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*Brigham Young University*

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A Quasi-Experimental Study of the Effect of Experience Staging  
Techniques on Engagement

Emerson Ferrell Watanabe

A thesis submitted to the faculty of  
Brigham Young University  
in partial fulfillment of the requirements for the degree of  
Master of Science

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## ABSTRACT

### A Quasi-Experimental Study of the Effect of Experience Staging Techniques on Engagement

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Master of Science

The purpose of this study is to examine the effect of experience staging techniques (personalization through co-creation and multisensory stimuli) on engagement level. This study also explores the possible contribution of experience staging techniques as practical tools that recreation professionals can use to better engage participants in recreation activities and events. A 2-way univariate ANOVA revealed no significant relationship between the use of co-creative and multisensory stimulating techniques and engagement levels in participants ( $F(3,200) = .263, p = .826, \text{partial } \eta^2 = .004$ ). Practical applications for recreation professionals and further research opportunities are discussed.

Keywords: engagement, experience staging, personalization, co-creation, multisensory stimuli

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## Introduction

Engagement has frequently been studied in various fields. Managers search for ways to engage employees (Kahn, 1990); teachers seek to engage students (Fredricks, Blumenfeld, & Paris, 2004); and companies strive to encourage customers to engage with their products or services, as *The Experience Economy* (Pine & Gilmore, 1999, 2011) points out. Pine and Gilmore (1999, 2011) explain a fundamental shift in our economy, where businesses now sell memorable and engaging experiences in connection with their products or as the products themselves. “When a person buys an experience, he pays to spend time enjoying a series of memorable events a company stages—as in a theatrical play—to engage him in an inherently personal way” (Pine & Gilmore, 2011, p. 3). Ellis and Rossman (2008) combine Pine and Gilmore’s (1999) principles with bodies of customer service research (Cronin & Taylor, 1994; Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1988; Williams & Buswell, 2003), consumer experience (Pine & Gilmore, 1999, 2011), and quality management (Kano, 1984) to create a model for experience staging in recreational settings.

Ellis and Rossman’s model (see Figure 1) presented techniques that are meant to increase the likelihood of engaging customers by facilitating memorable experiences. The model proposed the employment of *technical performance* and *artistic performance* techniques aimed at improving service quality and customer experience respectively, and ultimately to elicit delight in customers. Technical performance elements include reliability, tangibles, empathy, assurance, and responsiveness (Parasuraman et al., 1988). Artistic performance elements include using a clear and immersive theme, personalizing the experience to the individual, and employing multisensory stimulation (Pine & Gilmore, 1999, 2011). Inclusion of opportunities for an individual to co-create the experience is thought to be a way to personalize the experience for

that individual. Technical and artistic performance are thought to work interactively to increase the likelihood of memorable experiences. More specifically, artistic performance elements are meant to delight and engage guests dependent on the proper deployment of technical elements.

The technical and artistic performance elements Ellis and Rossman (2008) proposed may provide recreation professionals with practical tools to use in staging memorable and engaging experiences for their customers. Testing this assertion would guide recreation professionals when applying these techniques in their programs and events. Stricklin (2016) tested the veracity of Ellis and Rossman's (2008) model of experience staging by presenting theoretical scenarios to gather feedback about a tailgate experience in order to test reactions to different combinations of technical and artistic elements. No study to date, however, has tested the elements of Ellis and Rossman's model by implementing the model in a live recreation setting.

Additionally, Ellis and Rossman (2008) suggested immersion and absorption are two types of experiences that previous researchers (Pine & Gilmore, 1999; Oh, Fiore, & Jeoung, 2007) asserted are the "result of experience staging encounters" (p. 12). They further posited that inquiry into other experience types, such as engagement, may be relevant. "Research is needed to determine what immediate experiences are most amenable to changes, as a function of the technical and artistic manipulations implemented by the experience stager" (Ellis & Rossman, 2008, p. 13).

Although the effects of numerous combinations of technical and artistic performance elements might be studied on various immediate experience types, this study focused on the effects that artistic performance elements might have on engagement, while holding the technical performance elements constant. This would allow us to isolate their specific effect on engagement. Multisensory stimulation and co-creation elements were chosen as independent

variables because they were thought to be simple to manipulate and easily quantifiable in a live recreation setting.

Therefore, the purpose of this study was to explore the effect of employing multisensory stimulation and co-creation in engaging participants in a memorable experience during a live recreation event.

### **Review of Literature**

The literature related to engagement in recreation activities is reported in this section. For organizational purposes, the literature is presented in the following topic order: (a) engagement, (b) staging experiences (c) multisensory stimuli, (d) co-creating experiences, and (e) summary.

#### **Engagement**

Experts in various fields, from sociology to marketing, have defined “engagement” in different ways (Hollebeek, 2011). For example, social engagement is defined as involvement in and a response to (a) social stimuli, (b) participation in social events, and (c) interacting with other individuals (Achterberg et al., 2003; Tsai, et al., 2009). Student engagement exists in several dimensions—cognitive, emotional, and behavioral—and is exhibited in a student’s (a) willingness to master learned skills, (b) positive or negative reactions to teachers, and (c) participation in extracurricular activities respectively (Fredricks et al., 2004). Consumer engagement is the intensity of a consumer’s participation and connection with an organization’s offerings or organized activities (Vivek, 2009). Customer engagement is the level of a customer’s physical, cognitive, and emotional presence while interacting with a service organization (Patterson, Yu, & De Ruyter, 2006). Although these definitions differ somewhat, several common themes emerge.

First, engagement involves participation in a task or activity. Second, engagement involves interaction with individuals, products, ideas, or physical environments. Third, responses to stimuli come in the form of a physical, mental, or emotional reaction. Each discipline defines engagement through its own lens, and each definition clarifies our understanding of what engagement is and what it is not.

Most often, customer or consumer engagement describes the interaction between individuals and leisure, tourism, or recreation organizations and their product offerings. This is based largely on the ideas of Pine and Gilmore's *The Experience Economy* (1999), where companies, including organizations that offer recreational activities, present their product or service offerings to customers through the orchestration or staging of a memorable experience around said offerings. Prahalad and Ramaswamy (2004) define customer engagement as a co-creative process, where organization and customer work collaboratively to enhance the product and the experience. Customers are personally engaged in this process by acting in a partnership with the firm instead of simply giving feedback which the firm may or may not use. This definition is in harmony with Ellis and Rossman's (2008) model for experience staging, which includes the customer in the creation process of the experience itself. This definition of engagement focuses on active participation.

Similarly, student engagement literature defines "engagement" as "energy in action, the connection between person and activity" (Frydenburg, Ainley, & Russell, 2005, p. 1). In other words, engagement reflects an individual's active involvement in a task or activity (Reeve, Jang, Carrell, Jeon, & Barch, 2004). This definition of engagement as involvement and action can be broadly applied and expanded upon in many settings, including recreation activities.

**Engagement as a multidimensional construct.** Another idea seen repeatedly in engagement literature is that engagement is a multidimensional construct. Three dimensions of engagement are often mentioned in varying forms but are most often identified as physical, emotional, and cognitive engagement (Appleton, Christenson, Kim, & Reschly, 2006; Fredricks et al., 2004; Kahn, 1990; Patterson et al., 2006). Within the student engagement literature, behavioral (i.e., physical), emotional, and cognitive engagement have been defined individually (Fredricks et al., 2004).

Physical engagement is a student's involvement and participation in school and extracurricular activities. Emotional engagement relates to both positive and negative interactions with teachers, peers, and school subjects that affect the student's willingness to complete schoolwork. Cognitive engagement is the student's willingness to invest their time and effort to master skills and understand complicated ideas. Fredricks et al. (2004) combine these individual definitions of cognitive, physical, and emotional engagement into a single construct, stating that all three dimensions are necessary to understanding student engagement but when applied individually, these concepts are inadequate. Similarly, the organizational behavior literature describes engagement as the expression of oneself physically, cognitively, and emotionally (Kahn, 1990).

Kahn (1990) describes how people engage physically, emotionally, and cognitively in work related tasks when they feel comfortable and by employing or expressing psychological conditions in a social setting. Psychological conditions are the "momentary circumstances of people's experiences that shape behaviors" (Kahn, 1990, p. 703). People refer to their past experiences to decide how much of their "preferred selves" they insert into work tasks. For example, a person might recall the close friendships they cultivated with co-workers in a

previous job, which might encourage them to happily accept and interact more openly in a group assignment.

*Preferred self* can be defined as the expression of self when a person feels they can be authentic or their true selves, exhibiting behaviors natural to them instead of acting in a way that they feel is expected of them. A person determines how much of their preferred self to insert into a situation, much the same way they would determine whether to enter into a contract. If certain conditions are met in an acceptable way, then they will feel comfortable enough to personally engage themselves in a work-related task. Additionally, a person might feel more comfortable if there is one or more people in the group with whom they have previously spoken.

Specifically, in work settings people have a clearly defined boundary between their preferred selves and their work selves. Engagement in work settings, then, is the way people drive their energy into cognitive, emotional, and physical labor and underlies such concepts as effort (Hackman & Oldham, 1980), involvement (Lawler & Hall, 1970), flow (Csikszentmihalyi, 1982, 1990), and intrinsic motivation (Deci, 1975). The idea of engagement and disengagement, being either the expression of personal energy or lack thereof, infers there may also be varying degrees of personal energy brought to bear in a given situation.

**Engagement as a continuum.** Engagement is a continuum from fully engaged to completely disengaged. For example, engagement with video games brings some useful understanding to the idea that a person can engage in varying degrees (see Figure 3). Like many leisure activities, video games can distract people from the worries and concerns of everyday life. Individuals sometimes become so engaged in the digital world of a video game that they lose themselves in the game until they become disengaged from reality, so much so that time passes, and events transpire around them without notice (Jennett et al., 2008). “Immersion”

describes the way individuals engage, like with video games, in the aforementioned way. Brown and Cairns (2004) describe immersion as a tiered construct. Engagement is the first and lowest level, and is characterized by the investment of time, effort, and attention. The second level is engrossment, which is characterized by direct emotional responses to the experience and a decreased awareness of self and surroundings. The highest level is total immersion and is characterized by a total lack of awareness, i.e. being completely cut off from reality.

**Engagement as action.** Another useful definition of engagement can be found in the student motivation and engagement literature. “Engagement describes energy in action, the connection between person and activity” (Frydenburg et al., 2005; Ainley, 2012, p. 285). By this definition, “engagement” describes the amount of energy a person puts into an activity. This definition links directly with the definition that Kahn (1990) has given us. Engagement is the cognitive, emotional, and physical energy that one puts into a given task or activity and may be expressed in varying degrees and broken up into a tiered construct much the way Brown and Cairns (2004) suggest. Similar to Brown & Cairns’ tiered construct, Ainley (2012) uses the example of a car’s gears to explain levels of engagement. The top gear is akin to being fully engaged, while lower gears or lower levels of engagement are comparable to minimal involvement or passing the time and putting the car in park and being disengaged with the activity all together.

All these conceptualizations have merit when describing engagement with a recreation activity or staged experience. Individuals express themselves cognitively, physically, and emotionally as they interact with a staged experience. The level to which a person engages with a staged experience can also differ in intensity. Through the use of experience staging techniques,

a recreation organization can encourage a person to exert their cognitive, emotional, and physical energy into an activity, thereby increasing their engagement in the activity (see Figure 2).

### **Staging Experiences**

Since the introduction of *The Experience Economy* (Pine & Gilmore, 1999), researchers and professionals have recognized the value of the concepts and principles it espouses. Pine & Gilmore posit a new, and more highly valued, economic offering distinct from both goods and services—that is, experiences. By staging experiences for their customers, companies and organizations provide a product far more sought after because experiences remain in the memory long after the event is over (Pine & Gilmore, 1999). Dr. J. Robert Rossman (2007), in support of the experience idea, expressed his belief that leisure, tourism, and recreation professionals should be especially interested in staging experiences because that is exactly the purpose of the programming they do. The principles contained in *The Experience Economy* are centrally important to recreation organizations and worth investigation into its possible applications (Ellis, Freeman, Jamal, & Jiang, 2017; Ellis & Rossman, 2008).

Ellis and Rossman have created a model (see Figure 1) based on Pine and Gilmore's (1999) "technology" for staging experiences for customers and integrated the model with the principles of service quality (Cronin & Taylor, 1994; Parasuraman et al., 1988; Parasuraman et al., 1991; Williams & Buswell, 2003) and quality management (Kano, 1984). The model asserts that quality, memorable experiences are staged through the application of techniques categorized as either "artistic performance" or "technical performance" elements. The terms "artistic" and "technical" are borrowed from the ice-skating world, where competitors are judged on their artistic performance and the execution of technical skills. Technical performance in experience



staging includes three main elements: technical skills performance, setting performance, and interpersonal performance.

Technical performance can be thought of as how well the experience stagers performed in meeting expectations in regard to the tangible elements of the event, execution of the event, and interaction with the guests. For example, the tangible elements, being part of the technical performance, of a recreation center would include the availability of ample parking, the cleanliness of the facility and restrooms, the number and availability of varied fitness equipment, the availability of court or activity space, and the proper operation of the membership card scanner. Guests would expect these things to be available and work properly when they come to the recreation center. Execution of programs and events at the recreation center might include the expectation of classes, activities, and events starting on time. Classes should be available for different ages, interests, and skill levels. Clean towels should be available when and where they are needed. Courts should be swept. Staff members should be friendly and interact in a professional way with the patrons. Payments should be taken, questions answered, and help given quickly and professionally.

