Tourism Management 40 (2014) 425–435

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman

# Sunk costs and travel cancellation: Focusing on temporal cost

Jeong-Yeol Park [1], SooCheong (Shawn) Jang*

*School of Hospitality and Tourism Management, Purdue University, Marriott Hall, 900 W. State Street, West Lafayette, IN 47907, USA*

## HIGHLIGHTS

- This study identified that temporal distance can be converted to monetary costs.
- Monetary and temporal sunk costs reduce cancellation intention independently.
- Making reservation early can reduce potential travelers' cancellation intention.
- Imposing higher cancellation penalty can reduce potential travelers' cancellation intention.
- Compared to first-timers, revisitors showed lower cancellation intention when temporal costs were greater than 4 months.

## ARTICLE INFO

*Article history:*
Received 9 November 2012
Accepted 2 August 2013

*Keywords:*
Sunk cost effect
Temporal sunk cost
Monetary sunk cost
Tourist behavior
Tourism products

## ABSTRACT

Tourism products differ from ordinary retail products in terms of the spatial and temporal separation between the purchase and experiencing the product. Despite its importance, temporal separation has not drawn much attention in tourism research. The main objective of this study is to understand the effects of temporal sunk costs on potential travelers' cancellation intentions, in addition to monetary sunk costs. The results of this study suggested the possibility that temporal costs can be converted into monetary costs, but the conversion relationship may not be linear. This study also indicated that travelers' intentions to cancel a travel product decreased as the temporal and monetary sunk costs increased. Further, prior experience moderated the relationship when temporal sunk costs were involved, suggesting that repeat visitors' intentions to cancel their reservations are more influenced by temporal sunk costs than first-time visitors. Further discussion and implications are provided in the main body of this paper.



## 1. Introduction

It is a well-known fact that tourism products differ from ordinary retail products in various aspects – such as intangibility, separation of purchase and experience, tourists' novelty seeking behaviors, considerable risk taking, and so forth (Reisinger, Kandampully, Mok, & Sparks, 2001; Sirakaya & Woodside, 2005). More specifically, the separation between purchasing and experiencing the product means that tourists actually consume the product at a different location (i.e., spatial separation) and time (i.e., temporal separation) than the purchase. These separations have led to various studies focused on influential factors that affect travelers' behavioral intentions, such as pull-factor (Uysal & Crompton, 1985), perceived risk (Quintal, Lee, & Soutar, 2010), and perceived value (Sánchez, Callarisa, Rodríguez, & Moliner, 2006). However, these influential factors are mainly related to the spatial separation and are largely considered at the moment of purchase. Further, two different types of costs (i.e., monetary and non-monetary) are considered when purchasing a tourism product (Sirakaya & Woodside, 2005). Monetary costs are the price of the desired product, while non-monetary costs refer to such things as the risk of making a bad decision or spending a long time searching for the right product (Sirakaya & Woodside, 2005). Further, after purchasing a tourism product, most travelers have to wait for the actual tourism experience. This waiting time can be considered another form of non-monetary costs, a temporal cost.

Indeed, the importance of temporal costs has long been stressed in other research areas, such as social psychology (Liberman & Trope, 1998; Liberman, Sagristano, & Trope, 2002; Malkoc, Zauberman, & Ulu, 2005) and psychological economics (Rajagopal & Rha, 2009). Specifically, with the wide acceptance of the notion that time has a certain value (Becker, 1965), the possibility of time affecting consumer behavior has been suggested (Arkes & Ayton, 1999; Arkes & Blumer, 1985; Soman, 2001). Previous studies have

* Corresponding author. Tel.: +1 765 496 3610; fax: +1 765 494 0327.
*E-mail addresses:* park391@purdue.edu (J.-Y. Park), jang12@purdue.edu (S.(Shawn) Jang).
[1] Tel.: +1 765 404 6788.

0261-5177/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.tourman.2013.08.005

utilized the concept of the sunk cost effect and found that as the prior investment (i.e., time, money, and effort) gets larger, the tendency to stick with the initial decision increases even if a certain level of risk exists (Arkes & Blumer, 1985). Extending the concept of the sunk cost effect to tourism, the temporal costs due to the temporal separation between purchase and consumption can be considered to have a certain value that may affect potential travelers' behavior.

Currently, tourism product suppliers, such as airline companies and online travel agencies, impose significant penalties for changes or cancellations without understanding travelers' temporal costs. Moreover, past tourism studies have focused on factors related to spatial separation, even though some studies implied that temporal separation could be one of the most unique characteristics of tourism products (Reisinger et al., 2001; Sirakaya & Woodside, 2005). Considering the nature of tourism products, the role of temporal costs should be prioritized in tourism studies. Thus, this study was designed to answer the following research question: "Do temporal sunk costs have a significant influence on potential travelers' behavioral intentions in combination with monetary sunk costs?"

Answering this research question provides important implications for academic research, as well as tourism product suppliers. By identifying the influential role of temporal costs on potential travelers' behavioral intentions, this study provides a new research direction that includes temporal factors in the tourism decision-making process. Providing evidence that temporal sunk costs play a role in reducing cancellation intentions would contribute to tourism industry in that imposing too large of cancellation penalties could cause a negative attitude toward tourism product suppliers. Thus, this study aims to fulfill the following research objectives: (1) to examine potential travelers' perceptions of whether temporal distance can be converted into monetary value, (2) to examine the effect of sunk costs (i.e., monetary and temporal) on potential travelers' intentions to cancel their purchased product, and (3) to identify the moderating effect of prior experience on the relationship between sunk costs and cancellation intentions.

## 2. Literature review

### 2.1. The value of time

The phrase "Time is money" is commonly known, implying that time is a scarce resource (Bornemann & Homburg, 2011; Leclerc, Schmitt, & Dubé, 1995). Indeed, time is a scarce resource for everyone because there are only 24 h in a given day. Thus, time can be considered as *the* scarce resource, instead of *a* scarce resource (Arkes & Blumer, 1985; Leclerc et al., 1995; Rajagopal & Rha, 2009; Soman, 2001). The scarcity of time has been identified in various studies in economics, sociology, and social psychology (Jacoby, Szybillo, & Berning, 1976). Three major streams of time studies exist. First, researchers have used time diaries to understand how individuals use their time (Hendrix, Kinnear, & Taylor, 1979; Saini & Monga, 2008). Second, researchers have explored how people make decisions about allocating time between different activities using a rational-choice paradigm (Becker, 1965), which assumes rational behavior. The third stream is relatively recent and attempts to explore how people make decisions with respect to time (Leclerc et al., 1995), particularly in terms of time and money constraints (Arkes & Blumer, 1985).

The basic foundation of this third type of study is that time has a certain value due to its scarcity. Along the same lines, time has often been considered in combination with opportunity costs (Becker, 1965; Kahneman & Tversky, 1979; Thaler, 1985). More specifically, Becker (1965) suggested that temporal opportunity costs can be calculated in monetary terms (i.e., an hour of time spent is equivalent to an hour's worth of monetary wages one could have earned), meaning that consumers consider time as equivalent to money. Since it is widely known that time can be converted into monetary term studies in social psychology and psychological economics have started to consider time as important (Dhar & Nowlis, 1999; Homburg, Koschate-Fischer, & Wiegner, 2012; Leclerc et al., 1995; Read & Loewenstein, 2000). As previous studies have suggested, individuals may consider the costs of time in much the same way as they think about monetary costs (Arkes & Blumer, 1985). Moreover, time can be bought and spent as well as being saved or wasted (Soster, Monga, & Bearden, 2010). Thus, if the value of time can be accumulated like wages, it would be possible to assume that people would perceive the value of time differently according to its length.

For tourism products, overbooking is one of the most common practices that tourism suppliers, such as airline companies, hotels, and travel agencies, use to minimize losses from late cancellations and no-shows (Kimes & Chase, 1998). When a plane is overbooked and all the passengers showed up unexpectedly, airline companies look for passengers who will give up their seats voluntarily and provide a certain amount of compensation (U.S. Department of Travel, 2012). Following the notion that time has a certain value (Becker, 1965), the temporal distance between the purchase and the actual travel can be converted into a monetary value. That value should vary according to when the potential traveler made the reservation. If potential travelers perceive the value of the time differently based on how long the wait was between the purchase and the actual experience, travelers would ask for different amounts of compensation in an overbooking situation. Therefore, this study hypothesizes:

> $H_1$: Potential travelers who made their reservation earlier would demand more compensation than those who made reservations later.

