



Threshold free shipping policies for internet shoppers [☆]



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ABSTRACT

This study examines how consumers evaluate and respond to two economically equivalent but different forms of threshold free shipping (TFS) policy: piece-based or dollar-based (e.g., Regular: \$25; free shipping on orders of “4 items” as opposed to “\$100”) offered by an online store. We first demonstrate that a piece-based TFS will result in a higher intention to shop than a dollar-based TFS. However, this effect is attenuated when information about the shipping charge is present (e.g., “\$4.99 flat rate shipping. Free shipping on orders of ___”) or when the time restriction for the TFS policy is short (e.g., “today only”). Finally, the effect of the TFS policy on intention to shop is shown to be mediated by the consumer’s evaluation of the offer. The observations have important implications for internet retailers.

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1. Introduction

Offering free shipping is an effective way to have a positive impact on internet shoppers. According to the [Boston Consulting Group \(2012\)](#), 74% of consumers consider free shipping to be a more enticing factor than lower prices (50%) or free returns (35%) in motivating them to make a purchase. A survey published in [Walker Sands’ 2014 Future of Retail Study](#) found that 80% of respondents would be more likely to purchase products online if they were offered free shipping. Clearly, free shipping could be a critical marketing strategy that online retailers can use to attract and retain their consumers ([Rotem-Mindali and Salomon, 2007](#)).

Free shipping policies can be divided into two types: (1) *unconditional* free shipping, where the online retailer absorbs all shipping costs for all orders ([Becerril-Arreola et al., 2013](#)); and (2) *threshold* free shipping (TFS), where the retailer bears the cost of shipping for orders equal to or larger than a predetermined amount (i.e., a threshold value), but charges a fixed fee otherwise ([Koukova et al., 2012](#)). For example, the online apparel shop Nerdy Shirts, makes the following offer for the purchase of shirts priced at \$25: “Buy 4 shirts, get free shipping”. Unee Tee, another internet clothing retailer, offers “Free shipping on the purchase of \$100 or more” as a promotion for its \$25 shirts.

In their analysis, [Lewis et al. \(2006\)](#) found that unconditional free shipping increases order incidence but reduces order value. Furthermore, although the offering of unconditional free shipping increases order incidence, the increased revenues are not enough to offset the cost of delivery. Thus, by far the most common form of shipping policy is TFS ([Barry, 2010](#)). By setting a free shipping threshold that is above the current average order value, retailers are able to encourage their consumers to buy more with each purchase. From the retailer’s point of view, additional purchases will not only compensate

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for the lower profit margin (arising from the retailer having to cover the cost of delivery) for those consumers who meet the threshold, but will also increase revenue overall (Lewis et al., 2006). ComScore (2014) has found that 58% of online shoppers have added items to their shopping cart in order to qualify for free shipping. Using a database from an online retailer, Lewis et al. (2006) demonstrated that TFS is the most effective type of free shipping policy for generating bigger order amounts.

Although recognizing its effectiveness in leading to a larger average consumer expenditure, researchers have also noted that the TFS policy has only a small impact on order incidence (Lewis et al., 2006). That is, consumers may be reluctant to purchase online when there is a minimum purchase requirement or threshold value for free delivery. This can even happen right at the start of the browsing process, upon seeing information about the TFS policy on the main page of the retailer's website. The following questions arise: Why does the threshold quantity for free shipping influence consumer intention to shop? How can the detrimental impact of the TFS policy be reduced? Despite the importance of this topic, only a handful of studies have examined the effects of TFS policy in the business-to-consumer context (Koukova et al., 2012; Lewis, 2006; Lewis et al., 2006). Furthermore, these studies have restricted their examination of TFS to order values that exceed a given dollar amount (i.e., a dollar-based TFS).

This current study attempts to fill this gap by examining the effects of the two most common forms of TFS policy—dollar-based and piece-based TFS. In dollar-based TFS, retailers offer free delivery for orders that exceed a certain dollar amount (e.g., Unee Tee). With piece-based TFS, retailers waive the delivery charge for orders that exceed a certain number of items (e.g., Nerdy Shirts). Although both forms of shipping policy actually have an economically equivalent threshold value (4 pieces = 100 dollars), their impact on the consumer may be different. The units required to meet the free shipping threshold—pieces or dollars—communicate distinct deal values to the consumer (see the concept of “numerosity” as discussed by Pelham et al., 1994) which will influence how the TFS policy is perceived. We propose that the selection of the units (i.e., pieces as opposed to dollars) in which the threshold quantity is framed will affect the consumer's intention to shop. Specifically, a piece-based TFS will result in stronger shopping intention than a financially equivalent dollar-based TFS.

In addition, we examine other factors such as the shipping charge information (absent vs. present) and time limits (short vs. long) that may moderate the effect of the TFS policy on consumer intention to shop in order to provide a better understanding of the conditions under which different types of policies affect consumer response. Finally, one mediator (i.e., offer evaluation) is proposed and investigated. The results are not only expected to assist retailers in designing better communication strategies to lessen the negative impact of TFS policies, but also make a broader contribution to the literature by providing insight into the contextual influences and psychology that govern how internet shoppers evaluate and respond to piece- and dollar-based TFS policies. Fig. 1 shows an outline of the conceptual framework used in this study.

The rest of this paper is organized as follows. The conceptual background is discussed in the next section and specific predictions for the effect of TFS policy and potential moderators are developed. We then report on the results from laboratory and online experiments carried out to test the hypotheses and explore the boundary conditions. The final section summarizes key findings and discusses their theoretical and practical implications including directions for future research.

