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Tariff choice of online contents based on usage goal and self-control: can I control myself?

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Tariff choice of online contents based on usage goal and self-control: can I control myself?

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Abstract

Purpose – People can easily track and understand their usage pattern for any content (e.g. movies, games) or service (e.g. card payment, cell phone usage) by using technologies such as the internet and smart phones. When consumers evaluate their past consumption patterns, they may experience two different kinds of regret: content-based or monetary-based. The purpose of this paper is to propose that perceived self-control, defined as the extent to which people believe they can control their usage, plays a moderating role in the tariff-choice process (flatrate vs pay-per-use) for two types of content: vice-based and virtue-based.

Design/methodology/approach – Two laboratory experiments were designed to test the hypotheses. There were a total of 200 participants (86 for Experiment 1 and 114 for Experiment 2) who completed the entire experimental process (i.e. stimulus exposure, questionnaire reporting, dependent variable measurement, manipulation of the independent variables, and control checks).

Findings – The results of this research provide evidence supporting the role of perceived self-control in tariff preference by showing that preference varies between flat-rate and pay-per-use tariff options. Specifically, virtue-based content users were more likely to prefer the pay-per-use tariff when their perceived self-control was low vs when it was high. In contrast, vice-based content users were more likely to prefer the flat-rate tariff when their perceived self-control was low vs when it was high.

Originality/value – There are three contributions of the present research. First, the authors investigated the effect of content type on tariff preference. Second, the authors suggest that there is a moderating effect of perceived self-control on tariff preference. Third, this study revealed the factors affecting consumers' perceived self-control.

Keywords Flat-rate tariff, Online content, Past-usage pattern, Pay-per-use tariff, Self-control, Tariff preference

Paper type Research paper

1. Introduction

Rapid and converging technological advances in computing, communications, and digital devices have caused an explosion in the generation, processing, storage, transmission, and consumption of enormous amounts of digital content (Jun *et al.*, 2014). These trends are likely to continue to accelerate and have profound effects on content delivery and consumption (Subramanya and Yi, 2005). Digital content generally refers to movies, songs, news, or educational material that spans various application domains, including personal entertainment, business, and education and training. Digital content providers offer various pricing schemes, ranging from pure pay-per-use tariffs to flat rates (Lambrecht and Skiera, 2006). These enable consumers

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to make choices for obtaining access to the various contents and services. Thus, it is important for both company profits and consumer utility that content providers offer optimal price plans for digital content and that consumers use these plans.

Imagine a situation that frequently occurs in everyday life: Bob has a New Year's resolution to "master various programing skills" through intensive learning. When he visits online learning sites, he finds there are two types of payment plans: a single pass and a monthly pass. The monthly pass has a lower cost than a set of single passes, so he decides to purchase a monthly pass. Bob is confident that he will visit the web site and take the online class everyday. However, he does not keep his resolution for more than a few days, and after one month, he finds that he went to the online learning site only a few times; thus, he regrets purchasing the monthly pass instead of several single passes. Additionally, he feels that he does not have the self-control necessary to continue taking the class on a regular basis. In this context, which payment option would Bob choose for the next month?

As a different example, Julia, who heavily indulges in entertainment through internet video-on-demand (VOD) services, makes the decision to reduce the time she spends on internet entertainment and to increase the time she spends on productive tasks. Thus, she chooses the pay-per-use tariff option for VOD service rather than the monthly flat-rate option. Unfortunately, after one month, she finds that she spent more time than she intended using internet entertainment, so she regrets choosing the pay-per-use tariff over the flat-rate option. In addition, and similar to Bob in the previous example, she feels she does not have the self-control necessary to reduce the amount of time she spends on entertainment activities. In this context, which tariff option would Julia choose for the next month?

As these stories illustrate, people have to determine the appropriate tariff for any service based on their desired goals and the feasibility of achieving those goals. Moreover, the desired goal may differ depending on the content and service (Batra and Ahtola, 1991; Dhar and Wertenbroch, 2000; Lee *et al.*, 2014; Park and Park, 2013; Wertenbroch, 1998). Some content supports productive work, so people aim to use it often, whereas other content supports hedonic activities, so people aim to use it less.

Consumers may perceive the ability to control their usage differently, depending on their past-usage pattern and their personality or trait-like (chronic) characteristics. In the above example, Bob can choose the flat-rate tariff or unlimited access again and make a promise to himself to increase the number of times he takes the online learning class (e.g. he may think to himself, "I don't want to mess up again this time!"). Alternatively, he may choose the pay-per-use tariff because he is uncertain that he will take the online learning class more often (e.g. he may think to himself, "I had better choose the pay-per-use tariff because I'm not sure I can control myself this month either"). The purpose of this study is to determine which option people will choose in such circumstances. More interestingly, we investigate whether tariff choice differs depending on the goal: virtue-based (e.g. an online learning class) or vice-based (e.g. internet VOD for pleasure).