### 2.2. Sunk cost effect

Sunk costs, also referred to as 'stranded costs', are costs that have been incurred and cannot be recovered. The sunk cost effect refers to the fact that people are more likely to continue an endeavor once an investment (i.e., money, effort, or time) has been made and is known as an irrational economic behavior (Arkes & Blumer, 1985). Prior to a study by Arkes and Blumer (1985), sunk costs were not identified as influential factors in the decision-making process. Specifically, they found that consumers are more likely to stick with their decisions when a large initial investment was made, regardless of participants' economic knowledge or preferences (Arkes & Blumer, 1985).

Theoretically, the sunk cost effect is associated with cognitive dissonance theory (Festinger, 1957). According to this theory, once a subject is induced to expend effort on a challenging task, the worth of the task is revalued upward (Aronson & Mills, 1959). Such revaluation would presumably result in an increased willingness to expend further resources on the task compared to the resources that would be voluntarily allocated by a subject not having made a prior expenditure. From this perspective, the sunk cost effect is similar to cognitive dissonance theory (Arkes & Blumer, 1985). The sunk cost effect can also be explained by research on entrapment (Brockner, Shaw, & Rubin, 1985). Subjects in entrapment situations typically incur small, continuous losses as they seek or wait for an eventual goal. Brockner et al. (1985) suggested that time already spent waiting could be identified as a sunk cost. In other words, time spent waiting for a certain object can increase the probability of such waiting behavior.

Another theory related to the sunk cost effect is prospect theory (Zeelenberg & Van Dijk, 1997). Prospect theory is a descriptive model of decision-making under risk (Kahneman & Tversky, 1979). One of the main features of prospect theory is that choices are not evaluated in terms of final assets, but in relation to a reference point. The outcome of a choice is coded as a gain when it is above the reference point and as loss when it is below the reference point. Due to diminishing marginal value, the value function is concave for gains and convex for losses (Kahneman & Tversky, 1979). As a consequence of this S-shaped value function, people are generally risk aversive in gain situations and risk seeking in loss situations. Another characteristic of the value function is that it is steeper for losses than for gains, implying that losses loom larger than gains (Kahneman & Tversky, 1979). For example, the pleasure associated with a gain of $100 is less intense than the pain associated with a loss of the same amount. Explanations of the sunk cost effect in terms of prospect theory imply that prior investments are not totally discounted. According to this explanation, prior investments are seen as a loss and are still present in the decision maker's mind when evaluating subsequent prospects. Due to these facts, decision makers are more likely to stick with their prior investment decisions even if financial risks exist.

#### 2.2.1. Temporal sunk cost and its effect

Every behavior can be defined in terms of the time invested, whether it is waiting in a checkout line, maintaining a friendship, enjoying a hobby, or practicing a religion (Navarro & Fantino, 2009). Consumers' desired activities require a certain amount of time, and due to its scarcity time itself can influence consumers' behavior (Leclerc et al., 1995). The influential effect of time on consumer behavior was mainly studied by adopting the concept of opportunity costs or the sunk cost effect. Since Arkes and Blumer (1985) defined sunk costs as including money, effort, or time, various studies have attempted to identify the role of sunk costs on consumer behaviors or behavioral intentions. However, the results have differed by researcher, especially for temporal sunk costs.

Unlike opportunity cost, which mainly identifies the role of information searching behavior (Cox & Oaxaca, 1989; Gursoy & McCleary, 2004; Kogut, 1992), temporal sunk costs have mainly been examined in situations where participants are required to spend a certain amount of time to acquire their desired product. For example, Soman (2001) conducted a study to identify the temporal sunk cost effect, but it influenced consumer behaviors only when a wage rate was explicitly stated and linked with time or when subjects had received instructions about economic approaches to time. Thus, Soman (2001) concluded that people process time and money information differently. Similarly, Soster et al. (2010) tried to identify the role of accounting periods (i.e., within the same accounting period versus in a different accounting period) on consumers' propensity toward risky decisions. In their study, they used a scenario that asked participants to imagine purchasing 1-day lift tickets for a 4-day ski vacation, enjoying 3 days of skiing, and facing warm rain on the 4th day. They manipulated both cost (i.e., time versus money) and accounting periods (i.e., same versus different). They found that accounting period (i.e., temporal distance) influenced intentions to cancel the lift ticket for the 4th day only when combined with monetary costs. This suggests that consumers may not perceive the cost of time the same way as they perceive monetary costs.

Conversely, Navarro and Fantino (2009) attempted to identify the role of temporal sunk costs on consumer behavior. In their study, they adopted a situation where participants invested their time as well as their effort mining copper to acquire a reward (10 pounds of copper). They suggested that once time had been invested in the reward participants would persist with their initial choice even though a risk existed. In other words, similar to monetary sunk costs, time was found to play an important role in the decision-making process.

In summary, researchers have obtained different results regarding the role of temporal sunk costs (Navarro & Fantino, 2009; Soman, 2001; Soster et al., 2010). These varied results may be driven by the difference in product characteristics. First, in the studies by Navarro and Fantino (2009) and Soman (2001), the participants were assigned to a situation where they paid for the tickets with time spent instead of money. That is, participants did not pay any amount of money to acquire their desired product, implying that participants could perceive these products as a reward. Second, Soman (2001) explicitly provided the notion that time can be converted into monetary terms, such as a wage. However, this is not a common situation for consumers when they purchase products. Third, Soster et al. (2010) asked participants to identify their behavioral intentions after enjoying 3 days of skiing. In other words, 3 days of skiing might have caused a satiation effect (Voss, Godfrey, & Seiders, 2010) causing consumers not to regret giving up their final day of skiing.

Contrary to the situations in previous studies, temporal sunk costs associated with tourism products differ. First, the size of the temporal costs is relatively greater than the temporal cost of the retail products adopted in the study by Soman (2001). Specifically, Soman (2001) assigned 9 and 15 hours to participants to acquire their desired product, but tourism products require longer temporal costs before the realization of this temporal investment. Second, purchasing a tourism product requires both monetary and temporal costs at the same time. In other words, potential travelers have to pay a monetary cost to make a reservation, as well as investing time (temporal costs) until the actual departure. Suppose that the price of a package tour product is $1000 and average annual interest rates are 2%. If a potential traveler invested this amount for 6 months he or she would have earned $10 in interest. In other words, his or her invested time cannot be retrieved. Third, compared to ordinary retail products tourism products require higher levels of risk taking because certain situations may inevitably arise where potential travelers have to cancel or change their purchase. More specifically, potential travelers may not perceive these temporal costs at the time of purchase because they do not expect a situation that might block their travel opportunity. However, unexpected risky situations, such as thunderstorm or tsunami, may evoke the feeling that they have already invested a certain amount of time after making a payment. In other words, the temporal gap between purchase and travel can be considered as costs, and these temporal costs may accumulate (Soster et al., 2010). Thus, this study hypothesizes:

> $H_2$: The amount of temporal sunk costs will have a negative effect on potential travelers' intentions to cancel their purchase.

#### 2.2.2. Monetary sunk cost and its effects

The sunk cost effect has usually been studied in terms of monetary costs. For example, if consumers spent $100 for a ski trip to Michigan and $50 for another ski trip to Wisconsin, they are more likely to stick with the event for which they spent $100 if these two events occur at the same time. This holds true even if the participants prefer the Wisconsin ski resort (Arkes & Blumer, 1985). Similarly, Thaler (1980) suggested that once a consumer pays a certain amount of money to attend an activity this prior expenditure makes him or her more willing to attend the activity, even in a risky situation such as a blizzard. This phenomenon was consistently observed regardless of participants' preference for the activities or their economic knowledge level.