2. Conceptual background

2.1. Numerosity

In consumption situations, quantitative information can appear in different units. For example, a notebook warranty can be specified in terms of months or years (e.g., 24 months or 2 years). A smartphone's battery life can be specified in hours or days (e.g., 72 hours or 3 days). A rational perspective would suggest that the units would have no influence. However, the literature on numerosity reveals that the choice of unit used to describe quantitative information does affect consumer perceptions and decisions made, because of the size of the associated numbers (Monga and Bagchi, 2012; Pandelaere et al., 2011; Pelham et al., 1994).

When determining the value of a quantity, numbers and units are inseparable, they coexist. To arrive at a specific value, small units translate into large numbers (e.g., 24 months), and large units produce small numbers (e.g., 2 years). In other

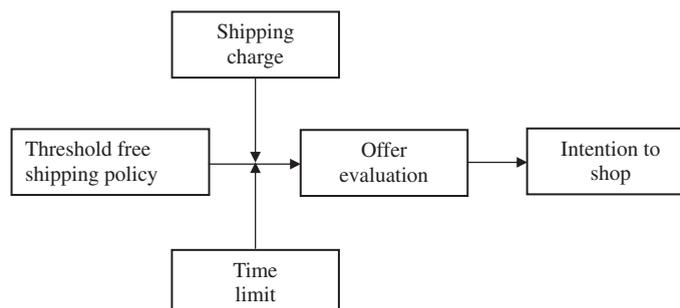


Fig. 1. Conceptual framework.

words, there is an inverse relationship between them (Monga and Bagchi, 2012). Previous work has demonstrated that when people judge quantitative information they focus on the size of the numbers without considering the units, which makes all quantities dimensionless (Pandelaere et al., 2011). As a result, higher numbers are perceived as representing bigger quantities and vice versa (this is known as the numerosity heuristic; Josephs et al., 1994; Pelham et al., 1994). Pelham et al. (1994) noted that because it is relatively effortless to simply see the numerosity of a stimulus, people tend to use this heuristic to make quantity judgments. Despite the potential usefulness of the numerosity heuristic, it can lead to a reversal of judgments.

Price (1994), for example, demonstrated that people would evaluate a rental fee more negatively when the price difference between a more conveniently located \$650 apartment and a less conveniently located \$600 apartment is framed as a yearly (\$600) rather than a weekly fee (\$11.54). In a donation solicitation study, Grouville (1998) asked participants to rate the probability that they would offer a donation. The results showed that a daily donation of \$1 significantly increased their likelihood of donating, while a yearly donation of \$350 decreased that likelihood. Raghuram and Srivastava (2002) found that consumers judged prices in foreign currencies on the basis of their nominal value, inferring for instance, that a price of 1100 Korean won would be higher than a price of 110 Japanese yen, regardless of their equivalence in U.S. dollars. Similarly, research on loyalty programs has indicated that rewards expressed in larger numbers are perceived as better deals, even if the outcomes are identical (Bagchi and Li, 2011).

Findings have been similar in relation to risk and ratio assessments. For example, Yamagishi (1997) examined perceptions of the likelihood of the occurrence of cancer. He found that participants estimated the likelihood of occurrence to be greater when the risk was expressed as a larger (e.g., 1286/10,000) rather than a smaller ratio (24.14/100). Pacini and Epstein (1999) indicated that a gamble with a 9 in 100 chance of winning was preferred to a gamble with a 1 in 10 chance of winning.

These studies reveal that consumers generally fail to take the units and denominators into account when evaluating quantitative information. Instead, they rely only on the numbers and numerators, resulting in misestimation of the outcomes (Pandelaere et al., 2011). Likewise, consumers ignore the units in which the threshold quantity for free shipping is specified, meaning that they think that the threshold for free delivery is higher when the TFS policy is based on a relatively large amount of “dollars” rather than on a smaller number of “pieces” (e.g., “100” dollars > “4” pieces), interpreting this as having to pay more to get the reduced cost of delivery. As noted above, this perception significantly decreases their evaluation of the offer (Grouville, 1998; Price, 1994). Studies have further shown that a decrease in the offer evaluation lowers the consumer’s purchase intent (Inman et al., 1997). Conversely, the smaller numerosity of a quantity inherent in an equivalent piece-based TFS will be evaluated more favorably, which in turn increases consumer intention to shop at an online store. Thus, we hypothesize that:

H1. A piece-based TFS policy will lead to a greater intention to shop than an equivalent dollar-based TFS policy.

In addition, since the consumers’ response to a piece- versus dollar-based TFS policy affects offer evaluation, and subsequently influences behavioral intention, it is expected that the effect of TFS policy on intention to shop will be mediated by the offer evaluation. Formally stated:

H2. Offer evaluation mediates the effect of the TFS policy on the consumer’s intention to shop.

2.2. Moderator of shipping charge

In addition to specifying the threshold value (e.g., “4 pieces” or “\$100”), TFS policies often (but not always) include the shipping charge associated with purchasing less than the specified quantity. For example, Uniforms & Scrubs.com offers the following TFS policy on the main page of its website: “\$4.99 flat rate shipping; free shipping on orders over \$95”. The question that arises is what is the influence when both messages are concurrently displayed to the internet shopper? We predict that including the shipping charge in the TFS advertising will prompt the consumer to process the threshold information in detail and by doing so, the TFS effect may disappear. In other words, offering information on the shipping charge will tend to moderate the effect of TFS policy on shopping intention.

