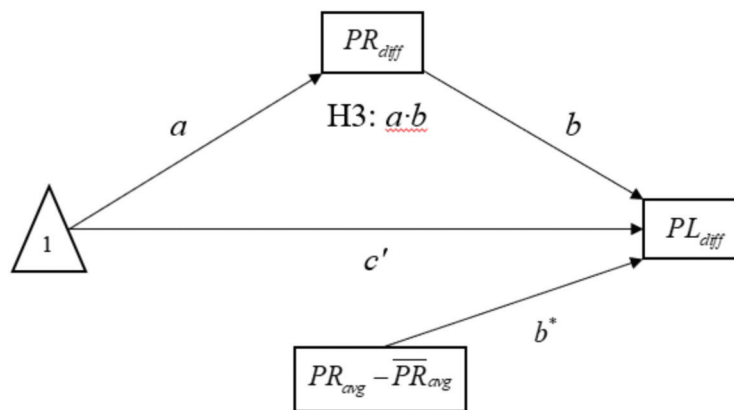


Fig. 3. Statistical path diagram of the two-condition (Nominal) within-subject mediation model with corresponding hypotheses (ignoring errors). (difference of two nominals = '1', indirect effect = $a \cdot b$, direct effect = c').

Table 4. Results of the two-condition (Nominal) within-subject mediation model with and without a moderator (Desire).

Program	Effect	Mediation without desire			Mediation with desire		
		B	SE	P(BootCI)	B	SE	P(BootCI)
A	<i>a</i>	0.12	0.06	.05	0.13	0.05	.01
	<i>b</i>	0.51	0.07	<.001	0.31	0.08	<.001
	<i>c'</i>	0.08	0.06	.21	0.11	0.06	.07
	<i>d</i>				0.70	0.08	<.001
	<i>e</i>				0.49	0.11	<.001
	indirect	0.06	0.03	[0.00, 0.13]	0.04	0.02	[0.00, 0.09]
	total	0.14	0.07	.04	0.14	0.06	.02
B	<i>a</i>	0.09	0.06	.12	0.12	0.04	.01
	<i>b</i>	0.74	0.08	<.001	0.41	0.10	<.001
	<i>c'</i>	-0.04	0.06	.52	0.01	0.06	.82
	<i>d</i>				0.92	0.08	<.001
	<i>e</i>				0.71	0.13	<.001
	indirect	0.07	0.05	[-0.02, 0.17]	0.04	0.02	[-0.00, 0.08]
	total	0.03	0.08	.71	0.03	0.06	.65
C	<i>a</i>	0.17	0.06	.01	0.10	0.05	.06
	<i>b</i>	0.39	0.07	<.001	0.28	0.08	.00
	<i>c'</i>	0.11	0.06	.06	0.10	0.06	.08
	<i>d</i>				0.81	0.10	<.001
	<i>e</i>				0.32	0.13	.01
	indirect	0.07	0.02	[0.02, 0.12]	0.05	0.02	[0.01, 0.09]
	total	0.18	0.06	.01	0.18	0.06	.00

The results of the two-condition (Nominal) within-subject mediation model without a moderator are summarized in the left side of Table 4. In implementing the two-condition within-subject mediation model, the estimates *a* and *c'* of equation (5) and (6) are intercepts of the fitted regression models.

The effect estimates of Nominal on PR were significant in programs A and C, but not in program B (A: $a = 0.12 p = .05$; B: $a = 0.09 p = .12$; C: $a = 0.17 p = .01$), meaning that subjects are more to get PR values with a large Nominal relative to those with a small Nominal in programs A and C. The effect estimates of PR measurements on PL measurements, were all positive for all three programs (A: $b = 0.51 p < .001$; B: $b = 0.74 p < .001$; C: $b = 0.39 p < .001$), meaning that as the PR measurements increases, subjects are more to have the PL measurements.

The indirect effect estimates of Nominal on PL measurements were significant in programs A and C, but not in program B (A: indirect = 0.06 BootCI = [0.00, 0.13]; B: indirect = 0.07 BootCI = [-0.02, 0.17]; C: indirect = 0.07 BootCI = [0.02, 0.12]). This result means that the subjects are more to have PL measurements with a large Nominal relative to a small Nominal through the process of the PR measurements in programs A and C. H3 was partly supported.