When purchasing a tourism product, a potential traveler pays a certain amount of money in advance for reservations. However, due to the relatively higher risk of the product itself, there may be a

need for these potential travelers to cancel or change the product. Thus, tourism suppliers impose cancellation charges to minimize the loss from consumers' cancellations or changes (Kimes & Chase, 1998). Generally, cancellation penalties differ by tourism suppliers or even based on the timing of the reservation. Since it is not very often that potential travelers see the exact amount of cancellation charges when purchasing their products, they may not perceive the payment as a sunk cost until the cancellation penalty is imposed. Moreover, the amount of monetary sunk costs might be higher than those in studies by Arkes and Blumer (1985) or Thaler (1980). Specifically, package tour products require much higher monetary costs, and the amount of monetary sunk costs due to cancellation charges would be significantly higher than for ordinary retail products. Indeed, in reality most tourism product suppliers impose a fee for canceling or changing the product in order to reduce the chance of cancellation. Accordingly, travelers' cancellation decisions can be affected by the fee imposed by suppliers. Thus, this study proposes the hypothesis that the amount of monetary sunk costs influences cancellation intentions in a negative direction:

$H_3$: The amount of monetary sunk costs will have a negative effect on potential travelers' intentions to cancel their purchase.

### 2.3. Interaction between monetary and temporal sunk costs

Previously, most experimental studies have focused on one particular cost – either monetary or temporal costs (Arkes & Blumer, 1985; Navarro & Fantino, 2009; Okada & Hoch, 2004; Shafir & Thaler, 2006; Soster et al., 2010; Zeelenberg & Van Dijk, 1997). For example, in the study by Navarro and Fantino (2009), participants were asked to imagine a situation where they were working at a copper mine. In this study, participants invested either a certain amount of time or money. Similarly, in the study by Arkes and Blumer (1985), participants were asked to imagine a situation where they had already invested a certain amount of money that could not be retrieved. That is, a situation where two different costs are incurred at the same time has not been considered in the previous studies.

Indeed, these situational settings may work for financial investment settings or for a prize that requires one type of sunk cost. However, purchasing a tourism product requires two types of costs at the same time – monetary and non-monetary costs (Sirakaya & Woodside, 2005). In general, interactions occur when treatment effects vary over levels of other factors (Shadish, Cook, & Campbell, 2002). Specifically, the two types of sunk costs vary over levels of each sunk cost. For instance, when a potential traveler wants to cancel their purchased product due to an unexpected weather condition (i.e., thunderstorm) they would be asked to pay a cancellation penalty. Even if he or she was imposed 10% of product price as cancellation penalty, the reservation timing can differ by individuals. Accordingly, the cancellation penalty can be differently imposed, even though he or she made a reservation at the same day as another potential travelers. Thus, each type of sunk costs is not constant but varies over levels of other sunk cost. In other words, both types of sunk costs would influence cancellation intentions jointly. Therefore, this study hypothesizes the following:

$H_4$: There is an interaction effect between monetary and temporal sunk costs on potential travelers' intentions to cancel their purchase.

### 2.4. Moderating effect of experience

A potential traveler chooses between two different types of destinations – a new destination or a previously visited destination. Thus, potential travelers can be classified into two different categories – first-time visitors and repeat visitors. In general, prior experience is known to influence future purchase intentions and behavior (Bentler & Speckart, 1979; Sönmez & Graefe, 1998). Eagly and Chaiken (1993) and Ouellette and Wood (1998) suggested that the best predictor of future behavior and intentions is the frequency of past behavior directly related to the behavioral intentions being predicted. Prior experience can reinforce future behavioral intentions and reduce cancellation intentions.

In contrast, in terms of the decision-making process prior experience can cause different results. When planning to travel to a novel destination, potential travelers are required to go through an extended decision-making process that utilizes an enormous amount of time and effort (Hong, Lee, Lee, & Jang, 2009). However, when a consumer considers revisiting a destination, he or she tends to make a quicker decision with minimal effort. This is known as limited problem-solving (Moutinho, 1987). The foundation of limited problem-solving process is related to perceived risk. When a potential traveler plans to revisit the same destination, he or she has greater knowledge about the destination than those who have no prior experience. Once a destination has been visited, travelers are more likely to perceive the destination as less risky and feel safer in choosing it in the future (Sönmez & Graefe, 1998). Accordingly, Gitelson and Crompton (1984) identified that the most common factor for predicting revisiting a destination is past experience, which reduces the risk of an unsatisfactory experience.

Nevertheless, it is also possible to presume that when these repeat visitors face an unexpected risk (i.e., thunderstorm), they may show a higher tendency to cancel their purchase or change their destination because they have a greater understanding of the impact of risks at the destination. Further, the intention to cancel their product can differ when sunk costs are considered. When an enormous sunk cost is already invested (i.e., a large cancellation penalty or early reservations), repeat visitors would not want to go through an extended decision-making process. Thus, their cancellation intentions could be lower than first-time visitors. Comparatively, the expected utility for first-time visitors could be higher than for repeat visitors due to the fact that marginal utility often decreases with prior experience. Therefore, this study hypothesizes:

$H_5$: Prior experience moderates the relationship between sunk costs (i.e., temporal and monetary sunk costs) and the intention to cancel the product.

## 3. Methodology

### 3.1. Scenarios

Previous studies on sunk cost effects have commonly adopted the scenario method (Arkes & Blumer, 1985; Soman, 2001; Tan & Yates, 1995; Zeelenberg & Van Dijk, 1997). Accordingly, this study also utilized a scenario method with two different scenarios. The first scenario was designed to identify whether participants perceive time as a cost differently according to the length of temporal distance ($H_1$). Initially, the scenario was developed based on a previous study by Shafir and Thaler (2006) and modified for the tourism setting. To test the hypothesis, an overbooking situation was used since it is one of the most common practices in tourism revenue management (Kimes & Wirtz, 2003). In the scenario participants were asked to give up their seats voluntarily in return for a certain amount of compensation when the plane was overbooked. The price for the airplane ticket was set at $500 for all participants, but the temporal distance (i.e., reservation time) differed. 5 temporal distance points were included (i.e., 15 days, 1 month, 2 months, 3 months, and 6 months), and participants were randomly

assigned to each temporal distance point. After reading the scenario, participants were asked to rate their intention to give up their seat and their desired amount of compensation (Fig. 1).

Another scenario was developed to identify the role of both temporal ($H_2$) and monetary ($H_3$) sunk costs, the interaction effect ($H_4$), and the moderating effect of prior experience ($H_5$) on participants' behavioral intentions (i.e., cancellation intention). The scenario was developed based on a study by Soster et al. (2010) and modified to reflect purchasing a package tour product. First, to construct the scenario as realistically as possible, it was necessary to consider the appropriate travel time for the general population. Summer was chosen since the demand for travel is highest (Greene, 2012). Second, to provide an unexpected risky event, we adopted a thunderstorm, which is similar to the blizzard in the study by Thaler (1999). To identify the role of temporal sunk costs participants were randomly assigned to different reservation times (i.e., 15 days, 1 month, 2 months, 3 months, and 6 months). Further, to test monetary sunk costs participants were randomly assigned to four different situations (i.e., no charge, 10%, 20%, and 30%). In sum, participants were randomly assigned to one of twenty different scenarios (i.e., $5_{\text{temporal sunk costs}} \times 4_{\text{monetary sunk costs}}$). After imposing sunk costs participants were asked to rate their intention to cancel their purchase. The second scenario is provided in Figure 2.

### 3.2. Research design and data collection

The main objective of this study was to identify the role of temporal sunk costs on travelers' cancellation intentions in combination with monetary sunk costs. To fulfill this goal, this study set the population as potential travelers. To determine the level of monetary sunk costs, we contacted travel agencies and asked about average cancellation charges a week before departure. The cancellation penalty for tour package products varies by products and suppliers, but the average rate for cancellation a week prior was 20–30%. Thus, we adopted cancellation charges of no charge, 10%, 20%, and 30%. Additionally, temporal sunk costs were assigned as making a reservation 15 days, 1 month, 2 months, 3 months, or 6 months prior to the departure date.