Artistic performance elements are taken from Pine and Gilmore's (1999, 2011) and Kano's (1984) literature, comprising three main areas of concern: theme performance, unanticipated value performance, and multisensory performance. Theme performance includes the "quality, consistency, and appropriateness of physical and interpersonal cues used to immerse guests in the theme" (Ellis & Rossman, 2008, p. 12). It also entails employees "staying in character" and "performing to the theatrical form" appropriate to match the theme. For example, the employees at Disneyland, referred to as "cast members" are expected to be in uniform or

costume at all times when they are “on stage.” This means they are always in character while in the public’s view, adding to and enhancing the public’s experience at the theme park.

An unanticipated value performance can be accomplished by showing genuine empathy for guests. Showing genuine concern and interest in guests helps personalize the experience by attending to each individual’s needs and expectations as much as possible. A company might also personalize an experience by engaging customers in the creation process. For example, a company like Build-A-Bear Workshop provides its customers the opportunity to piece their own bear together, making decisions about features like the color, clothing, and amount of stuffing. The opportunity for a child to take part in the making of their stuffed animal personalizes the experience and may cause greater enjoyment as they cuddle their bear and remember that they helped make it themselves. In other words, the customer co-creates the experience with the company (Prahalad & Ramaswamy, 2004). Lacanienta and Duerden (2019) stated that co-creation is a “core concept” of experience design and an important way for any organization to create quality experiences for customers.

Multisensory performances may also enhance the experience by engaging the senses: vision, hearing, touch, smell, and taste. A restaurant such as Benihana enhances the dining experience by engaging the patrons’ senses while they see their food cook right in front of their eyes, smell it as it is cooks, and hear it sizzle on the grill. The artistic performance elements are meant to delight (Kano, 1984) guests, a reaction that is dependent on the proper execution of the technical performance elements, thus the two create a “joint, collaborative effect” to enhance the experience (Stricklin, 2016). “Staging experiences is not about entertaining customers; it’s about engaging them” (Pine & Gilmore, 2011, p. 45). The goal of stimulating the senses; personalizing

the experience through co-creation; and incorporating an overarching, immersive theme is to engage the customer.

### **Multisensory Stimulation**

Multisensory stimulants are meant to support and enhance the theme of a staged experience. “The more effectively an experience engages the senses, the more memorable it will be” (Pine & Gilmore, 1999, p. 88). Supermarkets may add flashing lights and thunderstorm sounds to accompany the vegetable misters in the produce aisle to engage shoppers. Disneyland offers its patrons fresh popcorn, engaging their sense of smell as they enter the park and priming them for the experience they are about to have. Simple uses of sensory stimulation can greatly enhance an experience.

Sensory stimulation has long been studied and implemented as part of an effective marketing plan. Kotler (1974) introduced the concept of “atmospherics” which is the “conscious designing of space to create certain effects in buyers” (p. 50). The “atmosphere”—the quality of surroundings—of a place is experienced through sight, smell, sound, and touch.

A company may use the atmosphere of the purchasing or consumption space to influence purchasing behavior in three main ways. First, a company may use atmosphere as an attention-creating medium by employing colors, noises, and/or motion to make their space stand out. Second, a company may use atmosphere as a message-creating medium by communicating their intended audience and level of service provided. Third, a company may use atmosphere as an affect-creating medium by arousing instinctual reactions that increase purchase probability. A customer may perceive certain sensory qualities of the consumption space, which may affect their information and affective state, and influence their probability of purchasing the product or service. Krispy Kreme Doughnuts actively displays their production process, allowing their

customers to see and smell the donuts being made right in front of them. They have designed their store space to allow customers an open look into their production process. By stimulating the senses of sight and smell, Krispy Kreme has used the atmosphere of their purchasing and consumption space to directly affect the customers' purchasing probability, by utilizing the sight and smell of freshly made donuts to stimulate in their customers the desire to taste them as well.

The study of atmospherics created a research stream that encompasses topics such as shelf space studies, environmental psychology, and servicescapes (Turley & Milliman, 2000). All these topics focus on the effect that the physical surroundings have on consumer behavior. Such studies have evaluated the effectiveness of atmospheric stimuli such as color, music, scent, and crowding. There are thought to be five general categories of atmospheric stimuli: (a) the exterior of the store, (b) the interior of the store, (c) the layout and design of the store, (d) point of sale and decorations, and (d) human interaction (Berman & Evans, 2004; Turley & Milliman, 2000). Multisensory stimuli variables are found within these general categories, though visual stimuli are most prevalently discussed. Color scheme, lighting, scents, public announcement (PA) system usage, and temperature are all sensory elements included as well, and are thought to play a part in influencing not only the customers but also the employees (Berman & Evans, 2004; Bitner, 1992).

The positive effects of sensory stimulation have also been studied in many other fields, including physical and cognitive therapy. Children recovering from traumatic brain injuries have benefitted from controlled, multisensory stimulation therapy. The rooms in which this therapy is offered contains visual, olfactory, vestibular, and proprioceptive equipment such as mirror light balls, bubble tubes, fiber-optic cables, ball pools, aromatherapy, and music. Such an environment is meant to increase relaxation and provide an enjoyable experience for patients (Hotz et al.,

2006). Nine types of improved function have been reported as a result of this sensory stimulation therapy including (a) increasing relaxation, (b) developing self-confidence, (c) achieving a sense of self-control, (d) encouraging exploration and creative activities, (e) establishing rapport with caretakers, (f) providing leisure and enjoyment, (g) promoting choice, (h) improving attention span, and (i) reducing challenging behaviors (Kwok, To, & Sung, 2003). The connection between sensory stimulation therapy and several of the nine aforementioned functions creates an interesting link to the use of sensory stimulation in recreation settings.

Employing multisensory stimuli in an exercise program for dementia patients has also been shown to increase engaging and enjoyable participation. The primary senses (i.e., arousal, olfactory, auditory, and touch) are engaged to promote more adaptive behavior. For instance, a physical therapist might use spinning, flashing lights to improve alertness and attention, or vibration to help with muscle stretching. Storytelling and imagery can also stimulate cognitive function and memory recall in individuals with dementia (Heyn, 2003).

Many companies have employed multisensory stimuli to enhance the consumption experience for their customers (Pine & Gilmore, 2011). Likewise, recreation organizations can use multisensory stimuli to engage their participants in their programs and events. For instance, the races staged by the City of St. George, Utah, employs techniques to engage the senses. Popular music is played at the beginning of most races to put runners in a good mood and motivate them for the race and stimulate their sense of hearing. Chocolate milk is always handed out at the finish line of all the city's races, and runners have come to expect this treat and even connect the taste of chocolate milk with the joy of crossing the finish line. In this way, the runners' sense of taste is stimulated. Each of the other senses can be stimulated in a similar manner and used in any number of different recreation events.

Marketers, physical therapists, and recreation professionals aim to engage their customers, patients, and participants through the stimulation of the senses. In all three cases, such stimuli have been shown to improve engagement and may also do so in a variety of recreation activities.

### **Co-Creation**

Co-creation has recently gained popularity in many fields, including consumer engagement, business management, architecture design, leisure and tourism, and education (Diekelmann & Lampe, 2004; Mascarenhas, Kesavan, & Bernacchi, 2004; Prahalad & Ramaswamy, 2004; Prebensen & Foss, 2011; Sanders & Stappers, 2008; Vargo & Lusch, 2004a; Vargo, Maglio, & Akaka, 2008). Depending on the field of study, the concept may go by another name such as co-design (Sanders & Stappers, 2008) or co-production (Brandsen & Pestoff, 2006; Ramirez, 1999). Although the study of co-creation has increased in popularity in the last few years, the idea predates this current surge.

A precursor to co-creation is participatory design, the inclusion of the user in the development of systems management (Bodker, 1996). Participatory design dates back to the 1970s. In a study, members of the Norwegian Iron and Metal Workers Union actively cooperated with researchers to develop computer systems and improve the efficiency of their work tasks (Bodker, 1996; Sander & Stappers, 2008). Participatory design was the impetus for the study of co-creation.

Co-design and co-production are often used interchangeably with co-creation (Etgar, 2008; Sanders & Stappers, 2008). These terms, however, are also differentiated in various bodies of literature. Within the product design literature, co-design is described as a subset of co-creation (Sanders & Stappers, 2008). Co-creation refers to “any act of collective creativity”

(Sanders & Stappers, 2008, p. 6), while co-design is a “specific instance of collective creativity within the design process” (Sanders & Stappers, 2008, p. 6). In the consumer engagement literature, co-production has also been differentiated from co-creation (Etgar, 2008; Vargo & Lusch, 2004a). Co-creation of value takes place while a customer is actively using the product during the consumption phase, while co-production of value takes place prior to consumption, during the production process (Etgar, 2008). In any case, all three terms refer to the collaboration of producer and consumer in the creation of value (Ramirez, 1999).

Co-creation has been defined within the experience marketing literature as the active participation and collaboration between consumers and firms in the creation of value from which stems personalized experiences for consumers (Caru & Cova, 2007; Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004a; Lacanienta & Duerden, 2019). This definition of co-creation suggests that both parties consciously and actively participate in the creation of value. Caru and Cova (2007), however, suggest that individuals can either participate in the co-creation process actively or passively. This further suggests that individuals choose the degree to which they participate in the co-creation of experiences.

Duerden, Ward, and Freeman (2015) similarly stated that participants in a structured experience choose the way they engage with the manipulated elements of the experience. Sarmah, Kamboj, and Rahman (2017) posited that the degree to which a customer engages in the co-creation process is determined in part by their trust in the service provider. These points suggest that choice does indeed play a large part in co-creation. It seems clear that Pine and Gilmore (2011) are correct in suggesting that all experiences are co-created (Ellis, Freeman et al., 2017).

Pine and Gilmore (2011) suggested that experience is co-created inside of a person in reaction to what is staged outside of that person. In other words, what a person thinks and feels about what is staged around them is what creates the experience. This suggests that a person may not necessarily take an active part in the co-creation process but contribute unconsciously. Ellis and Rossman (2008) suggested a similar concept of co-creation stating that the experience of each participant is mitigated to some degree by each individual's emotions, attitudes, and motivations. For instance, a son who feels he is expected to continue playing football because his father pushes him, may not enjoy the experience or be motivated to improve his performance. In this way, each participant co-creates the experience with the experience stager but may not do so consciously.

Although co-creation may be either active or passive and either conscious or unconscious, for the purposes of this study, co-creation was defined as being both active and marked by conscious participation and collaboration with the experience stager in value creation. Engagement, as was defined in this study, is the physical, emotional, and cognitive energy one puts into an activity, which suggests active and conscious participation.

### **Summary**

Engaging customers in memorable experiences is important to any organization or business and is especially important for recreation professionals. Rossman (2007) expressed his belief that leisure, tourism, and recreation professionals should be especially interested in staging experiences since this is exactly the purpose of the programming they do. The principles contained in *The Experience Economy* are centrally important to recreation organizations and worth investigation into its possible applications (Ellis & Rossman, 2008). The model of experience staging Ellis and Rossman (2008) proposed is intended to provide memorable



experiences for customers, guests, and patrons by engaging them through the application of technical and artistic performance techniques. The artistic performance element of sensory stimulation and use of co-creation principles may be particularly effective at engaging customers.

When the senses are stimulated, a person engages emotionally and cognitively, affecting behavior, attitude, and learning based on their perceptions of the product or brand (Krishna, 2012). By stimulating the senses of customers during a recreation event, recreation professionals could engage these individuals physically, emotionally, and cognitively, thereby increasing their enjoyment of the event and making it more memorable. They can also engage participants physically, emotionally, and cognitively by providing opportunities for them to take an active part in co-creating the experience. Co-creation, when offered as a way to personalize the experience, may increase the likelihood of actively engaging participants.

Thus, the purpose of this study was to test Ellis and Rossman's (2008) assertion that the artistic elements of their model may increase the likelihood of providing a memorable experience by evaluating the effect of multisensory stimuli and personalization through co-creation on participant engagement at a recreation event.

### **Hypotheses**

The study was designed to test the following null hypotheses (H0):

1. H01: There is no relationship between multisensory stimuli and level of engagement of a school age child (8–13 years old) at a recreation event.
2. H02: There is no relationship between co-creation and level of engagement of a school age child (8–13 years old) at a recreation event.

3. H03: There is no interactive relationship between multisensory stimuli and co-creation with the level of engagement of a school age child (8–13 years old) at a recreation event.

### **Methods**

The purpose of this study was to explore the effect of employing multisensory stimulation and co-creation elements of engaging participants in a memorable experience during a live recreation event. This chapter is composed of the following parts: (a) event, (b) sample, (c) data collection procedures, (d) intervention, (e) instrumentation, and (f) analysis.

#### **Event**

The Sciencepalooza event is staged by the City of St. George Leisure Services Department in cooperation with Dixie State University faculty and students from the College of Science & Technology. The City of St. George Leisure Services Department provides events, activities, classes, and facilities that promote health, wellness, leisure, and recreation to members of the St. George, Utah community. Sciencepalooza provides engaging science activities and demonstrations for elementary students and middle schoolers. Sciencepalooza also encourages the pursuit of science-based higher education degrees and careers.

#### **Sample**

This study is considered quasi-experimental because there were no efforts to collect a true random sample. A convenience sample was collected of those children who attended Sciencepalooza at the St. George Recreation Center on April 14, 2018. Furthermore, the children self-selected which of the activity rooms to visit (i.e. DNA Crystallization, Tin Robots, or Hummingbird Feeders) as well as what time to visit and therefore unconsciously chose which intervention to which they would be exposed (i.e. 10:30 AM was the control group, 11:30 AM received co-creation interventions only, etc.).

### **Data Collection Procedures**

Brigham Young University's IRB approved this research study. The City of St. George's Recreation Manager, Steven Bingham, granted permission to collect data during Sciencepalooza (see Exhibit 1). Consent forms for the instrument were offered outside the main entrance to the St. George Recreation Center, and children with parental consent received a wristband marked with a three-digit number for participant identification. Three demonstration rooms were set up in different locations in the St. George Recreation Center: Room 1 was a DNA crystallization activity, Room 2 was a tin robot activity, and Room 3 was a hummingbird feeder activity. At the end of each 25-minute session, the children with wristbands remained in the room for a few minutes to respond to the questionnaire about their experience. Parents of young children read the questions and responses out loud so their children could respond to the instrument. Age, sex, grade level, school attended, family size, and socioeconomic status were identified in the instrument.