People can track and understand their usage pattern for any content (e.g. movies, games) or any service (e.g. card payment, cell phone usage) easily by using technologies such as the internet and smart phones. For example, they can select an effective payment plan for a mobile phone service according to the cost of each plan, and they can create a reasonable budget by examining their spending patterns on their credit card bills. Moreover, consumers can track their usage patterns for services such as gym

and health care center visits and the time spent on online gaming. These usage patterns may affect consumers' choices to continue to consume the content (or use the service) or to continue with a given payment plan (Nunes, 2000).

When consumers evaluate their past consumption patterns, they may experience two different kinds of regret: content-based or monetary-based. Content-based regret occurs when consumers either use content (or a service) regarded as virtue-based (e.g. exercising to improve health) less than their initial goal, or use content (or a service) regarded as a vice-based (e.g. chocolate, cigarettes, or games) more than their initial goal (Uhrich *et al.*, 2013). Monetary-based regret occurs when consumers either use content (or a service) less than the "break-even" point between a flat-rate tariff and a pay-per-use tariff when they chose the flat rate, or use content (or a service) more than the break-even point between the two tariff options when they chose the pay-per-use tariff (Herweg and Mierendorff, 2013; Schlereth and Skiera, 2012). These regrets often lead consumers to choose a different tariff option the following month. In terms of content-based regret, consumers typically want to reduce their usage of vice-based goods, while they want to increase their usage of virtue-based goods. Alternatively, in terms of monetary-based regret, consumers typically worry about heavy usage of vice-based goods and low usage of virtue-based goods. Thus, depending on which regret has a stronger influence, consumer tariff choices will differ.

This paper proposes that self-control, defined as the ability to regulate one's content usage, plays a moderating role in the tariff-choice process. Self-control conflicts arise when salient local incentives (feasibility options) contrast with people's more global objectives (desirability options; Fujita, 2008). People fail at self-control when they make decisions based on local rewards rather than their global goals. Alternatively, people succeed at self-control when they make decisions based on their global goals rather than local rewards. That is, if consumers have a high level of self-control, they will choose the tariff option that reduces content-based regret (a desirability-based choice). Thus, vice-content users tend to choose the pay-per-use tariff whereas virtue-content users tend to choose the flat rate. In contrast, if they have a low level of self-control, they will choose the tariff option that reduces monetary-based regret (a feasibility-based choice). Consequently, vice-content users tend to choose the flat-rat whereas virtue-content users tend to choose the pay-per-use tariff. In addition, this research attempts to reveal the factors that affect consumers' perceived self-control by measuring consumers' personality characteristics and the gap between planned and actual usage.

2. Theoretical background

2.1 Tariff choice

The current study focusses on two representative basic tariffs: flat-rate and pay-per-use. Previous studies have shown that consumers generally prefer the flat-rate tariff, and that they are more likely to choose the flat rate even in situations in which they would pay less money using the pay-per-use tariff. Research on health-club tariff choices (DellaVigna and Malmendier, 2006; Nunes, 2000) and telephone services (Train *et al.*, 1987) give some examples of this "flat-rate bias" (Train, 1991). Recently, Lambrecht and Skiera (2006) explained the causes of the flat-rate bias with the insurance effect, the taximeter effect, and the convenience effect. In addition, they showed that people tend to overestimate their usage of the content or services, and the result is that the flat-rate tariff becomes more attractive than the pay-per-use tariff

(Lambrecht and Skiera, 2006). However, in some cases, such as when usage volume is underestimated, the flat-rate bias is less likely to occur and a pay-per-use bias is observed (Lambrecht and Skiera, 2006; Miravete, 2002). Although there are a number of such biases in tariff choices, the estimation of usage amount for content or services is a key factor for consumers to choose the right tariff (Lambrecht and Skiera, 2006). Lambrecht and Skiera (2006) showed that when consumers estimated that they would heavily use a service, they were more likely to choose the flat-rate tariff, but when they estimated that they would moderately use a service, they were more likely to choose the pay-per-use tariff.

2.2 Usage estimation depending on content type

Consumers use digital content or services for two basic reasons: hedonic gratification and utilitarian achievement (Batra and Ahtola, 1991). Hedonic consumption aims for pleasure, fun, and enjoyment (i.e. immediate gratification despite long-term guilt). At the extreme, it may even be frivolous or decadent (O'Curry and Strahilevitz, 2001). By contrast, utilitarian consumption reflects functional needs and requirements (i.e. long-term benefits). Pure utilitarian services are practical, instrumental, necessary, and/or functional (O'Curry and Strahilevitz, 2001). Research has used different terms to categorize products that lead to immediate gratification and long-term guilt vs products that lead to long-term benefits. "Wants" vs "shoulds" is one type of categorization in which "wants" are seen as more experiential and appealing than "shoulds." Hedonic and utilitarian products are another way to classify these two types of purchases (Dhar and Wertenbroch, 2000). Virtue and vice categorization distinguishes products that offer positive payoffs in the short run (i.e. vices) and those that offer positive payoffs in the long run (i.e. virtues; Wertenbroch, 1998). In the current study, we use the terms "virtue" or "vice" to categorize digital content.

