PUBLIC PREFERENCE FOR WINTER RECREATION ACTIVITIES AND WILLINGNESS TO PAY

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ABSTRACT

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This thesis studies financial willingness to pay and winter recreation preference among a college population. Data collection was accomplished by having survey respondents broadly identify their preference for winter recreation activities using a collection of 21 winter recreation activity pictures. The pictures used in the data set will seek to represent a diverse range of winter activities that vary in levels of built infrastructure support. In order to reduce bias based on actual income level, separate picture sorts will represent different recreational expenditure allowances, namely $10, $25, and $50 dollars. The results of the Friedman's Analysis of Variance statistical test found that x_r^2= 3.15, rejecting the first research hypothesis that there is a correlation between the winter activities that people prefer and how much they are willing to pay for those activities. When looking at recreation preference using Kendall's Coefficient of Concordance a calculated x_r^2= 48.53. When compared to the tabulated value of 39.99 this showed significant results that regardless of the budget considerations everyone prefers to participate in similar activities. Providing insight on activity selection regardless of budget is performed with the goal of specifying a winter recreation preference baseline from which planners will be able to better design and implement park systems that promote increased access to recreation during winter months.

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1. Introduction

While much research has been done regarding park use, park benefits, physical activity, and public health, park preference, and willingness to pay for park spaces, few studies investigate these relationships specifically during the winter months (Chan & Ryan, 2009). It has been accepted that colder temperatures, low sunlight levels, and inclement weather patterns during winter months can result in little to no participation in recreation and physical activity (Chan & Ryan, 2009). Studies examining recreation preferences in the past have focused on recreation during the warmer summer months when people tend to participate more in recreation and are more active and willing to engage in outdoor activity. Although designers and planners often discuss ways to incorporate winter systems in their designs these areas may often sit vacant and fail to function as intended due to a lack of understanding of public preference. This study seeks to shift the paradigm from basic recreation preference research into more specifics regarding seasonality specifically winter.

2. Literature Review

2.1 History of Parks and Park Use

When discussing the history of parks and recreation in landscape architecture it is important to realize the transformation of parks through various ages of influence and development. Urban public parks have historically met peoples needs using four different tendencies in park planning: parks as landscapes, parks as adult recreation areas, parks as children's neighborhood playgrounds, and open space parks that preserve green areas from urban development (Cranz, 1982) (Hayward & Weitzer, 1984). While the term public park has not always been used, the idea of open natural space for leisure use has been part of human settlements dating back to the ancient civilizations, for activity spaces such as hunting parks or private gardens (Pregill & Volkman, 1999, 111). These very first parks and open spaces were not public spaces at all but reserved for the rich as paradise gardens. Record of such spaces first takes place around 550 B.C. during the formation of the great Ottoman Empire. These designs feature spaces that were mainly rectilinear and often included a central water feature, as well as being shaded with sycamore trees (Burley & Machemer, 2016, 111).

2.1.1 Medieval to Romantic Period

The medieval period, spanning from the 5th Century and merging into the Renaissance, saw park concepts that can be well represented through the Roman Empire's idea of internal colonies (Pregill & Volkman, 1999, 111-114). These self-sufficient colonies were often characterized by features such as town squares at the center, grid layouts, a Basilica (meeting and business place), as well as being surrounded by a protective wall (Pregill & Volkman, 1999, 115).

As new cities began to expand many urban dwellers initiated escape from the bustling economic and political activity of large urban cities. Leaving the unhealthy and crowded conditions of the city and escaping to the countryside became common at the beginning of the Renaissance, which marks a time period of cultural expression through the Arts and landscape. This period of expression took place across Europe in various forms. The English Renaissance, for example, sought to move away from formalized landscape planning to more naturalistic and free flowing designs (Burley & Machemer, 2016, 218) while the Italians constructed their iconic villas which were inspired by ideals of order and beauty with extensive use of water as a design element (Burley & Machemer, 2016, 130).

2.1.2 Early U.S. Park Development

In the US, the developing new nation included town squares where citizens gathered for political, social, and economic reasons, and often used as common areas (Pregill & Volkman, 1999, 400). Planning and design shifted based on two philosophical movements known as the Enlightenment and Romanticism became popular influenced by writers such as Henry David Thoreau, who wrote extensively about nature and how the American character benefited from American wilderness and scenery (Burley & Machemer, 2016, 320). Initially, the word park had been synonymous with garden and it was during the Romantic time period that the paradigm shift occurred where parks became more associated with nature, wilderness, and recreation (Pregill & Volkman, 1999, 418). Early planning attempts focused mainly on site rather than city and were largely influenced by increases in housing costs due to large numbers of available jobs, increased wages, an increase in distance from work to home due to the automobile and a

demographic shift that occurred as wealthy manager class citizens relocated to country estates and cities swelled with immigrant populations (Pregill & Volkman, 1999, 522). This created poor urban conditions such as crime, pollution, noise, and sanitation issues due to lack of infrastructure and rapid expansion (Pregill & Volkman, 1999, 523). Planning efforts fixated heavily on the use of a gridiron pattern as can be seen in various city plans of this time including Philadelphia plan of 1762 and New York City 1811 (Burley & Machemer 2016, 356).

2.1.3 City Beautiful Movement

Important plans in the advancement of public green space and park systems included the Boston plan by Robert Gourlay (1844,1857) which was revolutionary with its use of prior planning, connectivity to scenic areas through the use of parkways and greenbelts, and historic preservation and use of these areas as focal points (Pregill & Volkman, 1999, 525-526, Burley & Machemer, 2016, 356). The Boston 1872 plan by Robert Morris Copeland featured an integrated system of parks and boulevards to meet housing and commercial needs, as well as the use of zoning in planning (Pregill & Volkman, 1999, 527). In Chicago, HWS Cleveland was advocating for parks and green space citing health, safety, and welfare of citizens. He advocated for functional urban planning using two main principles stressing the importance of prior planning by landowners, the beginning of participatory planning, as well as resolute belief that urban planning was more than laying down a grid and should be done for economic, aesthetic, and sanitary reasons (Pregill & Volkman, 1999, 528).

2.1.4 Suburbanization

Suburbanization or the growth of mainly residential villages within daily travel distance to the city, dates back to 1815 but occurred widespread around 1860-1870 (Pregill & Volkman, 1999, 529). Two major influences of suburban development were the industrial suburbs, which grew around areas of major commerce in support of factory job needs, and the romantic suburbs. Romantic developments were characterized by a shift from formal to more naturalized landscapes. The landscape garden school derived from England and the rural romantic cemeteries like Mount Auburn in Massachusetts, embraced natural plantings and landform, rustic elements, and curvilinear roads and paths (Pregill & Volkman, 1999, 456-457). Lake Forest, IL, Riverside, IL, and Llewellyn, NJ were some of the romantic suburbs of the mid 19th century that all included parks and green space amidst development (Pregill & Volkman, 1999, 534). Much of the influence for this shift came from literature and the arts, including America's first writer on landscapes Andrew Jackson Downing. He was renowned as an advocate and champion of public parks from the beautiful to the picturesque, helping pass the first public park act in New York 1851 which allowed NY to purchase land for the public and was also a strong believer that the environments that surround us affect human behavior (Pregill & Volkman, 1999, 464, Burley & Machemer, 2016, 323).

2.1.5 19th Century Parks and Planning

Prior to 1857 public open spaces were limited to small public squares and gardens, some shortcomings of these spaces were the lack of enough area to give the illusion of being outside of the city and they also tended to support active recreation that removed tranquility, detracting from overall sense of natural (Burley & Machemer, 2016,

323). The design competition of Central Park sought to change the template by which public parks were designed by featuring a number of very specific design programming elements. Calvert Vaux and Frederic Law Olmsted are the most associated figures with the design and implementation of Central Park in 1857 with their design called the Greensward Plan. Olmsted was a stalwart in the design and implementation of park systems utilizing active recreation programming for women as well as men, especially in working-class areas of cities and playgrounds for small children(Schuyler, 2015). He did this for multiple reasons: recognizing the demand for new forms of recreation and hoping to relieve pressure on larger parks where the new uses may not have been the most suitable (Schuyler, 2015). This design of Central Park represented a major shift in in park design in terms of scale of space, move from private to public, move toward function, and recognition of the economic, environmental, social, and aesthetic benefits (Burley & Machemer, 2016, 323-324).

2.1.6 20th Century Parks and Planning

Ebenezer Howard was another important influence on parks during the late 19th century with his development of the Garden City concept or the creation of a place that contains elements both town and country (Pregill & Volkman, 1999, 258-260). In the US, the city beautiful movement at the turn of the 19th century is noted as the beginning of the modern age of planning and design, beginning the transition from Romantic to the scientific planning of the 20th century. Planning in this era emphasized the importance of open space, particularly the creation of active rather than only passive spaces. Planners and designers during this time saw the opportunity to use urban beauty as a way to morally uplift society. Daniel Burnham's 1907 Chicago plan considered the lakefront,

parks and boulevards and included a series of parks connected in a greenbelt (Pregill & Volkman, 1999, 590), while Clarence Stein and Henry Wrights 1928 design for Radburn, NJ included a system of pathways linking garden courts and parks (Pregill & Volkman, 1999, 609). The idea of including parks in urban development continued with the greenbelt towns of the New Deal (Greenbelt, MD, Greenhills, OH, and Greendale, WI) (Pregill & Volkman, 1999, 682-684). New traditional communities and new urbanist communities of the late 20th century continued to include both large and smaller scale parks and open systems like those at Seaside, Florida (Pregill & Volkman, 1999, 714).

2.1.7 Parks Today

Today, the word park has become an encompassing term for many different types of complex greenway systems common in todays design environment and include linear parks, trail systems, sports complexes, urban parks and more. A park in the modern age of planning and design contains many of the same purposes as historical parks and is usually influenced by the intended purpose, audience, and available land features. They remain greatly varied in quality and function across different communities with diverse needs. It is important to recognize that many types of park systems remain vital to health and welfare of communities, and that their functions within the recreation and leisure environments can serve many different roles. Numerous communities such as Detroit in Michigan are in periods of resurgence and recognize the value of investing in their park systems as positive community development. In 2016, the Kresge Foundation has invested $1.5 million during the second round of their Kresge Innovative Projects into 21 projects around Detroit focusing on initiatives such as building and land renovations, plans for city parks, green infrastructure, and youth engagement (“$1.5 million from

Kresge supports 21 projects in neighborhoods across Detroit," 2016, May 26). In Grand Rapids Michigan park improvements on six projects were completed in the Summer of 2016, planning for improvements on an additional three were completed during the Fall of 2016 and design for an additional three is now underway ("City of Grand Rapids" n.d.). These are only a few examples of progressive park movements that developing cities are implementing in modern planning and design of parks.

2.2 Benefits of Parks and Green Space

Many studies have shown that parks and park usage have numerous positive impacts including economic, social and health benefits. These positive outcomes of greenspace are seen at all levels, from the individual, to the community, to the region. Individuals may gain health benefits by actively using parks. Communities may gain social benefits by encouraging social interaction and networks. The region may gain economic benefits as users contribute financial resources for park development and use.

2.2.1 Economic Benefits

The outdoor recreation economy in the United States is larger than one might think and it is a significant driver of the economy nationwide. Nationally, parks produce around 6.1 million direct American jobs while generating $646 billion in direct consumer spending each year along with $39.9 billion in federal tax revenue and $39.7 billion in state/local tax revenue ("OIA State Reports on Outdoor Recreation Economy" n.d.). This spending mainly occurs in two areas: the purchase of gear such as apparel and vehicles and dollars spent on trips and travel. In Michigan consumer spending generated by the outdoor recreation economy is roughly 18.7 billion and it supports around 194,000 Michigan jobs ("OIA State Reports on Outdoor Recreation Economy" n.d.). With at least

63% of Michigan residents participating in outdoor recreation each year (not including hunting, fishing, and wildlife viewing) is important that communities create and preserve access to new and unique outdoor recreation opportunities in order to help protect the economy, local businesses, and the health, safety and welfare of the residents ("OIA State Reports on Outdoor Recreation Economy" n.d.).

2.2.2 Social Benefits

Many studies have shown positive correlations between increased social and physical environments that parks provide (Adrian E Bauman et al., 2012; Bedimo-Rung, 2005; McCormack, Rock, Toohey, & Hignell, 2010). A review of characteristics associated with park use and physical activity identified that parks with organized festivals or other events that bring together people from divergent backgrounds encouraged multi-demographic social use (Gill & Simeoni, 1995). For women and girls, opportunities to socialize in safe and supportive social environments appeared to be important in attending park facilitates (McCormack et al., 2010) Psychosocial factors such as self-efficacy (confidence in the ability to be physically active) was a correlate in both children and adolescents while other factors like perceived behavioral control (perceptions of ones ability to be physically active) were a consistent positive correlate and determinant of physical activity in adolescents but inconclusive in children (Adrian E Bauman et al., 2012).

2.2.3 Physical/Health Benefits

Numerous epidemiologic studies have confirmed the health benefits of regular moderate-intensity physical activity, including walking (Gebel, Bauman, & Petticrew, 2007). Within the urban realm, areas available for participation in physical activity can

be severely limited leaving parks as the only option for many urban and suburban residents (Bedimo-Rung, 2005) These common community features can provide opportunities for physical activity, yet very little is known about what specific park characteristics are most related to increased levels of physical activity (Frumkin, 2003). It has been widely accepted that access to parks and green space can improve many aspects of human well being as well as offering economic, social, and both mental/physical health benefits (More & Payne, 1978); Sugiyama, Leslie, Giles-Corti, & Owen, 2008). Although parks and green space are often a common feature in communities it is important to remember that the condition and accessibility of parks are often varied and these spaces do not automatically promote appreciation of nature, or physical activity (Mowen, Kaczynski, & Cohen, 2008). This relatively unrecognized aspect of urban park design makes it important for researchers to understand why people are using park facilities and promote these uses in future park design and implementation.

Physical activity promotion to improve the health of populations, rather than individual behaviors, has only had an identifiable infrastructure since 2000 (Kohl et al., 2012). While it has been shown that participation in physical activity is able to provide mental and physical health benefits and can also reduce the risk of many chronic diseases, (A.E. Bauman, 2003) it has often been paired with diet to address obesity rather than as it own public health issue (Kohl et al., 2012). This lack of individualization has left gaps in the literature relating to understanding specific aspects of physical activity preference in the winter.

2.3 Factors Influencing Recreation Participation

A previous study on physical activity concluded that children are more active outdoors and that being outdoors is the singular most powerful correlate of physical activity (Sallis, Bauman, & Pratt, 1998). Opportunities arise with this to determine selected forms of recreation to promote physical activity, character building, social skills, and exposure to nature (Godbey, Caldwell, Floyd, & Payne, 2005). Research relating to the determinants of physical activity and inactivity has previously focused on determinants at the individual level, largely neglecting physical environments as influences of physical activity (Owen, Leslie, Salmon, & Fotheringham, 2000). Recent research has shifted to examining environmental approaches of encouraging physical activity (Centers for Disease Control and Prevention, 2001; National Center for Chronic Disease Prevention and Health Promotion & Centers for Disease Control and Prevention, 1997; Pate et al., 1995) using elements such as trails, public swimming pools, and public parks that target structural factors beyond control of a single individual but which make it easier for individuals to be physically active (Bedimo-Rung, 2005). Although government municipalities often regulate the location of these parks the facilities and amenities may be greatly influenced by local parks, recreation, and other community associations creating localized use (Godbey et al., 2005). Ecological concepts may provide insight here. Ecology is generally referred to as the relationship between organisms and the environments in which they live (Hawley, 1944). Within the field of ecology, allopatric speciation or geographic speciation is defined as when biological populations of the same species become isolated from each other to an extent that prevents or interferes with genetic interchange (Starr & Taggart, 1995). With this in mind

in stands to reason that humans, who were raised in an environment contrary to their current settings, will have preferences that differ from those who grew up in that locality.

In northern climates park usage is typically lower during the colder winter months. Severe weather is an environmental factor that has been shown to impact physical activity participation negatively in adults (Chan, Ryan, & Tudor-Locke, 2006; Humpel, Owen, & Leslie, 2002; Togo, Watanabe, Park, Shephard, & Aoyagi, 2005; Uitenbroek, 1993) and children (Brodersen & Steptoe, 2005; Duncan, Hopkins, Schofield, & Duncan, 2008). Self-reported data from (Humpel, Owen, Iverson, Leslie, & Bauman, 2004) indicates that those who are habitually active or those who enjoy being active (Salmon, Owen, Crawford, Bauman, & Sallis, 2003) are less likely to report weather as a barrier to engage in physical activity. Previous literature identifies that weather conditions influenced physical activity participation in 73% (n=27) of the studies investigated (Tucker & Gilliland, 2007) with up to 51% of variance explained in physical activity during summer months for Greek-Cypriot children (Loucaides, Chedzoy, Bennett, & Walshe, 2004). Studies that have used objective measures of physical activity include engagement, weather conditions, and increases in temperature as positively associated with physical activity, while rainfall was negatively associated (Duncan et al., 2008; Togo et al., 2005). These studies were done in areas of varied climate where there can be substantial changes in the weather within the year (Badland, Christian, Giles-Corti, & Knuiman, 2011). As for other environmental factors the strongest correlates for children were walkability, traffic speed and volume (inversely), mix of land use, residential density, and proximity to recreation facilities (Ding, Sallis, Kerr, Lee, & Rosenberg, 2011).

2.4 Park Elements and Impact on Preference

Attributes such as park size (Giles-Corti et al., 2005); the presence of sports fields (Floyd, Spengler, Maddock, Gobster, & Suau, 2008); wooded areas, trails, paths, and sidewalks for walking (Kaczynski, Potwarka, & Saelens, 2008; Reed et al., 2008; Shores & West, 2008) and the total number of features/amenities (Kaczynski et al., 2008) may promote park use and physical activity, while the presence of litter, vandalism, and unclean public facilities may deter use (Gobster, 2002). A positive association was observed between physical activity and several variables, including perceived presence of recreation facilities, sidewalks, shops and services, and perceiving traffic not to be a threat to safety (Brownson, Ross C., Hoehner, C., Day, K., Forsyth, A., 2010). In several studies proximity to recreational facilities appears to be a major determinant of participation in physical activity and there is evidence that distance from parks and open space is inversely associated with use and physical activity behaviors (Kaczynski & Henderson, 2007; Ries et al., 2009). This means the creation of more parks within walking distance of residents could result in greater park use and increased physical into consideration due to some of the variables previously mentioned as people will not utilize parks that are perceived as neglected (Gobster, 2002).

Features within the parks include items such as playgrounds, basketball courts, walking paths, running tracks, swimming areas, lighting, shade, and drinking fountains can all be important for encouraging physical activity among adolescents and their caregivers (Coen & Ross, 2006) Urban parks that provide varied opportunities for leisure activities strongly encourage physical activity among various populations through their accessibility, facilities to encourage active pursuits, and somewhat semi-permanent

nature (McCormack, Rock, Toohey, & Hignell, 2010). Physical activities associated with leisure time can be conducted in a variety of community environments often accessible to citizens at low or no cost (Godbey et al., 2005). Therefore these parks must be of sound design, well up-kept, and possibly redesigned due to changing demographic or shifts in public interest.

2.5 Willingness to Pay for Parks/Green Space

One well-established measure of users' perceived benefits from outdoor recreation is their 'willingness to pay' for continued participation (Loomis J. B., 1989). Willingness to pay includes both the amount that a user actually spend to visit a recreation area and the personal gain that they realize over and above their actual expenditures to participate (Akbar, Puad, & Som, 2010). Establishing a reasonable and affordable pricing policy for public parks and outdoor recreation areas can be an effective way to achieve successful and sustainable management and also provide quality products and services to visitors (Akbar et al., 2010). There are many questions that arise when discussing how to establish an appropriate pricing policy for the recreational areas broad range of users and while preserving the nature beauty parks provide. The willingness to pay method is often used to assess visitors' views and opinions towards potentially paying more in order to sustain an organization's role in nature management and conservation. This is important because increased revenue funds from visitors' fees can greatly improve management efficiency and conservation effectiveness (Spergel & Moye, 2004). It has been found that the most common type of income generating is the entry fee, which has been known for its ability to generate revenue to cover operating costs (Spergel & Moye, 2004). Previous willingness to pay studies done on protected areas

have indicated that tourists were willing to pay the proposed rate, and in many circumstances they were willing to pay far more than the established rate (Riley et al., 2006). As mentioned above this can make establishing the correct fee or price difficult and these park facilities often keep the amount low to ensure wide acceptance.

2.6 Why is this Current Research Study Important?

While there is abundant research on the topics mentioned above: park use, park benefits, physical activity, and public health, park preference, and willingness to pay for park spaces, few studies investigate these relationships during the winter months. Using previous literature on recreation preference and willingness to pay was practical in determining a starting point for winter recreation research but more research is needed until it is truly understood. Planners and designers often acknowledge that recreation planning, design and participation is affected by winter climate and conditions, but few studies investigate these conditions in objectivity. This study attempts to begin the foray into further understanding human preference during cold winter months and provide a standard from which supplementary research may commence. Although it begins to provide insight into public preference there are many facets to truly understanding human preference. Therefore extensive additional research is needed to better comprehend winter recreation preferences. This study will explore the public preferences and willingness to pay for winter recreation activities.

3. Methodology

3.1 Methods: Set-Up

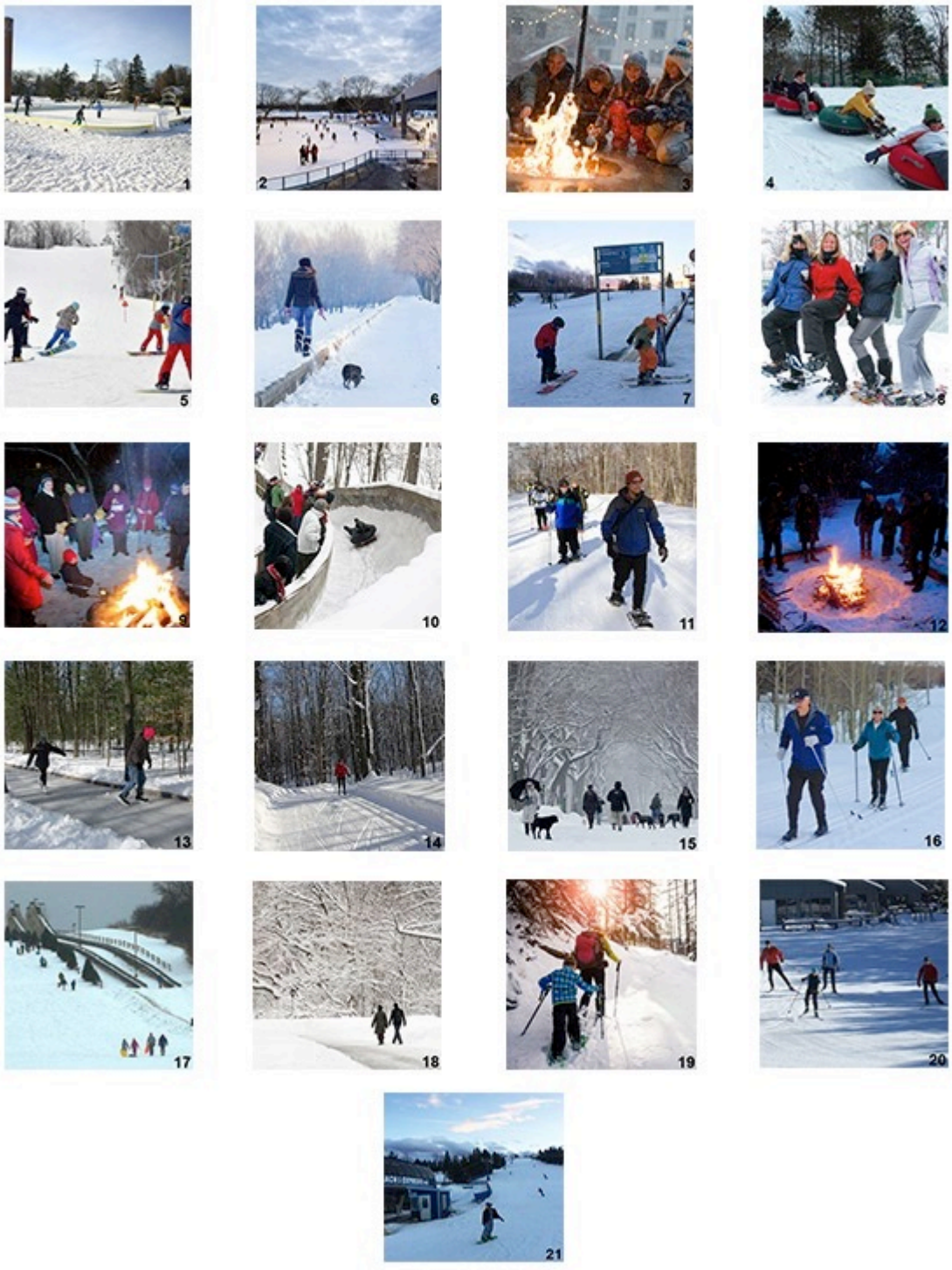
This study seeks to understand the elements of survey respondent's recreation preferences and willingness to pay responses and to see whether these determinants are consistent with the hypothesis. The hypothesis for this study is that there is a correlation between the winter activities that people prefer and how much they are willing to pay for those activities. Each person who participates in the survey will be chosen as a respondent, based on a convenient sampling. Selecting heavily trafficked areas on campus and asking everyone who walked by if they would be interested in taking a short survey achieved this. Areas that were targeted include the main library, the Union, and two dining halls Shaw and Snyder-Phillips. A total of 95 respondents from the Michigan State University campus with ages ranging from 18 to 47 were surveyed in March of 2017, and they broadly defined their winter recreation preference and willingness to pay from the picture set of 21 winter recreation images (See Fig. 1). The survey contained two sections. Section one represented the socio-demographic characteristics of visitors. The second part was designed to identify recreation preferences and the willingness to pay associated with the various pictures/activities. A numbered set of 21 winter recreation activity flashcards was presented and respondents were asked to select those that they would participate given the surveyor defined budget constraint. Three varying budget constraints of $10, $25, and $50 were given as separate surveys in attempt to determine willingness to pay. The surveys were given to respondents who were asked to carefully read the questions and answer them using their best judgment. Respondents identified which pictured activities they would do by circling the associated number on

an answer form. Survey responses were then coded into an excel database in correspondence to the statistical analysis being preformed. With this binary data, investigation using Friedman's Analysis of Variance and Kendall's Coefficient of Concordance was performed to test the following two hypotheses:

Hypothesis 1: There is a correlation between the winter activities that people prefer and how much they are willing to pay for those activities.

Hypothesis 2: Regardless of budget considerations everyone prefers to participate in similar activities.

Figure 1. Activity Set Used in the Survey Instrument



3.2 Methods: Friedman two-way analysis of variance by ranks

Friedman Two-Way of Variance Test is a non-parametric statistical test used to evaluate the treatments' values based on ranks (Daniel, 1978.). When completing Friedman's Test the first step is to convert the results into rankings. To do this, the observations within each block are ranked separately from smallest to largest so each block contains a separate set of *k* ranks

Individual scenarios allowances or treatments are ranked from 1-3 where one is signified as the most chosen from the three treatments and three are the pictures chosen the least. Twenty-one blocks are each ranked for the three different treatments.

For this research, the null hypothesis (H_0) is that there is no correlation between the winter activities that people prefer and how much they are willing to pay and the research hypothesis (H_1) is that there is a correlation between the winter activities that people prefer and how much they are willing to pay for those activities. It is expected that the true state of the null hypothesis will be reflected in the way the sums of the ranks within blocks are distributed over the columns (Daniel, 1978, 225). If all treatments have identical effects than we would expect the sums of the ranks to be objectively analogous in size. In the case that one sum that is sufficiently distinctive from the others, the null hypothesis can then be rejected. The sums are then squared (R^2) and the following equation one is used to calculate the computational chi-squared:

$$x_r^2 = \frac{12}{bk(k+1)} \sum_{j=1}^{k} R_j^2 - 3b(k+1) \quad \text{.....Eq.1}$$

Where:

- b is the number of blocks

- k is the number of treatments
- R is the sum of ranks for reach treatment

When b and k are small x_r^2 is compared for significance with appropriate critical values found in "A Table of Percentage Points of the x^2 Distribution" in Daniel (1978, p. 452). If the computed x_r^2 is greater or to the tabulated x_r^2, researchers can reject the H_o at the alpha (α)= .005 level of significance. Alpha is the percent chance that the null hypothesis is correct. For values of b and/or k that are not included in "A Table of Percentage Points of the X^2 Distribution" the x^2 is compared for significance with the tabulated values of chi-square with k-1 degrees of freedom. If the x_r^2 computed from the data is greater or equal to the tabulated values then the null hypothesis can therefore be rejected at the alpha level of significance (Daniel, 1978).

To adjust for ties within the ranks, tied observations are given the mean of the rank positions for which they are tied. The test statistic may then be adjusted by dividing x_r^2 by the following equation.

$$1 - \sum_{i=1}^{b} T_i \,/\, bk(k^2 - 1) \quad \text{Eq. 2}$$

Where:

- $T_i = \sum t_i^3 - \sum t_i$
- t_i = The number of observations tied for a given rank in the ith block

3.3 Methods: Kendall's Coefficient of Concordance *W*

Kendall's Coefficient of concordance W is concerned with the extent to which two sets of rankings of *n* objects or individuals agree or disagree. In practical applications researchers may be interested in the degree of agreement among several *m* sets of rankings of *n* objects or individuals (Daniel, 1978). Data is organized into a table displaying the score for each image and treatment. Scores for each treatment are then totaled. From there data is then analyzed using Kendall's Coefficient of Concordance (Daniel 1978) to determine the relationship between the pictures in the activity set.

A raw score was given to each image based on the total of the ranks from all respondents. Based on this raw score, a new rank out of 21 was given to each image (because there are 21 images in total). If the raw score of an image was equal to that of another image in the set, the average of the ranks was assigned to all images, this is referred to as a tie. Following the process in Daniel (1978) for Kendall's Coefficient of Concordance, the sum of the ranks for each corresponding image is then found. The sums of the ranks are then squared (R_j^2). The general value for *W* was found using the ensuing equation.

$$W = \frac{12\sum_{j=1}^{n} R_j^2 - 3m^2n(n+1)^2}{m^2n(n^2-1)} \quad \text{.....Eq. 3}$$

Where:

- *W* = Kendall's coefficient of concordance
- *m* = number of sets of rankings
- *n* = number of individuals or objects that are ranked

- R_j^2= Sum of the ranks assigned to the *j*th object or individual

Following Daniel (1978) to determine a valid measure of the relationship or association among the characteristics, researchers must examine the occurrences of rank values within given columns. If the characteristics are unrelated we expect to see rank values within the columns to be a random occurrence and subsequently the columns totals to be approximately equal. If there is a relationship we expect to see some columns with larger ranks and other with a relatively small. We may obtain a measure of the difference of the column totals from expectation by computing the sum of the squared deviations from their expected values. When the observed sets of rankings are in close agreement computed value tends to be large therefore making *W* large. Sufficiently large values of *W* will lead researchers to reject the null hypothesis of no association. In a set of observations that are being ranked if two or more observations are equal then the mean of the tied rank positions was assigned. The original test statistic is then adjusted for ties by replacing the denominator of *W* in Eq. 3 with the following equation.

$$m^2 n(n^2 - 1) - m\sum(t^3 - t) \quad \text{Eq. 4}$$

The chi-square was then computed using the following equation.

$$X^2 = m(n - 1)W \quad \text{Eq. 5}$$

4. Results

Using Friedman two-way analysis of variances by ranks, this study finds that there is no correlation between the winter activities people prefer and their willingness to pay. Furthermore using the Kendall's coefficient of concordance, the study finds that that there is a correlation between activities people want to participate in, regardless of budget considerations.

4.1 Results: Friedman Two-Way Analysis of Variance by Ranks

In this research the results for the Friedman's analysis of variance are as follows. The sum of the ranks for separate scenario allowances shown in Table 1 are equal to: Treatment 1 R=48.5, Treatment 2 R=39.5, and Treatment 3 R=38. The resulting R2 values are as follows: Treatment 1 R^2=2352.25, Treatment 2 R^2=1560.25, and Treatment 3 where R^2=1444. For this research the block number (*b*) is 21 and the number of treatments (*k*) is 3.

Therefore: $x_r^2 = \frac{12}{(21(3)(3+1)}(48.5^2 + 39.5^2 + 38^2) - 3(21)(3+1) = 3.07$ ……Eq. 6

The computational chi-squared is calculated to be $x_r^2 = 3.07$. By dividing the calculated x_r^2 by 1-12/(21*3*(9-1)) the statistic was adjusted for ties resulting in a revised $x_r^2 = 3.15$.

Table 1. Results of Friedman's Two-Way Analysis of Ranks

Pictures	Treatment 1 ($10)	Rank	Treatment 2 ($25)	Rank	Treatment 3 ($50)	Rank
1	0.30	1.5	0.28	3	0.30	1.5
2	0.58	3	0.78	1	0.67	2
3	0.67	3	0.75	1	0.70	2
4	0.67	3	0.88	1	0.70	2
5	0.36	3	0.47	2	0.50	1
6	0.39	2	0.50	1	0.37	3
7	0.33	3	0.44	2	0.47	1
8	0.42	1	0.34	2	0.27	3
9	0.61	2	0.56	3	0.70	1
10	0.58	3	0.78	2	0.80	1
11	0.39	1	0.25	3	0.37	2
12	0.64	2	0.72	1	0.63	3
13	0.55	3	0.63	1.5	0.63	1.5
14	0.36	2	0.22	3	0.40	1
15	0.39	3	0.44	1	0.43	2
16	0.42	1	0.28	3	0.40	2
17	0.45	3	0.75	1	0.57	2
18	0.36	3	0.38	1	0.37	2
19	0.42	1	0.19	3	0.30	2
20	0.39	2	0.25	3	0.40	1
21	0.33	3	0.53	1	0.47	2
Sum of Rank		48.5		39.5		38
Sum Squared		2352.25		1560.25		1444

In this research the alpha or level of risk (α) is equal to 0.05. Alpha is the percent chance that the null hypothesis is correct. When the alpha is equal to 0.05, it means that there is a 95% chance that the research hypothesis is true. Using the book, Applied Nonparametric Statistics, Daniel provides a table (Daniel, 1978, p.452) that contains the chi-square values of $x^2_{(1-\alpha)}$ with k-1 degrees of freedom (Daniel, 1978). If x_r^2 is greater than or equal to the tabulated value of $x^2_{(1-\alpha)}$ with 2 degrees of freedom, then the null hypothesis will be rejected (Daniel, 1978). The value of $x^2_{0.95}$with 2 degrees of freedom is

5.991, which is larger than the revised computational chi-square of 3.15. Therefore, in this research, we can reject the research hypothesis and accept the null hypothesis.

4.2 Results: Kendall's Coefficient of Concordance *W*

As discussed in the Methods section, a rank was given to each image out of 21 based on the raw scores from all 95 respondents. If ties in raw scores occurred, they were accounted for (i.e. Images 2 and 10 both had a raw score of .58, therefore the average of ranks (5+6)/2 = 5.5 was given). This process was repeated for all treatments. The *m* and *n* are given where *m* is the number of sets (3) and *n* is number of images in each set (21). Table 2 shows the relationship between all treatments with the raw scores and individual ranks for each image. The general value of *W* was then found using Eq. 3 by substituting R_j^2, *m*, and *n* variables for their corresponding values in the following equation calculated *W* = .805 shown in equation 7.

$$.805 = \frac{(12x28448.5)-3(3)^2 21(21+1)}{3^2 21(21^2-1)} \quad \text{.....Eq.7}$$

W was then adjusted for ties using Eq. 4. By substituting the R_j^2, m, n, and $\Sigma(t^3-t)$ variables for their corresponding values, it was computed that the revised *W*=. 825. Where: W = Kendall's coefficient of concordance adjusted for ties.

$$W = \frac{(12x28448.5)-3(3)^2 21(21+1)}{3^2 21\left(21^2-1\right)-3(684)} \quad \text{.....Eq. 8}$$

Table 2. Results of Kendall's Analysis Part 1

Scenarios	Treatments									
Pictures	1	2	3	4	5	6	7	8	9	10
$10	0.30	0.58	0.67	0.67	0.36	0.39	0.33	0.42	0.61	0.58
rank	21	5.5	1.5	1.5	17	13.5	19.5	10	4	5.5
$25	0.28	0.78	0.75	0.88	0.47	0.50	0.44	0.34	0.56	0.78
Rank	16.5	2.5	4.5	1	11	10	12.5	15	8	2.5
$50	0.30	0.67	0.70	0.70	0.50	0.37	0.37	0.27	0.70	0.80
Rank	19.5	5	3	3	9	16.5	16.5	21	3	1

Sum of Rank	57.0	13.0	9.0	5.5	37.0	40.0	48.5	46.0	15.0	9.0
Square	3249.00	169.00	81.00	30.25	1369.00	1600.00	2352.25	2116.00	225.00	81.00

Table 3. Results of Kendall's Analysis Part 2

Scenarios	Treatments										
Pictures	11	12	13	14	15	16	17	18	19	20	21
$10	0.39	0.64	0.55	0.36	0.39	0.42	0.45	0.36	0.42	0.39	0.33
rank	13.5	3	7	17	13.5	10	8	17	10	13.5	19.5
$25	0.25	0.72	0.63	0.22	0.44	0.28	0.75	0.38	0.19	0.25	0.53
Rank	18.5	6	7	20	12.5	16.5	4.5	14	21	18.5	9
$50	0.37	0.63	0.63	0.40	0.43	0.40	0.57	0.37	0.30	0.40	0.47
Rank	16.5	6.5	6.5	13	11	13	8	16.5	19.5	13	10

Sum of Rank	48.5	15.5	20.5	50.0	37.0	39.5	20.5	47.5	50.5	45.0	38.5
Square	2352.25	240.25	420.25	2500.00	1369.00	1560.25	420.25	2256.25	2550.25	2025.00	1482.25

Finally, the chi-square value was determined using by Equation 5 substituting the variables x^2, m, n, and W (adjusted for ties) for their corresponding values to come up with equation 9 where x_r^2 = 49.53.

x_r^2= 3(21-1) 0.805……..…Eq. 9

Where: x_r^2= chi-square value.

In this research the alpha or level of risk (α) is equal to 0.005. Alpha is the percent chance that the null hypothesis is correct. When the alpha is equal to 0.005, it means that there is greater than a 99% chance that the research hypothesis is true. Using the book, Applied Nonparametric Statistics, Daniel provides a table (Daniel, 1978, p.452) that

contains the chi-square values of $x^2_{(1-\alpha)}$ with k-1 degrees of freedom (Daniel, 1978). If the calculated value of x^2_r is greater than or equal to the tabulated value of $x^2_{(1-\alpha)}$ with 20 degrees of freedom, then the null hypothesis will be rejected (Daniel, 1978). The value of $x^2_{0.995}$with 20 degrees of freedom is 39.99, which is smaller than the revised computational chi-square of 49.53. Therefore, in this research, we can reject the null hypothesis and accept the research hypothesis that there is a relationship between activities people want to participate in regardless of budget considerations.

5. Discussion

5.1 Introduction

This study investigates the willingness to pay and activity preference associated with winter recreation commonly found in Michigan parks and landscapes. The results of our initial analysis using Friedman's two-way analysis of variance on the ninety-five surveys begins to shed light on winter recreation preference and willingness to pay. Given that the survey respondents were found on Michigan State University's campus in East Lansing, the results provide insight on winter park use of a rather specific demographic. Regarding the first hypothesis, the results of the Friedman's two-way analysis of variance test show there is no significant correlation between winter activity preference and willingness to pay. When considering the second hypothesis it was found that the statistical analysis using Kendall's Coefficient of Concordance showed significant results at the .995 significance level, that although users do not consider willingness to pay when determining recreation preference, their activity preference selection was consistent across the three different scenario allowances ($10, $25, $50) without regard to budget.

The following pictures shown in Figure 2 and Figure 3 respectively represent the pictures selected most consistently and those least selected across the three budgets.

Figure 2. Activities most selected across all budgets

Figure 3. Activities least selected across all budgets

This discussion is structured to address why this activity selection occurred using the key concepts listed as follows: Perceptions of Budget versus Price; Preference versus Desire/Want; Demographic Considerations; Recognition of Infrastructure Development; and Proximity.

5.2 Perceptions of Budget versus Price

When looking at reasons to explain the results of the Friedman's statistical analysis it can be justified by a misunderstanding of the survey question at the $10 scenario allowance. Numerous respondents did not seem to understand the difference between a "price" and a "budget" and therefore misunderstood the question. In this survey the differentiation between price and budget is essential to the understanding of the survey instrument. Price can be defined as: the amount of money given or set as consideration for the sale of a specified thing or the cost at which something is obtained. To compare a budget can be defined as: a quantity involved in, available for, or assignable to a particular situation. Misunderstanding the difference of these two terms may have caused several of them to answer in an incorrect manner skewing the results. For example, some of the activities pictured are not possible to participate in if your budget is $10, but the majority of respondents selected them regardless of the fact that they couldn't afford it. This leads researchers to believe that numerous respondents may have thought the price of each individual picture was $10, which is not the case. In effect, if people believe that all the activities pictures cost $10, then its understandable that they would select every picture as a preferred activity. However, if respondents had to make activity choices when they only had $10 to spend (i.e. a $10 budget) whereas if

they have a $10 budget and they understood what activities actual cost, they would be unable to participate in several of the activities such as those shown in Figure 2.

Figure 4. Examples of Activities Outside of $10 Budget

Survey responses and anecdotal input received when survey recipients asked follow up questions of the researcher brought forth additional insight. One respondent in particular, an older gentleman who received the $10 budget, seemed to understand the question as intended. After the survey was completed he asked questions in regards to being unable to afford many of the activities, which was reflected in his responses. In comparison, many of the respondents at the $10 dollar scenario allowance selected many if not all of the activities that would have been outside of their given budget. Another respondent with the $10 budget who selected every single activity made the comment "I don't think my results will help you very much, I would do all of these activities for $10". It is unfortunate that this type of response occurs simply because many of the

activities pictured are undoubtedly outside of a $10 budget thus skewing the results towards insignificance. This response was typical of a large majority of the respondents who were within to 18-20 year age range and didn't take the time to fully read and comprehend the question of budget versus price level.

An interesting observation is that many respondents only seemed to misunderstand the question with a lower budget. Although people with higher budgets choose many of the same activities in similar ratios, at the $50 dollar budget all activities were affordable while most of them were within the $25 budget. While looking at the data in this manner researchers deduced that this many of the respondents are essentially unaware of many of the possible winter recreation activities and their price structure. The most popular activity choices across all budgets were those perceived by researchers as the most available, accessible, or traditional of winter recreation. They were also activities that featured a high degree of social interaction and or thrill seeking during associated recreation activities. This begins to provide insight into possible design solutions that may increase outdoor recreation opportunities during winter months. Activities most selected as preferred across all price levels include those such as: sledding, skating, and social events with a strong central heat source such as a bonfire or fireplace.

An additional budget consideration is whether survey respondents assumed ownership of equipment or clothing. During this study it was difficult to take into account various equipment requirements for different activities and researchers simply allowed respondents to make their own assumptions about cost, in hope to generate a wider price structure on account of respondents conceivably renting equipment and pay to play/use

areas. This was intentional hoping that respondents without proper equipment would be paying increased prices on activities requiring rentals while those with the equipment adjusted prices accordingly. When a respondent is in possession of equipment required for certain activities the price structure of these activities drops significantly. For example, once an individual buys cross country skies or snowshoes, two of the activities featured in the activity set the cost to participate drops significantly from free to often times less than $5 dollars at park facilities featuring additional amenities such as groomed and illuminated trails.

If an individual is not in possession of such equipment it is often available to rent at many park facilities. With rentals and pay to use fees implemented for an activity such as cross country skiing it becomes a matter of how much is an individual truly willing to pay to participate in these activities. This was an issue however as mentioned above users are simply unaware how much various winter recreation activities cost. A possible clarification to this study may be to include prices on the pictures of the activity set representative of their actual cost. Although in theory this seems simple, accounting for variables such as travel and equipment costs cause the prices to vary drastically from one place to another for the same or similar activities making it very difficult.

Potential misunderstanding of the survey question is one limitation of this study as mentioned above. A hypothetical remedy to this misunderstanding of price versus budget might be to structure the survey instrument as a game similar where respondents are assigned a dollar amount and asked to spend it on activities they wish to participate in which are assigned different monetary values as well as various necessary items such as food, transportation, tuition, housing, etc. It was discussed if prices should be included in

this survey but researches eventually decided to omit this and let the respondent make their own assumptions based on equipment owned and personal experience with various activities.

Another method to achieve significant data may be to set up the survey scenario differently and provide concise write up of very specific scenario allowances. For example, "You are planning a weekend of activities and you have a $50 budget for recreation activities after bills (food gas/transportation, housing, tuition, etc.), which of the following would you participate in?" Give them choice of activities five free/low cost, five medium cost, and five high cost. Price the individual activities within the activity set to reflect actual price structure of the activities in reality. Give people a varying budgets and keep activities the same price and so the only thing you change is the different budgets for people similar to the study that was given. Include the standard yes/no answer for participation but also include options for answering such as: interested but unwilling or unable to pay the price pictured. An alternative addition could be a time frame that forces people to make a decision about which activities they actually want to participate in with the given budget and time frame. With this method researchers may be able to separate actual preference and what they are willing to pay for from those respondents choosing activities solely because they looked fun.

5.3 Preference versus Desire/Want

Another misunderstanding that may have occurred when in response to the survey instrument is a confusion of preference versus desire or want. One may consider these two terms similar but in application a respondent simply cannot do everything and therefore must make a conscious choice of what to participate in. These two terms differ

in scope of ones ability to participate. At the $50 budget, all activities were within the budget restraint therefore enabling respondents to choose any activities that they would want to do. At this scope there is essentially no difference between want and preference because one has the means to do whatever they desire. In essence they prefer to do everything simply because they can Preference becomes more visible in the equation at lower budgets when activities start to become unavailable and respondents must choose those activities that they prefer instead of all of those that look entertaining.

To change the survey question so that this type of demographic understands the survey instrument clearly, it must be simplified. One possible method to achieve this might be to simply offer a similar activity set as the one offered in this research with the following adjustments suggested to the survey instrument. When defining winter recreation preference instead of selecting all of those that they would participate in for a given budget, the researchers could instead have respondents only select a limited number, 3 for example, that they would choose. In looking at this data it may be possible to achieve further conclusions about what activities draw interest during winter months when recreation preference is not as often participated in.

5.4 Demographic Considerations

One problem with a convenient sampling in front of cafeterias is a younger demographic of significant economic security within the MSU community that effects the data collected from this survey. These younger students may not understand cost structure because of financial security and perhaps didn't take the time to fully read and understand the survey question. In other words due to their young age and worldviews they just skipped over the part saying budget and just picked whatever activities they

wanted. Researchers believe that many survey respondents simply don't have to pay for anything due to being raised by successful parents. The increase in economic security in recent years has resulted in an increased budget for recreation or leisure activities allowing many younger demographics opportunities otherwise unavailable.

Additionally, it is not known if winter recreation activities are familiar to this demographic. Many people do not actually participate in winter activities so they have no experience with what they cost. Many opportunities are available for winter recreation at affordable costs but many respondents are unaware of the availability of many of the pictured activities. When looking at the pictured activities they simply picked those that they thought they might enjoy, even if the respondent has never actually done the pictured activity. Another consideration is that respondents selected winter activities that are considered traditional or familiar to what they perceive as winter recreation. If a person is unaware of an activity represented in a photo they may be unlikely to choose said activity because people are often reluctant to choose the unfamiliar.

It could also be presumed when looking at the pictures that many respondents chose activities that represent those that could be considered as social activities versus primarily solo activities. These include activities such as ice skating, sledding, as well as sitting around a fire. This is another hypothesis that could be tested in order to further the understanding of winter recreation preference. One method to test this could be another photo preference study showing example of primarily social spaces versus those same activities represented as solo activities. If the hypothesis were true researchers would expect to see significantly more selection of the social spaces than solo spaces. This

simple understanding of social versus independent spaces could be essential for planners and designers developing a variety of parks and open spaces at various scales.

5.5 Recognition of Infrastructure Development

An area for further investigation within this research is recognition of infrastructure development and infrastructure cost. To help spread the willingness to pay to a wider range of values, researchers attempted to select pictures representing comparable activities at various levels of infrastructure support. This was done in an attempt to show similar activities at different cost levels. It was anticipated that respondents would be able to recognize an increased investment in the development of pictured activity and surrounding space, and thus be willing to pay more for it. However, the results imply that survey respondents did not even recognize the infrastructure differences between images. For example, they may not see the magic carpet, versus the rope tow, versus the chairlift (Figure 5) and even if the respondents note these varying levels of infrastructure, the results may be because they have no clue as to what a rope tow costs versus a chairlift.

Figure 5. Infrastructure Variation Activity Set

It may be that respondents are unable to consider the increased value of a space to due to improved infrastructure developments when viewed in picture form. To determine if this is true researchers could a conduct a similar study to the current research. To accomplish this it may be that researchers use the same set of pictures used in the activity set and simply ask respondents, "How much are you willing to pay for this activity?". The data from this study could help reveal if people are taking increases in design development into consideration when considering willingness to pay for an activity. Including more activities that represent those that are available at varying price structures could expand upon this and provide experts with an increase understanding of a consumer's willingness to pay for recreation infrastructure.

5.6 Proximity

When looking at the picture set using Kendall's, it can be noted that pictures with higher scores are also activities that tend to be more widely available to the general population. One item that must be taken into consideration to account for this is the lack of proximity as a variable in this study. In previous literature proximity has been shown to have a significant impact on participation in many recreation studies conducted during the summer months. Due to the lack of literature regarding winter recreation it was difficult to access distance in this study but one can make inferences about distance based on respondent picture selection. Many of the activities selected a significant amount of times appear to be those that are readily accessible in the current planning and design paradigm. These include activities such as sledding and social events, particular those providing a comfortable outdoor environment with a central heat source. When looking at

winter recreation in particular it is important to consider proximity due to a number of variables such as weather conditions that may restrict safe travel.

Researchers may discover that if you include items such as distance required getting to an activity it might influence respondent's willingness to pay. It could be an alternative hypothesis that willingness to pay will increase as distance traveled for activity increases due to importance of the activity to that person. This can be explained by ones interest in a given activity. Respondents who are regular participants in an activity may be willing to travel a greater distance and pay more to participate. An example of this could be represented by an urban respondent trying to participate in skiing or snowboarding. Researchers believe this was not selected due to travel and cost increases caused by larger travel times. For much of the general population it becomes infeasible top participate in activities such as these at regular intervals and they are regarded as a vacation activity or one not participated in often due to the restrictions mentioned above. This is another study that needs to be conducted to truly understand people's winter recreation preferences and continue to help planners and designers develop effective spaces.

6. Conclusion

This research set out to fill a gap in winter park recreation preference and willingness to pay. This important for planners and designers in order to better design functional sites that can provide year round recreation value. Investigating public recreation preference and willingness to pay this study found that there is no significance between the amount of money someone is budgeted and the activities that they prefer. It was found however that there is a significant association between the activities that people prefer regardless of how much money they are budgeted. In other words everyone wants to participate in similar activities, regardless of budget. These studies are in line with previous literature investigating summer recreation that recognizes preference for a particular activity over another or that parks with more activities are more preferred. More important than the statistical results is the discussion on what may or may not be influencing people to choose a particular winter recreation activity and their willingness to pay. It provides insight into various aspects to consider when planning and designing parks such as demographic and use. It also shows that as planners and designers it may not be helpful to consider willingness to pay due to respondent's insensitivity to considering it. It is hoped that the knowledge gained from this study will help researchers further the understanding of winter recreation preference as well as help park planners and designers be able to better design four-seasons recreation facilities.

APPENDIX

Figure 6. Image 1

Source: http://www.bhamgov.org/revize_photo_gallery/BarnumPark/Barnum_Ice_Rink___December_2010_003.jpg, http://www.bhamgov.org/revize_photo_gallery/BarnumPark/

Figure 7. Image 2

Source: https://media.timeout.com/images/102699231/image.jpg

Figure 8. Image 3

Source: http://blog.hawkpr.com/wp-content/uploads/2014/02/HM-Firepit-Marshmallows.jpg, http://blog.hawkpr.com/wp-content/uploads/2014/02/HM-Firepit-Marshmallows.jpg

Figure 9. Image 4

Source: http://pk.ingham.org/Portals/PK/Images/Burchfield/DSCF0091.JPG

Figure 10. Image 5

Source: http://bloximages.newyork1.vip.townnews.com/petoskeynews.com/content/tncms/assets/v3/editorial/f/70/f7065612-b557-11e5-b5a2-736d3383ec0e/568e8bef908ec.image.jpg?resize=1200%2C755

Figure 11. Image 6

Source: http://pets.uteki.net/wp-content/uploads/2016/01/dog-walking-in-winter.jpg

Figure 12. Image 7

Original photo by: Aaron Senchuk

Figure 13. Image 8

Source: https://mikelovestc.files.wordpress.com/2013/02/timber-ridge-ladies-showing-shoes1.jpg

Figure 14. Image 9

Source: http://2.bp.blogspot.com/_hikjq4SSRx4/TRFzXxPkkII/AAAAAAAACJ8/f7skoXp87Us/s1600/S33.JPG

Figure 15. Image 10

Source: http://www.wmta.org/wp-content/uploads/2015/12/muskegon-park-1.jpg

Figure 16. Image 11

Source: https://recreation-acm.activefederal.com/assetfactory.aspx?did=6557

Figure 17. Image 12

Source: https://searchedafterfoundeverywhere.files.wordpress.com/2014/01/january-bonfire-9.jpg

Figure 18. Image 13

Source: http://3.bp.blogspot.com/-p0dDMCXg2WA/UTPyzjQkyJI/AAAAAAAACxA/PMfM9UydmEQ/s1600/Muskegon_IceSkatingTrail.jpg

Figure 19. Image 14

Source: http://www.crystalmountain.com/images/galleries/cross-country-skiing/04-cross-country.jpg

Figure 20. Image 15

Source: http://media.gettyimages.com/videos/view-of-snow-storm-at-central-park-and-people-and-dogs-walking-down-video-id514836845?s=640x640

Figure 21. Image 16

Source: http://www.tetonpines.com/Images/Library/trails.jpg

Figure 22. Image 17

Source: http://www.aroundwaukesha.com/wp-content/uploads/2012/01/Lowell-Park-Toboggan-Run.jpg

Figure 23. Image 18

Source: http://cdn.c.photoshelter.com/img-get2/I0000HnyntHkCuug/fit=1000x750/Winter-Wonderland.jpg

Figure 24. Image 19

Source: http://www.todaysparent.com/family/activities/50-essential-winter-activities/#gallery/50-essential-winter-activities-new-gallery-size/35

Figure 25. Image 20

Source: http://www.gannett-cdn.com/-mm-/fc09bb184ad59f2526c0012e3b4f69fa95d66fd7/c=0-158-3024-1859&r=x633&c=1200x630/local/-/media/Lansing/2015/01/07/B9315777386Z.1_20150107182620_000_G0G9K6ME4.1-0.jpg

Figure 26. Image 21

Original photo by: Aaron Senchuk

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