As discussed above, the TFS effect arises because consumers tend to use numerosity heuristics rather than engage in systematic information processing strategies when they are exposed to a TFS policy and therefore, the size of the numbers biases their judgment and the decision-making process (Pandelaere et al., 2011). Apparently, this effect may be attenuated when consumers make use of highly sophisticated strategies to handle the threshold information. The question then becomes whether presenting the dollar value of the shipping cost leads to heightened processing of TFS information?

There is evidence that consumers are very sensitive to shipping charges (Hamilton and Srivastava, 2008; Lewis et al., 2006; Smith and Brynjolfsson, 2001). When a shipping fee is explicitly shown in a TFS advertisement, it attracts the consumer’s attention (Koukova et al., 2012). Specifically, the inclusion of the monetary amount of the shipping charge (\$4.99) makes the possible gain or loss derived from an online transaction more salient and transparent (−\$4.99 if order value is above the threshold; +\$4.99 if purchasing less than the threshold). With a view to approaching the gain or avoiding the loss, consumers are motivated to process the promotion-related information more thoughtfully and accurately (Raghuram, 2006). When the TFS information is carefully processed and evaluated, the exact amount of the threshold will be realized and the effect induced by the numerosity heuristic may be eliminated.

Research findings on price partitioning agree with our argument (Chatterjee, 2011; Morwitz et al., 1998; Schindler et al., 2005; Xia and Monroe, 2004). Morwitz et al. (1998), for example, found that consumers are likely to engage in more accurate mental arithmetic calculation rather than use simplifying heuristics to process the total sales price of a product with a shipping surcharge when the perceived benefits of a promotion are salient. Xia and Monroe (2004) demonstrated that noticeable and important consumption benefits give consumers a higher incentive for processing different price information at length. Chatterjee (2011) and Schindler et al. (2005) reached similar conclusions. Extending this line of reasoning, when the shipping charge is displayed and the possible benefits or savings are obvious (compared to when they are absent), consumers are likely to assess the threshold information more thoroughly to take advantage of free shipping, which will eventually affect offer evaluation and intention to shop. Hence, we hypothesize that:

H3. There is an interaction between TFS policies and shipping charge, such that a piece-based TFS will result in higher shopping intention than an equivalent dollar-based TFS when the shipping charge is absent, but not when it is present.

2.3. Moderator of time restrictions

Advertisements for TFS also often contain time restrictions (e.g., “today only”, “offer available till ___”). The obvious motivation for a retailer’s use of time restrictions is to create the perception of scarcity in the minds of potential buyers. It is assumed that this will induce a relatively thoughtless response, thereby enhancing the perceived value of associated deals as they become less available (Cialdini, 2001; Inman et al., 1997). However, other researchers have concluded that scarcity appeals actually cause consumers to scrutinize an offer more carefully, so do not necessarily lead to perceptions that the offer is valuable (Brannon and Brock, 2001; Brock and Brannon, 1992; Suri et al., 2007).

Mazis (1975), for example, in a field experiment questioning 121 housewives, found that participants in a scarcity condition would pay more attention to a detergent’s attributes (also see Worchel et al., 1975). Gollwitzer (1990) indicated that individuals would adopt a more deliberative mind set when a decision needs to be made within a time limit. In a similar vein, Bozzolo and Brock (1992) showed that individuals have greater motivation to think about the message in the presence of scarcity than when it is absent. In addition, Suri et al. (2007) examined how perceived scarcity, operationalized as a time restriction, influences consumers’ processing of price information. Their results indicate that cognitive elaboration and accuracy of recall increase with scarcity. Even when there is low motivation to process information, scarcity can induce systematic processing that subsequently alters value perceptions and shopping intentions.

Finally, Brannon and Brock (2001) found, after observing the real behavior of 305 drive-through restaurant consumers, that willingness to order an item (in their case a cinnamon twist) is affected if scarcity information is offered. Specifically, a tight time restriction (available-today-only) prompts consumers to scrutinize the information more carefully, and this heightened scrutiny is greater than that elicited with a loose time restriction (available-all-year), resulting in a change in sales volume. Brannon and Brock thus inferred that although scarcity has been widely assumed to function as a cue that hinders people’s ability to think, in actuality, a short time restriction can stimulate a thoughtful response and enhance evaluative scrutiny.

In summary, these studies indicate that tight time restrictions drive increased scrutiny of message merit and further influence consumers’ offer evaluation and purchase decisions. Similarly, offering a TFS with a short time limit may result in consumers paying more attention to information relevant to the promotion, leading to more systematic processing of the threshold value. When the numbers as well as the units are integrated and evaluated, the effect of piece- and dollar-based TFS on intention to shop will vanish.

H4. There is an interaction between the TFS policy and time limits. When the time restriction is long, consumers offered a piece-based TFS policy report stronger intention to shop than those offered the equivalent dollar-based TFS policy. However, when the time restriction is short, the difference in shopping intention becomes insignificant.

3. Study 1

The objective of Study 1 is to explore how consumers evaluate and respond to a TFS policy framed in different units that appears in a promotional advertisement on an e-retailer’s home page with and without shipping charge information. We expect that framing the free-shipping threshold in terms of pieces will lead to higher intention to shop than framing it in terms of dollars but this effect is present only when the shipping charge is not mentioned in the ads.

3.1. Research design and participants

A 2×2 factorial between-subject design with two factors: TFS policy (piece- vs. dollar-based) and shipping charge (absent vs. present) was used in this study. The stimulus was a fictitious online clothing store, www.MyTees.com.tw, offering a variety of designer and printed t-shirts at NT\$330 each (i.e., a t-shirt specialty shop) (US\$1 = NT\$30). A fictitious website

Table 1
Experimental conditions.