Regarding usage estimation for each content type (vice-based vs virtue-based), consumers may consider two aspects of content consumption: desirability and feasibility. Construal level theory proposes that the assessment of future events is influenced by individual considerations of both desirability and feasibility (Liberman and Trope, 1998). Desirability refers to the valence an individual attributes to an anticipated end state, whereas feasibility refers to the ease with which the end state can be reached. From the perspective of desirability, vice-based goods, such as online games and chocolate cake, generally make people feel guilty as their usage of them increases. Thus, people often strive to decrease their usage of these goods as much as possible (e.g. Baumeister, 2002; Chang *et al.*, 2014; Davis *et al.*, 2013; Hoch and Loewenstein, 1991; Li *et al.*, 2012; Trope and Fishbach, 2000; Wertenbroch, 1998). Alternatively, people often strive to increase their usage of virtue-based goods, such as online learning, swimming for health, and fruit salad (Chang *et al.*, 2014; Davis *et al.*, 2013). In other words, vice-based content can be conceptualized as "the less, the better" and virtue-based content as "the more, the better." From the perspective of feasibility, people have difficulty consuming less of vice-based goods because, as compared to virtue-based goods, choosing vice-based goods leads to small but immediate hedonic gratifications in addition to the larger but delayed and less positive (or even negative) consequences (Read *et al.*, 1999; Wertenbroch, 1998). In contrast, people are less likely to consume more virtue-based goods because doing so requires more cognition, is affect-poor, and involves considering only the delayed consequences of consumption while holding the immediate consequences fixed

(Khan *et al.*, 2005). Finally, consumers consider both the desirability and feasibility of each content consumption when forming their usage expectations, and they then decide on a payment plan based on their usage estimation.

In terms of desirability, the usage goal will differ depending on content type (vice-based vs virtue-based). In terms of feasibility, however, it is still not clear which type of tariff option is more attractive where the goal attainability is uncertain. Some prior work has shown that when faced with such uncertainty, consumers sometimes modify their future usage estimation and switch tariffs, if necessary, in order to minimize costs by learning from their past-usage experiences (Goettler and Clay, 2011; Miravete, 2002, 2003; Narayanan *et al.*, 2007). However, there is few research which investigate the role of content type on tariff preference. Indeed, no prior work has provided empirical evidence how these usage goal and the goal attainability dynamically impact on tariff preference. We propose that to effectively implement tariff options, we need to gain a better understanding of the mechanism of tariff preference where consumers' goal attainability is uncertain. Specifically, this study propose that perceived self-control plays a moderating role on the strength of desirability and feasibility at the tariff-choice stage for vice- and virtue-based content.

2.3 Impact of the level of self-control on tariff choice

The ability to intentionally produce desirable outcomes and prevent undesirable outcomes has been referred to as self-control and may be a basic human need. That is, when the short-term outcomes of an activity are in conflict with its long-term consequences, people may perceive the short-term outcomes as a threat to their long-term well-being and involve a variety of cognitive, affective, and motivational processes to exercise self-control. Consequently, a substantial body of literature has focussed on how people attempt to control their short-term consumption impulses in order to secure their long-term interests (DellaVigna and Malmendier, 2006; Wertenbroch, 1998). Individuals who have high levels of self-control: can persist in their chosen course of action when faced with adversity; are better at problem solving (Ross and Murkowski, 1989); experience less anxiety related to unpredictable outcomes (Kay *et al.*, 2009); are more confident in their ability to cope with danger and minimize its future occurrence (Miller, 1979); and have high self-efficacy (Thompson, 1981). Based on construal level theory, self-control is broadly conceptualized as making decisions and acting in accordance with global, high-level interpretations of the situation rather than local, low-level interpretations (Fujita *et al.*, 2006). Desirability concerns involve the value of the action's end state (a high-level construal feature), whereas feasibility concerns involve the means used to reach the end state (a low-level construal feature). Liberman and Trope (1998) have illustrated that high-level construal corresponds with desirability whereas low-level construal corresponds with feasibility. Therefore, desirability concerns should have greater influence than feasibility concerns as self-control increases (Liberman and Trope, 1998; Todorov *et al.*, 2007).