The total effect estimates of Nominal on PL measurements were variable depending on programs (A: total = 0.14 $p = .04$; B: total = 0.03 $p = .71$; total = 0.18 $p = .01$). The direct effects of Trend on PL measurements were not significant for all three programs (A:

$c' = 0.08 p = .21$; B: $c' = -0.04 p = .52$; C: $c' = 0.11 p = .06$). Comparing the direct, indirect, and total effects, it can be stated: No matter how the nominal value affects the program loyalty in total, a large nominal value makes the program loyalty larger or at least similar through the enhancement of the perceived value of a reward program when compared to a small nominal value.

The three programs A, B, and C do not show completely consistent results in testing significance of the path coefficients. It can be stated, however, that the effect of Nominal on PR (*a*) plays an important role in determining the positive indirect effect. This fact implies that the nominal program should be designed to produce the perceived value of reward program as much as possible to assure a large program loyalty measurement.

The effect of Nominal on PL measurements through PR measurements has been studied without considering effects of desirability assessment by participants arising during the prospective fulfillment of the point-accumulation program.

Consider a two-condition within-subject mediation model where Desire is moderating the paths from Nominal to PR as well as from Nominal to PL. Let $Desire_j$ be the Desire value at the Nominal value j ($j = 1,2$). Also let $Desire_{diff} = Desire_2 - Desire_1$ and \overline{Desire}_{avg} be the sample mean of $Desire_{avg} = (Desire_1 + Desire_2)/2$. Then, for two Nominal values ($j = 1,2$), the differences of PR values (PR_{diff}) and PL values (PL_{diff}) for each subject are expressed as two equations (see

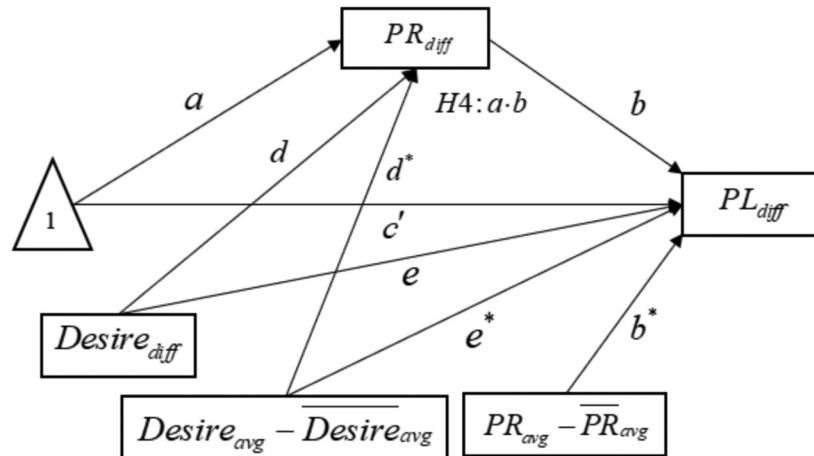


Fig. 4. Statistical path diagram of the two-condition (Nominal) within-subject mediation model with a within-subject covariate (*Desire*) with corresponding hypotheses (ignoring errors). (difference of two Nominal values = '1', unconditional indirect effect = $b \cdot (a + d \cdot \overline{Desire_{diff}})$, unconditional direct effect = $c' + e \cdot \overline{Desire_{diff}}$).

Appendix for derivation):

$$PR_{diff} = a + d \cdot Desire_{diff} + d^* \cdot (Desire_{avg} - \overline{Desire_{avg}}) + \varepsilon_{PR_{diff}} \quad (7)$$

$$PL_{diff} = c' + b \cdot PR_{diff} + b^* \cdot (PR_{avg} - \overline{PR_{avg}}) + e \cdot Desire_{diff} + e^* \cdot (Desire_{avg} - \overline{Desire_{avg}}) + \varepsilon_{PL_{diff}} \quad (8)$$

