Does the sequence of presentations matter for academic conferences? An application of the peak-end rule in event management

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In psychology, the peak-end rule has been used to describe the effects of emotional factors on lived experiences. However, it has yet to be examined in the contexts of events and conferences. This study investigated the influence of conference presentation order, excitement following peak experience, previous conference experience, and time since one’s last visit on conference satisfaction and loyalty. Although no significant differences in satisfaction and loyalty were found with regard to the order of presentations, previous experience and time since last visit were found to have significant effects on attendees’ outcomes. End-of-conference peak experiences exhibited the strongest influence on loyalty.

**Keywords:** events, conferences, satisfaction, loyalty, peak-end rule, prior experience, excitement

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Introduction

No matter how meticulously events are planned, each is unique due to the many possible patterns of interaction between people, settings, event designs, and programs (Getz, 2007). Conferences are uniquely designed for discussion, fact finding, problem solving, and consultation (Events Industry Council [EIC], 2019). Academic conferences are one- or multi-day organized events where researchers showcase their work, ideas, and projects while networking with scholars and practitioners within and across fields (Buddie, 2016; Edelheim, Thomas, Aberg, & Phi, 2018; Verbeke, 2015). Academic conferences allow researchers to stay connected with their peers and keep abreast of cutting-edge research. Conferences differ from other large-scale conventions in that they are generally smaller in scale, more specific in their objectives, and shorter in duration (EIC, 2019). Yet such events are better known for their dry discussions and research presentations than their entertainment value, and for offering attendees educational, networking, and career-oriented opportunities. In contrast to attendees of corporate events, conference attendees have a choice of whether or not to attend.

The challenge for conference organizers is to create an exciting and meaningful experience that will attract attendees year after year, in spite of shrinking funds from institutions to support attendance (Stevens, Bressler, & Silver, 2016). It is important for organizers to understand what compels people to participate in one academic conference over others. Organizers must realize the need to enhance attendee experiences by introducing novel changes to conference format and theme with each iteration. Organizers must be creative in planning their events within budgetary constraints. Some choose to focus on keynote speakers while others give precedence to an appealing destination (Henderson, Shurville, & Fernstrom, 2009), when simply changing the format or order of presentations may be more cost effective than pouring resources into a new destination or venue (Kim, Lee, & Kim, 2012; Lee & Back, 2008).

People’s visit to a place is the result of a sequence of experiences taking place at different points in time. These experiences add up to one’s overall perception of an experience that further influences such outcomes as satisfaction and loyalty. Verhoef, Antonides, and de Hoog (2004) offered the example
of amusement park experiences. In their study of the peak-end rule in service encounters, an attraction experienced at the beginning of the day affected overall evaluation of the experience as much an attraction visited at the end of the day. In other words, overall evaluation of the amusement park visit did not depend on the order of attractions visited. This concern for the sequence of related experiences may be applied to other contexts in the hospitality and service industry, including store visits, restaurants, and flights (Verhoef et al., 2004). This notion also carries over to the meetings and events industry—hence this study’s focus on academic conferences. Conferences consist of multiple functions and may include a keynote presentation, multiple research presentations, coffee breaks, and meals. In this study, the peak-end rule is used to investigate emotional responses to the order of presentations rather than the service encounter, per se.

While numerous studies have regarded motivations and inhibitors for convention or meeting attendees, most such studies are not focused on academic conferences. Previous studies substantiate the belief that event program and service quality are the primary antecedents of attendee satisfaction and behavioral intentions. More recent attention in psychology literature has focused on the effects of emotional factors on people’s experiences, especially in relation to the peak-end rule. According to Getz and Page (2016), the emotional aspects of event experiences are an emerging subject of event research. Yet no research has investigated the effects of the order of presentations on attendees’ emotions leading to satisfaction and loyalty. In an attempt to fill the aforementioned research gaps, this study tested the peak-end rule in the conference context and accordingly investigated the differences in conference satisfaction and loyalty. More specifically, the objectives of this study are: (1) to examine the differences in conference attendees’ satisfaction and loyalty based on the order of presentations, (2) to investigate the influence of positive excitement levels of peak experiences on conference attendees’ satisfaction and loyalty, (3) to explore the differences in conference attendees’ satisfaction and loyalty based on previous experiences, and (4) to examine the differences in conference attendees’ satisfaction and loyalty in light of how much time has elapsed since their last conference visit.
Literature Review