Consequently, consumers may adjust their usage goal depending on their perceived level of self-control. If consumers have high levels of self-control, they should simply seek to attain the desired goal depending on the content type and choose a tariff based on that goal (i.e. desired usage volume). It is expected that consumers who have high levels of self-control will choose the pay-per-use tariff for vice-based content and the flat-rate tariff for virtue-based content. However, if consumers have low levels of

self-control, they should be concerned about failure to attain their goal, and they should choose the tariff option that reduces their anticipated regret because of failure (Hetts *et al.*, 2000; Simonson, 1992).

With respect to virtue-based content, consumers who choose the flat-rate tariff and only moderately consume the virtue-based content should feel both types of regret simultaneously: they should be discouraged because they were unable to increase their usage of the virtue-based content (i.e. content-based regret) and spent more money than they would have if they had chosen the pay-per-use tariff (i.e. monetary-based regret). Consumers who choose the pay-per-use tariff and use a large amount of the virtue-based content should feel only monetary-based regret, but this monetary-based regret can be justified relatively easily because the content was virtuous. Finally, it is expected that consumers who have low levels of self-control are likely to choose the pay-per-use tariff for virtue-based content:

H1. Virtue-based content users are more likely to prefer the pay-per-use tariff when their perceived self-control is low compared to when it is high.

With respect to vice-based content, consumers who choose the pay-per-use tariff and fail to reduce their usage may feel two types of regret simultaneously: they should be discouraged because they were unable to decrease their usage of vice-based content (i.e. content-based regret) and spent more money than they would have if they had chosen the flat-rate tariff (i.e. monetary-based regret). If they choose the flat-rate tariff and do not consume a high amount of the vice-based content, they should only feel monetary-based regret. However, this regret can be justified relatively easily through this reduced usage. Finally, it is expected that consumers who have low levels of self-control are likely to choose the flat rate for vice-based content:

H2. Vice-based content users will be more likely to prefer the flat-rate tariff when their perceived self-control is low compared to when it is high.

Additionally, we propose two factors affecting consumers' perceived self-control: the gap between planned usage and real usage (Experiment 1), and consumers' personality characteristics (Experiment 2). First, perceived self-control may vary depending on whether a consumer's current usage fits his or her past-usage goal. Consumers may set a usage goal explicitly or implicitly in any consumption situation. Their past-usage pattern shows the extent of their goal achievement. If consumers successfully achieved a past-usage goal, then their perceived self-control increases and, as a result, they expect that they can control future consumption of any content. However, if consumers failed to achieve a goal, then their perceived self-control decreases and, as a result, they become uncertain about their future usage (Hofmann *et al.*, 2012). Since consumers can easily view their usage history through their online records for certain types of content, they can easily evaluate their cost and actual usage amount at virtually any time.

Second, when the consumers' past-usage patterns are controlled, their personality characteristics also affect self-control. Puri (1996) found that consumers with high-impulsivity scores (termed hedonics) were more likely to behave impulsively than those with low-impulsivity scores (termed prudents). Hedonic consumers are more likely to give in to temptation when they have an opportunity to do so (Karande and Merchant, 2012). Consequently, they should show a tariff-preference structure similar to individuals who have failed at goal achievement. Prudent consumers, by contrast, are intrinsically in control of themselves, and thus are less likely to give into temptation. Thus, they should show a tariff-preference structure similar to those individuals who have succeeded at goal achievement.

3. Experiment 1: the effect of perceived self-control on tariff preference

Prior research has examined the relation between consumers' level of self-control and the ability to avoid temptations (e.g. overspending) and found that when consumers are confident in their ability to control themselves, they tend to follow normative rules (Hoch and Loewenstein, 1991). For example, in the context of online content usage, users of vice-based content are likely to spend relatively less time using the content whereas users of virtue-based content are likely to spend relatively more time using the content. Thus, if consumers observe that they used more (less) time than the past-usage target for virtue-based (vice-based) content in their past-usage pattern, they will perceive their level of self-control as high. As a result, users of virtue-based content will use even more, and users of vice-based content will use less. We hypothesize that virtue-based content users are more likely to prefer the flat-rate tariff than vice-based content users when they have a high level of self-control.

Alternatively, if consumers observe that they used less (more) than their past-usage target for virtue-based (vice-based) content, they will perceive their level of self-control as low. In this case, consumers' preference for a certain tariff can be explained as a concern about choosing a tariff and not being able to minimize their monetary loss relative to their behavior. Thus, they will choose the tariff that is easy to justify if they fail. We hypothesize that vice-based content users will be more likely than virtue-based content users to prefer the flat-rate tariff when they have a low level of self-control.

3.1 Research design, variables, and procedure

A 2 (self-control: high vs low) × 2 (content type: vice vs virtue) between-subjects design was employed. There were 86 participants; their mean age was 31.5 years and 51 were male. The participants were paid $5 of online money for their participation.