Study	Conditions	Piece-based TFS	Dollar-based TFS
One	Shipping charge absent	Regular: NT\$330 <i>Free shipping on orders of 3 pieces</i>	Regular: NT\$330 <i>Free shipping on orders of NT\$990</i>
	Shipping charge present	Regular: NT\$330 <i>NT\$60 flat rate shipping</i> <i>Free shipping on orders of 3 pieces</i>	Regular: NT\$330 <i>NT\$60 flat rate shipping</i> <i>Free shipping on orders of NT\$990</i>
Two	Time limit short	Regular: NT\$330 <i>Today only!</i> <i>Free shipping on orders of 3 pieces</i>	Regular: NT\$330 <i>Today only!</i> <i>Free shipping on orders of NT\$990</i>
	Time limit long	Regular: NT\$330 <i>Two weeks only!</i> <i>Free shipping on orders of 3 pieces</i>	Regular: NT\$330 <i>Two weeks only!</i> <i>Free shipping on orders of NT\$990</i>

was used in order to control for the possible confounding effect of website reputation. To carry out the experiment, we created four different web pages, each identical in layout and content, except for the TFS messages.

The conditions for free shipping were specified in the TFS manipulation, namely, the number of items the consumers must buy (3 pieces) or the specified dollar amount (NT\$990) needed to receive free shipping. To create the shipping charge manipulation, the promotional messages were presented with or without the delivery cost associated with the offer. For example, within the dollar-based TFS condition, the shipping charge was either presented as simply “Free shipping on orders of NT\$990” (i.e., shipping charge absent) or “NT\$60 flat rate shipping. Free shipping on orders of NT\$990” (i.e., shipping charge present). The shipping charge appeared in the same font size, was italicized, and appeared on the line above the TFS information. A summary of the experimental conditions is shown in Table 1. NT\$60 was selected as the stimuli because this is a standard rate per order that is charged by most online clothing stores in Taiwan.

Participants were recruited from undergraduate business class students at a national university in Taiwan. All the participants had prior experience in using the Web for shopping purposes. A total of 133 participants took part in the study. They were randomly assigned to the four treatment groups (ranging in size from 33 to 34). The students received class credit as an incentive for their participation. Of these participants, 70.7% were female and their mean age was 21.6 years (range of 19–25 years).

3.2. Procedure

The experiments were conducted in a computer classroom. Each participant was given a computer and was isolated from others so he/she could complete the task independently. Participants were asked to behave naturally as if they were shopping on the fictitious website. After logging on to www.MyTees.com.tw, and noticing the TFS advertisement on the home page, they were asked to complete a questionnaire. Upon completion of the experiment, the participant's contribution was gratefully acknowledged.

3.3. Measures

The measure “intention to shop” was adapted from Howard and Kerin (2006). The two 7-point items were ($r = .65$): “How likely or unlikely would it be for you to shop at MyTees.com.tw?” 1 = very unlikely/not possible to 7 = very likely/very possible. Offer evaluations were measured on a three-item 7-point scale ($\alpha = .86$): “The online clothing store's offer is” 1 = unattractive/undesirable/unreasonable to 7 = attractive/desirable/reasonable (Koukova et al., 2012).

In addition, price perceptions (“The price of NT\$330 that the online store is asking for the t-shirt is?” 1 = low/acceptable to 7 = high/unacceptable, $r = .84$, borrowed from Koukova et al., 2012), preference for t-shirts (“I like to wear t-shirts” 1 = strongly disagree to 7 = strongly agree), online apparel shopping experience (“How often do you buy clothes on the internet?” 1 = never to 7 = very often), and monthly expenditure on clothes (“How much do you generally spend on clothes in a month?”) were collected as possible covariates. At the end of the survey, participants were asked to complete some demographic information. As these covariates and demographic variables had no significant effect, they were excluded from further analysis.

4. Results and discussion

4.1. Manipulation checks

The effectiveness of the TFS policy manipulation was measured by comparing participants' perceptions of the threshold value for the TFS policies across the experimental conditions (Huang and Yang, 2015): “I think buying 3 pieces/NT\$990 to get free shipping is a high threshold” and “I think buying 3 pieces/NT\$990 to get free shipping is a difficult requirement to meet” (1 = strongly disagree to 7 = strongly agree, $r = .78$). The piece-based TFS group received a mean rating of 3.90 and the

dollar-based TFS group a mean rating of 4.54, $t_{(131)} = -2.51$, $p < .05$, showing that the manipulation was perceived as intended. In relation to the shipping charge information, the manipulation check employed a recognition task. Participants were asked to answer whether the shipping charge was present or not. Of these participants, 87.5% in the charge absent scenarios and 95.1% in the charge present scenarios were able to correctly identify the content after reading the scenario ($\chi^2 = 90.09$, $p < .001$), indicating that the manipulation was effective.

4.2. Hypotheses testing

To test the hypotheses, we performed a two-way analysis of variance (ANOVA) on intention to shop with TFS policy and shipping charge as independent variables. Results showed a main effect for TFS policy ($M_{\text{piece-based}} = 5.14$ vs. $M_{\text{dollar-based}} = 4.72$, $F_{(1, 129)} = 4.99$, $p < .05$), such that participants given the piece-based TFS condition showed a higher level of shopping intention than those given the dollar-based condition. Therefore, H1 was supported.