Note that the moderation between the condition (Nominal) and the moderator (*Desire*) in a two-condition within-subject mediation model is expressed as a covariate ($\overline{Desire_{diff}}$) in the difference equations (7) and (8) (see Montoya 2019). Since the moderator *Desire* is specified in the paths from Nominal to PR as well as to PL, the direct and indirect effects of Nominal on PL are the conditional functions of $\overline{Desire_{diff}}$. To see the overall effects across the sample $\overline{Desire_{diff}}$ values, the unconditional direct effect (UDE) and unconditional indirect effect (UIDE) are obtained by taking $\overline{Desire_{diff}}$ as its sample mean (that is, $\overline{Desire_{diff}} = \overline{Desire_{diff}}$) (see Appendix for derivation):

$$(UDE) = c' + e \cdot \overline{Desire_{diff}} \quad (9)$$

$$(UIDE) = b \cdot (a + d \cdot \overline{Desire_{diff}}) \quad (10)$$

Fig. 4 shows the statistical path diagram of the two-condition within-subject moderated mediation model ignoring the error terms.

The results of the two-condition (Nominal) within-subject moderated mediation model are summarized in the right side of Table 4. In implementing the two-condition within-subject mediation model, the estimates a and c' of equation (7) and (8) are the intercepts of the fitted regression models.

The effects of Nominal on PR when *Desire* was accounted for are significant for programs A and B, and marginally significant for program C (A: $a = 0.13, p = .01$; B: $a = .12, p = .01$; C: $a = 0.10, p = .06$), while the effect of *Desire* on PR was highly significant in all the three programs (A: $d = 0.70, p < .001$; B: $d = 0.92, p < .001$; C: $d = 0.81, p < .001$). The effects of the difference of PR values on the difference of PL values when *Desire* was accounted for were still significant for all three programs (A: $b = 0.31, p < .001$; B: $b = 0.41, p < .001$; C: $b = 0.28, p = .00$).

Consequently, the indirect effects of Nominal on PL through PR showed the same significance as those when the *Desire* was not accounted for (A: indirect = 0.04, BootCI = [0.00, 0.09]; B: indirect = 0.05, BootCI = [-0.00, 0.08]; C: indirect = 0.02, BootCI = [0.01, 0.09]). Thus, H4 was at least marginally supported.

The results of mediation analysis when *Desire* was accounted for showed that the indirect effects of Nominal on the PL through PR were effective in enhancement of PL regardless of considering *Desire* or not.

4. General discussions

In this research, it was shown that consumers make decisions and evaluate an outcome based on the process that mediates their initial effort and final reward. Consumers prefer more if an increasing point-accumulation trend was given, though there was no difference in the total points from a diminishing point-accumulation trend. Similarly, consumers prefer more if a large nominal value was given, though the actual outcome is of no difference. Furthermore, it was shown that both effects of an increasing

point-accumulation trend and a large nominal value on the program loyalty were mediated by the perceived value of reward in the positive direction. It was also shown that either an increasing point-accumulation trend or a large nominal value does not enhance program loyalty when the mediating effect was accounted for.

Furthermore, the measurement of desirability of the medium scheme plays an important role in the sense that how consumers will feel during the prospective fulfillment of the medium. The desirability showed a significant impact on the medium scheme; the desirability measurement contributed significantly to explaining the perceived value of a reward program and the program loyalty which, in turn, made the effect of the point-accumulation trend negligible. That means that those felt the same desirability of the medium scheme, the point-accumulation trend does not play any significant role in explaining the perceived value of a reward program or the program loyalty. On the other hand, the nominal value contributed to explain the perceived value of a reward program and the program loyalty, despite the impact of the desirability on the medium scheme.

This research is demonstrating a systematic difference between choice with a diminishing and increasing point-accumulation trends as well as choice with small and large nominal values. There are possible improvements and potential topics for future research. Regarding the nature and limitations of the research, some constructive suggestions can be made for future studies. First, a longitudinal study will have a better chance to measure consumers' loyalty toward a reward program and toward a brand in a more realistic way. Studies with scenarios may not assess the true loyalty, which allows certain amount of time to grow. Thus, future research may measure the perceived value toward a reward program first and then assess consumer loyalty after a certain period. Second, in the real world, types of rewards can be very diverse. Here we only mentioned different types of discount coupons, but loyalty programs can practically provide some complimentary gifts: e.g., a free cup of coffee or movie ticket. Furthermore, consumers' decisions or attitudes can be different from the current results when these free gifts are given. Lastly, the results, which are limited to the point accumulation program in the current study, can be applied to real-world phenomena. Under a business-to-business setting, for example, a supplier can see the changing loyalty of a retailer when incentives are given in different formats. Thus, the current research can make important theoretical and managerial contributions and serve as a foundation for studies in the future.