The participants were asked to carefully read the instructions provided in the survey and to complete the survey independently. Next, the participants were given a scenario that described a situation in which they had been using a web site that involved either vice-based (e.g. dramas and movies) or virtue-based (e.g. foreign language classes on English and Chinese) content. Afterward, the participants were shown a table and graph depicting their content-usage patterns. The same pattern of past usage was provided across all experimental conditions (e.g. the same variance score), but the average usage was either 25 or 35 hours per month across conditions (see Figure 1). In addition, when shown the table/graph, the participants were asked to imagine that they had a target usage of 30 hours per month. This asked the participants to compare the target with their average past usage. We intended for participants in the virtue-based content condition to experience failure at self-control when their past-usage pattern was 25 hours per month and to experience success at self-control when their past-usage pattern was 35 hours per month. In addition, we intended for participants in the vice-based content condition to experience failure at self-control when their past-usage pattern was 35 hours per month and to experience success at self-control when their past-usage pattern was 25 hours per month.

After the participants were exposed to the scenario, they were asked to evaluate their preference for the pay-per-use ($0.5 per hours) vs the flat-rate ($15 per month) tariff. The flat-rate tariff of $15 exceeded the average cost of the pay-per-use tariff. The cost of the flat-rate tariff over the pay-per-use tariff was $1.5, which we estimated

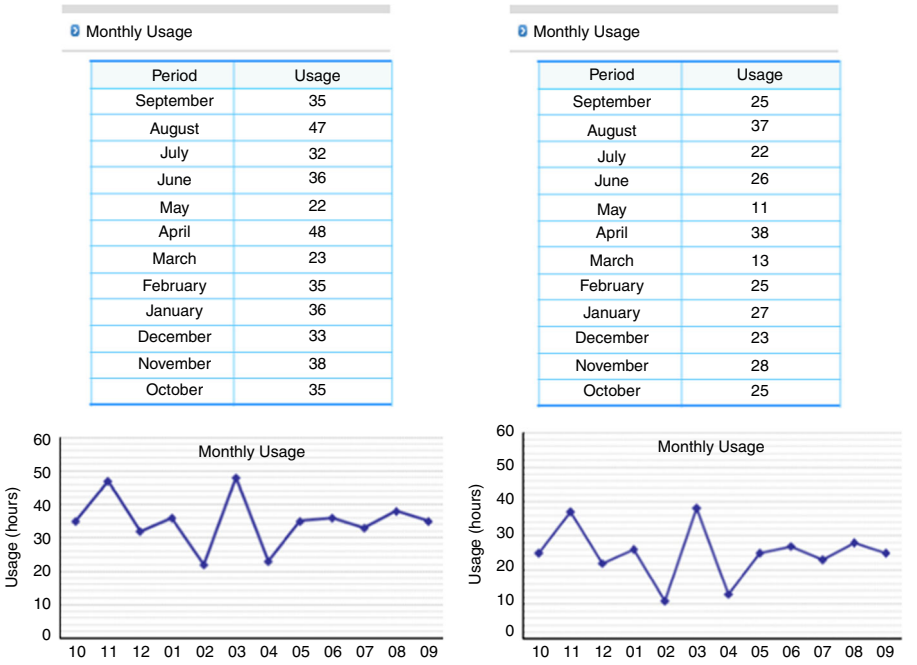


Figure 1. Average online-content usage for participants in the 35-hour condition (left) and the 25-hour condition (right)

would remove any flat-rate bias. Tariff preference was assessed with a single, 11-point Likert-type scale question (−5 to +5, where −5 indicated a preference for the pay-per-use tariff, 0 indicated indifference, and +5 indicated a preference for the flat-rate tariff).

There were also two manipulation-check questions that probed the participants' perception of self-control (Cronbach's $\alpha = 0.93$): "How well did you achieve your goal?" and "How well did you control your usage of the content?" There were four questions that served as a manipulation check for content type (vice-based vs virtue-based). The manipulation-check items for each content type were averaged (Cronbach's $\alpha = 0.90$). Finally, the participants completed demographic items, and then were debriefed and thanked.

3.2 Results and discussion

3.2.1 Manipulations checks. In total, 86 participants in the experiment were randomly assigned in each condition: 22 for the condition of "high self-control and vice-based contents," 18 for the condition of "high self-control and virtue-based contents," 24 for the condition of "low self-control and vice-based contents," and 22 for the condition of "low self-control and virtue-based contents." To evaluate participants' level of self-control in relation to the past-usage pattern and online content type, we conducted two separate 2 (level of self-control: low vs high) × 2 (content type: vice vs virtue) analyses of variance (ANOVAs). The ANOVA on the manipulations check for self-control revealed a significant main effect ($M_{LOW} = 4.57$ vs $M_{HIGH} = 5.08$, $F(1, 82) = 4.45$, $p < 0.038$). The ANOVA on the manipulations check for content type showed that participants perceived content as being more useful and productive, and less fun and

entertaining, in the virtue-based condition ($M_{VIRTUE} = 4.35$) than in the vice-based condition ($M_{VICE} = 3.57$, $F(1, 82) = 49.29$, $p < 0.001$). These results demonstrated that both manipulations were successful.