Conference Satisfaction

Satisfaction is defined as customers’ fulfillment response (Oliver, 2014). Satisfaction is attained when visitors/customers achieve their expectations or find those expectations exceeded (de Rojas & Camarero, 2008). In the context of meetings, conventions, and conferences, satisfaction has been used to examine attendees’ evaluation of the event in question (e.g., Bauer, Law, Tse, & Weber, 2008; Hahm, Breiter, Severt, Wang, & Fjelstul, 2016; Kim et al., 2012; Kim, Lee, & Love, 2009; Lee & Back, 2009; Lu & Cai, 2011; Severt, Wang, Chen, & Breiter, 2007; Tanford, Montgomery, & Nelson, 2012). Many studies based on Oliver’s (1980) Confirmation/Disconfirmation-Paradigm have compared expectations and perceived performances to measure satisfaction, while others have deferred to overall performance theory (Carneriro et al., 2019). According to Churchill and Suprenant (1982), for non-durable goods such as conventions or conferences, the C/D-Paradigm is appropriate. This explains why many studies of convention or conference satisfaction have used a list of attributes (e.g., accessibility, accommodations, food functions, safety and security, general and educational sessions, networking opportunities, career enhancement, educational benefits) to evaluate the performance of the convention and/or destination (e.g., Bauer et al., 2008; Hahm et al., 2016; Kim et al., 2009; Severt et al., 2007). Some researchers have used overall satisfaction to measure convention/conference performance in addition to attributes (e.g., Hahm et al., 2016; Kim et al., 2009; Lu & Cai, 2011). Lee and Back (2009) used only an overall satisfaction measure to predict attendee loyalty.

Several studies have suggested that satisfaction is influenced not only by cognitive components (i.e., attributes) but also by affective components (Bigné, Andreu, & Gnoth, 2005; del Bosque & San Martín, 2008; Eusébio & Vieira, 2013; Mason & Paggiaro, 2012; Wirtz & Bateson, 1999) such as feelings, emotions, and moods (de Rojas & Camarero, 2008; Hosany & Gilbert, 2010). De Rojas and Camarero (2008) examined both cognitive and affective components as antecedents of overall satisfaction
in the context of cultural exhibitions. Under the affective approach, the emotional path begins when performance reaches or exceeds expectations, thus evoking pleasure that directly affects satisfaction (de Rojas & Camarero, 2008). The more pleasure is experienced during an experience, the higher the satisfaction (Akhoondnejad, 2016; Mano & Oliver, 1993; Oliver, 1993; Westbrook, 1987; Westbrook & Oliver, 1991; Wirtz & Bateson, 1999).

Some event studies have explored the impacts of eventscape and emotions on satisfaction and loyalty (Carneiro, Eusébio, Caldeira, & Santos, 2019; Hightower, Brady, & Baker, 2002; Lee & Chang, 2017; Lee, Lee, Lee, & Babin, 2008, Lee, Lee, & Choi, 2011; Mason & Paggiaro, 2012; Özdemir & Çulha, 2009; Uhrich & Benkenstein, 2012; Wan & Chan, 2013). Eventscape is a multidimensional construct related to the physical environment and atmosphere experienced at an event, such as the program, entertainment, fun, design, venue, and facilities (Bitner, 1992; Mason & Paggiaro, 2012). Depending on the type of event, one dimension might be more influential on satisfaction and loyalty than the others (Carneiro et al., 2019). Özdemir and Çulha (2009) found that the festival’s program and quality of facilities had a direct impact on the satisfaction of attendees. Wan and Chan (2013) showed that location and accessibility, core features of the event, venue, and aspects related to entertainment affected satisfaction levels at a food festival. Bruwer (2014) suggested that generic festival features and service staff, entertainment and catering, comfort amenities, venue, and information had influences on satisfaction. Dimitrovski (2016) discovered that program content and entertainment had a positive effect on satisfaction at urban gastronomic festivals. Tanford and Jung (2017) found that attributes related to festival activities (including the program), along with environment, were important predictive factors with regard to attendee satisfaction. Most recently, Carneiro et al. (2019) have shown that, among eventscape dimensions, design and entertainment had the most positive impact on emotions, satisfaction, and loyalty of attendees of historical re-enactments.
Conference Loyalty

Loyalty is the willingness to revisit or repurchase a service (Oliver, 1999) and has been studied extensively in hospitality and tourism research (Novello & Fernandez, 2016). The literature traditionally outlines two major types of loyalty: attitudinal and behavioral (Eusébio & Vieira, 2013; Harris & Goode, 2004; Oppermann, 2000; Yoon & Uysal, 2005). Attitudinal loyalty is defined as customers’ predisposition toward a brand and explained by positive word-of-mouth and revisit intentions (Zeithaml, Berry, & Parasuraman, 1996), while behavioral loyalty refers to customers’ repetition of a purchase behavior (Zeithaml et al., 1996).

For decades, satisfaction has been considered a major predictor of loyalty in hospitality and tourism research (Back & Parks, 2003; Mattila & Mount, 2003; Zeithaml, Bitner, & Gremler, 2009). Researchers have increasingly examined attendee satisfaction and loyalty in event-specific contexts (e.g., Akhoondnejad, 2016; Ayob, Wahid, & Omar, 2013; Baker & Crompton, 2000; Crompton & Love, 1995; Petrick, Bennett, & Tsuji, 2013; Carneiro et al., 2019; Novello & Fernandez, 2016; Wan & Chan, 2013). A number of studies in the context of conventions and conferences found a relationship between attendee satisfaction and loyalty (e.g., Hahm et al., 2016; Kim et al., 2009; Lee & Back, 2009; Lu & Cai, 2011; Severt et al., 2007; Tanford et al., 2012). While most previous research confirms the influence of attendee satisfaction on loyalty-related attitudes and behaviors, such studies rarely take into account event duration, event arrangement, or emotional attributes.