To ensure implementation fidelity, a research assistant was placed in each activity room. Each research assistant was given a set of protocols to follow in order to make sure that all data collection procedures took place as planned. These research assistants made sure that each participant had the required wristband and 3-digit identification number. They were instructed to coordinate and review the interventions with each presenter and ensure that they were implemented as planned and in the correct order. They also read the instrument aloud to the participants and provided extra explanation to ensure the questions were understood.

### **Intervention**

*Intervention* refers to an action taken to improve a situation. Two types of interventions were introduced during this study to increase participant engagement, co-creative elements and

multisensory stimulating elements. Three separate rooms were set up with three distinct interactive activities for participants to experience. Staff members in each room independently conducted each demonstration and collected survey responses to keep the data separate. This separation made it possible to accurately measure the effect of multisensory stimuli and co-creation on engagement against control groups (see Figure 4).

The staff in each of the three rooms employed the same intervention types in the same order and all at the same start times. In this way, we ensured that a participant in one room did not receive the same intervention in a different room if they attended more than one demonstration activity. Each room employed the interventions in successive sessions in the following order: (1) neither multisensory stimuli nor co-creation, (2) co-creation, (3) multisensory stimuli, and (4) both multisensory stimuli and co-creation. This order was specifically chosen to make sure the interventions did not confuse or overlap each other.

Co-Creation was introduced into each of the three demonstration rooms by allowing the participants to personalize the experience through specific choices offered to them. At certain points during the demonstration, the demonstration leader gave the group several choices of activities to move into next, and the participants made the final choice, allowing participants to co-create the experience with the demonstration leader. In the DNA crystallization activity room, participants chose the flavor of Gatorade used for their solution as well as whether they used pineapple juice or meat tenderizer as a catalyst. In the tin robot activity room, participants personalized their tin robots by choosing which body types, legs, wheels, and eyes to use to piece the robot together. In the hummingbird feeder activity room, participants personalized their hummingbird feeders by choosing the color, size, and shape of the stems, leaves, and flower petals.

Multisensory stimuli—such as brightly colored pictures and diagrams, or tactile items were employed through using sensory stimulants to engage sight, sound, touch, and smell. Wax warmers were placed in each of the activity rooms to provide a pleasant smell. Fun, science-themed music was played in each of the activity rooms, and videos were played to engage the children with sight and sound.

The first group acted as the control group and received neither multisensory stimuli nor co-creation interventions. With no intervention, no effect spilled over into the next group. The second group had co-creation elements employed only. The co-creation elements, i.e. the provision of certain choices throughout the activity, were best situated second because they were easily removed or hidden so their effects could not spill over into the next intervention group. The third group had multisensory stimuli employed only. The multisensory stimuli, i.e. scent, sounds, etc., were best situated third because the scent from the wax warmers would remain in the room for a time after the activity ended, and the sights and sounds from videos and music would leave a lasting effect on the participants. This meant that the stimuli could possibly spill over into the next intervention group. The fourth group had both multisensory stimuli and co-creation introduced as interventions. Since multisensory stimulants had already been introduced to the room in group three and was also employed in group four, there was no confounding the effect of multisensory stimuli in these groups.

### **Instrument**

A new measurement scale, called the Leisure Engagement Scale for Children (LESC), was created to measure child engagement with a leisure activity. The LESG is based on a multidimensional construct of engagement with cognitive, emotional, and physical elements. The LESG is based on two selected and reviewed measurement scales: The School Engagement Scale

(Fredricks, Blumenfeld, Friedel, & Paris, 2005) and a perceived value and engagement “monitoring instrument” for youth (Ellis, Taggart, Martz, Lepley, & Jamal, 2017). Each of these engagement scales were inadequate individually in measuring engagement as it is defined and measured in the current study; however, each provided some important insights.

The School Engagement Scale (see Exhibit 2) measures student engagement with school in three dimensions: cognitive, emotional, and physical. This is also how engagement was theorized to be measured in this study, but the questions were focused on how a student engages specifically with school tasks and activities. Reliability coefficients for the three dimensions of engagement measured in The School Engagement Scale are (a) cognitive engagement ( $\alpha = .82$ ), (b) emotional engagement ( $\alpha = .83$ ), and (c) behavioral engagement ( $\alpha = .72$ ). The basic intention of each question to measure cognitive, emotional, or physical engagement remains unchanged, while the school setting changes to a leisure activity setting. For example, the question “I feel excited by my work at school,” was adapted to “I felt excited while doing the activity” to be pertinent to the current study.

The monitoring instrument (see Exhibit 3) developed by Ellis, Taggart, et al. (2017), focuses on how engaged an individual is during a youth program as well as their perceived value of the program. The current study was also meant to measure how engaged an individual is during a leisure activity as well as to determine how they felt, what they experienced, and what they thought about. The monitoring instrument (Ellis et al., 2016) measures how an individual felt during a youth program on a time continuum from none of the time to all the time. This monitoring instrument had a mean engagement score of .69 showing that respondents were engaged for 69% of the activity with a reliability coefficient of 0.71. The LESC is simplified by being measured using a five-point Likert Scale. The intention of using the LESC was to measure

engagement, feelings, thoughts, and actions remains the same as Ellis et al.'s (2016) instrument, but it was adapted to be more understandable for children. For example, one question states, "I felt comfortable during the activity." The available responses range from "strongly agree" to "strongly disagree" and are simplified by using smiley faces (see Figure 2).

A Flesch-Kincaid Grade Level Readability test was conducted on the LESC to determine its readability and understandability for children. The results show that the LESC has a fifth-grade level readability score. To help overcome any reading comprehension barriers, the demonstration leader in each room read the instructions and questions aloud to the group, explaining any unfamiliar words if necessary. Parents of younger children also read and explained the questions.

The LESC was piloted on a group of 24 children ages 5 to 16 that participated in a recreation event put on by the City of St. George. A focus group was also conducted and recorded with a 10-year-old boy, a 9-year-old boy, an 8-year-old girl, and a 7-year-old boy. They were asked to explain what they felt each of the questions on the LESC meant.

The questions seek to measure engagement in physical, emotional, and cognitive dimensions. The pilot questionnaire (see Exhibit 4) had 19 questions. Two questions gather demographic information (age and sex), six questions measure physical engagement, seven questions assess cognitive engagement, and four questions evaluate emotional engagement. A reliability analysis was conducted on all but the demographic questions, and the survey was revised and pared down to 13 questions pertaining to engagement, or four questions each in cognitive engagement and physical engagement and five questions in emotional engagement (see Exhibit 5). The pilot test yielded alpha reliability coefficients for the three dimensions of

engagement: cognitive engagement ( $\alpha = .859$ ), emotional engagement ( $\alpha = .759$ ), and physical engagement ( $\alpha = .897$ ).

Questions designed to measure cognitive engagement were focused on mental focus and concentration on the activity. For example, “I focused all my attention on the activity” determines if the activity was engaging enough to keep the children’s focus. Similarly, questions concerning physical engagement (e.g., “During the event there was nothing else I would rather be doing.”) and emotional engagement (e.g., “I felt happy during the activity.”) gauge participants’ actions and attitudes during the activity, respectively.

### **Validity**

“Face validity” is the degree to which a psychological test seems to measure what is intended at a surface level (Laerd dissertation, n.d.). The LESC is based on the construct of school engagement, as proposed by Fredricks et al. (2004), having three distinct dimensions: physical, emotional, and cognitive. The instrument items were reviewed by Professors Peter Ward, Mat Duerden and Neil Lundberg, and it was apparent to all that the items are written around the three constructs of engagement used in this study.

“Content validity” is the “extent to which a specific set of items reflects a content domain” (DeVallis, 2003, p. 49). Content validity was established by including multiple variations of the same questions in the pilot to include various synonyms that would be understandable to a fifth-grade student. For example, to measure emotional engagement, the synonyms “comfortable,” “safe,” and “happy” were all inserted into the question, “I felt \_\_\_\_\_ during the activity.”

“Criterion-related validity shows an empirical association between an item or scale and some criterion or gold standard” (DeVallis, 2003). Since this survey is new and has not been



previously tested in a rigorous way, it does not have criterion-related validity established. It is hoped that one of the minor outcomes of this study will be to help establish criterion-related validity. One possible association between constructs that could help institute criterion-related validity is the relationship between engagement and the likelihood of a memorable experience (Ellis & Rossman, 2008).

Construct validity explains whether a measure “behaves” the way the purported construct is meant to behave with regard to “established measures of other constructs” (DeVallis, 2003, p. 53). In other words, it defines whether the measurement tool works the same way within this construct as it does in other established measurement tools. This has not yet been established, as the LESC has only been tested in a pilot and in the current study and would need to be tested in many situations over several years to establish construct validity.

### **Analysis**

The data was cleaned of outliers and improbable responses (i.e., all questions answered with “Strongly Disagree”), and then a listwise technique was used to address missing data. The number of usable responses after cleaning was ( $N = 204$ ). The data was analyzed with a series of univariate ANOVA tests and t-tests using the statistical software SPSS v25. Interactions between the two independent variables (co-creation and multisensory stimuli) and the dependent variable (engagement) were reviewed to determine statistical significance.

## **Results**

### **Sample**

The study consisted of a sample of 277 children who attended the Sciencepalooza event. Of the 277 collected questionnaires, 248 surveys were complete at ( $N = 248$ ) and 29 were incomplete. Of the 248 completed questionnaires, 44 were considered outliers or improbable

responses, giving a final sample of (N = 204). The 204 completed questionnaires exceed the minimum necessary sample size of 180, as determined by the power analysis previously conducted.

Each of the respondents was subjected to none, one, or both interventions. Group 1 received no interventions and was presented at 10:30 AM shortly after the event started. Group 1 had 47 respondents. Group 2 received the co-creation interventions only and was presented at 11:30 AM. Group 2 had 62 respondents. Group 3 received the multisensory interventions only and was presented at 12:30 PM. Group 3 had 64 respondents. Group 4 received both co-creation and multisensory interventions and was presented at 1:30 PM toward the end of the event. Group 4 had 31 respondents.

Children ages 5 and up were given a blue, numbered wristband signifying consent was given to participate in the study. The respondents ranged in ages from 5 to 13 years old, with the highest density of responses coming from children ages 6 to 10 (74%). The respondents were fairly evenly split between male, 97 (48%), and female, 107 (52%). The majority of respondents were in kindergarten to fifth grade (88%), and 80% of respondents came from families with three to five members. Socioeconomic status was measured by asking the degree to which their needs and wants were being met. Two percent of respondents felt their needs were not being met, 30% felt their needs were met but not their wants, 13% felt their needs and some of their wants were met, 29% felt that their needs and most of their wants were met, and 25% felt their needs and all their wants were met. One hundred and seventy-three, or 85%, of respondents attend schools within six miles of the St. George Recreation Center where the event took place. Table 1 below summarizes the demographic information of the respondents.

Table 1

*Demographics by Intervention Group*

	Sex		Needs	Grade	Age	Family
	Male	Female	Average SES Level	Average Grade Level	Average Age	Average Family Size
Group 1	20	27	3.51	3.8 or 2nd/3rd grade	8.23	7.83
Group 2	34	30	3.25	3.95 or 2nd/3rd grade	8.38	7.11
Group 3	29	33	3.45	4.34 or 3rd/4th grade	8.87	10.33
Group 4	14	17	3.77	3.65 or 2nd/3rd grade	6.06	3.44

**Effects of Co-Creation and Multisensory Stimuli on Engagement**

The data was analyzed using a two-way univariate ANOVA in SPSS, with “engagement” as the dependent variable and “intervention” types (co-creation and multisensory) as independent variables, using various control variables (e.g., age, sex, and family size.) to gauge interactive effects. Our main effect hypothesis was that the addition of co-creation and multisensory stimuli elements to the activities at Sciencepalooza would significantly increase engagement. To test this effect hypothesis, three main null hypotheses acted as the foundation for the tests:

1. H01: There is no relationship between multisensory stimuli and level of engagement of a school age child (8–13 years old) at a recreation event.
2. H02: There is no relationship between co-creation and level of engagement of a school age child (8–13 years old) at a recreation event.

3. H03: There is no interactive relationship between multisensory stimuli and co-creation with the level of engagement of a school age child (8–13 years old) at a recreation event.

After running these analyses, there is insufficient evidence to reject the main effect null hypotheses,  $F(3,200) = .263$ ,  $p = .826$ ,  $\text{partial } \eta^2 = .004$ . Intervention type had no significant effect on engagement. When we measured the engagement level of each participant, we found that there was no significant difference between the engagement levels being reported in the intervention types. This means that inserting added elements for participants to co-create the activity experience and inserting multisensory stimuli to enhance the activity experience did not significantly increase engagement with the activity.

The added interventions of co-creation and multisensory stimuli individually and interactively had no significant effect on engagement ( $p = .826$ ), indicating a significant increase in engagement when co-creative and multisensory stimulating elements were added to the activities. Engagement levels differed only slightly between the group presented with co-creative opportunities (group 2) and the control group that had no interventions added to their experience (group 1). The co-creation group had a mean engagement score of 57.37, and the control group had a mean engagement score of 56.89 (See Figure 9). The difference between the engagement mean scores of these two groups was 0.48, or less than a 1% increase in the engagement mean score.