For data collection, a web-based survey was conducted by an online marketing research firm in the U.S. The company randomly distributed the survey questionnaire to their panel members in the U.S. Each participant was given two different scenarios. First, they were randomly assigned to one of five different scenarios ($5_{\text{temporal distances}}$) that were designed to measure their perceptions over time. Then, they were randomly assigned to one of twenty scenarios ($5_{\text{temporal sunk costs}} \times 4_{\text{monetary sunk costs}}$), which were aimed to identify the role of sunk costs on cancellation intentions. The survey firm distributed 700 surveys via e-mail and 640 samples were collected. After eliminating responses with errors and missing values, 624 usable responses were collected netting an 89.1% usable response rate.

### 3.3. Variables and analysis methods

The questionnaire consisted of four different sections. The first section included questions to get participants thinking about traveling in the summer. For example, participants were asked to identify their anticipated destination for their next summer vacation and then to identify their prior experience (1 = '*Have prior experience*' and 0 = '*Have no prior experience*'). Additionally, involvement level was included as a control variable to avoid potential bias caused by participants' high involvement with this destination. To measure involvement, we adopted the personal involvement inventory (PII) scale developed by Zaichkowsky (1985). PII has been extensively used in tourism and leisure studies and is considered useful in examining tourists' behaviors and participation in leisure activities (Backman & Crompton, 1989, 1991; Gursoy & Gavcar, 2003; Havitz & Crompton, 1990). Another control variable was participants' level of risk propensity. By definition, risk propensity is a positive attitude toward taking recognized risks. Empirically, risk propensity level was used to explain consumers' everyday risk-taking behaviors, such as selecting a risky travel destination or choosing between medical treatments (Meertens & Lion, 2008). Traveling in bad weather as considered a risky behavior, participants with a higher risk propensity would have a lower chance of cancellation. Thus, this study included a risk propensity measure developed by Meertens and Lion (2008) with a 7-point Likert scale (1 = '*Totally disagree*' and 7 = '*Totally agree*').

The second section included the first scenario to identify perceptions of the cost of time. After reading the randomly assigned scenario, participants were asked to mark their desired amount of compensation as a percent of the airplane ticket price ($500). The third section included another scenario to identify the role of both monetary and temporal sunk costs on participants' intentions to cancel their purchase. In this section, participants were asked to read the scenario and to rate their cancellation intention using a 7-point Likert scale (1 = '*Not at all*' and 7 = '*Most likely*'). The final section included questions about the participants' demographic variables (i.e., gender, age, annual household income, state, type of residence, and marital status).

To identify the difference in perceptions of temporal costs ($H_1$) this study adopted one-way ANOVA. The dependent variable was the percent of ticket price as compensation in return for giving up their seat voluntarily. To test $H_2$–$H_4$ hierarchical regression analysis was conducted. Finally, to test $H_5$ moderated regression analysis (MRA) was adopted as suggested by Sharma, Durand, and Gur-Arie (1981). In general, a moderator is a qualitative or quantitative variable that affects the direction and/or strength of the relationship between an independent variable and a dependent variable (Baron & Kenny, 1986). There are three types of moderators – 'homologizer,' 'quasi' moderator, and 'pure' moderator. A homologizer influences the strength of the relationship but is not significantly related to either the independent or dependent variable.

- Suppose that you were planning to have a leisure travel during this summer. You had purchased an airline ticket six months ago. Since summer time is a high demand season, you could not get a discount. You paid for full price ($500). On the day of travel, you arrived at the airport, and tried to check in for your flight.
- When you checked in, an employee at the desk told you that the plane was overbooked. She said, "we are very sorry for overbooking. If you give up your seat voluntarily, the airline would provide a ticket for the next flight (after four hours) and certain amount of money ($) as compensation."
- Remember: You purchased your airline ticket ($500) six months ago.

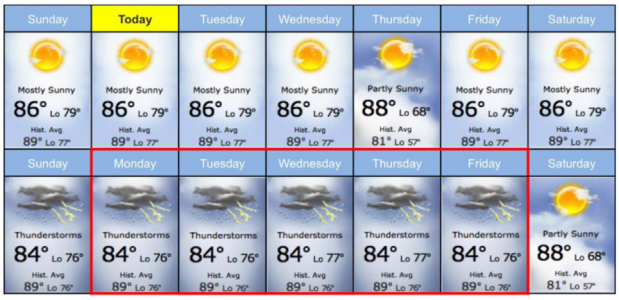
**Fig. 1.** Scenario 1.

- **Six months ago**
  - Six months ago, you and your friends were planning to have a domestic travel to a destination that you wanted to visit for summer. After reviewing several tour package products, you and your friends found a 5-day package product to your destination. The price, location, hotel, and even the view from the room were all satisfactory. Moreover, this destination is famous for its beautiful sunny weather. You and your friends purchased this tour package product, and made a full payment for this package ($1,300 per person).

<Purchased Product>


- **Today is a week (7 days) before the departure**
  - Your long wait for this travel (six months) would be over soon. You and your friends were supposed to leave for this travel next week (after 7 days). To make sure everything would be all right, you decided to check the weather condition at the destination. You thought it would be sunny. Contrary to your expectation, you found that there could be 80% chance of thunderstorm.

<Weather Forecast>




- **You and your friends were "frustrated"**
  - You and your friends were so frustrated that you checked other weather forecasting services. Unfortunately, the results were all the same – unexpected thunderstorm. Since you only had seven days till departure, you called the travel agency to check the possibility of cancellation. They said, *"you can cancel this product, and there is no cancellation fee.*

**Fig. 2.** Scenario 2.

'Quasi' and 'pure' moderators are variables that modify the form of the relationship between the independent and dependent variables (Sharma et al., 1981). The main difference between pure and quasi moderators is whether or not the moderator is related to the criterion and/or predictor. If the moderator itself can play the role of predictor it can be identified as a quasi moderator.

To apply moderated regression analysis requires constructing three sequential regression equations and testing for the equality of the regression coefficients as follows:

$$y = a + b_1 x \tag{1}$$

$$y = a + b_1 x + b_2 z \tag{2}$$

$$y = a + b_1 x + b_2 z + b_3 xz \tag{3}$$

If equations (1) and (2) are not different but differ from equation (3) (i.e., $b_2 = 0$; $b_3 \neq 0$), the variable $z$ can be identified as a pure moderator. A quasi moderator requires that equations (1)–(3) all differ from each other (i.e., $b_2 \neq b_3 \neq 0$). This study adopted a moderating variable – prior experience with a destination.

## 4. Results

### 4.1. Sample characteristics and random assignment of scenarios

Among the 624 participants, 42.76% ($n = 298$) were female and 52.24% ($n = 326$) were male with a mean age of 37.62. The average household income was $63,137. To identify whether demographic variables were balanced among the divided groups, an $\chi^2$ test was conducted. Results suggested that no demographic variables significantly differed across groups ($\chi^2_{\text{gender}} = 10.028$, $p > 0.05$; $\chi^2_{\text{age}} = 16.407$, $p > 0.05$; $\chi^2_{\text{income}} = 141.373$, $p > 0.05$), implying that the samples were well balanced across groups. Table 1 presents the descriptive statistics of the random assignment for each scenario. For Scenario 1, participants were randomly assigned to five different temporal cost situations. As a result, nearly 120 participants were randomly assigned to each situation. For Scenario 2, participants were randomly assigned to 20 different situations (i.e.,

**Table 1**
Random assignment for scenarios.

| | | | Temporal Costs | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 15 days | 1 month | 2 months | 3 months | 6 months | Total |
| Scenario 1 | | | 125 | 117 | 126 | 127 | 129 | 624 |
| Scenario 2 | Monetary | 0% | 31 | 31 | 30 | 33 | 32 | 157 |
| | Cost | 10% | 31 | 32 | 31 | 31 | 31 | 156 |
| | | 20% | 31 | 32 | 30 | 32 | 32 | 157 |
| | | 30% | 31 | 30 | 30 | 31 | 32 | 154 |
| Total | | | 124 | 125 | 121 | 127 | 127 | 624 |

**Table 2**
Requested compensation for giving up seat by temporal distance.

| Reservation | 15 days | 1 month | 2 months | 3 months | 6 months |
|---|---|---|---|---|---|
| % for compensation | 60.309[a] (27.876)[b] L[c] | 63.677 (28.982) L | 62.857 (27.007) L | 64.054 (31.749) L | 77.169 (28.522) H |
| Observation | 81 | 68 | 70 | 74 | 83 |
| *F*-value | 4.290 ($p < 0.01$) | | | | |

*Note:* Equal variance assumption was not violated (Leven's statistic: $F = 0.504$, $p > 0.05$).
[a] Mean.
[b] Standard Deviation.
[c] Result from Duncan post-hoc test (L: low and H: high).