In addition, there was a significant two-way interaction between TFS policy and shipping charge ($F_{(1, 129)} = 6.03$, $p < .05$). As can be seen in Fig. 2, participants given the shipping charge absent condition reported stronger intention to shop when the TFS policy was based on pieces rather than dollars ($M_{\text{piece-based}} = 5.41$ vs. $M_{\text{dollar-based}} = 4.53$, $F_{(1, 129)} = 10.92$, $p < .001$). Conversely, participants given the shipping charge present condition reported insignificantly different ratings for shopping intention in both the piece- and dollar-based TFS groups ($M_{\text{piece-based}} = 4.87$ vs. $M_{\text{dollar-based}} = 4.91$, $F_{(1, 129)} = .03$, $p = .87$). Therefore, H3 was supported.

To test whether offer evaluation mediates intention to shop, we conducted a moderated mediation analysis with TFS policy as the independent variable (0 = piece-base, 1 = dollar-based), shipping charge as the moderator (0 = absent, 1 = present), offer evaluation as the mediator, and intention to shop as the dependent variable (SPSS Macro PROCESS, Model 7, Hayes, 2012). We used a bootstrapping technique to generate a 95% confidence interval (CI) around the indirect effect of offer evaluation, in which successful mediation occurs if the CI does not contain a zero (Preacher et al., 2007; Zhao et al., 2010). Consistent with our hypothesis, bootstrap analysis using 5000 samples revealed that offer evaluation mediates the interaction in the predicted direction. Specifically, we found a significant indirect effect for the shipping charge absent condition (indirect effect = $-.36$, SE = $.15$; CI = $[-.6938, -.0783]$), such that a dollar-based TFS policy decreased offer evaluation, which eventually lowered the consumers' intention to shop. In contrast, no significant indirect effect was found for piece- and dollar-based TFS when the shipping charge was present (indirect effect = $.11$, SE = $.15$, CI = $[-.1867, .4115]$, includes 0). In other words, offer evaluation mediated the effect of TFS policy on intention to shop for shipping charge absent participants but not shipping charge present participants. Thus, H2 was supported.

In short, the results of Study 1 revealed that a piece-based TFS policy led to higher intention to shop at an online store relative to a dollar-based TFS policy. Our findings highlight that the unit (i.e., pieces vs. dollars) the threshold value was framed in greatly influenced participants' perceptions and behavioral intentions. However, the difference diminished when the delivery surcharge was mentioned in the promotional advertisement. In addition, we found that offer evaluation mediated the effect of TFS policy on consumer intention to shop.

5. Study 2

The main purpose of Study 2 was to test the hypothesis that when the TFS policy is offered for a short period of time, consumer intention to shop does not appear to be affected by the framing of the free-shipping threshold (H4). There were

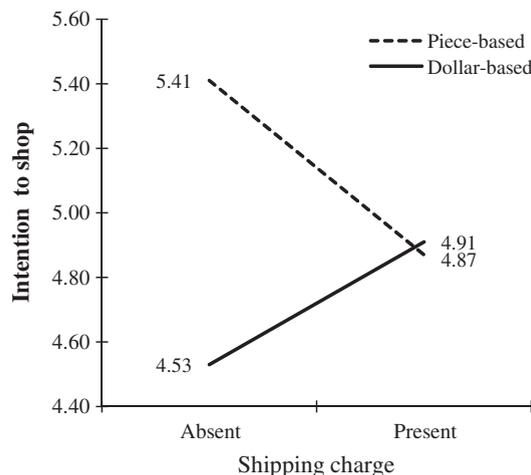


Fig. 2. Interaction between the TFS policy and shipping charge (Study 1).

several important differences between Studies 1 and 2. First, instead of a lab experiment, an online experiment was conducted with participants who had experience with apparel shopping from online stores. Second, instead of using only one product (t-shirts), multiple products such as t-shirts, polo shirts, and vests for men, women, and kids were included. Third, to enhance its ecological validity, we modified components of existing clothing websites to use in the experiment (see examples at www.101.com.tw and www.lativ.com.tw). Like with a real e-shop, detailed shopping and transportation information (e.g., cube, weight, and different shopping rates) could be easily accessed through different links.

Finally, although the results of Study 1 revealed that a piece-based framework increases the average shopping intention, potentially leading to a larger number of orders than a dollar-based framework, how such framings may affect consumers' purchase amount is unknown. Since one of the main reasons retailers use TFS is to increase order size, it is necessary to investigate "how many" consumers would buy or spend when different types of framing are present. Thus, in addition to the consumers' intention to shop, information about quantity purchase intention was also collected in order to further understand how the framing of the free-shipping threshold will impact order sizes.

5.1. Experimental design and stimuli

We used a 2 (TFS policy: piece-based vs. dollar-based) \times 2 (time limit: short vs. long) between-subject design in this study. The TFS policies were manipulated as described in Study 1. Following Ramanathan and Dhar (2010), the time limit manipulation refers to the expiration date restriction, specifying that the TFS policy was only available until an immediate (i.e., today only) or a longer expiration date (i.e., two weeks only). The restriction was given in the same font size, italicized, and displayed above the statements "Free shipping on orders of 3 pieces" or "Free shipping on orders of NT\$990", in a manner similar to Study 1 (see Table 1). In addition, a fictitious online clothing store was again used, with the same regular price (NT\$330) as well as threshold value (3 pieces vs. NT\$990) followed. Based on this, four different websites were designed to simulate the online apparel shopping experience. Each website was identical in layout and content, except for the TFS advertisements.

5.2. Participants and procedure

A posting about the online experiment appeared on SurveyMonkey in April 2015. Only those who had previously purchased items from an online clothing retailer were invited to participate in the survey. Participants knew in advance they would each receive a sum of NT\$100 as a reward for participating. A total of 271 samples were collected. However, 13 respondents were dropped for lack of online apparel shopping experience and 9 outliers were removed, leaving 249 cases for statistical analyses. There were 130 females and 119 males, ranging in age from 20 to 56 years, with an average age of 32.5 years ($SD = 8.48$). Of these participants, 68% reported spending NT\$1000–3000 on internet shopping monthly. In terms of education, 54% of the sample reported having at least a bachelor's degree.