There was a similar minor difference in engagement mean scores between group 1 (control group or no interventions) and group 3 (multisensory stimuli), which had a mean score of 56.74 (See Figure 9). The mean score difference between the two groups was 0.15—a less-than-one-percent decrease in the engagement mean score. The difference in engagement mean score between group 1 and group 4 (interaction of co-creation and multisensory stimuli) was

larger than the others. Group 4 had an engagement mean score of 58.19 (See Figure 9), which constitutes an increase of 1.3, or 2.3%, in engagement mean score over group 1. In short, the engagement level of those who were subjected to co-creation and multisensory elements was not any higher than those who were subjected to no experience staging elements at all.

The interventions also had no significant impact on engagement when interacting with control variables (See figure 15 below). This means that differences in the activity rooms, school attended, size of immediate family, age, sex, or socioeconomic status in combination with the intervention type did not significantly affect the participants' engagement level.

### **Discussion**

Participants in grades K through 3 and grade 6 had generally higher engagement scores, while grades 4, 5, 7, and 8 had generally lower engagement scores (see Figure 11). This may be attributed to the Sciencepalooza activities being more suitable for younger age groups or possibly the children in the lower grade levels having had no previous exposure to the types of science activities offered at Sciencepalooza, i.e., the activities were engaging because they were new and exciting to the children. The higher-grade levels may have already experienced similar science activities in their classes at school, so they were not as engaged or excited to repeat an activity. Further restricting the grade level of the participants to elementary school grades (K-5), may yield better results.

Engagement scores steadily declined from age 5 to age 13 (see Figure 13), adding credence to the idea that the Sciencepalooza activities were more suited for younger ages. This may also be attributed to the excitement young children exhibit when experiencing something new which can engage a child for a time, similar to when a child receives a new toy. They will be engaged in play until the excitement has worn off and the toy (or activity) no longer piques

their interest. It may be that the older children at Sciencepalooza have already experienced some of the activities, and like a toy they have already played with, no longer find any interest in it. This may help recreation professionals understand that repeating events each year may require some new twists and upgrades to make them more exciting for repeat customers. Preparing the exact same activity each year will not keep the interest of older children who have already participated previously, so they will have to plan different or more unique events and programs.

When looking at the interaction between sex and intervention type, the male respondents had higher mean engagement scores in the co-creation group (59.06), while females had a somewhat lower mean engagement score (55.47). Alternately, female respondents had a higher mean engagement score (57.85) in the multisensory group than the male respondents (55.48). Interestingly, the difference in mean scores between males and females was much smaller when looking at the control group (no interventions), which had mean engagement scores of 57.25 and 56.63, respectively, and the interactive group (both interventions together), which had mean engagement scores of 58.64 and 57.82, respectively. Previous research on learning styles has shown that male students are more kinesthetic when learning new material; they favor touching and interacting physically while learning (Honigsfeld & Dunn, 2003). Female students tend to be more auditory while learning; they listen more effectively to instructions and learning material (Honigsfeld & Dunn, 2003). The difference in effective learning styles seems to support the differences in engagement mean scores for males and females. Higher engagement scores for males when co-creation elements were introduced is in harmony with the idea that males learn best by touching and interacting physically with the learning material. The higher engagement scores for females when multisensory elements were introduced is in line with the idea that females learn best through auditory cues.

It would be interesting to test how and why different experience staging methods might affect engagement in males versus females, and which methods work better on each. This could help inform recreation professionals to how they might set up specific activities to engage with male and female participants together and separately. Knowing how best to engage a target market is important in any industry. Leisure and recreation professionals can and should use this knowledge to help engage participants in their events and programs.

When we calculated the interaction between socioeconomic status (needs) and the intervention types, but the interaction effect was insignificant. Notably, socioeconomic status had a significant effect ( $F = 3.705$ ) on engagement independent of the studied interventions (multisensory stimuli and co-creation). This suggests that a difference in socioeconomic status made a difference in the children's level of engagement, and the higher the child's socioeconomic status, the higher their level of engagement (see Figure 10). Sirin (2005) found that a family's socioeconomic status "sets the stage for students' academic performance both directly by providing resources at home and indirectly by providing the social capital that is necessary in school" (p. 438). Furthermore, children from lower socioeconomic situations often exhibit cognitive deficiencies such as shorter attention spans and high levels of distractibility (Alloway, Gathercole, Kirkwood, & Elliott, 2009; Jensen, 2013). These deficiencies can result from various factors such as poor nutrition or a lack of hope due to their situation (Jensen, 2013). Higher socioeconomic status seems to play a large role in both a child's academic success and their ability to engage with the activities like those provided at the recreation event.

It would be interesting to see how specific engagement types, if any, are better suited to participants with a lower socioeconomic status. This knowledge would allow teachers and recreation professionals alike to better engage children and youth in their communities that may

be at risk due to their socioeconomic status. This knowledge provides teachers and recreation professionals the tools that may allow them to help an individual break out of a poverty cycle and create better lives for themselves and their families.

The reported engagement scores were high for all four intervention groups and the addition of the artistic elements of co-creation and multisensory stimuli did not significantly increase engagement of later groups over the control group. An event like Sciencepalooza where each activity is meant to engage participants, naturally incorporates artistic elements such as a clear and immersive theme, multisensory stimulation, and personalization. At what point are additional artistic elements unnecessary to increase engagement? This study was based on the premise that the artistic performance elements of personalization through co-creation and multisensory stimulation would increase engagement, yet it seems a saturation point was reached even without the planned interventions. This begs the question, what is the saturation point where additional artistic elements no longer have a significant effect on engagement?

Additional study of this issue may yield beneficial information for recreation professionals. Many leisure and recreation organizations, especially municipal parks and recreation departments, operate on a tight budget. Knowing where to draw the line when implementing artistic performance elements would allow recreation professionals to be fiscally efficient in planning activities and events to engage their customers.

### **Limitations**

Each of the intervention groups had a different number of participants, with more participants in groups 2 and 3 (62 and 64 respectively) and fewer participants in groups 1 and 4 (47 and 31 respectively). At the start and end of an event, the number of guests is low. As guests arrive at an event, they take some time to orient themselves, while at the end of an event they



have had their fill of activities or want to take care of cranky children and trickle out before the event is over. The lack of uniformity may have limited the ability to compare the interventions' perceived effects. A Levene's test of homogeneity of variances shows that the variances for intervention groups were not equal when controlling for school attended, family size, and SES (See Figure 16).

Many participants were young. Of the 204 participants, 136 were 9 years old or younger. The LESC was written at a 5th grade reading level, making it easily understandable for children 10 years and older. Many of the children at the event explored the activities on their own or with friends, unless they were younger (5 to 6 years old). These children couldn't read at this high level and likely couldn't understand the questionnaire without help from a parent, which may have limited their ability to fully comprehend the questions asked. Also, children so young may not have been able to accurately assess their own engagement level. It is possible that if this study were to be repeated among older children, such as teenagers, that the results would differ based on their increased ability to understand.

The nature of an event like Sciencepalooza, where the very purpose is to engage children, creates a tough situation to increase engagement even further. Reported engagement mean scores were quite high (57.30 out of a possible 65). Because each activity was engineered to elicit maximum engagement this created a ceiling effect which "decreased the likelihood that the testing instrument... accurately measured the intended domain" (Salkind, 2010). In other words, because the activities offered at Sciencepalooza were intended to provide a high level of engagement with or without interventions, it was difficult to measure any increase in engagement through the addition of multisensory stimuli and co-creation as well as the use of the LESC.

### **Future Research**

Because special events happen infrequently, there is often an increased sense of anticipation and excitement leading up to and continuing throughout the event. With a special event being outside of a child's normal routine, the effect of any interventions may get lost in the heightened excitement of the experience. The distribution of overall emotional, cognitive, and physical engagement mean scores in this study all lean strongly to the right (see Figures 1, 2, 3, and 4), showing that the majority of reported engagement scores was high. This seems to support the assertion that a child's engagement score during a special event may be artificially high. A more suitable study may be made of an activity that is part of a child's daily, weekly, or monthly routine. This would also allow for a more easily repeatable study and more consistent data. Any intervention would also create a clear contrast with the normal flow of routine activities and possibly make a larger impact on increasing perceived engagement.

### **Conclusion**

The purpose of this study was to test Ellis and Rossman's (2008) assertion that the artistic elements of their model of experience staging may increase the likelihood of providing a memorable experience by evaluating the effect of multisensory stimuli and personalization through co-creation on participant engagement at a recreation event. Understanding the relationship between experience staging techniques and immediate experiences like engagement help recreation professionals to better prepare their events and activities for their customers. Although significance was not found between engagement and the co-creative and multisensory elements, some important insights were gleaned from this study.

Though not the main purpose of this study, connections between sex and engagement, and socio-economic status and engagement emerged. Continued study into these connections

would provide useful insights to help engage customers by allowing recreation professionals the ability to cater their activities to specific segments of the community. Another insight gleaned from this study is the idea that there is a tipping point in regard to providing artistic elements of experience staging. At what point are additional artistic elements unnecessary to increase engagement? Additional study into this topic would be beneficial to recreation professionals allowing for fiscal efficiency in preparing engaging events.

### References

- Achterberg, W., Pot, A. M., Kerkstra, A., Ooms, M., Muller, M., & Ribbe, M. (2003). The effect of depression on social engagement in newly admitted Dutch nursing home residents. *The Gerontologist, 43*(2), 213–218.
- Ainley, M. (2012). Students' Interest and engagement in classroom activities. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 283–302). New York: Springer.
- Alloway, T. P., Gathercole, S. E., Kirkwood, H., & Elliott, J. (2009). The cognitive and behavioral characteristics of children with low working memory. *Child Development, 80*(2), 606–621.
- Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the Student Engagement Instrument. *Journal of School Psychology, 44*(5), 427–445.
- Berman, B., & Evans, J. R. (2004). *Retail management: A strategic approach* (9th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Bitner, M. J. (1992). Servicescapes: The Impact of physical surroundings on customers and employees. *Journal of Marketing, 56*(2), 57–71.
- Bødker, S. (1996). Creating conditions for participation: Conflicts and resources in systems design. *Human-Computer Interaction, 11*(3), 215–236.
- Brandsen, T., & Pestoff, V. (2006). Co-production, the third sector and the delivery of public services. *Public Management Review, 8*(4), 493–501.

- Brown, E., & Cairns, P. (2004). *A grounded investigation of game immersion*. In Extended Abstracts of the 2004 Conference on Human Factors in Computing Systems. ACM Press, New York, 1297-1300.
- Caru, A., & Cova, B. (2007). *Consuming experience*. New York: Routledge.
- Cronin, J. J., Jr., & Taylor, S. A. (1994). SERVPERF versus SERVQUAL: Reconciling performance-based and perceptions-minus-expectations measurement of service quality. *Journal of Marketing*, 58(1), 125–131.
- Csikszentmihalyi, M. (1982). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal performance*. New York: Cambridge University Press.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum Press.
- DeVallis, R. F. (2003). *Scale development: Theory and application*. London: Sage Publications.
- Diekelmann, N., & Lampe, S. (2004). Student-centered pedagogies: Co-creating compelling experiences using the new pedagogies. *The Journal of Nursing Education*, 43(6), 245–247.
- Duerden, M., Ward, P., & Freeman, P. (2015). Conceptualizing structured experiences. *Journal of Leisure Research*, 47(5), 601–620.
- Ellis, G., Freeman, P., Jamal, T., & Jiang, J. (2017). A theory of structured experience. *Annals of Leisure Research*. <https://doi.org/10.1080/11745398.2017.1312468>
- Ellis, G., Taggart, A., Martz, J., Lopley, T., & Jamal, T. (2017). Monitoring structured experiences during youth programs: Development of brief measures of perceived value and engagement. *Journal of Youth Development*, 11(3), 159 - 174.

- Ellis, G. D., Freeman, P., & Jiang, J. (2016). Creating experiences for study-abroad tourists. *Journal of Tourism Insights*, 8(1). <https://doi.org/10.9707/2328-0824.1072>
- Ellis, G. D., & Rossman, J. R. (2008). Creating Value for Participants through Experience Staging: Parks, Recreation, & Tourism in the Experience Industry. *Journal of Park and Recreation Administration*, 26(4), 1–20.
- Etgar, M. (2008). A descriptive model of the consumer coproduction process. *Journal of the Academy of Marketing Science*, 36(1), 97–108.
- Fredricks, J. A., Blumenfeld, P. C., Friedel, J., & Paris, A. H. (2005). School engagement. In K. A. Moore & L. H. Lippman (Eds.), *What do children need to flourish? Conceptualizing and measuring indicators of positive development* (pp. 305–321). New York: Springer.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.
- Frydenberg, E., Ainley, M., & Russell, V. J. (2005). *Schooling issues digest — Student motivation and engagement 2005/2*. Canberra: Australian Government Department of Education, Science and Training.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Heyn, P. (2003). The effect of a multisensory exercise program on engagement, behavior, and selected physiological indexes in persons with dementia. *American Journal of Alzheimer's Disease and Other Dementias*, 18(4), 247–251.
- Hollebeek, L. D. (2011). Exploring customer brand engagement: Definition and themes. *Journal of Strategic Marketing*, 19(7), 555–573. <https://doi.org/10.1080/0965254X.2011.599493>
- Honigsfeld, A., & Dunn, R. (2003). High school male and female learning-style similarities and differences in diverse nations. *The Journal of Educational Research*, 96(4), 195–206.