$5_{\text{temporal sunk costs}} \times 4_{\text{monetary sunk costs}}$). According to Table 1, the samples were almost equally assigned to each situation.

### 4.2. The value of time

To test $H_1$, a one-way ANOVA was used (Table 2). This study included a question regarding the participant's intention to give up their seat in return for compensation. Only those who answered that they '*probably will*' or '*definitely will*' give up their seat were included for analysis. After eliminating respondents who did not have any intention of giving up their seat, 376 responses were used for analysis. One-way ANOVA results suggested that there was a significant difference in the perception of temporal costs over time ($F_{4,371} = 4.290$, $p < 0.01$). To more accurately determine where this difference occurred, a post-hoc test was necessary. Thus, a Duncan's post-hoc test was conducted and the results suggested that only reservations made 6 months prior significantly differed from the other temporal distances. Additionally, a nonparametric test (i.e., Kruskal–Wallis rank analysis) was conducted due to the violation of normality for each group. Similar results to the ANOVA were found ($\chi^2 = 17.210$, df = 4, $p < 0.05$). Therefore, it can be concluded that $H_1$ was partially supported.

### 4.3. Temporal and monetary sunk cost effects and their interaction

Prior to examining the role of sunk costs on cancellation intentions, descriptive statistics of cancellation intentions by each group were presented in Table 3. Hierarchical regression analysis was conducted to test the role of temporal and monetary sunk cost effects on potential travelers' cancellation intentions (Table 4). Prior to hierarchical regression analysis, it was necessary to confirm the internal consistency of the control variables. Cronbach's $\alpha$ was calculated for ten involvement items and seven risk propensity items. The results suggested that involvement had 0.963 and risk propensity had 0.865 for Cronbach's $\alpha$, meaning that all items had a high level of internal consistency. The mean values for involvement and risk propensity were used for further analysis. In Model I, a constant and two control variables (i.e., participants' involvement levels and risk propensity levels) were included. Model II included an additional variable – temporal sunk cost. In Model III monetary sunk cost was added. Lastly, Model IV included an interaction term (temporal sunk cost × monetary sunk cost).

In Model I, both control variables were significant. In Model II, the temporal sunk cost was significant ($\beta = -0.097$, $p < 0.01$), implying that the intention to cancel a purchase decreases as temporal sunk costs increase. Similarly, monetary sunk cost was significant ($\beta = -0.016$, $p < 0.01$), implying that cancellation intentions decrease as monetary sunk costs increase (Model III). Therefore, the results indicated that $H_2$ and $H_3$ were supported, while Model IV suggested that the interaction effect was not significant. Thus, $H_4$ was not supported. It can be concluded that temporal and monetary sunk costs influence potential travelers' intentions to cancel their purchases independently, but not jointly. Figures 3 and 4 show the decreasing patterns of cancellation intentions as temporal and monetary sunk costs increase.

### 4.4. Moderating effect of prior experience

To identify the moderating effect of prior experience on the relationship between each type of sunk cost and intention to cancel ($H_5$) Moderated Regression Analysis (MRA) was conducted for each type of sunk cost (Table 5). Following the MRA procedure (Sharma et al., 1981), four different models were developed for each sunk cost as follows:

$$\text{Model I: Intention to cancel} = \beta_0 + \beta_1 \text{IV} + \beta_2 \text{RP}$$
$$\text{Model II: Intention to cancel} = \beta_0 + \beta_1 \text{IV} + \beta_2 \text{RP} + \beta_3 \text{SC}$$

**Table 3**
Descriptive statistics of cancellation intention by sample group.

| | | Temporal Sunk Cost | | | | | |
|---|---|---|---|---|---|---|---|
| | | 15 days | 1 month | 2 months | 3 months | 6 months | Total |
| Monetary Sunk Cost | 0% | 4.000[a] (1.342)[b] | 4.129 (1.727) | 4.267 (1.76) | 3.818 (2.023) | 3.500 (1.646) | 3.936 (1.716) |
| | 10% | 4.065 (1.843) | 4.313 (1.804) | 3.839 (1.594) | 3.839 (1.917) | 2.903 (1.64) | 3.795 (1.806) |
| | 20% | 3.806 (1.6) | 3.813 (1.991) | 3.767 (1.455) | 3.313 (1.615) | 3.344 (1.335) | 3.605 (1.612) |
| | 30% | 3.774 (1.892) | 3.500 (1.635) | 3.367 (1.956) | 3.419 (1.587) | 3.594 (1.757) | 3.532 (1.753) |
| Total | | 3.911 (1.668) | 3.944 (1.802) | 3.810 (1.709) | 3.598 (1.792) | 3.339 (1.605) | 3.718 (1.726) |

[a] Mean of cancellation intention.
[b] Standard deviation.

**Table 4**
Hierarchical regression analysis on cancellation intentions.

| | $\beta$ (S.E.) | $t$-value | $F$-value |
|---|---|---|---|
| Model I ($R^2 = 0.047$) | | | |
| Constant | 3.645 (0.368) | 9.905*** | 15.181***[a] |
| Involvement | 0.129 (0.053) | 2.432** | |
| Risk Propensity | −0.188 (0.059) | −3.185*** | |
| Model II ($\Delta R^2 = 0.012$, $F = 7.856$***) | | | |
| Constant | 3.884 (0.376) | 10.336*** | 12.851*** |
| Involvement | 0.124 (0.053) | 2.346** | |
| Risk Propensity | −0.178 (0.059) | −3.026*** | |
| Temporal Cost | −0.097 (0.034) | −2.803*** | |
| Model III ($\Delta R^2 = 0.010$, $F = 6.816$***) | | | |
| Constant | 4.181 (0.391) | 10.694*** | 11.433*** |
| Involvement | 0.119 (0.053) | 2.250** | |
| Risk Propensity | −0.192 (0.059) | −3.255*** | |
| Temporal Cost | −0.096 (0.034) | −2.796*** | |
| Monetary Cost | −0.016 (0.006) | −2.611*** | |
| Model IV ($\Delta R^2 = 0.004$, $F = 2.515$) | | | |
| Constant | 4.321 (0.400) | 10.794*** | 9.672*** |
| Involvement | 0.125 (0.053) | 2.368** | |
| Risk Propensity | −0.187 (0.057) | −3.18*** | |
| Temporal Cost | −0.169 (0.002) | −2.946*** | |
| Monetary Cost | −0.028 (0.010) | −2.857*** | |
| Interaction (TC × MC) | 0.005 (0.003) | 1.586 | |

[a] ***$p < 0.01$, **$p < 0.05$.

$$\text{Model III: Intention to cancel} = \beta_0 + \beta_1 \text{IV} + \beta_2 \text{RP} + \beta_3 \text{SC} + \beta_4 \text{EXP}$$
$$\text{Model IV: Intention to cancel} = \beta_0 + \beta_1 \text{IV} + \beta_2 \text{RP} + \beta_3 \text{SC} + \beta_4 \text{EXP} + \beta_5 \text{SC} \times \text{EXP}$$

where IV denotes the level of involvement and RP is the level of risk propensity. These two variables were included as control variables. SC denotes each sunk cost (i.e., monetary or temporal) and EXP is prior experience ('1' for prior experience and '0' for no experience). Lastly, SC × EXP is the interaction term.