3.2.2 Preference for tariff. A 2 (level of self-control) × 2 (content type) between-subjects ANOVA was conducted to test tariff preference. First, the content type did not affect participants' tariff preference ($M_{VICE} = 7.17$ vs $M_{VIRTUE} = 6.98$; $F < 1$, ns). More importantly, our analysis revealed a significant interaction ($F(1, 82) = 13.29$, $p < 0.001$, partial $\eta^2 = 0.14$). Specifically, as hypothesized, in the vice-based content condition, participants who perceived themselves as having low self-control reported a higher preference score for the flat-rate tariff than those who perceived themselves as having high self-control ($M_{LOW} = 7.80$ vs $M_{HIGH} = 6.43$, $F(1, 82) = 4.06$, $p < 0.05$). By contrast, in the virtue-based content condition, participants who perceived themselves as having low self-control reported a higher preference for the pay-per-use tariff than those who perceived themselves as having high self-control ($M_{LOW} = 5.95$ vs $M_{HIGH} = 8.22$, $F(1, 82) = 9.63$, $p < 0.003$) (Figure 2).

In this experiment, virtue-based content users perceived that they were successful in terms of their usage when it exceeded their target, whereas vice-based content users perceived themselves as unsuccessful in terms of usage when it did not meet their target. This implies that people are motivated to increase their usage of virtue-based content and decrease that of vice-based content. More importantly, virtue-based content users showed a greater inclination toward the flat-rate tariff if they perceived themselves as having high self-control than if they perceived themselves as having low self-control. However, vice-based content users showed a greater inclination toward the pay-per-use tariff if they perceived themselves as having high self-control than if they perceived themselves as having low self-control.

Experiment 1 provides insight for understanding the underlying process of preference formation for tariffs. When people expect they will have a low level of self-control based on their past-usage patterns, they perceive a high risk of failure in tariff choice and prefer the tariff that reduces anticipated regret (Hetts *et al.*, 2000). When people expect they will have a high level of self-control, they choose a tariff in the normative way. Because the norm for virtue-based content is to increase usage, these consumers prefer the flat-rate tariff. Because the norm for vice-based content is to decrease usage, they prefer the pay-per-use tariff.

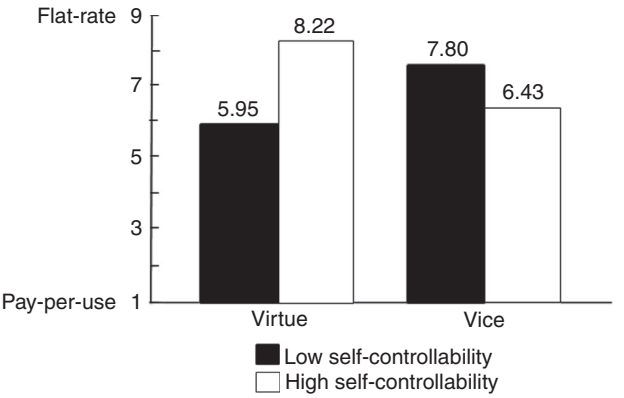


Figure 2.
The preference for each tariff type under conditions in which self-control was low or high and content was either virtue-based or vice-based

4. Experiment 2: the effect of self-control on tariff preference

Experiment 1 confirmed that a difference in tariff preference is largely due to the interaction between the level of self-control and type of content. Experiment 2 further evaluates the implications of this finding. We used the consumer impulsiveness scale (CIS; Puri, 1996) to systematically replicate Experiment 1, as it is a valid measure of enduring self-control.

In several experiments, Puri (1996) found that hedonics were more likely to behave impulsively than prudents. Hedonic consumers anticipate a tariff-choice failure and, consequently, are more likely to prefer the pay-per-use (flat-rate) tariff for virtue-based (vice-based) content in order to avoid a situation in which they simultaneously experience monetary-based and content-based regret. Prudent consumers, by contrast, have intrinsically high self-control and, thus, prefer the flat-rate and pay-per-use tariffs for virtue-based and vice-based content, respectively (i.e. they intend to use each content type in a normative way). In sum, hedonic consumers are more likely to prefer the pay-per-use tariff than prudent consumers for virtue-based content, but are more likely to prefer the flat-rate tariff than prudent consumers for vice-based content.