Constructs related to emotions or emotional commitment have been considered major predictors of loyalty in hospitality research, such as hotels (e.g., Barsky & Nash, 2002; Bowen & Shoemaker, 2003; Mattila, 2006; Tanford, Raab, & Kim, 2011; Torres & Kline, 2013), casinos (e.g., Baloglu, 2002; Sui & Baloglu, 2003), restaurants (Jang & Namkung, 2009; Mittal, Katrichis, & Kumar, 2001), theme parks (e.g., Bigné et al., 2005), and airlines (e.g., Chen & Chang, 2008). In the context of conventions and conferences, the use of emotions or psychological constructs to explain loyalty has been scarce (Hahm et al., 2016; Tanford et al., 2012). Tanford et al. (2012) posited six items of emotional commitment, along
with attendee satisfaction and switching costs, to predict loyalty. The authors found that emotional commitment was the stronger predictor over satisfaction for loyalty. Similarly, Hahm et al. (2016) investigated the relationships between sense of community (a psychological construct), satisfaction, and future intentions. The authors discovered that sense of community was a better predictor of future intentions than satisfaction. These studies were able to prove the strong influence of attendees’ emotional connections over loyalty. Toward ensuring a successful event and encouraging loyalty, it is suggested that organizers not only evaluate the physical components but also the emotional aspects of their events (Ayob et al., 2013; Hahm et al., 2016).

**Peak-end Rule**

The peak-end rule refers to self-evaluation of experiences based on one’s feelings at the peak of an experience (i.e., its most vivid or intense point) and at the end of an experience (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993). The peak-end rule has been supported in studies of life quality assessment (Diener, Wirtz, & Oishi, 2001), video viewing (Fredrickson & Kahneman, 1993), and television advertising (Baumgartner, Sujan, & Padgett, 1997). Kahneman et al. (1993) conducted a laboratory experiment with a series of unpleasant and less unpleasant experiences. The first condition for the study subjects was to place their hands in 57°F water for 60 seconds and the second condition was to place their hands in 59°F water for an additional 30 seconds after the first condition. Interestingly, participants preferred the second condition even though it was a prolonged unpleasant experience. This result is an indication that the participants based their evaluation on the end experience, which was less unpleasant than the first condition. In their study of guided tour programs, Park, Hahn, and Jun (2018) found differences in overall satisfaction based on expectation, reciprocity, and peak-end. The authors also found significant interaction between reciprocity and peak-end for overall satisfaction. Hargreaves and Styck (2013) tested the peak-end rule during physical exercises and concluded that it predicted 39% to 58% of the variance in participants’ evaluation depending on the time of measurement. These studies
suggested that negative emotions have negative effects on revisit intentions and word-of-mouth, while positive emotions positively influence behavioral intentions based on the duration and time of measurement (Ladhari, 2007). Based on previous literature on peak-end rule and its effect on satisfaction and loyalty, the following hypotheses were developed:

H₁: There is a difference in conference satisfaction based on the order of presentations.

H₂: There is a difference in conference loyalty based on the order of presentations.

It has been known that the final outcome of a series of events is the most prevalent in one’s evaluation of an experience (Anderson, 2000). This suggests that the last experience should be the most salient (Verhoef et al., 2004). In an event context, a peak presentation, or the most emotional and vivid experience, can be placed at the beginning, middle, or end of the event. Not all event experiences are homogeneous in terms of temporal intensity and emotional profile. Specifically, some parts of the event experience can be more emotional, while others can be neutral or even negative. Planned events have a beginning, an end, and a variety of programs in between, which are generally arranged in detail (Getz, 2007). Some event studies have found that a program improved attendee emotions (Fu, Zhang, Lehto, & Miao, 2018; Lee & Chang, 2017). Tanford et al. (2012) suggested that convention programs significantly influenced satisfaction. Lee and Back (2008) recommended that convention organizers offer a variety of sessions in various formats—including keynote sessions, panel discussions, small group discussions, and video conferences—to satisfy the widest possible range of attendees. Event organizers have an opportunity to easily modify their event programs in an effort to evoke positive emotions while increasing attendee satisfaction and loyalty. This study is an attempt to apply findings from psychology, related to the influence of peak experience placement, to the event context.

There is some evidence in the literature to suggest that the order of events affects service outcomes such as satisfaction and loyalty (Verhoef et al., 2004). Oliver and Burke (1999) found that expectations influenced people’s experiences earlier rather than later. Hansen and Danaher (1999)
likewise showed that people’s judgment of their experience was relatively positive when performance improved earlier. Verhoef et al. (2004) tested the effects of peak experience on service calls, finding that the average utility of the service call significantly influenced customer satisfaction. Additionally, the positive peak of the sequence had a positive effect on customers’ experiences. The authors suggested that a positive peak experience would boost satisfaction. Barnes, Mattson, and Sorensen (2016) argued that tourists’ positive emotions during their travel experience increases revisit intentions, and concluded that long-term remembered experiences have a greater influence on revisit intentions than short-term remembered experiences. At the same time, research to date has tended to focus on the retrospective evaluation of emotional states related to previous experience rather than moment-by-moment evaluation of visitors’ emotions. No study has investigated the effects of event arrangement on conference satisfaction and loyalty-related outcomes. Therefore, this study hypothesizes:

$H_3$: Positive peak experience at the end influences conference satisfaction.

$H_4$: Positive peak experience at the end influences conference loyalty.

**Previous Experience and Time since Previous Visit**

A number of hospitality and tourism researchers have reported that motivations, expectations, perceptions, satisfaction, and loyalty of first-time customers or visitors are different from those of repeated customers/visitors. On the one hand, customers might receive additional emotional value by consuming a product or service for the first time (Proctor & Kitchen, 2002). On the other hand, previous experience can influence one’s level of satisfaction (e.g., Cheung, Luo, Sia, & Chen, 2009; Severt, 2002; Westbrook & Oliver, 1991), destination image and perceptions (e.g., Beerli & Martín, 2004; Marchiori & Cantoni, 2015; Sharifpour, Walters, Ritchie, & Winter, 2014), and various tourist behavior (e.g., Dedeoglu, Bilgihan, Buonincontri, & Okumus, 2018; Kozak & Rimmington, 2000; Lehto, Kim, & Morrison, 2006; Lehto, O’Leary, & Morrison, 2004; Mazursky, 1989). Researchers have found that
perceptions formed after direct experiences with a product or service are usually more realistic, complex, and even positive (Beerli & Martín, 2004; Sharifpour et al., 2014).

In the event context, it is widely known that retaining repeat attendees is a powerful way to maintain high attendance (Getz, 1991; Mohr, Backman, Gahan, & Backman, 1993; Godovykh, 2019). Several studies explored different behaviors and characteristics of first-time and repeat visitors. Mohr et al. (1993) showed differences in motivation and satisfaction levels between first-time and repeat festival-goers. Boo, Ko, and Blazey (2006) found that prior festival visit experience significantly influenced the amount of visitor expenditures. Lee, Lee, and Yoon (2009) also analyzed the differences between first-time and repeat festival-goers and discovered differences in what they deemed a quality festival. Funk, Toohey, and Bruun (2007) examined sport events visitor outcomes and confirmed that prior experience influenced registration intentions. Specific to conventions or business events, Kang and Schrier (2011) reported strong relationships between prior experience and tradeshow visitor loyalty. Kim et al. (2012) collected data at three academic conventions and compared perceptions and values between first-time attendees and repeaters. The authors shared that first-timers were more concerned with site environment and professional education than repeaters, who placed higher value on networking. Accessibility and extra convention opportunities did not influence loyalty for either group.

Researchers also reported the temporal nature of visitor satisfaction, loyalty, and their antecedents in tourism (Oppermann, 2000), financial services (Crosby & Stephens, 1987; Bolton, 1998), and education (Mittal, Katrichis, & Kumar, 2001). These studies showed that the effects of previous experience on visitor satisfaction and loyalty could change over the course of time. In tourism, several researchers have studied image decay, which is based on the premise that people’s attitudes toward a place, product, or service change over time due to the limited capacity of human memory (Jenkins, Earle-Richardson, Slingerland, & May, 2002; Schwarz, 2007). Tourism researchers found that it is easier for tourists to recollect information related to current feelings and have more positive feelings and revisit intentions during their visit, which may gradually decline as they return to their daily activities (e.g.,
Bigné, Sánchez, & Sánchez, 2001; King, Chen, & Funk, 2015; O’Leary & Deegan, 2005). Although the impact of prior experience has been described with regard to different contexts, there is a lack of empirical attention on conference satisfaction and loyalty based on previous experience and time since one’s last visit. This study hypothesized that conference satisfaction and loyalty can be affected by prior conference experience and time since previous visit.

H₅: There is a difference in conference satisfaction between people who have been to one conference and those who have been to multiple conferences.

H₆: There is a difference in conference loyalty between people who have been to one conference and those who have been to multiple conferences.

H₇: There is a difference in conference satisfaction based on time since previous conference visit.

H₈: There is a difference in conference loyalty based on time since previous visit conference visit.

Methodology

Survey Instrument

This study used an online experimental design to test the effects of presentation order, previous experience, and time since the last visit on conference satisfaction and loyalty. Based on previous studies, conference satisfaction was measured using a single item (“I am satisfied with the event”) on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Using a single item to measure satisfaction is consistent with past research (Cunningham & Sagas, 2002; Chi & Qu, 2008; Lee & Back, 2009). Conference loyalty was measured using a three-item loyalty scale from Zeithmanal et al. (1996) and included the following statements: “I would say positive things about the conference to other people,” “I would revisit the conference in the next few years,” and “I would recommend the conference to someone who seeks my advice.” The level of excitement following presentations was measured by asking
respondents to rate their level of agreement with the statement, “I was excited about the presentation” on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) from Geus, Richards, and Toepoel (2016). The previous experience variable was recoded into two categories: visited one academic conference and visited more than one conference. Time since last visit had three values: less than one month ago, from one to three months ago, and more than three months ago. Sociodemographic information was collected at the end of the survey. The manipulated order of presentations had the following values: peak presentation at the beginning of the conference, peak presentation in the middle part of the conference, and peak presentation at the end of the conference.

Data Collection and Analysis

A sample of 211 people residing in the United States who had visited an academic conference within the last 12 months was recruited via Amazon Mechanical Turk (MTurk). MTurk is known as a reliable method of participant recruitment (Buhrmester, Kwang, & Gosling, 2011). The online scenario-based experiment has high levels of internal validity (Victorino & Dixon, 2016). The scenarios were intentionally designed to mimic an academic conference experience with which respondents would be familiar. The experimental nature of the study made it possible to manipulate the order by placing the vivid or peak presentation at different parts of the conference experience. Participants were randomly assigned to one of the three conditions: peak presentation at the beginning, in the middle, and at the end of the conference.

Each conference scenario consisted of several presentations. The majority of presentations were designed based on a real academic conference program. There were two major types of presentations: vivid/peak and neutral. The vivid or peak presentation showcased a popular speaker taking attendees on a journey through YouTube binges, Wikipedia rabbit holes, and bouts of staring out the window. It was essentially a keynote presentation accompanied by music, video on large screens, and lighting effects on a
wide stage in a grand ballroom. The neutral presentations were designed as breakout sessions in smaller meeting rooms focused on a specific topic. These presentations did not make use of full production values like the vivid one but found a presenter in front of a screen showing a PowerPoint presentation.

Data were checked for any missing values, outliers, and assumption violations, such as normality, multicollinearity, and linearity. There were no missing values due to the force response filter used in the online questionnaire. There were no assumptions violated so further analysis was performed. Using SPSS 24, descriptive statistics, frequencies, chi-square tests, t-tests, one-way ANOVA, and regression analysis were conducted to analyze the study data. Manipulation checks and bias checks were performed and presented as detailed in the following results section.

**Results**

**Profile of Respondents**

The sociodemographic characteristics and previous conference experience of respondents are provided in Table 1. Of the 211 respondents, the majority attended more than one conference in the past 12 months (66.4%). The gender distribution showed almost an even distribution between males (44.5%) and females (52.6%). All age groups were represented in the survey, while the most frequent age categories were 30-39 years old (41.7%) and 20-29 years old (36.5%). The majority of respondents had college or university degrees (51.2%), followed by Master’s or Ph.D. degrees (37%). More than two-thirds of respondents identified themselves as White/Caucasian (69.7%). All income groups were evident: less than $30,000 (19.9%), $30,000 - $49,999 (23.7%), $50,000 - $69,999 (22.3%), $70,000 - $89,999 (13.3%), and $90,000 or more (20.9%).
Table 1. Socio-demographic characteristics and previous conference experience (N = 211)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>94 (44.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>111 (52.6%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>77 (36.5%)</td>
</tr>
<tr>
<td>30-39</td>
<td>88 (41.7%)</td>
</tr>
<tr>
<td>40-49</td>
<td>27 (12.8%)</td>
</tr>
<tr>
<td>50-59</td>
<td>15 (7.1%)</td>
</tr>
<tr>
<td>60 or more</td>
<td>4 (1.9%)</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>9 (4.3%)</td>
</tr>
<tr>
<td>Vocational School/Associate</td>
<td>15 (7.1%)</td>
</tr>
<tr>
<td>College/University</td>
<td>108 (51.2%)</td>
</tr>
<tr>
<td>Master's or PhD</td>
<td>78 (37.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>White/Caucasian, non-Hispanic</td>
<td>147 (69.7%)</td>
</tr>
<tr>
<td>African American</td>
<td>21 (10%)</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>18 (8.5%)</td>
</tr>
<tr>
<td>Asian or Asian American</td>
<td>22 (10.4%)</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>2 (0.9%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Annual income</td>
<td></td>
</tr>
<tr>
<td>Less than $30,000</td>
<td>42 (19.9%)</td>
</tr>
<tr>
<td>$30,000 - $49,999</td>
<td>50 (23.7%)</td>
</tr>
<tr>
<td>$50,000 - $69,999</td>
<td>47 (22.3%)</td>
</tr>
<tr>
<td>$70,000 - $89,999</td>
<td>28 (13.3%)</td>
</tr>
<tr>
<td>$90,000 or more</td>
<td>44 (20.9%)</td>
</tr>
<tr>
<td>Previous experience</td>
<td></td>
</tr>
<tr>
<td>Only one conference</td>
<td>71 (33.6%)</td>
</tr>
<tr>
<td>More than one conference</td>
<td>140 (66.4%)</td>
</tr>
</tbody>
</table>

**Bias Check**

In order to ensure that differences found in analyses were not due to differences in groups, bias checks were performed. Although there are differences in distributions for different groups—peak presentation at the beginning (n = 76), in the middle (n = 69), and at the end (n = 66) of the hypothetical conference—one-way analysis of variance and chi-square tests did not show significant differences for any of the sociodemographic variables (Table 2). Therefore, it can be said that the different conference scenario groups (peak presentation at the beginning, in the middle, and at the end of the conference) are
homogeneous and that any differences found in satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend could be related to the manipulated order of presentations.

Table 2. Socio-demographics of respondents for different conference scenarios

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Chi-square test and one-way ANOVA significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.810</td>
</tr>
<tr>
<td>Age</td>
<td>.579</td>
</tr>
<tr>
<td>Educational level</td>
<td>.639</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.875</td>
</tr>
<tr>
<td>Annual income</td>
<td>.252</td>
</tr>
</tbody>
</table>

**Manipulation Check**

A one-way analysis of variance (ANOVA) test was used to check if manipulated presentation scenarios (peak presentation and neutral presentations) were effective in causing different levels of excitement (Table 3). The average level of excitement after the peak presentation (M = 4.87, SD = 1.62) was significantly higher than that after the neutral presentations (M = 4.47, SD = 1.36), which means that the presentation stimuli achieved expected manipulation of respondents’ excitement levels.

Table 3. Excitement levels after peak and neutral presentations

<table>
<thead>
<tr>
<th>Scenario groups</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak presentation</td>
<td>4.87</td>
<td>1.62</td>
<td>.000*</td>
</tr>
<tr>
<td>Neutral presentations</td>
<td>4.47</td>
<td>1.36</td>
<td></td>
</tr>
</tbody>
</table>

\* p < 0.05

**Descriptives of Satisfaction, Loyalty, and Excitement**

Table 4 displays all measurement items (i.e., satisfaction, three loyalty items, and excitement) with mean values and standard deviation values. All items rated above the mid-point of the 7-point Likert scales they were measured on. Of the three loyalty markers, word of mouth ranked the highest (M=4.93), followed by willingness to recommend (M=4.85).
Table 4. Descriptive statistics of all items

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>I am satisfied with the event.</td>
<td>4.81</td>
<td>1.40</td>
</tr>
<tr>
<td>Loyalty</td>
<td>I would say positive things about the conference to other people.</td>
<td>4.93</td>
<td>1.32</td>
</tr>
<tr>
<td></td>
<td>I would revisit the conference in the next few years.</td>
<td>4.56</td>
<td>1.59</td>
</tr>
<tr>
<td></td>
<td>I would recommend the conference to someone who seeks my advice.</td>
<td>4.85</td>
<td>1.48</td>
</tr>
<tr>
<td>Excitement</td>
<td>I was excited about the presentation.</td>
<td>5.15</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Note: 7-point Likert scale (1=strongly disagree, 7=strongly agree); Satisfaction from Lee & Back, 2009; Loyalty items from Zeithman, Berry, & Parasuraman (1996); Excitement from Geus, Richards, and Toeepoel (2016).

**Effects of Peak Presentations**

Table 5 demonstrates the average levels of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend the conference in all conference scenarios, as well as one-way ANOVA test results. Overall, satisfaction and all markers of conference loyalty are higher for scenarios in which the peak presentation takes place at the end rather than at the beginning or in the middle part of the conference. The rating of satisfaction is evaluated as 4.64 for peak presentation at the beginning, 4.75 for peak presentation in the middle, and 5.06 for peak presentation at the end. The reported levels of loyalty for peak presentation at the end (5.03 for word-of-mouth, 4.64 for revisit intentions, and 5.08 for willingness to recommend) are also higher than loyalty for peak presentation in the middle (5.03 for word-of-mouth, 4.58 for revisit intentions, and 4.88 for willingness to recommend) and loyalty for peak presentation at the beginning (4.76 for word-of-mouth, 4.49 for revisit intentions, and 4.62 for willingness to recommend). However, the one-way ANOVA test did not reveal statistically significant differences among groups’ ratings of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend. Thus, H₁ and H₂ were not supported.
Table 5. Levels of satisfaction and loyalty for different presentation scenarios

<table>
<thead>
<tr>
<th>Variables</th>
<th>Peak presentation at the beginning (n=76)</th>
<th>Peak presentation at the middle (n=69)</th>
<th>Peak presentation at the end (n=66)</th>
<th>One-way ANOVA test significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>4.64</td>
<td>4.75</td>
<td>5.06</td>
<td>.195</td>
</tr>
<tr>
<td>Positive word-of-mouth</td>
<td>4.76</td>
<td>5.03</td>
<td>5.03</td>
<td>.374</td>
</tr>
<tr>
<td>Revisit intentions</td>
<td>4.49</td>
<td>4.58</td>
<td>4.64</td>
<td>.852</td>
</tr>
<tr>
<td>Willingness to recommend</td>
<td>4.62</td>
<td>4.88</td>
<td>5.08</td>
<td>.178</td>
</tr>
</tbody>
</table>

To examine the relationships between peak experience excitement levels, satisfaction, and overall loyalty, regression analyses were performed (Table 6). Excitement levels for all peak presentations were statistically significant in estimating satisfaction (Model 1: \(F(3, 207) = 63.188, p = .00\)) and overall loyalty (Model 2: \(F(3, 207) = 85.360, p = .00\)). Based on the \(R^2\) statistic, excitement levels explained 47% of variance in satisfaction and 54.7% of variance in overall loyalty ratings. Peak presentations at the beginning made the strongest contribution to satisfaction, while peak presentations at the end were the strongest predictor of overall loyalty. Thus, \(H_3\) and \(H_4\) were supported.

Table 6. Regression analysis of relationships between excitement levels based on peak placement, satisfaction, and loyalty.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>(\beta) Satisfaction</th>
<th>(t)</th>
<th>(\beta) Loyalty</th>
<th>(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak at the beginning</td>
<td>.477*</td>
<td>9.508</td>
<td>.430*</td>
<td>9.258</td>
</tr>
<tr>
<td>Peak in the middle</td>
<td>.343*</td>
<td>6.836</td>
<td>.328*</td>
<td>7.053</td>
</tr>
<tr>
<td>Peak at the end</td>
<td>.364*</td>
<td>7.241</td>
<td>.510*</td>
<td>10.983</td>
</tr>
<tr>
<td>(R^2)</td>
<td>.470</td>
<td>.547</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F) test statistic, (p)</td>
<td>(F(3, 207) = 63.188,)</td>
<td></td>
<td>(F(3, 207) = 85.360,)</td>
<td></td>
</tr>
<tr>
<td>significance</td>
<td>(p = .00)</td>
<td></td>
<td>(p = .00)</td>
<td></td>
</tr>
</tbody>
</table>

* \(p < .01\)
Effects of Previous Experience

Table 7 demonstrates the average levels of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend the conference based on previous experience. The previous experience variable had two categories: visited one conference \((n = 71)\) and visited more than one conference \((n = 140)\) during the past 12 months. The independent samples \(t\)-test revealed significant differences for satisfaction and the three markers of conference loyalty.

Table 7. Conference satisfaction and loyalty for different previous experience

<table>
<thead>
<tr>
<th>Variables</th>
<th>Visited one conference ((n=71))</th>
<th>Visited more than one conference ((n=140))</th>
<th>(T)-test significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>4.31</td>
<td>5.06</td>
<td>.000*</td>
</tr>
<tr>
<td>Positive word-of-mouth</td>
<td>4.55</td>
<td>5.13</td>
<td>.002*</td>
</tr>
<tr>
<td>Revisit intentions</td>
<td>4.08</td>
<td>4.81</td>
<td>.002*</td>
</tr>
<tr>
<td>Willingness to recommend</td>
<td>4.37</td>
<td>5.09</td>
<td>.001*</td>
</tr>
</tbody>
</table>

\(p < 0.05\)

The results suggest that people who previously visited more than one academic conference have significantly higher levels of satisfaction (5.06), positive word-of-mouth (5.13), revisit intentions (4.81), and willingness to recommend the conference (5.09) than people who visited only one conference (satisfaction [4.31], positive word-of-mouth [4.55], revisit intentions [4.08], and willingness to recommend [4.37]). Thus, \(H_5\) and \(H_6\) were supported.

Effects of Time since Previous Visit

Table 8 demonstrates the average levels of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend the conference based on how much time has passed since the last conference visit. The mean values of satisfaction (5.32), revisit intentions (5.00), and willingness to recommend (5.29) for people who visited an academic conference during the last month are significantly higher than...
the same values for respondents who attended their last conference one to three months ago (4.86 for satisfaction, 4.70 for revisit intentions, and 4.99 for willingness to recommend) and more than three months ago (4.55 for satisfaction, 4.27 for revisit intentions, and 4.54 for willingness to recommend). Only one component of loyalty (positive word-of-mouth) did not demonstrate a significant difference. Thus, H7 was supported and H8 was partially supported.

Table 8. Conference satisfaction and loyalty based on time since previous visit

<table>
<thead>
<tr>
<th>Variables</th>
<th>During last month (n=41)</th>
<th>From 1 to 3 months ago (n=76)</th>
<th>More than 3 months ago (n=94)</th>
<th>One-way ANOVA test significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>5.32</td>
<td>4.86</td>
<td>4.55</td>
<td>.013*</td>
</tr>
<tr>
<td>Positive word-of-mouth</td>
<td>5.05</td>
<td>5.12</td>
<td>4.73</td>
<td>.140</td>
</tr>
<tr>
<td>Revisit intentions</td>
<td>5.00</td>
<td>4.70</td>
<td>4.27</td>
<td>.030*</td>
</tr>
<tr>
<td>Willingness to recommend</td>
<td>5.29</td>
<td>4.99</td>
<td>4.54</td>
<td>.014*</td>
</tr>
</tbody>
</table>

*p < 0.05

Discussion and Conclusions

Conclusions

The purpose of this study was to test the peak-end rule in the context of academic conferences, investigating differences in conference satisfaction and loyalty based on the order of presentations, as well as excitement levels of peak experience, previous experience, and time since attendees’ last conference. The results of this online experimental study showed that overall satisfaction and the three markers of conference loyalty were higher for scenarios ending on a “high note” with peak presentation as compared to those exhibiting peak presentation at the beginning or during the middle phase of the conference. However, the differences among groups’ ratings of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend were not statistically significant. This finding is in agreement with Verhoef et al. (2004), who concluded that overall evaluation of a visit does not depend on the order of experiences throughout said visit. As for the influence of excitement levels after peak
presentations on satisfaction and overall loyalty, regression analysis results showed that excitement ratings for peak presentations at the beginning, in the middle, and at the end have the predictive ability for both satisfaction and overall loyalty. Satisfaction was highest when the peak presentation was at the beginning. Loyalty was highest when the peak presentation was at the end. The model examining the relationship between peak presentation excitement and loyalty explained more of the variance than the satisfaction model, thus indicating that excitement levels after peak presentations impact conference loyalty more than conference satisfaction and that peak presentations at the end contribute more toward conference loyalty. These findings agree with Verhoef et al.’s (2004) in their correlation of positive peak experience with boosts in satisfaction, as well as Barnes et al.’s. (2016) in their correlation of positive emotional experiences with increased loyalty. Although relationships between positive peak experiences and satisfaction and loyalty were found, it is important to note that a positive peak experience at the end exhibited the strongest contribution to overall loyalty, but not to satisfaction.

**Implications**

Based on this study’s findings, providing a positive peak experience at the end of a conference does not necessarily encourage higher levels of satisfaction than loyalty among attendees. In fact, satisfaction levels were stronger when positive emotions were experienced at the beginning of the conference. This finding could be explained by people’s expectations being influenced by their experiences earlier rather than later (Oliver & Burke, 1999). As previous research has stated, satisfaction is related to people’s evaluation of their experience—in this case, a conference. Satisfaction is influenced by many different attributes and components throughout the experience. This is evidenced by studies such as Lu and Cai (2011) and Tanford et al. (2012), neither of which found a relationship between overall satisfaction with, and loyalty toward, conventions. Although this study found a significant relationship between overall satisfaction and loyalty, other variables not measured in this study may influence satisfaction.
Nonetheless, conference organizers must set precedents by planning and providing experiences that evoke positive emotions as early on as possible to ensure higher levels of overall satisfaction. In addition, ending the conference with positive excitement will more likely bring people back, encouraging them to recommend the conference to others. Traditionally, keynote presentations have kicked off multi-day conferences or conventions. Some events offer keynote presentations each morning of the conference. Based on this study’s findings, ending with a captivating presentation is likely to leave a lasting memory in attendees’ minds, leading them to convey the experience to others and return for subsequent iterations of the conference in question. In the context of such entertainment events as concerts, performers typically save their most popular songs until the end. There is no reason why conferences cannot deliver the same excitement for their attendees.

The study results revealed that people who previously visited more than one academic conference in the past year had significantly higher levels of satisfaction, positive word-of-mouth, revisit intentions, and willingness to recommend the conference than people who visited only one conference. These findings further support previous literature on the influence of prior experience on consumer outcomes (Kang & Schrier, 2011; Kim et al., 2012). Although this was a hypothetical conference, the results show that people with more conference experience tend to have relatively positive perceptions. Academic conferences usually take place on an annual basis. Therefore, it is imperative for conference organizers to retain their attendees year after year via memorable experiences. As previous research suggests, organizers should provide a variety of functions to satisfy the disparate needs of first-time and repeat attendees alike (Kim et al., 2012). The results of this study should encourage conference organizers to better design and advertise their events by targeting first-time attendees and repeaters with distinctive messaging tailored to those demographics. For example, educational sessions are important components of academic conferences and of particular interest to first-time attendees (Kim et al., 2012). Conference organizers should therefore consider focusing their marketing of educational opportunities to first-timers.
For repeat attendees, networking opportunities and innovative components of the conference should be stressed.

This study also found that the amount of time that had elapsed since attendees’ last conference visit influenced their levels of satisfaction, revisit intentions, and willingness to recommend the conference to others. These findings confirmed the temporal dimensions of previous experience on satisfaction and loyalty (Bigné et al., 2001; King et al., 2015; O’Leary & Deegan, 2005). More specifically, those who had most recently attended a conference gave the highest ratings in those fields. This result supports the common belief that attendees are best surveyed immediately following an event while the experience is fresh in their minds. A major trend among conferences is to set up a mobile app that can easily track and collect more accurate feedback from attendees in real time. By using available technology to the advantage of organizers, satisfaction levels and future intentions can be tracked even before attendees leave the sessions in which they are engaged. This method benefits organizers by eliminating the extra step of sending out mass emails, thus reducing inbox clutter.

Theoretically, this study contributes to event research by adopting the peak-end rule used so widely in psychology. Overall, the study experiment showed that conference satisfaction and loyalty do not depend on the order of presentations. However, positive excitement levels after a peak experience at the beginning of a conference contributed more toward satisfaction. In terms of conference loyalty, positive excitement was higher when a peak experience occurred at the end of the conference. This study used the affective component of excitement to examine satisfaction and loyalty in the conference context, thereby expanding a corpus of event research that has historically relied on cognitive attributes. This study also supported existing research by confirming that previous experience and time since one’s previous visit are important antecedents of visitor outcomes. Lastly, a new method of modeling scenarios was used to investigate peak experience effects in the context of conferences, which could be applied in future event studies, tourism, and hospitality.
Limitations

This study has limitations that should be addressed and considered for future studies. First, the focus of this research was an academic conference. Therefore, the study results are not generalizable to other types of events, which may function differently from an academic conference. Future studies could adopt the methodology used in this study to other events (e.g., conventions, festivals, retreats). Second, data were collected online regarding hypothetical scenarios. It would be worthwhile to compare the results of a study conducted at an actual conference. Third, this study used a single item to measure satisfaction and excitement. Future studies could use a satisfaction scale with a number of items to evaluate specific attributes. Furthermore, given that emotions are a complex construct, different scales with multiple items to measure emotions (e.g., pleasure and arousal scales) could be used. Lastly, with more measurement items, a model could be developed and tested using such advanced statistical methods as structural equation modeling to get a holistic understanding of emotions and their influence on satisfaction and loyalty in event-specific settings.

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