- Hotz, G. A., Castelblanco, A., Lara, I. M., Weiss, A. D., Duncan, R., & Kuluz, J. W. (2006).  
Snoezelen: A controlled multi-sensory stimulation therapy for children recovering from  
severe brain injury. *Brain Injury: [BI]*, 20(8), 879–888.
- Jennett, C., Cox, A. L., Cairns, P., Dhoparee, S., Epps, A., Tijs, T., & Walton, A. (2008).  
Measuring and defining the experience of immersion in games. *International Journal of  
Human-Computer Studies*, 66(9), 641–661.
- Jensen, E. (2013). How poverty affects classroom engagement. *Educational Leadership*, 70(8),  
24–30.
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at  
work. *Academy of Management Journal*, 33, 692–724.
- Kano, N. (1984). Attractive quality and must have quality. *Hinshitsu (Quality)*, 14, 147–156.
- Kotler, P. (1974). Atmospherics as a Marketing Tool. *Journal of Retailing*, 49(4), 48–64.
- Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect  
perception, judgment and behavior. *Journal of Consumer Psychology*, 22(3), 332–351.
- Kwok, H. W. M., To, Y. F., & Sung, H. F. (2003). The application of a multisensory Snoezelen  
room for people with learning disabilities-Hong Kong experience. *Hong Kong Medical  
Journal*, 9(2), 122–126.
- Lacanieta, A., & Duerden, M. D. (2019). Designing and staging high-quality park and  
recreation experiences using co-creation. *Journal of Park and Recreation Administration*,  
[Abstract]. Retrieved from <https://doi.org/10.18666/JPRA-2019-8818>.
- Laerd dissertation. (n.d.). Retrieved January 27, 2018, from [http://dissertation.laerd.com/face-  
validity.php](http://dissertation.laerd.com/face-validity.php)

- Lawler, E. E., & Hall, D. T. (1970). Relationships of job characteristics to job involvement, satisfaction, and intrinsic motivation. *The Journal of Applied Psychology*, 54(4), 305–312.
- Mascarenhas, O., Kesavan, R., & Bernacchi, M. (2004). Customer value-chain involvement for co-creating customer delight. *Journal of Consumer Marketing*, 21(7), 486–496.
- Oh, H., Fiore, A. M., & Jeoung, M. (2007). Measuring experience economy concepts: Tourism applications. *Journal of Travel Research*, 46(2), 119–131.
- Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing*, 69(4), 420–451.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12–37.
- Patterson, P., Yu, T., & de Ruyter, K. (2006). *Understanding customer engagement in services: Advancing theory, maintaining relevance*. Proceedings of ANZMAC 2006 Conference, Brisbane, Australia, 4–6 December.
- Pine, B., & Gilmore, J. (2011). *The experience economy (Updated ed.)*. Cambridge, MA: Harvard Business Press.
- Pine, B. J., II, & Gilmore, J. H. (1999). *The experience economy: Work is theater and every business a stage*. Boston: Harvard Business School Press.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14.
- Prebensen, N. K., & Foss, L. (2011). Coping and co-creating in tourist experiences. *International Journal of Tourism Research*, 13(1), 54–67.



- Ramirez, R. (1999). Value co-production: Intellectual origins and implications for practice and research. *Strategic Management Journal*, 20(1), 49–65.
- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion*, 28(2), 147–169.
- Rossman, J. R. (2007). *The pursuit of happiness: Programming in the experience economy of the 21st century*. George Butler Lecture, Leisure Research Symposium, National Recreation, and Park Association Annual Congress, September 26, 2007.
- Salkind, N. J. (2010). *Encyclopedia of research design (Vol. 1)*. Thousand Oaks, CA: Sage.  
Retrieved from <https://dx.doi.org/10.4135/9781412961288>.
- Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscape of design. *CoDesign*, 4(1), 5–18.
- Sarmah, B., Kamboj, S., & Rahman, Z. (2017). Co-creation in hotel service innovation using smart phone apps: An empirical study. *International Journal of Contemporary Hospitality Management*, 29(10), 2647–2667.
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417–453.
- Stricklin, M. K. (2016). *Effect of event staging strategies on quality of experience* (Unpublished master's thesis). Texas A&M University, College Station, TX.
- Tsai, C. F., Ouyang, W. C., Chen, L. K., Lan, C. F., Hwang, S. J., Yang, C. H., & Su, T. P. (2009). Depression is the strongest independent risk factor for poor social engagement among Chinese elderly veteran assisted-living residents. *Journal of the Chinese Medical Association*, 72(9), 478–483.

Turley, L. W., & Milliman, R. E. (2000). Atmospheric effects on shopping behavior: A review of the experimental evidence. *Journal of Business Research*, 49(20), 193–211.

Vargo, S. L., & Lusch, R. F. (2004a). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68(1), 1–17.

Vivek, S. D. (2009). *A scale of consumer engagement* (Unpublished doctoral dissertation). The University of Alabama, Tuscaloosa, AL.

Williams, C., & Buswell, J. (2003). *Service quality in leisure and tourism*. Cambridge, MA: CABI Publishing.

APPENDIX A

Figures

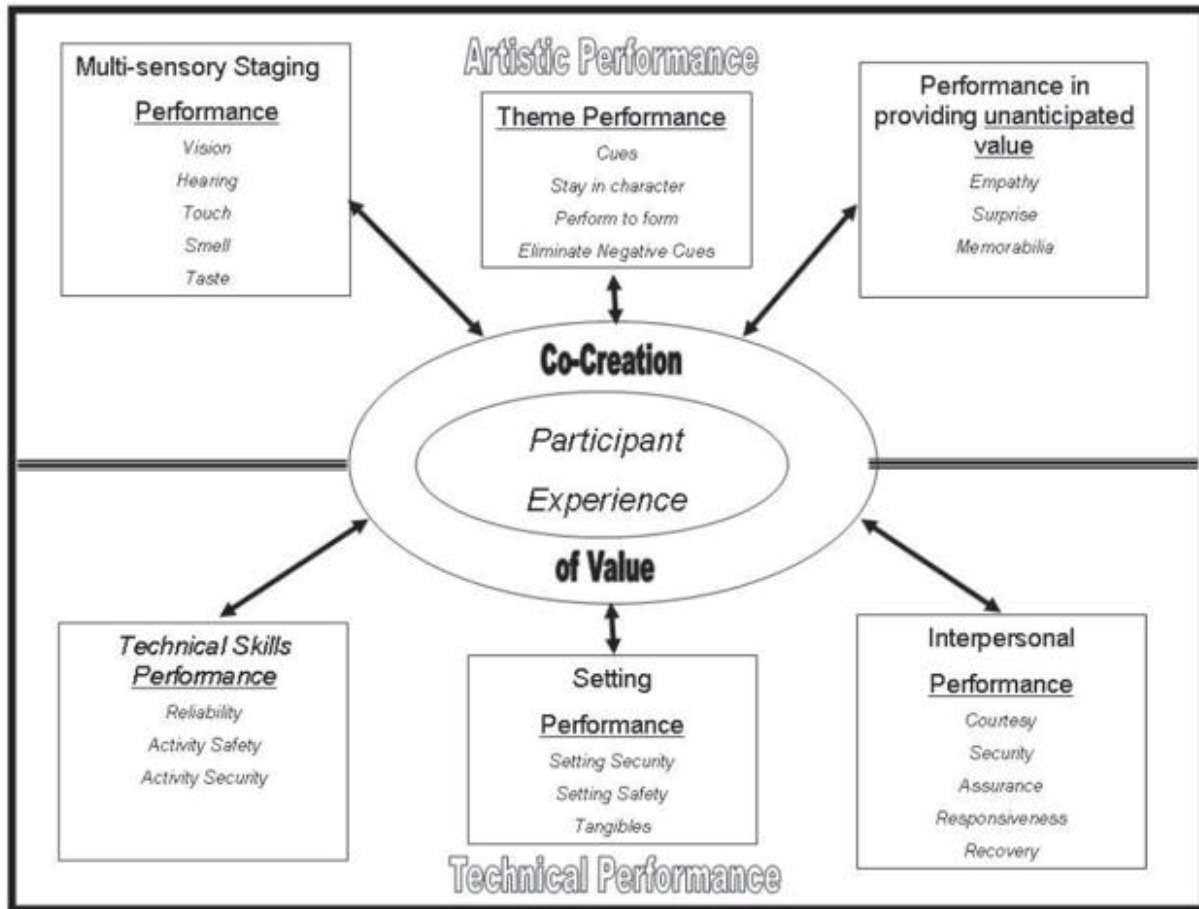


Figure 1. Ellis & Rossman’s (2008) Model of Experience Staging

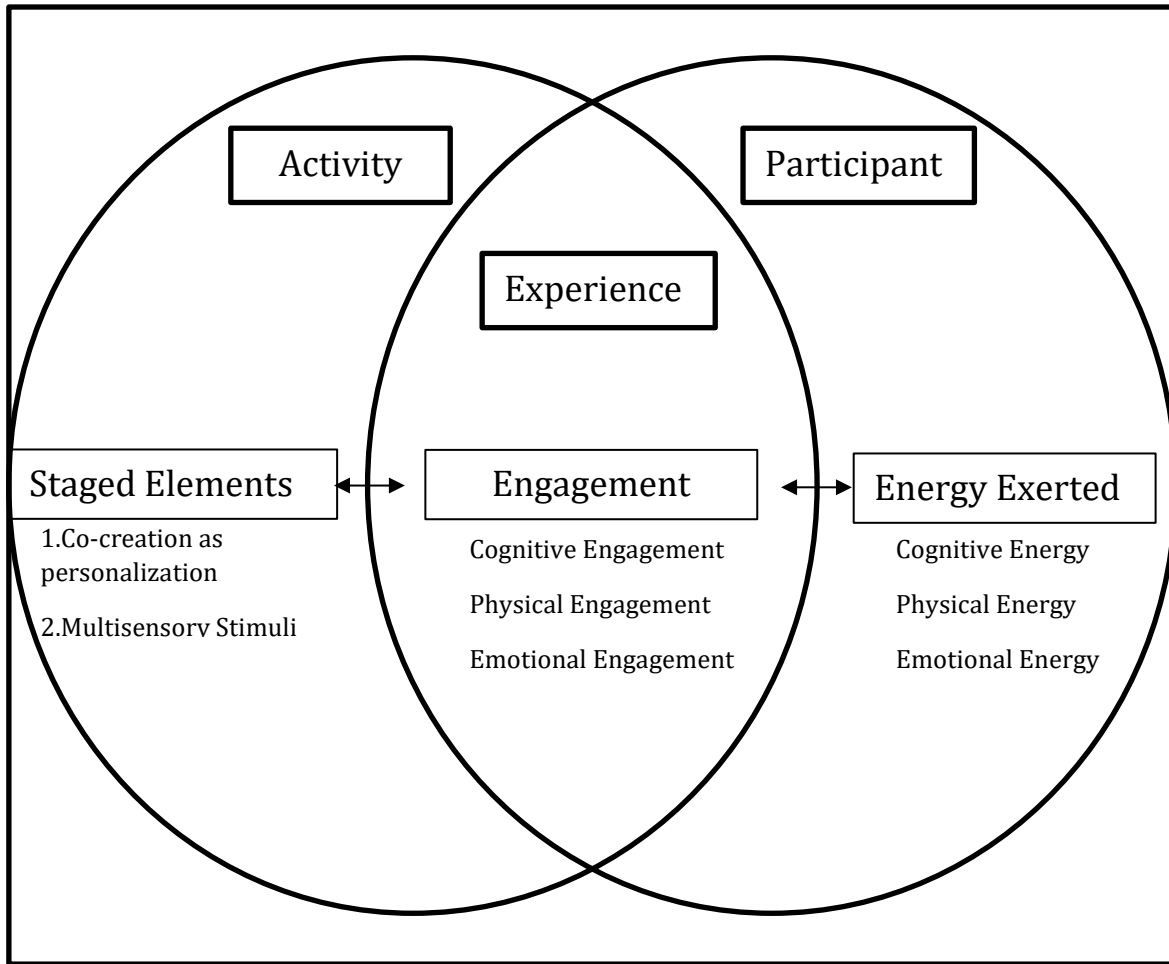


Figure 2. Engagement with a Recreation Activity

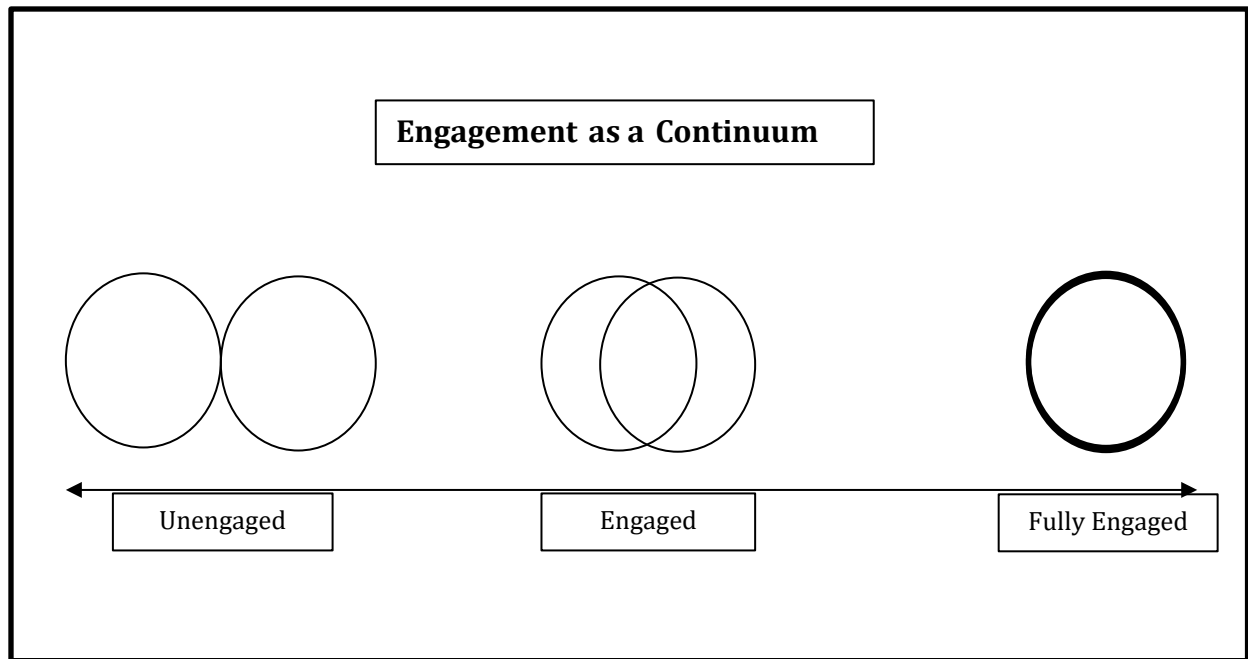


Figure 3. Engagement as a Continuum

## Multisensory Stimulation

<b>Co-creation</b>	<p><b>Group 4</b> Both Multi-sensory stimulation and Co-creation will be introduced to the 4<sup>th</sup> group allowing for both variables to work together.</p>	<p><b>Group 3</b> Multi-sensory stimulation will be introduced but not Co-creation. This will be the second intervention and introduced alone after Co-creation is introduced alone so that sensory stimuli such as ambient scents will not interfere with the independent effect of Co-creation.</p>
	<p><b>Group 2</b> Co-creation will be introduced but not Multi-sensory stimuli. This will be the first intervention introduced after the control group. This intervention will be first because it can be easily introduced or removed from the activity.</p>	<p><b>Group 1</b> Neither Co-creation nor Multi-sensory stimulation will be introduced. This will act as the control group and will be the first group to participate in the activity.</p>