4.1 Research design and procedure

We recruited 114 participants; their mean age was 31 years and 53 were male. Each participant was paid $5 of online money for participation. The procedure and measures of this experiment were similar to those of Experiment 1, except for the self-control manipulation. First, participants were randomly assigned to the vice-based or virtue-based content condition. Unlike in Experiment 1, each participant's enduring tendency toward impulsivity was measured as a continuous variable using the 12-item CIS (Puri, 1996). The CIS consists of two independent subscales. One measures hedonic orientation ("impulsive," "careless," "extravagant," "easily tempted," and "enjoy spending") and the other measures a cognitive dimension called prudence ("farsighted," "responsible," "restrained," "rational," "methodical," "self-controlled," and "a planner"). Exploratory factor analysis was used to estimate principal components for the 12 CIS items; and, similar to previous research (Puri, 1996), we found there were two main factors (Kaiser-Mayer-Olkin measure of sampling adequacy = 0.813; Bartlett's test of sphericity was significant, $\chi^2(66) = 509.56$, $p < 0.001$). In the current study, self-control was defined as the summation of the 12 items; the hedonic subscales were reverse coded such that lower CIS scores indicated higher impulsivity. Puri (1996) classified respondents with impulsivity scores below the median on both dimensions as impulsive, or hedonics, and those with scores above the median on both dimensions as non-impulsive, or prudent. In the current study, we did not use the median-split method. Rather, we followed the regression method suggested by Irwin and McClelland (2001). After completing the scale, the participants were thanked and debriefed.

4.2 Results and discussion

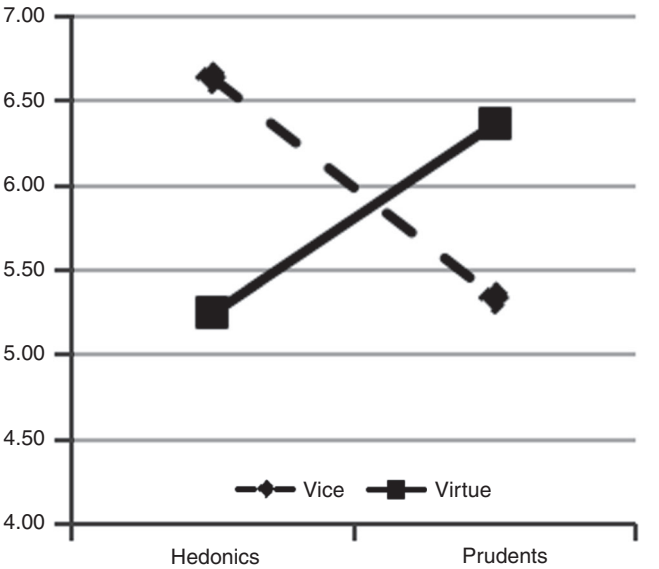
4.2.1 Manipulations checks. A one-way ANOVA was used to verify participants' perception of the online content; it showed that participants perceived the content as being more useful and productive, and less fun and entertaining, in the virtue-based condition ($M_{\text{VIRTUE}} = 4.69$) than in the vice-based condition ($M_{\text{VICE}} = 3.78$, $F(1, 110) = 33.37$, $p < 0.001$). This result demonstrates that the manipulation was successful.

4.2.2 Preference for tariff. We then regressed the tariff preference onto content type, mean-centered CIS score, and their interaction. The analysis revealed only a

significant interaction ($b = 0.07$, $t = 2.82$, $p < 0.05$), as illustrated in Figure 3. To explore this interaction, we examined the slopes of CIS at each level of content type. The slope of CIS was significant and negative when the content was vice-based ($b = -0.07$, SE = 0.03, $t = -2.13$, $p < 0.05$), and marginally significant and positive when the content was virtue-based ($b = 0.06$, SE = 0.03, $t = 1.85$, $p < 0.07$; Aiken and West, 1991). These results provide further evidence for our hypothesis that the preference for a particular tariff varies due to level of self-control and content characteristics. Specifically, virtue-based content users are more likely to prefer the flat-rate tariff as their chronic impulsivity decreases (prudents), and vice-based content users are more likely to prefer the flat-rate tariff as their chronic impulsivity increases (hedonics) (Table I).

5. Conclusion

The present study provides convergent evidence that perceived self-control plays a moderating role on the tariff-choice process with respect to vice- and virtue-based content.



Notes: Values for hedonics and prudents are plotted at one standard deviation below and above the mean of CIS. High scores indicate a preference for the flat-rate tariff

Figure 3.
The preference for tariff type for hedonics and prudents when the online content was either vice- or virtue-based

	b	SE	*t*
Content type (vice = −1, virtue = +1)	−0.07	0.98	−0.07
CIS (mean-centered)	−0.01	0.02	−0.22
Content type × CIS	0.07**	0.02	2.82
Constant	5.88***	0.23	25.93

Notes: **$p < 0.01$; ***$p < 0.001$

Table I.
Results of multiple regression analysis (Experiment 2)

We have illustrated this underlying process in the current experiments. Experiment 1 showed that, depending on the experience of goal success or failure, tariff preference varied between the flat-rate and pay-per-use options. More interestingly, this effect was moderated by content type. Experiment 2 replicated the results of Experiment 1 and further supported our theory by showing the same result when enduring self-control was measured.