Participants were randomly assigned to one of the four scenario groups (ranging in size from 60 to 64). They were asked to imagine themselves in a buying situation in which they were interested in purchasing clothes from an e-shop. Similar to the procedure used in Study 1, after logging onto MyTees.com.tw, promotional messages were placed on the website's main page. Upon browsing the hypothetical store, participants were asked to fill in a questionnaire. They were prohibited from completing the survey more than once.

5.3. Measures

Intention to shop ($r = .78$) and offer evaluation ($\alpha = .82$) were measured as in Study 1. The quantity purchase intention measure asked: "If you encountered the offer shown above, how many units (dollars) would you purchase? ____" (Manning and Sprott, 2007). Participants in the piece-based TFS condition answered the "units" question, while those in the dollar-based TFS condition answered the "dollars" question. Open-ended questions were used for the correspondent unit frame to avoid giving the participants any clues that could evoke different information processing strategies when they see different frames. In addition, we used a self-reporting measurement to capture participants' quantity purchase decision. This approach has been successfully utilized in a number of threshold-based price promotion studies (e.g., Manning and Sprott, 2007; Wansink et al., 1998; Yoon and Vargas, 2011).

Several possible covariates and screening question were collected: price perception ($r = .80$), online apparel shopping experience, monthly expenditure on internet ("How much do you generally spend on the internet in a month"), attitude toward the products shown on the website (measured on a three-item 7-point semantic differential scale: "They are unattractive-attractive," "I do not like them-I like them," and "they are bad-they are good", $\alpha = .86$, adopted from Coyle and Thorson, 2001). At the end of the survey, participants were asked to complete some demographic information. As these covariates and demographic variables had no significant effect, they were excluded from further analysis.

6. Results and discussion

6.1. Manipulation checks

As expected, participants given the piece-based TFS condition scored lower levels of perceived threshold than those given the dollar-based condition ($M = 4.13$ vs. 4.56 , $t_{(247)} = -2.44$, $p < .05$, $r = .71$). In addition, participants answered a question about perception of temporal distance (Ramanathan and Dhar, 2010), indicating how much time they believed they had to redeem the offer (1 = “very little time,” and 7 = “a lot of time”). Participants who saw TFS policies that expired the same day indicated that they had less time to redeem the offer than those who saw longer horizon promotions ($M = 2.40$ vs. 4.44 , $t_{(251)} = -12.39$, $p < .001$). Taken together, these results indicate that the manipulations were successful.

6.2. Hypothesis testing

ANOVA analysis using TFS policy and time limit as between-subject factors and intention to shop as the dependent variable showed a significant main effect of TFS policy ($M_{\text{piece-based}} = 4.43$ vs. $M_{\text{dollar-based}} = 4.07$, $F_{(1, 245)} = 7.96$, $p < .01$), supporting H1. Participants in the piece-based TFS condition expressed more intense shopping intention than those in the dollar-based condition. Consistent with H4, a significant TFS policy \times time limit interaction emerges ($F_{(1, 245)} = 5.17$, $p < .05$). As hypothesized, when the offer was limited to “two weeks only” (longer time limit), participants in the piece-based TFS condition reported higher levels of intention to shop than those in the dollar-based TFS condition ($M_{\text{piece-based}} = 4.67$ vs. $M_{\text{dollar-based}} = 4.02$, $F_{(1, 245)} = 13.19$, $p < .001$, see Fig. 3). In contrast, when the promotion was limited to “today only” (shorter time limit), there was no significant difference in ratings (for both the piece- and dollar-based TFS conditions) for intention to shop ($M_{\text{piece-based}} = 4.19$ vs. $M_{\text{dollar-based}} = 4.12$, $F_{(1, 245)} = .16$, $p = .69$).

The same bootstrapping techniques were used to evaluate the mediating role of offer evaluation (TFS coded as 0 = piece-based, 1 = dollar-based; time limit coded as 0 = short, 1 = long). Conditional indirect effects revealed that among participants in the long time limit group, there was an effect of TFS policy on intention to shop through offer evaluation (indirect effect = $-.31$, $SE = .11$; $CI = [-.5359, -.1117]$). In contrast, we did not observe this effect for those in the short time limit group (indirect effect = $-.05$, $SE = .09$; $CI = [-.2242, .1406]$ includes 0). The direct effect of TFS policy on consumer intention to shop is no longer significant ($p = .10$) when controlling for the mediation indicating indirect-only mediation (Zhao et al., 2010).

Finally, to understand whether the framing of the free-shipping threshold may have any effect on order size, we compared the means of quantity purchase intention between participants who were willing to shop at MyTees.com.tw (i.e., the mean of shopping intention is greater than 4) in the piece- and dollar-based TFS conditions. There were 76 participants in the piece-based condition reporting high shopping intention and their intended purchase amount is 2.67 units (about NT \$881). On the other hand, 55 participants in the dollar-based condition had strong shopping intention and their intended purchase amount was NT\$862. The t -test results showed that participants' quantity purchase intention for the piece-based TFS condition was equivalent to that for the dollar-based TFS condition ($M_{\text{piece-based}} = \881 vs. $M_{\text{dollar-based}} = \862 , $t_{(129)} = .43$, $p = .67$). In other words, the framing of the free-shipping threshold had no impact on the order sizes. This finding will be discussed further below. Note that there was neither a main effect of time restriction nor an interactive effect on quantity purchase intention ($ps > .2$) when a two-way ANOVA was run for the same data.

In short, the Study 2 results indicate that a time limit moderates the effect of the TFS policy. Specifically a piece-based TFS results in greater intention to shop when the expiration date restriction is long, however, when the expiration date

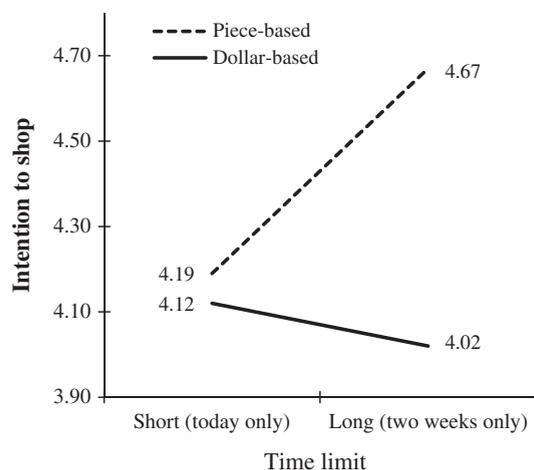


Fig. 3. Interaction between the TFS policy and time limit (Study 2).

restriction is short, the difference in shopping intention becomes insignificant. In addition, we again corroborate that the process by which TFS policy affects intention to shop is indirect: its influence is fully mediated by offer evaluation. Finally, it is shown that piece- and dollar-based TFS policies result in indifferent quantity purchase intention.

7. Conclusions

This paper aims to explore the influence of threshold free shipping (TFS) policies on consumer intention to shop when they are exposed to a website containing TFS promotional messages. We divide TFS into two categories—piece-based and dollar-based (e.g., Regular: NT\$330; free shipping on orders of “3 pieces” vs. “NT\$990”)—according to the transportation practices commonly used in e-commerce (see examples of [UneeTee.com](#) and [NerdyShirts.com](#)). Although the threshold values for both forms of TFS policies are economically equal (3 pieces = NT\$990), consumers show different perceptions and behavioral intentions when the units for TFS are varied. Specifically, a piece-based TFS is found to result in greater intention to shop than an equivalent dollar-based TFS. This finding is valuable as it shows that consumers' shopping intention can be enhanced by selecting a piece-based TFS policy. The rationale behind this is that consumers focus on the size of the numbers rather than the type of units in which threshold quantity is expressed, therefore, under certain conditions, a piece-based TFS is perceived as a lower threshold compared to a dollar-based TFS (“3” pieces < “990” dollars).

The findings support those noted in the numerosity literature, namely that internet shoppers tend to overestimate quantity from numerosity, relying on this as a cue for making judgments ([Pelham et al., 1994](#)). In addition, the findings are in agreement with research results on framing ([Tversky and Kahneman, 1981](#))—people process information passively and do not think over the possibility that the same information may have been framed differently. Our results contribute to the current literature by showing that the choice of a specific unit to express the free-shipping threshold is not arbitrary. Consumers apply heuristic reasoning strategies during online shopping that can lead to variation in perceptions and decisions made.

Another key contribution of this work is the introduction of a model of the process showing how TFS policy affects shopping intention through consumers' offer evaluation. In effect, the TFS policy is a kind of price discrimination and can be a double-edged sword. Consumers may be induced to purchase more for free delivery or they may be motivated to go to other websites when they see the order size needed to obtain free shipping. Retailers should recognize how consumers are affected by the threshold values in the TFS offers so as to design more effective promotional policies and formats. Our data provide evidence that a dollar-based TFS weakens consumer intention to shop by lowering offer evaluation.

In addition, we reveal that the effect of TFS policy is diminished when the offers include a statement regarding the shipping charge (e.g., “NT\$60 flat rate shipping. Free shipping on orders of ___”). Consumers are very sensitive to shipping charges ([Hamilton and Srivastava, 2008](#); [Lewis et al., 2006](#); [Smith and Brynjolfsson, 2001](#)), therefore, just presenting information about the shipping fee affects how promotional information is processed. When the shipping charge is not present, consumers are more likely to process the threshold information heuristically. In such a situation, a piece-based TFS is preferable to a dollar-based TFS. On the other hand, when the monetary amount of the shipping charge is present, consumers are more likely to process and integrate promotion-related information in detail. As a result, the TFS effect induced by the numerosity heuristic disappears. That is, the shipping charge moderates the TFS effect on intention to shop.

The findings again spotlight the importance of the shipping charge in online retailing. More importantly, our research adds to the current knowledge by showing that the presence of the real monetary value of flat rate shipping in the TFS advertisement may alter consumers' information processing strategies from heuristic to systematic. Research on price partitioning has produced similar conclusions showing that shipping charges affect how multiple price components (a base price and a shipping surcharge) are processed and combined ([Chatterjee, 2011](#); [Morwitz et al., 1998](#); [Schindler et al., 2005](#); [Xia and Monroe, 2004](#)).

Furthermore, time restrictions are also found to moderate the effect of TFS policy on intention to shop. Under conditions with a longer time limit (e.g., two weeks only), consumers offered the piece-based TFS are more willing to shop at the online store than those offered the dollar-based TFS. However, under conditions with a shorter time limit (e.g., today only), consumers in the piece- and dollar-based TFS groups do not demonstrate significantly different levels of shopping intention. These findings contribute to the understanding of scarcity by showing that high-time restriction appeals cause consumers to scrutinize an offer more thoroughly, thereby attenuating the numerosity effect.

Finally, this is no evidence showing that the framing of the free-shipping threshold impacts quantity purchase intention. That is, explicitly providing product-unit or monetary dollar values will have a parallel influence on how much a consumer buys. Why do threshold values affect a shopper's purchase amount? Research on anchoring effects has shown that the minimum purchase requirement or threshold value is often used as a reference point for the purchase quantity decision ([Manning and Sprott, 2007](#); [Wansink et al., 1998](#); [Yoon and Vargas, 2011](#)). [Wansink et al. \(1998\)](#), for example, indicated that the purchase quantity requirement specified in the ads (e.g., 6 cans for \$3) served as an anchor, affecting how many units the consumers would buy. Across three studies, [Manning and Sprott \(2007\)](#) found evidence that quantity embedded in the anchor- or threshold-based promotions—presented as multiple item promotions or quantity discounts (e.g., 8 for \$8)—has a positive effect on quantity purchase intention. [Yoon and Vargas \(2011\)](#) examined how quantity restrictions (e.g., 20% off if you buy at least 3 items) imposed in a point-of-purchase display shape the quantities purchased by the consumer. Their results demonstrate that most participants tend to buy the exact amount (3 items) when they see promotional anchors. Similarly, consumers, whether in a piece- or dollar-based TFS condition, may strive to reach the same threshold for free delivery, the result being an equivalent purchase quantity. Our findings support this contention and add to the anchoring effects.

To sum up, in the present study we develop a conceptual framework to explain how consumers evaluate and respond to a piece- versus dollar-based TFS policy, an important and as yet under-researched issue. In addition, one proposed mediator is included: offer evaluation, which is found to serve as the primary process mechanism for TFS policy. That is, the TFS policy influences consumer intention to shop through its influence on offer evaluation. Finally, contextual influences that might affect how consumers react to a TFS policy have also been confirmed. These contextual factors (or moderators) are the shipping charge and time limit. When the shipping charge is offered or the duration for a promotion is short, the effect of the TFS policy on intention to shop is diminished. These findings shed some light on dark areas in the transportation literature by systematically examining the effect of the two most common types of TFS policy on the internet shoppers' evaluations and their consequences, and testing the boundary conditions for the effect.

7.1. Managerial implications

There are several implications for online retailers that can be drawn from the results of this study. First, our findings indicate that internet shoppers use numerosity as a cue for evaluating the threshold value when they are exposed to a TFS advertisement. Obviously, the units in which the TFS policy is framed warrants the retailers' careful consideration. The pattern of findings suggests that it is easier for consumers to accept a piece-based rather than a dollar-based TFS policy presented on the first page of an online store, which in turn will help to increase the order incidence rates and will not hurt order sizes.

In addition, we learn that the effect of piece- and dollar-based TFS on intention to shop depends on whether information on the shipping charge is present or absent. Specifically, the presence of a monetary amount for flat rate shipping (NT\$60) in the promotional message may motivate consumers to process the exact value of the threshold, which in turn will damage the effect of TFS policy. With a view to maximizing the effectiveness of TFS, we suggest that retailers do not concurrently display a specific amount of shipping charge with the TFS information in the ads. It is better to keep it simple with something like "Free shipping on orders of N items". In addition, retailers should consider offering a longer promotion time for TFS because a shorter time constraint (e.g., today only) is found to activate a cognitive resource that is used in rendering a judgment regarding the offer and hence overshadows the impact of the TFS policy.

While more and more retailers are taking advantage of TFS as a competitive tool to increase order size, it has minor effects on order incidence (Lewis et al., 2006). To diminish the harmful influence of TFS, we offer several suggestions to online retailers. Thus, not only the framing of the units in the TFS, but also information about the shipping charge and time restriction can be strategically managed. Our research results clarify the best way to offer the TFS policy.

7.2. Limitations and directions for future research

There are some shortcomings and limitations to this research that need to be considered when evaluating and interpreting the findings. First, the studies were conducted in a lab setting and are therefore limited in terms of their ecological validity. Future work, including a field study or case study (even if archival) is needed to generalize the findings. Second, across our studies, only a single product category (clothing) is involved and the unit price is identical (NT\$330). Future research may be carried out to further explore how consumers would react to different TFS policies in a more complicated business situation where a wide assortment of product categories and different price ranges are offered. Third, this study focuses on the flat rate shipping without considering the dimensional weight and cubic size of a package. Researchers may experiment with different weights, cubes, and shipping rates which are also important when formulating TFS policies.

Fourth, the shipping fees are controlled to appear on the TFS advertisements regardless of purchase quantity (i.e., we investigate consumer reaction in the early stage of online shopping). However, in some cases, the shipping fees are not presented until the end of the online transaction, and whether the online shopper ever gets to see the shipping fee information is determined by the purchase quantity. Future research needs to be done to investigate how the effect of the framing of the free-shipping threshold may be influenced by the exposure of the consumers to shipping fees at a later stage of the online transaction process. Lastly, although the threshold quantity (3 pieces or NT\$990) and shipping charge (NT\$60) were selected based on the actual practices of online retailers, it is important in future to replicate the findings with other values. For example, what is the impact when a low versus high level of threshold quantity is offered? What if the shipping charge used as a stimulus is above or below usual market rates? In addition, prior research on price partitioning has shown that the relative size of the shipping charge in relation to the base price induces different information processing strategies (Chatterjee, 2011; Morwitz et al., 1998; Xia and Monroe, 2004). The size of the shipping charge relative to a threshold value (small vs. large) could be manipulated in order to ascertain the differences in information processing, which could ultimately affect consumers' offer evaluation and intention to shop.

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