Model I included two control variables and a constant. Model II included the sunk costs, and Model III included prior experience as an independent variable. Finally, both the interaction term (sunk cost × prior experience) and prior experience were included as independent variables in Model IV. For temporal sunk cost, Model III suggested that experience itself did not play a role as an independent variable, but Model IV showed that prior experience and its interaction term were both significant. In other words, prior experience was identified as a 'quasi' moderator for temporal sunk costs. Together with Figure 5, it can be concluded that when the temporal cost is less than 120 days repeat visitors had higher intentions to cancel the product. However, if the temporal cost is greater than 120 days first-time visitors had higher intentions to cancel the product. This can also be interpreted to mean that repeat visitors are more influenced by temporal sunk costs than first-time visitors. Comparably, for monetary sunk costs the interaction term in Model IV was not significant. Therefore, $H_5$ was partially supported.

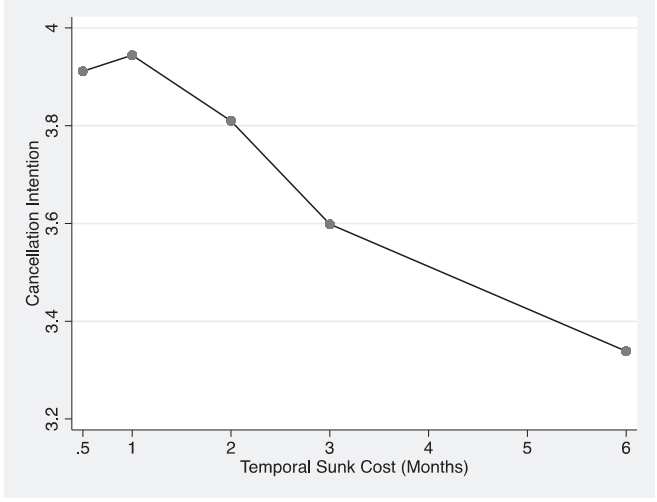



**Fig. 3.** The relationship between temporal sunk costs and cancellation intentions.

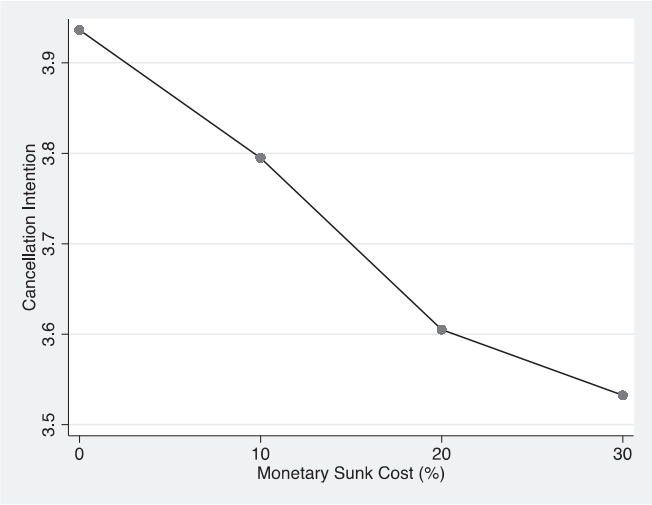



**Fig. 4.** The relationship between monetary sunk costs and cancellation intentions.

## 5. Conclusions

It is commonly known that tourism products differ from ordinary retail products (Sirakaya & Woodside, 2005). Beyond the intangible nature of tourism products, when purchasing a tourism product consumers inevitably experience a spatial and temporal

**Table 5**
Hierarchical regression analysis by type of sunk cost on cancellation intentions.

| | Temporal Sunk Cost | | Monetary Sunk Cost | |
|---|---|---|---|---|
| | $\beta$ (SE) | $t$-value | $\beta$ (SE) | $t$-value |
| Model I | $F = 15.18$***[a], $R^2 = 0.047$ | | $F = 15.18$***, $R^2 = 0.047$ | |
| Constant | 3.645 (0.368) | 9.900*** | 3.645 (0.368) | 9.900*** |
| Involvement | 0.129 (0.053) | 2.430** | 0.129 (0.053) | 2.430** |
| Risk Propensity | −0.188 (0.059) | −3.190*** | −0.188 (0.059) | −3.190*** |
| Model II | $F = 12.85$***, $\Delta R^2 = 0.012$*** | | $F = 12.50$***, $\Delta R^2 = 0.010$*** | |
| Constant | 3.884 (0.376) | 10.340*** | 3.946 (0.384) | 10.280*** |
| Involvement | 0.124 (0.053) | 2.350** | 0.124 (0.053) | 2.330** |
| Risk Propensity | −0.178 (0.059) | −3.030** | −0.202 (0.059) | −3.410*** |
| Sunk Cost | −0.097 (0.034) | −2.800*** | −0.016 (0.006) | −2.620*** |
| Model III | $F = 10.32$***, $\Delta R^2 = 0.004$ | | $F = 9.89$***, $\Delta R^2 = 0.003$ | |
| Constant | 3.821 (0.377) | 10.120 | 3.879 (0.386) | 10.040*** |
| Involvement | 0.118 (0.053) | 2.230** | 0.119 (0.053) | 2.240** |
| Risk Propensity | −0.180 (0.059) | −3.060*** | −0.203 (0.059) | −3.440*** |
| Sunk Cost | −0.098 (0.034) | −2.850*** | −0.015 (0.006) | −2.550** |
| Experience | 0.219 (0.135) | 1.620 | 0.192 (0.135) | 1.420 |
| Model IV | $F = 9.20$***, $\Delta R^2 = 0.007$*** | | $F = 3.408$, 8.63***, $\Delta R^2 = 0.005$*** | |
| Constant | 3.656 (0.384) | 9.520*** | 3.740 (0.393) | 9.520*** |
| Involvement | 0.117 (0.053) | 2.220** | 0.120 (0.053) | 2.260 |
| Risk Propensity | −0.179 (0.059) | −3.040*** | −0.208 (0.059) | −3.530*** |
| Sunk Cost | −0.031 (0.047) | −0.680 | −0.006 (0.008) | −0.710 |
| Experience | 0.587 (0.220) | 2.670*** | 0.524 (0.225) | 2.330** |
| SC × EXP[b] | −0.005 (0.002) | −2.120** | −0.022 (0.012) | −1.850 |

[a] ***$p < 0.01$, **$p < 0.05$.
[b] SC × EXP: interaction term between sunk cost (i.e., temporal and monetary) and prior experience.

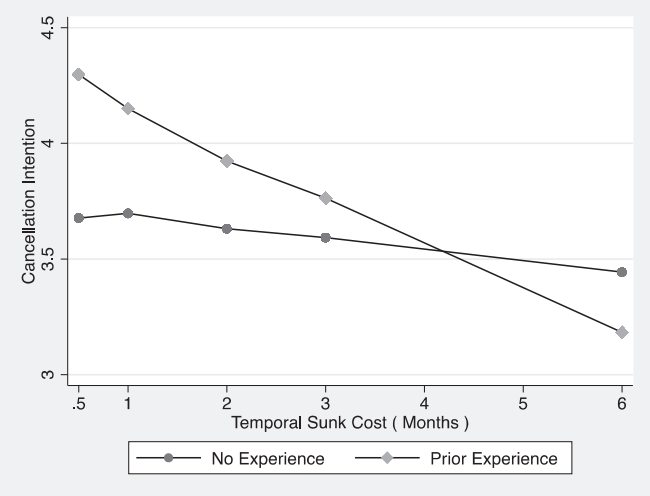



**Fig. 5.** Moderating effect of prior experience.

separation between the purchase and actual consumption. However, even though this temporal separation is considered a unique characteristic of tourism products it has not drawn much attention, unlike spatial separation. Thus, this study attempted to identify the role of temporal sunk costs on potential travelers' behavioral intentions in addition to monetary sunk costs.

By utilizing a scenario method, this study found significant results for the role of temporal sunk costs on potential travelers' perceptions over time and behavioral intentions. First, the results suggested that those who made a reservation earlier might not always require a higher amount of compensation in return for giving up their seat voluntarily. Specifically, there was no significant difference in compensation when the temporal costs were between 15 days and 3 months, but participants requested significantly higher amounts of compensation when the reservation was made much earlier (i.e., 6 months ago). In other words, when participants were asked to convert their temporal costs into monetary costs they did not perceive the increase in temporal costs in a linear manner. This nonlinear relationship between sunk costs and the amount of compensation requested can be explained as follows. First, the theory of time (Becker, 1965) posits that the value of time is constant for a short period. However, if it exceeds a certain level waiting time may be converted into a loss (Leclerc et al., 1995). Accordingly, it can be inferred that the value of time remains constant as along as the waiting time is not too long (i.e., from 15 days to 3 months). Yet, as the time exceeds 3 months waiting time can be coded as a loss, and, thus, travelers may request a significantly higher amount of compensation.