There are three contributions of the present research. First, we investigated the effect of content type on tariff choice. Many previous studies examined the cause of the preference for a particular tariff, but few have investigated the role of content type on tariff preference. Consumers' usage goals vary depending on whether the content type is vice- or virtue-based. Since consumption of vice-based content makes people feel guilty, they try to decrease their usage of vice-based goods (Trope and Fishbach, 2000; Wertenbroch, 1998). In contrast, people strive to increase consumption of virtue-based content. Thus, the desired goal differs depending on the content type and induces different usage goals of consumption. As we have illustrated, vice-based content users prefer pay-per-use tariffs whereas virtue-based content users prefer flat-rate tariffs when their perceived self-control is high. These results are caused by the different desired end states with respect to the two content types. Moreover, the results are consistent with prior research, which has suggested that future usage estimation plays a critical role in tariff preference. Prior research has shown that the flat-rate tariff becomes more attractive than the pay-per-use tariff when people overestimate their usage of the content or services (Lambrecht and Skiera, 2006). However, in some cases, usage volume is underestimated, meaning that the flat-rate bias is less likely to occur and a pay-per-use bias can be observed (Lambrecht and Skiera, 2006; Miravete, 2003). The current experiments show that the content type affects future usage estimation in terms of the usage goal. Vice-based content users underestimate their future usage when they have a high level of perceived self-control, whereas virtue-based content users overestimate their future usage.

Second, we suggest that there is a moderating effect of perceived self-control on tariff preference, and this was manipulated in two ways. Consumers with a high level of self-control will choose the tariff most likely to reduce content-based regret. Otherwise, they will choose the tariff most likely to reduce monetary-based regret. As a result, virtue-based content users preferred the flat-rate tariff, which allowed them to increase their usage of virtue-based content, when their perceived level of self-control was high. More interestingly, their tendency to choose the flat-rate tariff decreased as their perceived level of self-control decreased. In contrast, vice-based content users preferred the pay-per-use tariff, which allowed them to decrease their usage of vice-based content, when their perceived level of self-control was high. However, their tendency to choose the pay-per-use tariff decreased as their perceived level of self-control decreased.

Finally, this study revealed the factors affecting consumers' perceived self-control. Specifically, people perceived that they can control their usage better if their past usage met the usage goal. This was also true if they had more prudent characteristics. In contrast, consumers perceived a low level of self-control if they experienced failure in terms of target usage. This was also true if they had more impulsive or hedonic characteristics.

There are some practical implications of these results. Marketers can provide information about the average past usage as well as the degree of success or failure in meeting a goal for particular content. As they provide more information about

the past-usage pattern, they can control consumers' perceived level of self-control and consequently affect tariff preference and choice in a particular direction. Furthermore, content providers can recommend the right tariff for each consumer based on chronic impulsivity. When consumers register a service, content providers may have opportunities to gather consumers' various tendencies such as CIS or regulatory focus. Based on the information, content providers are able to offer more valuable tariff options to consumers. It leads consumers to avoid making a poor tariff choice. In the long-term, the companies will be more successful because customers will be more satisfied with the services they are offering. Finally, the result of this paper may be useful for content providers to design tariff options. Depending on the value of content (vice-base or virtue-base), content providers design the tariff options to minimize consumers' regret after the failure in tariff choice. In addition, content providers can show several cues (e.g. average usage amount of all consumers, monetary benefit from previous tariff choice) for consumers to overcome their regret.

This research has certain caveats. First, while an inclination toward the pay-per-use tariff was sometimes observed in Experiment 1, an overall flat-rate bias was observed. This result is consistent with previous research. However, the degree of bias can be controlled by increasing the cost of the flat-rate tariff. For example, Lambrecht and Skiera (2006) reported that when the flat-rate tariff is more expensive than pay-per-use tariff, the degree of flat-rate bias decreases compared to when the flat-rate tariff is as expensive as the pay-per-use tariff. There will be a certain range for the flat rate that allows the preference between the two tariffs to be indifferent. Second, we employed experimental settings to increase internal validity. However, there may be an ecological validity issue because the participants were exposed to a pre-determined scenario that was not based on their own experience and content-usage information. Finally, the experiment did not employ a reward/punishment mechanism to impose consequences related to the subjects' choices in the virtual environment. In other words, we observed the subjects preferences but not their "quasi-authentic" choices. In future studies, these issues could be addressed using real market data that includes consumers' tariff-choice history in order to advance our understanding of the theoretically interesting and managerially significant issue of self-control and tariff choice.

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Further reading

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