Figure 4. Two-Way ANOVA Table - Multisensory stimulation and Co-creation

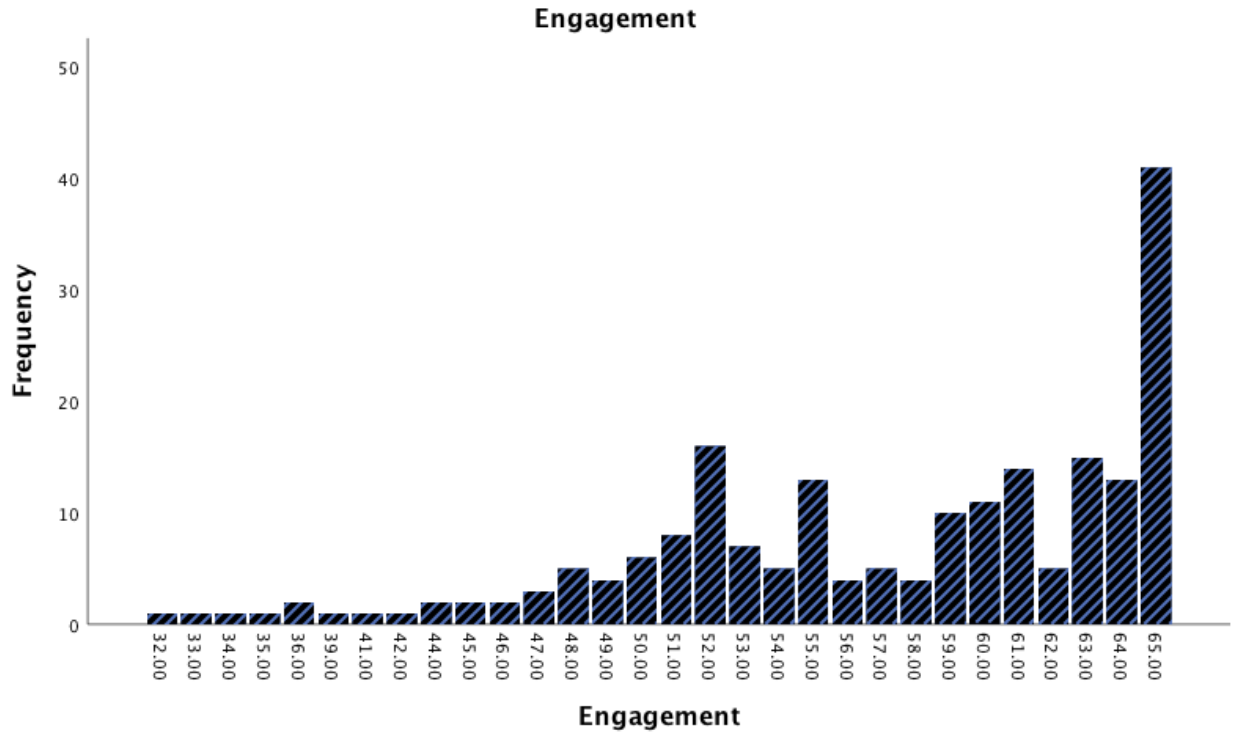


Figure 5. Mean Engagement Scores for Overall Engagement

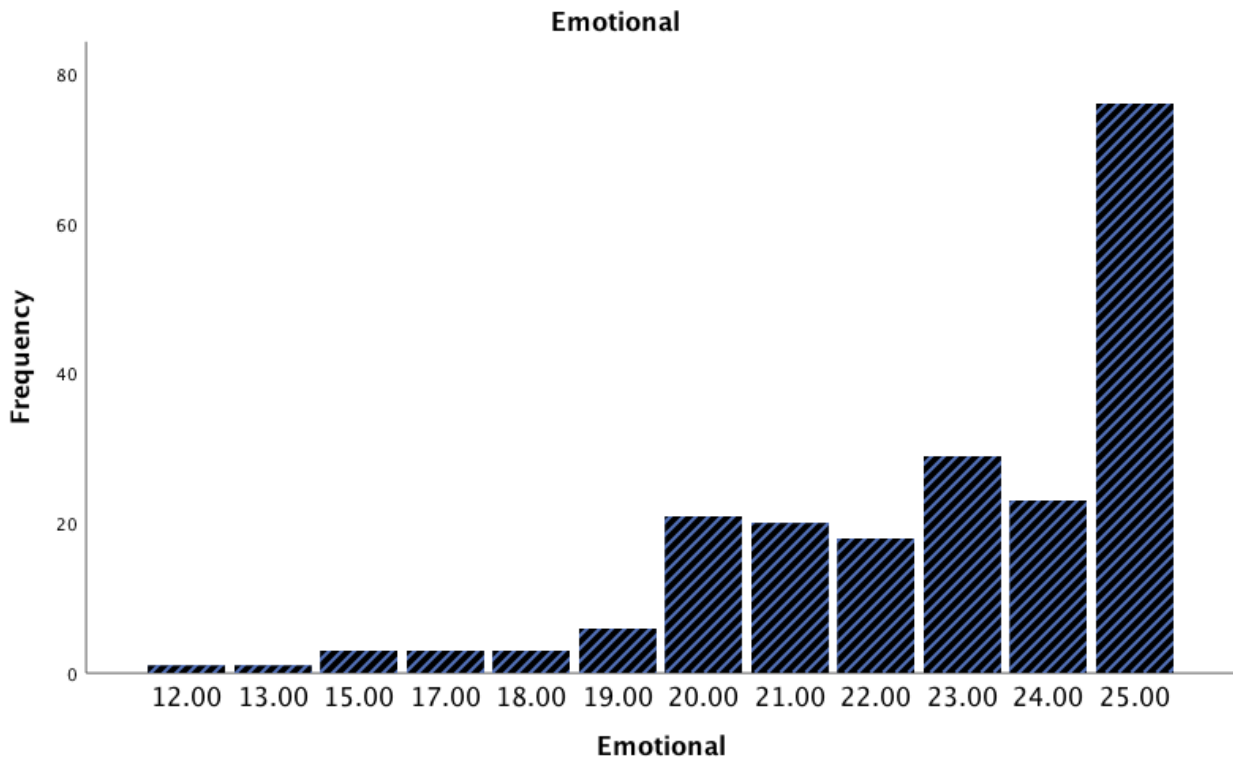


Figure 6. Mean Engagement Scores for Emotional Engagement

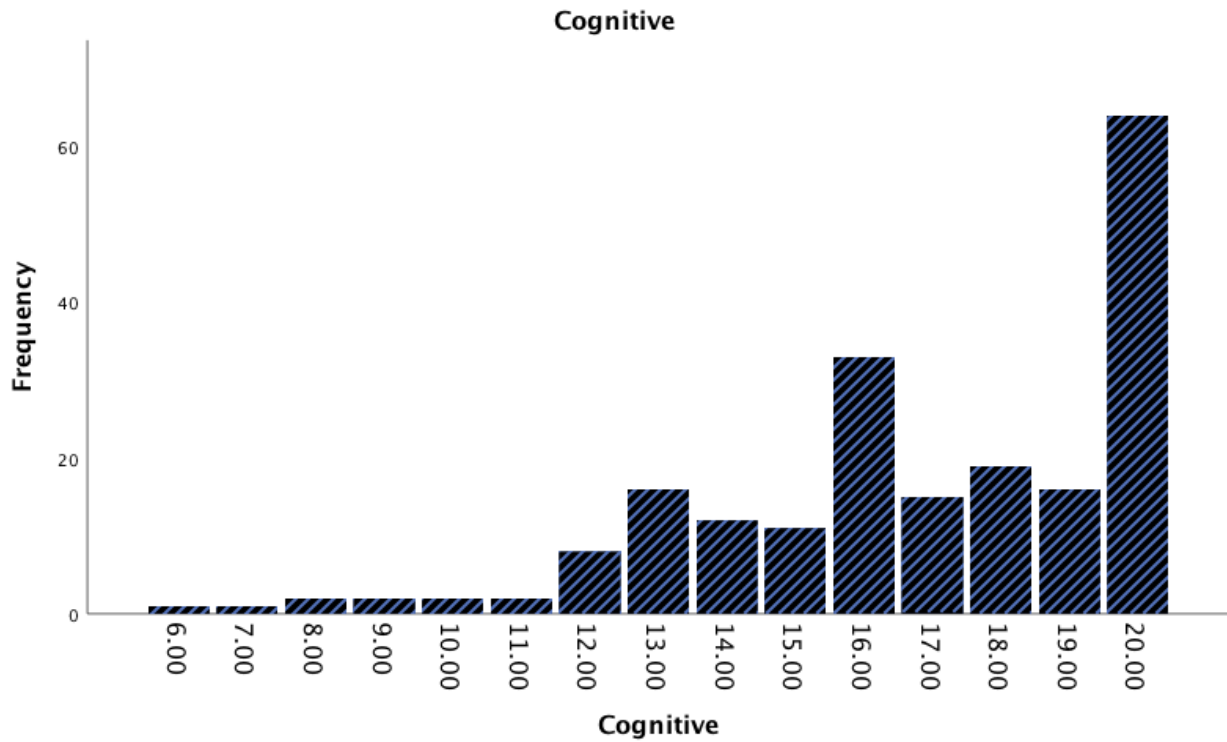


Figure 7. Mean Engagement Scores for Cognitive Engagement

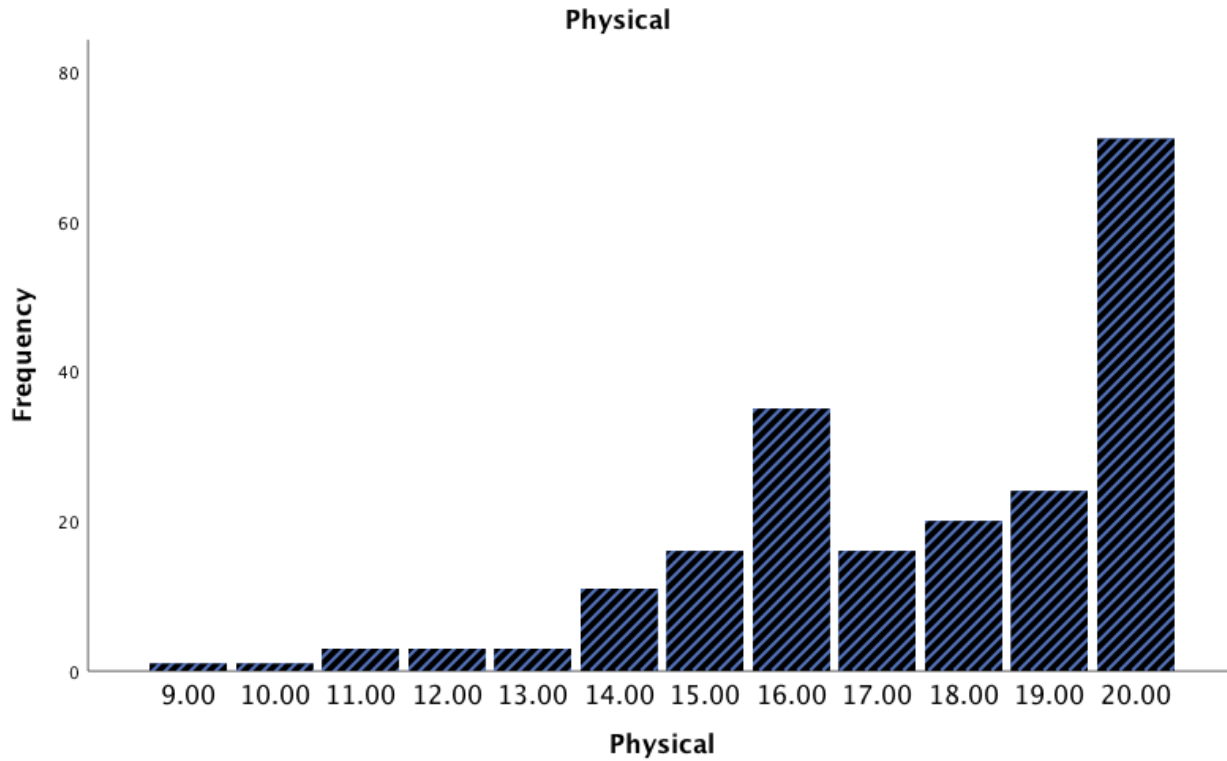


Figure 8. Mean Engagement Scores for Physical Engagement



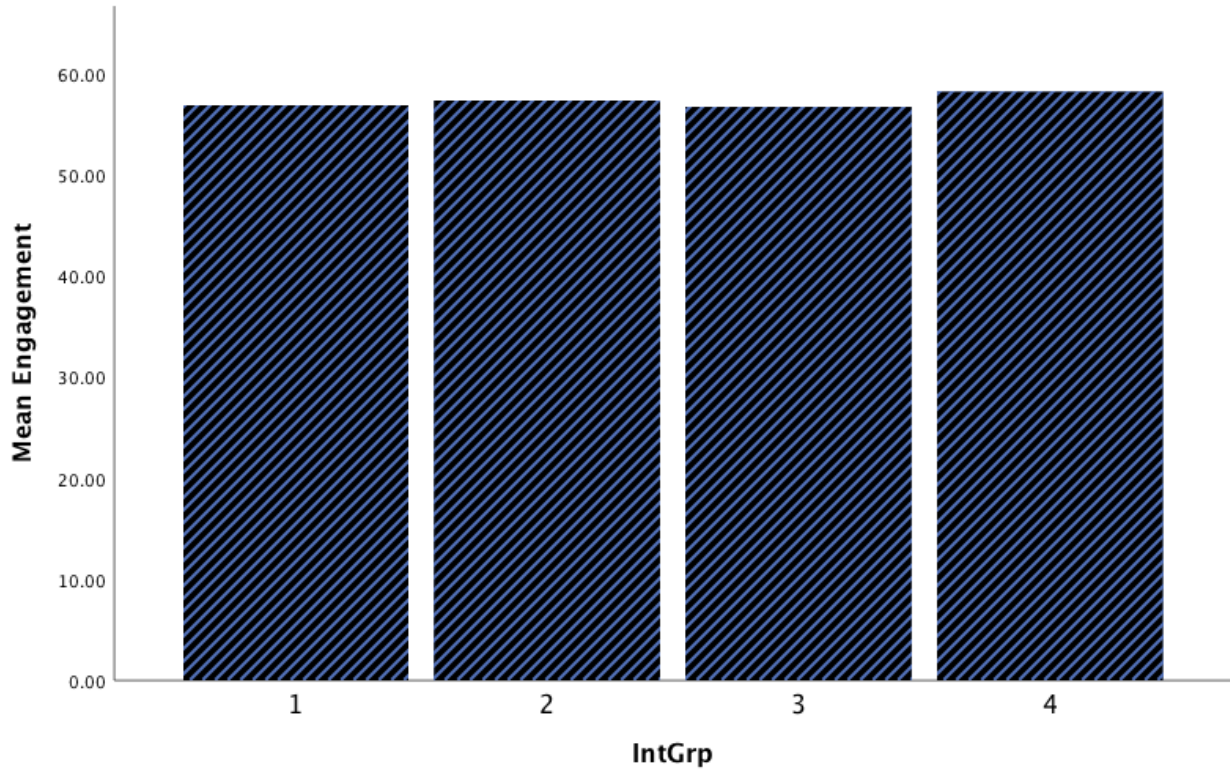


Figure 9. Mean Engagement Scores Across Intervention Groups

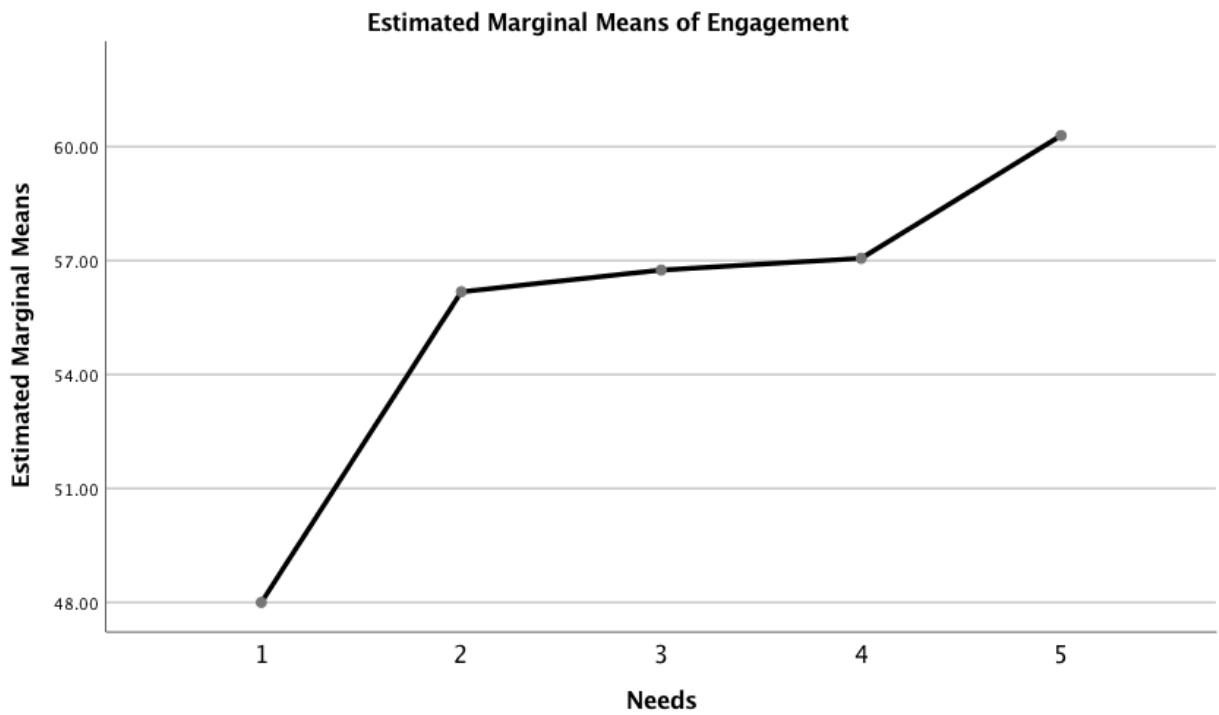


Figure 10. Engagement Mean Scores Across Level of Needs