Second, participants' sunk costs (i.e., temporal and monetary) negatively affected cancellation intentions, but no significant interaction effect was found. As temporal and monetary sunk costs increased, travelers showed lower intentions to cancel their purchased travel product. Although the two sunk costs are inseparable when purchasing a tourism product, they did not jointly restrain participants' intentions to cancel the purchase. Therefore, both temporal and monetary sunk costs can be independently utilized to inhibit consumers' intentions to cancel a product when potential risk is predicted in their travel reservations.

Third, prior experience moderated the relationship only when temporal sunk costs were involved. It can be inferred that neither type of sunk costs would have a significant effect on cancellation intentions for travelers with no prior experience of the destination because they would want to visit the destination whether or not sunk costs exist. Similarly, since repeat visitors have already visited the particular destination before they would rather change their destination without much concern about the cancellation penalty. When the temporal sunk costs were not high (i.e., less than 4 months) first-time visitors showed significantly lower cancellation intentions than repeat visitors did. Comparably, when the temporal costs were higher repeat visitors showed lower intentions to cancel than first-time visitors did. This implies that repeat visitors who made reservations early (i.e., at least 4 months prior) would want to visit this destination again due to their satisfaction or high level of enjoyment. In other words, whether or not a cancellation penalty is imposed these repeat visitors would persist in revisiting the destination. From this perspective, prior experience affected only temporal costs but not monetary costs.

As mentioned earlier, despite its importance temporal sunk cost has not been highlighted in tourism studies. Thus, this study clearly provides an important theoretical contribution to the literature in that it extends the concept of temporal sunk cost to the tourism setting. This study shows that travelers perceive temporal distance as a sunk cost, which can reduce consumers' cancellation intentions. Further, unlike previous studies of the sunk cost effect that mainly focused on one type of sunk cost (Arkes & Blumer, 1985; Zeelenberg & Van Dijk, 1997), this study identified two different sunk costs at the same time. By including two types of sunk costs this study provides evidence that both temporal and monetary sunk costs influence tourists' behavioral intentions independently. This implies that temporal sunk costs are as important as monetary sunk costs in tourism settings. This is consistent with Navarro and Fantino (2009) and Verhallen and Raaij (1993)in that consumers' behavior or behavioral intentions can be influenced by the price of time.

Further, this study adopted participants' prior experience with a destination as a moderator. In tourism research, tourists' revisiting a destination is often considered an important dependent variable (Huang & Hsu, 2009; Yuksel, Yuksel, & Bilim, 2010). The existence of previous experience can play an important role in explaining travelers' behavioral intentions. However, considering the difference in the decision-making process for first-time visitors and repeat visitors this study showed that prior experience is a potential moderator.

Along with theoretical implications, this study also provides managerial implications for tourism product suppliers. First, potential travelers perceived significantly higher costs when they made reservations very early (i.e., 6 months). In reality, tourism product suppliers have utilized the overbooking practice as a tool to minimize their anticipated loss from consumers' sudden cancellations or changing products (Kimes & Chase, 1998). Specifically, overbooking is very prevalent in airline companies. When a plane is overbooked and there are no volunteers to give up a seat, they ask customers to give up their seats without considering temporal costs. The U.S. Department of Transportation (DOT) has enforced consumer protections in overbooking situations. According to the regulation, DOT does not mandate the form or amount of compensation that airlines must offer to volunteers (U.S. Department of Travel, 2012). These volunteers may not be fully compensated when temporal costs are included. Thus, it is highly suggested that airline companies consider the temporal costs of passengers who made very early reservations when they determine compensation levels. That way, the compensation will satisfy any passenger regardless of their reservation time point in overbooking situations.

Second, tourism product suppliers have imposed large penalties for cancellations or product changes, and these penalties comprise a large portion of profits (Bertoni, 2009). Previous studies have shown that monetary sunk costs (e.g., Arkes & Blumer, 1985) can

play a restrictive role, encouraging consumers to stick with prior investments similar to the results of this study. In addition, our results also suggested that temporal sunk costs play an independent role in reducing cancellation intentions. That is, tourism product suppliers should develop a way to induce their customers to make reservations earlier, possibly by using the revenue management concept. Furthermore, imposing a large cancellation penalty on those who made very early reservations (i.e., 6 months before departure) can trigger travelers' negative emotions toward tourism product suppliers. Thus, it is suggested that revenue management or yield management should consider travelers' temporal costs as one of the most important factors.

Lastly, our results identified that prior experience had a significant moderating effect, especially in cases of temporal sunk costs. Early reservations (i.e., 6 months prior to the departure) made by repeat visitors can be considered as showing their high intention to revisit the destination. Therefore, imposing high cancellation charges may actually damage these customers' attitudes toward the tourism product supplier. Comparatively, if these repeat visitors made a reservation closer to departure, the possibility of cancellation can be higher for repeat visitors than for first-time visitors. This point can be utilized by airline or hotel companies as a practical reference.

Even though this study introduced a new research direction by considering temporal sunk costs in tourists' behavioral intentions, it still has some limitations. First, the time points included in this study could not cover all possible temporal points. Specifically, we set the maximum temporal cost as 6 months and did not include temporal points between 3 months and 6 months. Second, our study did not account for the discount rate provided by some tourism product suppliers for those who make reservations earlier. Third, this study did not include specific manipulation check, which should be utilized when the stimulus (i.e., independent variable) cannot be directly measured (Shadish et al., 2002). This study adopted two independent variables (i.e., time and money) that can be measured directly, and thus, we did not consider including a question for manipulation check. However, in order to strengthen proposed hypotheses it is suggestible that future studies include manipulation check, such as asking whether or not participants perceived the time as costs. Last but not least, other possible moderators (e.g., disaster type, travel type, etc.) or mediators (e.g., perceived fairness, importance of travel, etc.) may exist that can influence potential travelers' cancellation intentions. Thus, future studies should include more temporal points and other potential moderators to identify the role of temporal costs on travelers' behavioral intentions in various tourism settings.

## References


Arkes, H. R., & Ayton, P. (1999). The sunk cost and concorde effects: are humans less rational than lower animals? *Psychological Bulletin, 125*(5), 591–600.

Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes, 35*(1), 124–140.

Aronson, E., & Mills, J. (1959). The effect of severity of initiation on liking for a group. *Journal of Abnormal and Social Psychology, 59*(2), 177–181.

Backman, S. J., & Crompton, J. L. (1989). Discriminating between continuers and discontinuers of two public leisure services. *Journal of Park and Recreation Administration, 7*(4), 56–71.

Backman, S. J., & Crompton, J. L. (1991). The usefulness of selected variables for predicting activity loyalty. *Leisure Sciences, 13*(3), 205–220.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Becker, G. S. (1965). A theory of the allocation of time. *The Economic Journal, 75*(299), 493–517.

Bentler, P. M., & Speckart, G. (1979). Models of attitude-behavior relations. *Psychological Review, 86*(5), 452–464.

Bertoni, S. (2009). America's most overbooked airlines. Available at: http://www.forbes.com/2009/04/16/airline-tickets-flights-lifestyle-travel-airlines-overbooked.html.

Bornemann, T., & Homburg, C. (2011). Psychological distance and the dual role of price. *Journal of Consumer Research, 38*(3), 490–504.

Brockner, J., Shaw, M. C., & Rubin, J. Z. (1985). Factors affecting withdrawal from an escalating conflict: quitting before it's too late. *Journal of Experimental Social Psychology, 15*(5), 492–503.

Cox, J. C., & Oaxaca, R. L. (1989). Laboratory experiments with a finite-horizon job-search model. *Journal of Risk and Uncertainty, 2*(3), 301–329.