Conflict of interest

There is no conflict of interest.

Appendix: Derivation of equations (7) to (10)

The effect of Nominal on PR_{diff} in the presence of the within-subject moderator Desire can be formalized by two estimated values of PR, one for each condition:

$$PR_1 = a_1 + d_1 \cdot Desire_1 + \varepsilon_{PR_1}$$

$$PR_2 = a_2 + d_2 \cdot Desire_2 + \varepsilon_{PR_2}$$

Then using the relation

$$d_2 \cdot Desire_2 - d_1 \cdot Desire_1 = \frac{d_2 + d_1}{2} Desire_{diff} + (d_2 - d_1) Desire_{avg}, \tag{A.1}$$

the difference in PR can be written by subtracting PR_1 from PR_2 to get the difference model of PR (equation (7)):

$$PR_{diff} = a + d \cdot Desire_{diff} + d^* \cdot (Desire_{avg} - \overline{Desire}_{avg}) + \varepsilon_{PR_{diff}}, \tag{A.2}$$

where $a = a_2 - a_1 + d^* \cdot \overline{Desire}_{avg}$, $d = (d_2 + d_1)/2$, and $d^* = d_2 - d_1$.

The effect of Nominal on PL_{diff} through PR_{diff} in the presence of a within-subject moderator Desire can be formalized by the two values of PL, one for each condition:

$$PL_1 = c'_1 + b_1 \cdot PR_1 + e_1 \cdot Desire_1 + \varepsilon_{PL_1}$$

$$PL_2 = c'_2 + b_2 \cdot PR_2 + e_2 \cdot Desire_2 + \varepsilon_{PL_2}$$

Using equation (A.1), the difference in PL can be written by subtracting PL_1 from PL_2 to get the difference model of PL (equation (8)):

$$PL_{diff} = c' + b \cdot PR_{diff} + b^* \cdot (PR_{avg} - \overline{PR}_{avg}) + e \cdot Desire_{diff} + e^* \cdot (Desire_{avg} - \overline{Desire}_{avg}) + \varepsilon_{PL_{diff}}, \tag{A.3}$$

where $c' = c'_2 - c'_1 + b^* \cdot \overline{PR}_{avg} + e^* \cdot \overline{Desire}_{avg}$, $b = (b_2 + b_1)/2$, $b^* = b_2 - b_1$, $e = (e_2 + e_1)/2$, and $e^* = e_2 - e_1$.

It has been shown by Judd, Kenny, and McClelland (2001) that the direct and indirect effect occurs at the sample mean of PR_{avg} and $Desire_{avg}$. Thus, insert $PR_{avg} = \overline{PR}_{avg}$ and $Desire_{avg} = \overline{Desire}_{avg}$ on equations (A.2) and (A.3) and ignore the error term to get the direct effect (DE) and indirect effect (IDE) of Nominal on PL:

$$(DE) = c' + e \cdot Desire_{diff}$$

$$(IDE) = b \cdot (a + d \cdot Desire_{diff})$$

Note that the direct and indirect effects of Nominal on PL are expressed as the conditional effects given the $Desire_{diff}$ value.

To see the overall effects of Nominal on PL across the sample $Desire_{diff}$ values, unconditional direct and indirect effects (UDE and UIDE) are derived as the conditional effects evaluated at the sample mean value of $Desire_{diff}$ by letting $Desire_{diff} = \overline{Desire_{diff}}$ (equations (9) and (10)). That is,

$$(UDE) = c' + e \cdot \overline{Desire_{diff}} \quad (A.4)$$

$$(UIDE) = b \cdot (a + d \cdot \overline{Desire_{diff}}) \quad (A.5)$$

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