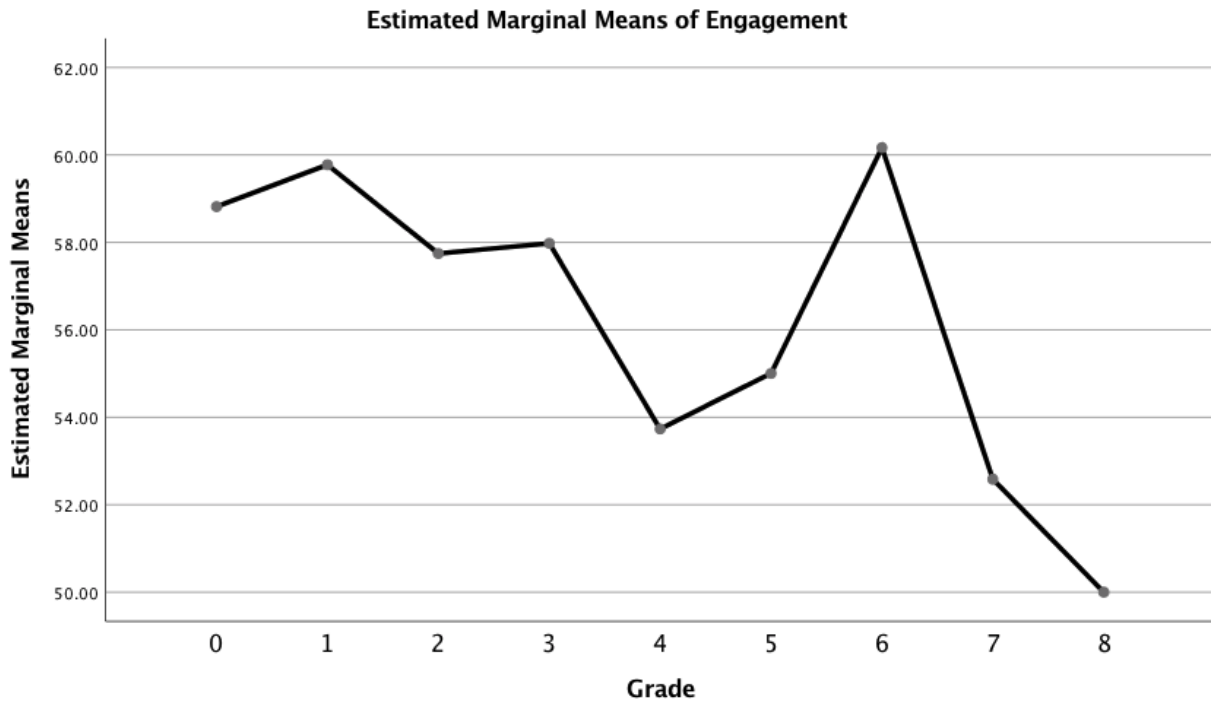


Figure 11. Engagement Mean Scores Across Grade Level

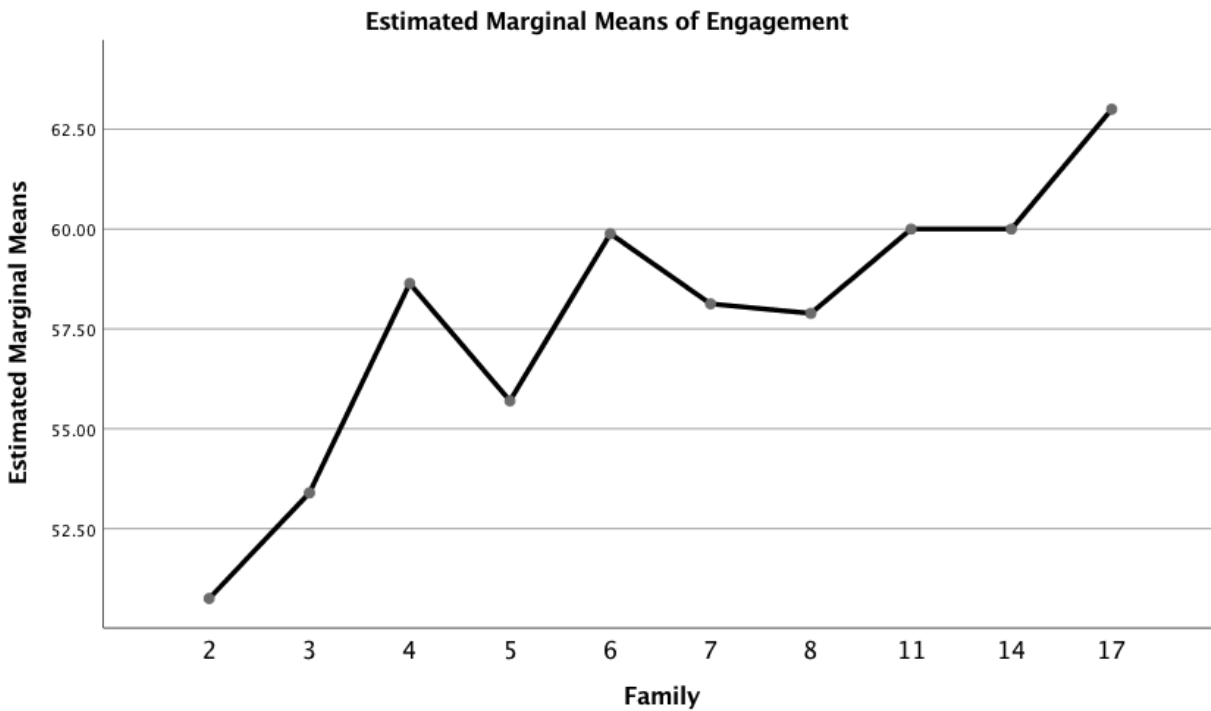


Figure 12. Engagement Mean Scores Across Family Size

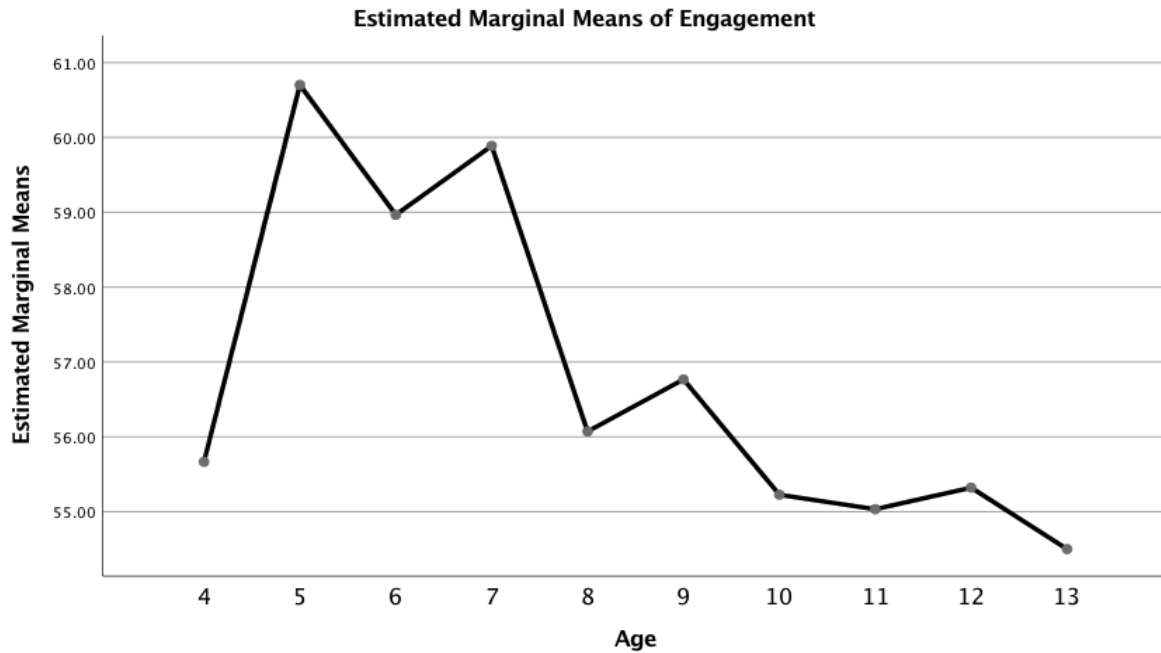


Figure 13. Engagement Mean Scores Across Participant Age

Interaction between Intervention Type and Sex					
Dependent Variable: Engagement				95% Confidence Interval	
IntGrp	Sex*	Mean	Standard Error	Lower Bound	Upper Bound
1	1	57.25	1.66	53.97	60.53
	-1	56.63	1.43	53.81	59.46
2	1	59.06	1.28	56.54	61.58
	-1	55.47	1.36	52.79	58.15
3	1	55.48	1.38	52.76	58.21
	-1	57.85	1.29	55.29	60.41
4	1	58.64	1.99	54.72	62.57
	-1	57.82	1.81	54.26	61.38