Dhar, R., & Nowlis, S. M. (1999). The effect of time pressure on consumer choice deferral. *Journal of Consumer Research, 25*(4), 369–384.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Orlando, FL: Harcourt Brace Jovanovich College Publishers.

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Gitelson, R. J., & Crompton, J. L. (1984). Insights into the repeat vacation phenomenon. *Annals of Tourism Research, 11*(2), 199–217.

Greene, D. L. (2012). Rebound 2007 analysis of U.S. light-duty vehicle travel statistics. *Energy Policy, 41*(C), 14–28.

Gursoy, D., & Gavcar, E. (2003). International leisure tourists' involvement profile. *Annals of Tourism Research, 30*(4), 906–926.

Gursoy, D., & McCleary, K. W. (2004). An integrative model of tourist' information search behavior. *Annals of Tourism Research, 31*(2), 353–373.

Havitz, M. E., & Crompton, J. L. (1990). The influence of persuasive messages on propensity to purchase selected recreational services from public or from commercial suppliers. *Journal of Leisure Research, 22*(1), 71–88.

Hendrix, P. E., Kinnear, T. C., & Taylor, J. R. (1979). The allocation of time by consumers. *Advances in Consumer Research, 6*(1), 38–44.

Homburg, C., Koschate-Fischer, N., & Wiegner, C. M. (2012). Customer satisfaction and elapsed time since purchase as drivers of price knowledge. *Psychology and Marketing, 29*(2), 76–86.

Hong, S. K., Lee, S. W., Lee, S., & Jang, H. (2009). Selecting revisited destinations. *Annals of Tourism Research, 36*(2), 268–294.

Huang, S., & Hsu, C. H. C. (2009). Effects of travel motivation, past experience, perceived constraint, and attitude on revisit intention. *Journal of Travel Research, 48*(1), 29–44.

Jacoby, J., Szybillo, G. J., & Berning, C. K. (1976). Time and consumer behavior: an interdisciplinary overview. *Journal of Consumer Research, 2*(4), 320–339.

Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica, 47*(2), 263–291.

Kimes, S. E., & Chase, R. B. (1998). The strategic levers of yield management. *Journal of Service Research, 1*(2), 156–166.

Kimes, S. E., & Wirtz, J. (2003). Has revenue management become acceptable? *Journal of Service Research, 6*(2), 125–135.

Kogut, C. A. (1992). Recall in consumer search. *Journal of Economic Behavior & Organization, 17*(1), 141–151.

Leclerc, F., Schmitt, B. H., & Dubé, L. T. (1995). Waiting time and decision making: is time like money? *Journal of Consumer Research, 22*(1), 110–119.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: a test of temporal construal theory. *Journal of Personality and Social Psychology, 75*(1), 5–18.

Liberman, N., Sagristano, M. D., & Trope, Y. (2002). The effect of temporal distance on level of mental construal. *Journal of Experimental Social Psychology, 38*(6), 523–534.

Malkoc, S. A., Zauberman, G., & Ulu, C. (2005). Consuming now or later? The interactive effect of timing and attribute alignability. *Psychological Science, 16*(5), 411–417.

Meertens, R. M., & Lion, R. (2008). Measuring an individual's tendency to take risks: the risk propensity scale. *Journal of Applied Social Psychology, 38*(6), 1506–1520.

Moutinho, L. (1987). Consumer behavior in tourism. *European Journal of Marketing, 21*(10), 3–44.

Navarro, A. D., & Fantino, E. (2009). The sunk-time effect: an exploration. *Journal of Behavioral Decision Making, 22*(3), 252–270.

Okada, E., & Hoch, S. (2004). Spending time versus spending money. *Journal of Consumer Research, 31*(2), 313–323.

Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: the multiple processes by which past behavior predicts future behavior. *Psychological Bulletin, 124*(1), 54–74.

Quintal, V. A., Lee, J. A., & Soutar, G. N. (2010). Risk, uncertainty and the theory of planned behavior: a tourism example. *Tourism Management, 31*(6), 797–805.

Rajagopal, P., & Rha, J. Y. (2009). The mental accounting of time. *Journal of Economic Psychology, 30*(5), 772–781.

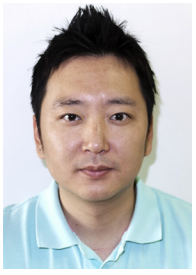
Read, D., & Loewenstein, G. (2000). Time and decision: introduction to the special issue. *Journal of Behavioral Decision Making, 13*(2), 141–144.

Reisinger, Y., Kandampully, J., Mok, C., & Sparks, B. (2001). Unique characteristics of tourism, hospitality, and leisure services. In J. Kandampully, C. Mok, & B. Sparks (Eds.), *Service quality management in hospitality, tourism and leisure* (pp. 15–47). Binghamton, NY: The Haworth Hospitality Press.

Saini, R., & Monga, A. (2008). How i decide depends on what i spend: use of heuristics is greater for time than for money. *Journal of Consumer Research, 34*(6), 914–922.

Sánchez, J., Callarisa, L., Rodríguez, R. M., & Moliner, M. A. (2006). Perceived value of the purchase of a tourism product. *Tourism Management, 27*(3), 394–409.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton, Mifflin and Company.
Shafir, E., & Thaler, R. H. (2006). Invest now, drink later, spend never: on the mental accounting of delayed consumption. *Journal of Economic Psychology, 27*(5), 694–712.
Sharma, S., Durand, R. M., & Gur-Arie, O. (1981). Identification and analysis of moderator variables. *Journal of Marketing Research, 18*(3), 291–300.
Sirakaya, E., & Woodside, A. G. (2005). Building and testing theories of decision making by travelers. *Tourism Management, 26*(6), 815–832.
Soman, D. (2001). The mental accounting of sunk time costs: why time is not like money. *Journal of Behavioral Decision Making, 14*(3), 169–185.
Sönmez, S. F., & Graefe, A. R. (1998). Influence of terrorism risk on foreign tourism decisions. *Annals of Tourism Research, 25*(1), 112–144.
Soster, R. L., Monga, A., & Bearden, W. O. (2010). Tracking costs of time and money: how accounting periods affect mental accounting. *Journal of Consumer Research, 37*(4), 712–721.
Tan, H. T., & Yates, J. F. (1995). Sunk cost effects: the influences of instruction and future return estimates. *Organizational Behavior and Human Decision Processes, 63*(3), 311–319.
Thaler, R. H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization, 1*(1), 39–60.
Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science, 4*(3), 199–214.
Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making, 12*(1), 183–206.
U.S. Department of Travel. (2012). Fly rights: a consumer guide to air travel. Available at: http://www.dot.gov/airconsumer/fly-rights.
Uysal, M., & Crompton, J. L. (1985). An overview of approaches used to forecast tourism demand. *Journal of Travel Research, 23*(4), 7–15.
Verhallen, T. M. M., & Raaij, W. F. V. (1993). How consumers trade off behavioural costs and benefits. *European Journal of Marketing, 20*(3/4), 19–34.
Voss, G. B., Godfrey, A., & Seiders, K. (2010). How complementarity and substitution alter the customer satisfaction-repurchase link. *Journal of Marketing, 74*(6), 111–127.
Yuksel, A., Yuksel, F., & Bilim, Y. (2010). Destination attachment: effects on customer satisfaction and cognitive, affective and conative loyalty. *Tourism Management, 31*(2), 274–284.
Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research, 12*(3), 341–352.
Zeelenberg, M., & Van Dijk, E. (1997). A reverse sunk cost effect in risky decision making: sometimes we have too much invested to gamble. *Journal of Economic Psychology, 18*(6), 677–691.



**Jeong-Yeol Park**, M.S. is Doctoral student in the School of Hospitality and Tourism Management, Purdue University in USA. His research interests include tourists' behavior and tourism marketing.

**SooCheong (Shawn) Jang**, Ph.D. is Associate Professor in the School of Hospitality and Tourism Management, Purdue University in USA, and Co-Editor-in-Chief of International Journal of Tourism Sciences. His research interests are twofold: hospitality finance/strategic management and hospitality/tourism marketing.