\*1 = Female; -1 = Male

Figure 14. Engagement Mean Scores Across the Interaction of Intervention Type and Sex

### Effects of Intervention Type x Control Variables

Effect	Output
Intervention Type	F (3,200) = .263, p = .826, partial eta squared = .004
Interaction Intervention Type x Activity Room	F (6,192) = .470, p = .830, partial eta squared = .014
Interaction Intervention Type x Age	F (25,166) = 1.144, p = .300, partial eta squared = .147
Interaction Intervention Type x Sex	F (3,196) = 1.676, p = .173, partial eta squared = .025
Interaction Intervention Type x School	F (54,114) = .263, p = .808, partial eta squared = .277
Interaction Intervention Type x Grade	F (22,170) = .839, p = .673, partial eta squared = .098
Interaction Intervention Type x Family	F (17,174) = 1.023, p = .436, partial eta squared = .091
Interaction Intervention Type x Needs	F (11,185) = 1.439, p = .159, partial eta squared = .079

Figure 15. Table of Intervention Type Effects on Engagement

Levene's Test of Homogeneity of Variances		
Intervention Group x Age	F(33, 156) = 1.32	p = .134
Intervention Group x Sex	F(7,196) = .684	p = .685
Intervention Group x School	F(49,114) = 1.93	p = .002
Intervention Group x Grade	F(28,170) = .872	p = .654
Intervention Group x Family	F(22, 174) = 2.52	p = .000
Intervention Group x Needs	F(16, 185) = 1.76	p = .040
Intervention Group	F(3,200) = 1.26	p = .288

Figure 16. Levene's Test of Homogeneity of Variances

## APPENDIX B

**Exhibits****Exhibit 1 – Letter of Consent from City of St. George**

January 2, 2018

To whom it may concern,

Emerson Watanabe works as a Program Coordinator for the City of St. George Recreation Division. Emerson supervises the operation and programming of the city's recreation center under my supervision.

One of the events that he has responsibility over is Sciencepalooza. Emerson has discussed his plans to collect data from participants at this event as part of his requirements for his master's thesis.

I understand that the questions of the survey are focused on the immediate experience the participants have had during Sciencepalooza. I understand that the study is non-invasive, and the survey does not ask for any personal identifying information such as names, phone numbers, addresses, etc. I have given him my permission to proceed. Please feel free to call or email with any questions.

Thank you

Steven Bingham  
Recreation Manager  
City of St. George  
435-627-4572  
steve.bingham@sgcity.org

**Exhibit 2 – School Engagement Scale (Fredricks, Blumenfeld, Friedel, & Paris (2005))***Engagement Scales and Factor Loadings*

Items	Behavioral	Emotional	Cognitive
I follow the rules at school.	.83		
I get in trouble at school. (REVERSED)	.78		
When I am in class, I just act as if I am working. (REVERSED)	.72		
I pay attention in class.	.72		
I complete my work on time.	.52		
I like being at school.		.79	
I feel excited by my work at school.		.75	
My classroom is a fun place to be.		.73	
I am interested in the work at school.		.72	
I feel happy in school.		.71	
I feel bored in school. (REVERSED)		.67	
I check my schoolwork for mistakes.			.73
I study at home even when I don't have a test.			.72
I try to watch TV shows about things we do in school.			.69
When I read a book, I ask myself questions to make sure I understand what it is about.			.67
I read extra books to learn more about things we do in school.			.66
If I don't know what a word means when I am reading, I do something to figure it out.			.62
If I don't understand what I read, I go back and read it over again.			.58
I talk with people outside of school about what I am learning in class.			.58

Exhibit 3 – Monitoring Instrument (Ellis, Taggart, Martz, Lepley, & Jamal, 2017)

Monitoring Instrument

***My experience at today's meeting!***

Please draw an X on the line that best shows your experience. For example, if you were happy for about half of the time you were here, you would put an X at the middle of the line, like this:

***During this meeting...***

***I was happy.***  
None of the time =====X===== All of the time

***I felt excited about what we were doing***  
None of the time ===== All of the time

***I felt curious about something***  
None of the time ===== All of the time

***I felt I was being useful***  
None of the time ===== All of the time

***I felt Important***  
None of the time ===== All of the time

-----

**Exhibit 4 – Leisure Engagement Scale for Children (LESC) – Pilot**

**How did you like our event?**

I am going to ask you some questions about the event tonight. Answer each question by circling the face that best matches what you did, thought, or felt about the event.

Example: I felt comfortable during the event.



Circle the face that best matches what you did, thought, or felt about the event.

1. I felt comfortable during the event. (Emotional #1)



2. I felt safe during the event. (Emotional #2)



3. I felt bored during the event. (Cognitive #1)



4. I was so focused on the event that I did not notice anything else going on around me.

(Cognitive #2)





5. I was thinking about the event the whole time. (Cognitive #3)



6. I listened to all the rules (Physical #1)



7. I felt excited while doing the event. (Emotional #3)



8. I felt happy while doing the event. (Emotional #4)



9. I focused all my attention on the event. (Cognitive #4)



10. I concentrated so much on the event that I did not notice what was going on around me.

(Cognitive #5)



11. I listened to all the instructions. (Physical # 2)



12. I was really focused on the activity. (Cognitive #6)



13. I followed all the rules. (Physical # 3)



14. During the activity there was nothing else I would rather be doing. (Physical #4)



15. I wanted to go and do something else during the activity. (Physical #5)



16. My thoughts were focused on the activity the whole time. (Cognitive #7)



17. I followed all the instructions. (Physical #6)



18. How old are you? \_\_\_\_\_

19. Circle one: BOY GIRL

**Exhibit 5 – Leisure Engagement Scale for Children (LESC) – Revised**

**How did you like the Activity?**

I am going to ask you some questions about the activity we just did. Answer each question by circling the face that best matches what you did, thought, or felt about the activity.

Example: I felt comfortable during the activity.

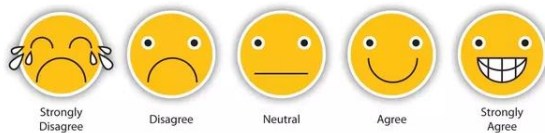


Circle the face that best matches what you did, thought, or felt about the activity.

1. I felt comfortable during the activity. (Emotional #1)

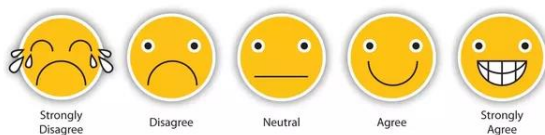


2. I felt safe during the activity. (Emotional #2)

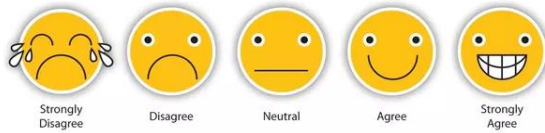


3. I was so focused on the activity that I did not notice anything else going on around me.

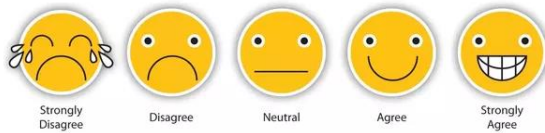
(Cognitive #2)



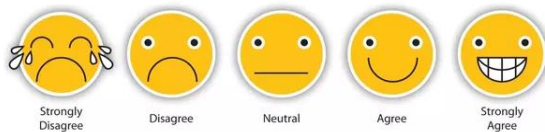
4. I was thinking about the activity the whole time. (Cognitive #3)



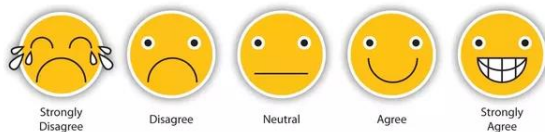
5. I felt excited while doing the activity. (Emotional #3)



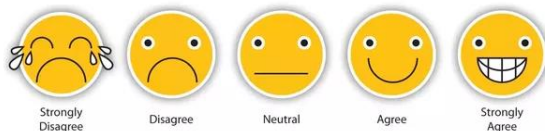
6. During the activity there was nothing else I would rather be doing. (Physical #4)



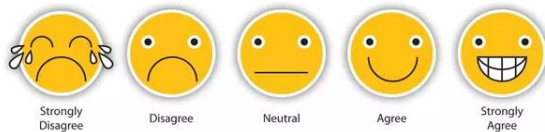
7. I felt happy while doing the activity. (Emotional #4)



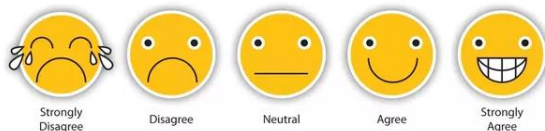
8. I focused all my attention on the activity. (Cognitive #4)



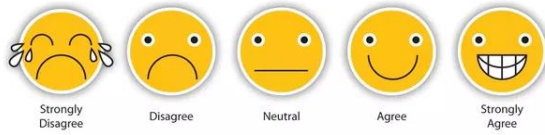
9. I listened to all the instructions. (Physical # 2)



10. I followed all the rules. (Physical # 3)



11. I wanted to go and do something else during the activity. (Physical #5)



12. My thoughts were focused on the activity the whole time. (Cognitive #7)



13. How old are you? \_\_\_\_\_

14. Circle one: BOY GIRL

15. What school do you go to? \_\_\_\_\_

16. What grade are you in? \_\_\_\_\_

17. How many people are in your family? \_\_\_\_\_ (Socioeconomic status)

18. Do you feel that you have...(choose one) (Socioeconomic status)

- a. Less than what you need
- b. What you need
- c. What you need and some of what you want
- d. What you need and most of what you want
- e. What you need and all of what you want

**Exhibit 6 – Parental Permission Form****Parental Permission for a Minor**

My name is Emerson Watanabe. I am a graduate student from Brigham Young University. I am conducting a research study about the relationship between experience staging techniques and engagement in recreation activities. I am inviting your child to take part in the research because (he/she) is attending Sciencepalooza.

Procedures

The study will be conducted in three demonstration rooms located around the St. George Rec Center during the Sciencepalooza.

If you agree to let your child participate in this research study, the following will occur:

Your child will be given a wrist band indicating that they have parental consent to take the survey. Only children with wristbands will be given a survey.

Your child will be asked to take a short survey regarding the experience they just had during the demonstration they attended.

Risks

There is little risk of loss of privacy. Age, sex, grade level and school attended will be identified in the survey. Several questions will also seek to determine socioeconomic status. These will be used as control factors. No further identifying data will be collected to protect the participants' identities. Once surveys have been completed and collected they will be scanned and converted into electronic copies for safe storage to await cleaning and analysis. The surveys and associated data will be stored in a secure file box in a locked and secured office on Brigham Young University Campus.

Confidentiality

The research data will be kept on an external hard drive in a secure location and only the researcher will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in a locked cabinet or office.

Benefits

There are no direct benefits for your child's participation in this project except that they may enjoy the activity more!

Compensation

There will be no compensation for participating in this project.

Questions about the Research

Please direct any further questions about the study to Emerson Watanabe at 435-627-4564 or emerson.watanabe@sgcity.org. You may also contact Peter Ward at 801-422-3140 or peter\_ward@byu.edu.

Questions about your child's rights as a study participant or to submit comment or complaints about the study should be directed to the IRB Administrator, Brigham Young University, A-285 ASB, Provo, UT 84602. Call (801) 422-1461 or send emails to [irb@byu.edu](mailto:irb@byu.edu).

You have been given a copy of this consent form to keep.

### Participation

Participation in this research study is voluntary. You are free to decline to have your child participate in this research study. You may withdraw your child's participation at any point without affecting your or your child's experience today at Sciencepalooza. Entry to the event is not dependent upon participation in the survey.

Child's Name:

Parent Name: Signature: Date:

**Exhibit 7 – Child Assent Form****Child Assent (7-14 years old)**What is this research about?

My name is Emerson and I am a student at BYU. I want to tell you about a research study I am doing. A research study is a special way to find the answers to questions. We are trying to learn more about engagement. You are being asked to join the study because you are here at Sciencepalooza today.

If you decide you want to be in this study, this is what will happen. You will participate in an activity that will last about 25 minutes. You will be asked to answer 17 questions about how much you liked or did not like the activity and how you felt during the activity.

Can anything bad happen to me?

No, nothing bad can happen to you during the activity.

Can anything good happen to me?

We don't know if being in this study will help you. But we hope to learn something that will help other people someday.

Do I have other choices?

You can choose not to be in this study.

Will anyone know I am in the study?

We won't tell anyone you took part in this study. When we are done with the study, we will write a report about what we learned. We won't use your name in the report.

What happens if I get hurt?

Your parents or legal guardians will know what to do if you somehow get hurt during the study.

What if I do not want to do this?

You don't have to be in this study. It's up to you. If you say yes now, but change your mind later, that's okay too. All you have to do is tell us.

Before you say yes to be in this study; be sure to ask Emerson to tell you more about anything that you don't understand.

If you want to be in this study, please sign and print your name.

Name (Printed):            Signature Date: