Exploring the Influence of Survey Item Order and Personality Traits on Perceived-crowding and Recreational-satisfaction in an Urban Park Environment

by

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ABSTRACT

Crowding and satisfaction remain widely studied concepts among those seeking to understand quality visitor experiences. One area of interest in this study is how the order of crowding and satisfaction items on a survey affects their measurement levels. An additional area of interest is the influence of personality traits on experience-use-history, crowding, and satisfaction. This study used two versions of a survey: A) crowding measured prior to satisfaction and B) satisfaction measured prior to crowding, to explore the influence of item order on crowding and satisfaction levels. Additionally, the study explored the influence of personality traits (extraversion and neuroticism) and experience use history (EUH) on crowding and satisfaction. EUH was included as a variable of interest given previous empirical evidence of its influence on crowding and satisfaction. Data were obtained from an onsite self-administered questionnaire distributed to day use visitors at a 16,000 acre desert landscape municipal park in Arizona. A total of 619 completed questionnaires (equally distributed between the two survey versions) were obtained. The resulting response rate was 80%. One-way ANOVA's indicated significant differences in crowding and satisfaction levels with both crowding and satisfaction levels being higher for survey version B. Path analysis was used to test the influence of personality traits and EUH on crowding and satisfaction. Two models, one for each version of the survey were developed using AMOS 5. The first model was tested using data in which crowding was measured prior to satisfaction. The second model relied on data in which satisfaction was measured prior to crowding. Results indicated that personality

traits influenced crowding and satisfaction. Specifically, in the first model, significant relationships were observed between neuroticism and crowding, neuroticism and EUH, EUH and crowding, and between crowding and satisfaction. In the second model, significant relationships were observed between extraversion and crowding, extraversion and satisfaction, and between EUH and satisfaction. Findings suggest crowding and satisfaction item order have a potential to influence their measurement. Additionally, results indicate that personality traits potentially influence visitor experience evaluation. Implications of these findings are discussed.

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Chapter 1

INTRODUCTION

Natural resource management is in a constant state of evolution. Growing populations, multi-use demands, environmental concerns, and budget limitations make mindful and efficient resource management increasingly important. Among the many issues that resource managers need to be concerned with, is managing for optimal visitor experiences. Perceived-crowding (crowding) and satisfaction remain two commonly measured visitor experience variables. Crowding is conceptualized as the negative valuation of human-density levels. Research indicates that crowding perceptions may be influenced by situational variables, characteristics of others encountered, and personal characteristics (Manning, 2011). Recreational-satisfaction is the subjective valuation of experiential variables (Williams, 1989) that may be influenced by emotion (Mano & Oliver, 1993; Noe & Uysal, 1997; Oliver, 1993).

One way of ensuring sound management decisions is to base these decisions on reliable and valid data. The literature suggests that ordering of survey items on a questionnaire and the proximity in which items are placed may influence how items are interpreted (Huber, G.P., 1985; Lau, Sears, & Jessor, 1990; Schomaker & Knopf, 1982; Sears & Lau, 1983). As such, one area of interest in this study is the influence of survey item order on crowding, satisfaction, and relationships among them.

Beyond this, the influence of other variables on crowding and satisfaction remain of interest. One such influencing variable is experience-use-history

(EUH). EUH is a multi-item construct that measures past experience with a place. Relationships between crowding, satisfaction and EUH have been explored in many studies (e.g. Absher & Lee. 1981; Armistead & Ramthun, 1995; Arnberger & Brandenburg, 2007; Budruk, Wilhem-Stanis, Schneider, & Heisey, 2008); however, results are not generalizable and therefore suggest a need for further exploration. The role of personality traits as an additional possible influencing variable on the crowding and satisfaction relationship is of interest here.

Personality traits are relatively stable internal human characteristics which influence human behavior in a consistent manner. Given that recreation engagements are freely chosen, unstructured and informal, it is likely that personality traits will manifest themselves and exert influence on behavior (Hampson, 1988; Mannell & Kleiber, 1997). Indeed personality traits have been shown to influence density and perceptions of crowding in non-recreational contexts (Iwata, 1979; Katsikitis & Brebner, 1980; Khew & Brebner, 1984). Yet, the likely relationship between personality and crowding perceptions has not been tested in a recreational context. Additionally, a relationship between personality traits and satisfaction has been hinted at in the context of leisure domains (Lu & Hu, 2005); however this relationship deserves further investigation. As such, this study adds to the literature by exploring the influence of personality traits on previously explored EUH-crowding and satisfaction relationships. Two primary personality traits are of interest. These are extraversion and neuroticism. Extraversion represents how outgoing or social (e.g. adventurous, talkative, frank)

a person is. Neuroticism represents how emotionally stable (e.g. anxious, sad, moody) an individual is (Ajzen, 2005; Goldberg, 1990; Tupes & Christal, 1961, 1992).

Given these gaps in knowledge, this study answers the following research questions:

R1: *Does survey item order affect crowding and satisfaction levels?*

R2: *Do the personality traits extraversion and neuroticism influence experience-use-history, crowding, and satisfaction levels?*

R3: *Does experience-use-history affect crowding and satisfaction levels?*

R4: *Does crowding affect satisfaction levels?*

Chapter 2

LITERATURE REVIEW

This chapter reviews literature pertaining to survey item order bias, personality and the personality traits extraversion (E) and neuroticism (N), experience-use-history (EUH), perceived-crowding, and recreational-satisfaction.

Item Order Bias

Item order bias suggests that the order in which items are presented may influence the way other items are interpreted (Huber, 1985). Indeed, few studies have identified survey item ordering, or response order, as a potential source of bias (Huber, 1985; Lau et al., 1990; Schuman, Presser, & Ludwig, 1981; Schomaker & Knopf, 1982; Sears & Lau, 1983). Political science literature has suggested that two forms of bias called "personalization" and "politicizing" may influence item response. Personalization has been identified as a bias introduced when a question of a personal nature is asked prior to a subjective valuation of a politician or political concept. Similarly, politicizing was identified as when questions of a personal nature are asked after questions related to a politician or a political concept. For each of these biases to affect response it is suggested that the questions must be in close proximity of each other (Lau et al., 1990; Sears & Lau, 1983).

Personalization suggests that a person will rate the politically based item based on the personal information they had previously been asked to provide. For example, research has indicated a relationship between personal financial situations and presidential approval. However, this relationship was only apparent

when the financial questions were asked immediately prior to the presidential performance questions (Lau et al., 1990; Sears & Lau, 1983). That is, people who indicated that in the past year they had done financially better than they expected gave the president a higher approval rating than those who felt they had done financially worse. However, this relationship was only observed when the financial questions were asked first and in close proximity to the political opinion questions. Similarly, this bias was also observed when assessing personal finances and attitudes toward tax policy (Sears & Lau, 1983).

Politicizing, in contrast to personalization, suggest that a person will rationalize their response to personal questions if asked immediately after a political opinion. As such, people may rate their personal situation in regards to their political opinion or choices. This relationship has been observed in relation to governmental economic performance ratings and personal finances. As respondents gave higher ratings to governmental performance they also gave higher ratings to their personal financial situation (Lau et al., 1990; Sears & Lau, 1983).

Item order bias has also been observed in public opinion research regarding abortion (Schuman et al., 1981). Respondents were asked their opinion of two items regarding abortion, one specific and one general. The specific item asked respondents if they approved of abortion if the child was to be born with birth defects. The general item asked if respondents approved of abortion if the mother did not want children. Two surveys were administered each asking the questions in reverse order. When the general question was asked first, respondents

were more likely to approve of an abortion if the mother did not want children as opposed to the specific question being asked first (Schuman et al., 1981).

In a recreation context, item order bias was observed while evaluating satisfaction of river users (Schomaker & Knopf, 1982). In this study, different survey versions were administered that presented identical satisfaction items in different contexts. That is, one version mixed satisfaction items with various situational items which evaluated density levels, river conditions, and wildlife. Another version asked the satisfaction items by themselves. Results indicated a significant difference in mean satisfaction ratings across versions. Satisfaction was higher when the items were asked by themselves rather than being mixed in with the situational items.

These studies have revealed a potential relationship between survey item response and the order and proximity in which questions are asked. This indicates that social science researchers must be mindful of item placement and potential biases that may otherwise result.

Personality

Personality trait research defines and explains human traits that most readily influence human behavior. Personality traits are viewed as relatively stable internal human characteristics which influence human behavior in a consistent manner. It is likely that these traits become important in situations that are informal, familiar, unstructured and freely chosen (Hampson, 1988; Mannell & Kleiber, 1997). Recreation and leisure experiences are assumed to be freely chosen and done without undue pressures, thus allowing the participants

opportunities for self expression, or in other words, the freedom "to be themselves" (Mannell & Kleiber, 1997, p. 155). As such, recreation and leisure are ideal situations in which personality can manifest and be most influential.

Personality trait models have developed around the assumption that individual traits may be identified through behavioral manifestations (Ajzen, 2005). Several different personality trait models such as the EPQ (Eysenck Personality Questionnaire) or P-E-N (Psychoticism-Extraversion-Neuroticism) (Eysenck, 1991), the Five Factor IPIP (International Personality Item Pool) (Goldberg et al., 2006), and the 16PF (16 Personality Factors) (Cattell & Mead, 2008) have been suggested. Each of these models essentially explains the same construct. It is the hierarchical structure of these different models that raises debate. For example, Eysenck (1991) argues that larger models, such as the 16PF, can be factored down to three primary personality dimensions, i.e. psychoticism, extraversion, and neuroticism. In other words, psychoticism, extraversion, and neuroticism are primary factors and the 16PF can be reduced to these three factors. Although these different models are assumed to measure essentially the same psychological construct, the means by which they were developed are quite different. The P-E-N model, for example, was developed on theory grounded in genetics and biological differences. As such, personality traits described in this model are related to the brain and nervous system (Eaves & Eysenck, 1975; Eysenck, 1967; Eysenck, 1990). For example, it is suggested that due to differences in the brain, which effect cortical arousal, some people are naturally in a higher state of arousal, i.e. introverts, than others, i.e. extraverts. This suggests

that introverts would reach unpleasant levels of arousal quicker than extraverts. As such, introverts may avoid arousing situations, while extraverts may seek out these situations, to maintain a comfortable state of arousal. Similarly, this theory also suggests that some people's nervous systems are highly sensitive to stimulus. Those who are highly sensitive, i.e. neurotics, are more prone to experience fear and anxiety (Eysenck, 1967).

Unlike the P-E-N model, the Five Factor IPIP model, was derived through trait identification methods and factor analysis. Early research by Tupes and Christal, first published in 1961 and later again in 1992, reviewed thirty-five traits identified in previous personality trait research. In eight separate studies, analyzing both male and female subjects of varied educational backgrounds and social structures, five prominent traits repeatedly emerged: surgency (i.e. extraversion), agreeableness, dependability (i.e. conscientiousness), emotional stability (i.e. neuroticism), and culture (i.e. openness or intellect) (Tupes & Christal, 1961, 1992). Their results indicated that extraneous variables (i.e. gender, education, and social structure) had very little effect on factor loadings across samples, thus, providing sufficient generalizability of the five identified traits. Nearly 30 years after Tupes and Christal's (1961, 1992) initial findings, Goldberg (1990) revisited the topic. Goldberg's study differed from Tupes and Christal's work by focusing on over 1,700 trait descriptive items. His findings offered further support of the five factor model. A comparison of these five personality traits may be found in Goldberg (1990, p. 1217). Each of the five personality traits are described as follows:

Extraversion, also known as surgency, is a dominant personality trait found, in one form or another, in numerous trait models dating back to Galen's four temperaments, 200 A.D. (Eysenck, 1967; Robins, Fraley & Krueger, 2007). Extraversion may be characterized by the descriptive terms: sociable, playful, adventurous, and talkative (Ajzen, 2005; Goldberg, 1990; Tupes & Christal, 1961, 1992). The opposite end of the extraversion continuum, also known as introversion, may be characterized by the descriptive terms: reserved, secretive, shy, and passive (Goldberg, 1990).

Agreeableness, the second trait mentioned in the five factor model, is associated with being empathetic and courteous. This trait can further be characterized by the descriptive terms: trustworthy, generous, tolerant, and honest. The opposite end of the agreeableness continuum is associated with indifference and hostility. This can further be characterized by the descriptive terms: aggressive, dogmatic, temperamental, and dishonest (Goldberg, 1990).

Conscientiousness, also known as dependability, is associated with being orderly and dependable. This trait can further be characterized by the descriptive terms: precise, punctual, and efficient. The opposite end of the conscientiousness continuum is associated with being inconsistent and rebellious. This can further be characterized by the descriptive terms: negligent, reckless, aimless, and frivolous (Goldberg, 1990).

Neuroticism, like extraversion is found across personality trait models (Eysenck, 1991). It has been described as "the tendency to be excessively emotional and to respond with anxiety to stressful situations" (Ajzen, 2005, p. 28)

and as "a proneness to negative emotions" (Dollinger, 1995, p. 476). This trait can be characterized by the descriptive terms: insecure, envious, gullible, and fearful. The opposite of neuroticism is emotional stability. Emotional stability can be characterized by the descriptive terms: calm, poised, emotionally stable, and independent (Goldberg, 1990).

Intellect, the final of the five personality factors, is also known as openness and culture. This trait is associated with being intellectual and open to new ideas. This trait can be further characterized by the descriptive terms: insightful, curious, creative, and sophisticated. The opposite end of the intellect continuum is associated with being shallow. This can further be characterized by the descriptive terms: unimaginative and imperceptive (Goldberg, 1990).

These five personality traits have been useful in exploring areas such as self-esteem and life satisfaction (Kwan, Bond, & Singelis, 1997), academic success (O'Connor & Paunonen, 2007), work performance (Barrick & Mount, 1993) and consumer preference (Mulyanegara, Tsarenko, & Anderson, 2007). Within the recreation and leisure fields, studies have focused on the personality traits extraversion and neuroticism. These studies have evaluated leisure motivation (Lin, Chen, Wang, & Cheng, 2007), leisure preferences (Kirkcaldy & Furnham, 1991), moods and leisure satisfaction-domain (Hills & Argyle, 1998; Lu & Hu, 2005) and leisure participation (Lu & Hu, 2005). Other alternative personality concepts have received some attention in the literature (e.g. personality needs, locus-of-control, attentional style, and type theory), and although not the focus of this study, these concepts too warrant further

investigation (Mannell & Kleiber, 1997). Overall, these studies indicate that personality traits are manifested in leisure and recreation contexts, and in some cases influence leisure motivation and activity preference. Of interest in this study are extraversion and neuroticism, henceforth referred to as E and N respectively, - two of the five personality traits. Literature pertaining to these two traits in recreation and leisure context are presented below.

Extraversion and Neuroticism

Within a recreation and leisure context, E has proven useful in several studies exploring activity preferences, motivations, and leisure satisfaction domain. In one such study, E was significantly and positively correlated to active recreation, e.g. sports, and negatively correlated with passive recreational activities e.g. puzzle solving, backgammon, and trivial pursuits (Kirkcaldy & Furnham, 1991). In other words, as E increased so did participation in activities that are active or social in nature e.g. canoeing, football, tennis or other sports. A similar study supports these results where E was significantly and positively correlated with sport participation (Hills & Argyle, 1998).

Beyond activity preference, E has been linked with leisure motivations. In a study among fitness center patrons, E was significantly and positively linked with four leisure motivations i.e. intellectual (i.e. exercise imagination and learn new things), social (i.e. be around others and develop friendships), competency-mastery (i.e. challenge and master abilities), and stimulus-avoidance (i.e. relaxation) (Lin et al., 2007). In other words, as levels of E increased motivation

to participate in leisure activities for intellectual, social, competency-mastery, and stimulus-avoidance reasons also increased.

Other studies have linked E with information processing (Gomez, Gomes & Cooper, 2002; Rusting & Larson, 1998). Information processing refers to the cognitive processes related to recognition and reaction to positive and negative stimuli (Rusting & Larson, 1998). Studies have found that E is significantly related to the recognition of and reaction to verbal and written emotional ques. For example, Gomez et al. observed a significant positive relationship between E and positive word recollection. In this study participants were asked to recall a list of words they had been shown previously that included both positive and negative words. As E increased, so did the number of positive words that were recalled.

A possible link between E and leisure satisfaction domain has also been suggested. Among Chinese university students E was significantly and positively related to leisure satisfaction domain (Lu & Hu, 2005). In other words, as individuals E levels increased so did their satisfaction with their overall life leisure pursuits.

N has also proven useful in studies evaluating recreation and leisure related variables. For example, a significant negative relationship has been observed between N and both active and passive recreation and leisure activities (Kirkcaldy & Furnham, 1991). As such, neurotic individuals were less inclined to participate in active and passive activities than more emotionally stable individuals. Another study found a significant negative relationship between N

and attending church and a significant positive relationship between N and watching TV (Hills & Argyle, 1998).

N, like E, has also been linked to information processing (Gomez, Gomes & Cooper, 2002; Rusting & Larson, 1998). Gomez et al. observed a significant negative relationship between N and negative word recollection. As with E, in this study participants were asked to recall a list of words they had been shown previously that included both positive and negative words. As N increased so did the number of negative words that were recalled.

A possible link between N and leisure satisfaction domain has also been suggested. A significant negative relationship between N and leisure satisfaction domain has been observed (Lu & Hu, 2005). In other words, as individuals N levels increased satisfaction with their overall life leisure pursuits decreased.

Besides, descriptive and relational studies, personality literature suggests that human cognition is ever changing and influenced by an almost unfathomable amount of complex psychological processes and environmental variables.

Personality is one of the factors assumed to be a part of this dynamic system. In such a system it is not reasonable to believe that all relationships are linear (Vallacher, Read & Nowak, 2002). As such, personality traits may only become influential once an external variable reaches an elevated level such that it triggers a response. Once this threshold has been reached, small changes in the external variable may elicit an increasingly stronger response (Vallacher et al., 2002). This suggests that non-linear relationship may exist between personality traits and external variables. For example, as a result of an individual personality

characteristic a person may have a tolerance for certain external stimuli and experience little or no effect from this stimulus until their personal threshold has been reached. However, once this threshold is reached any addition to this stimulus may have an increasing stronger response, such that the individual may become increasingly uncomfortable in that environment.

Overall, personality research has shown links between E and N and variables such as activity preference and participation, leisure motivation, and positive and negative emotional information processing. One study has hinted at links between personality traits and satisfaction, therefore warranting further exploration of this linkage. In addition, it is suggested that non-linear relationships may exist between cognitive processes related to external stimuli and personality traits.

Satisfaction

Developing a greater understanding of recreational satisfaction, and variables influential in satisfaction formation, has been a salient goal of recreation and leisure research for decades (Williams, 1989). Within the leisure and recreation context, satisfaction has been defined as the subjective valuation of accumulative experiential perceptions and outcomes (Noe & Uysal, 1997; Whisman & Hollenhorst, 1998; Williams, 1989) and is a product of complex cognitive and affective psychological processes.

Due to the subjective nature of satisfaction, investigators are forced to consider inherent complexities and sensitivities to influential variables when attempting to understand satisfaction response (Neufeld et al., 2006). Consumer

satisfaction theory has been suggested as most appropriate when considering outdoor recreation experiences (Williams, 1989). Consumer satisfaction theory suggests that satisfaction formation involves the following cognitive processes: expectation (i.e. pre-experience expectations of product performance), disconfirmation (i.e. product evaluation in relation to expectations), equity (i.e. subjective judgment based on the equitable balance of input-outcome between involved parties), attribution (i.e. evaluation of good and bad outcomes based on internal and external causal variables), and performance (i.e. valuation of actual product performance) (Oliver & DeSarbo, 1988). Oliver and DeSarbo (1988) evaluated these processes against satisfaction with a product. Their results offered at least partial support for each of the processes examined. That is, across the sample, each of the processes was influential in satisfaction response. Further, of the processes evaluated, disconfirmation was found to be a salient determinant of consumer satisfaction levels. These results suggest that satisfaction response can be highly individualistic and situational (Oliver & DeSarbo, 1988).

The disconfirmation model of satisfaction response assumes respondent's compare expectations to an actual experience. Disconfirmation can be positive or negative. Positive disconfirmation occurs when an individual compares an experience with their expectations and the experience is better than they expected which thereby raises satisfaction levels. Negative disconfirmation occurs when the experience is worse than a person expects, thus, lowering satisfaction levels (Oliver & DeSarbo, 1988).

In addition to the cognitive processes present within the disconfirmation framework, research suggests affect or emotion as influential in satisfaction formation (del Bosque & San Martin, 2008; Mano & Oliver, 1993; Oliver, 1993; Phillips & Baumgartner, 2002). Specifically, while evaluating consumer satisfaction among university students, positive emotion was positively related and negative emotion was negatively related to satisfaction (Mano & Oliver, 1993; Oliver, 1993). Similarly, Phillips and Baumgartner (2002) found further evidence to support affect within the satisfaction model. Their results indicated strong relationships between emotional experiences and corresponding levels of satisfaction. Positive emotional experiences induced positive satisfaction valuation. Inversely, negative emotional experiences induced negative satisfaction valuation. These studies suggest that both cognitive and emotionally driven processes are important in satisfaction formation.

In an attempt to further understand tourist satisfaction, linkages between expectations and affect were also uncovered by del Bosque & San Martin (2008). Unlike the previously discussed satisfaction literature that evaluated levels of positive and negative affect in relation to satisfaction (i.e. Mano & Oliver, 1993; Oliver, 1993; Phillips & Baumgartner, 2002), del Bosque & San Martin (2008) evaluated the number of positive and negative emotional experiences, over a period of time greater than one day, in relation to satisfaction. These emotional experiences were conceptualized as a product of disconfirmation where experiences were not as the individual expected them to be. In other words, if an experience was better than expected (i.e. positive-disconfirmation),

disconfirmation produced positive emotional experiences. Likewise, if an experience was worse than expected (negative-disconfirmation), disconfirmation produced negative emotional experiences. As hypothesized, positive-disconfirmation was significantly and positively related to positive emotional experiences, which was in turn positively related to satisfaction. Likewise, negative-disconfirmation was significantly and positively related to negative emotional experiences which were in turn negatively related to satisfaction.

Several methods for satisfaction measurement have been used across consumer satisfaction and recreation and leisure studies. These methods rate from single item scales (Budruk, Schneider, Andreck & Virden, 2002; Tseng et al., 2009; Whisman & Hollenhorst, 1998) to multi-item scales utilizing as many as twelve items (Bigne, Andreu & Gnoth, 2003; del Bosque & San Martin, 2008; Oliver, 1980; Oliver, 1993). The twelve item satisfaction scale was developed to capture various conceptual elements of satisfaction such as overall satisfaction, enjoyment, regret, and happiness (Oliver, 1980; Oliver, 1993). More recently, Del Bosque and San Martin (2008) used a four item scale adapted from the works of Oliver and others. The items of this scale represented cognition, fulfillment, enjoyment, and overall satisfaction.

These studies have indicated that satisfaction is a product of cognitive and emotional processes. Several methods have been used to evaluate satisfaction including single and multi-item scales, where some multi-item scales include items specific to emotion and cognition. Disconfirmation was identified as a salient cognitive process in satisfaction formation. Within the disconfirmation

framework, expected affect was also identified as a possible influential factor in satisfaction formation. Understanding satisfaction formation has been a key interest for leisure researchers and providers. Crowding judgment, a cognitive and potentially emotionally driven valuation, is often studied in relation to satisfaction.

Crowding

Current crowding theory developed from the natural resource management concept of human carrying capacity. Human carrying capacity of natural environments refers to the maximum allowable number of human occupants, within a set spatial parameter, which if exceeded could potentially damage or degrade the environment (Manning, 2011). This primarily objective concept evolved to consider negative impacts of excessive human occupancy on human-environment and social experiences. However, it lacked the ability to determine acceptable levels of such subjective factors (Manning, 2011). A concept similar to crowding is density. A distinction between the two must be made when attempting to quantify human response. Stokols (1972) made this distinction by defining density as the actual physical limitation of space and crowding as the negative perception of spatial limitation relative to the respondent. Crowding has therefore been defined as the subjective valuation of human occupancy relative to "spatial, social, and personal factors" (Stokols, 1972, p. 275).

For more than 30 years a single item nine point scale (Heberlein & Vaske, 1977) has been the dominant method for crowding measurement in recreation related research (Manning, 2011; Vaske & Shelby, 2008). Although expected

crowding has been measured in conjunction with crowding valuations (e.g. Budruk et al., 2002; Tseng et al., 2009), an widely used multi-item crowding scale has yet to be developed.

Theory suggests that complex cognitive and affective processes influence perceived-crowding (Schmidt & Keating, 1979). In addition, pertinent literature suggests levels of perceived-crowding may be partially dependent on a number of variables such as location and activity type (Manning, 2011; Vaske & Shelby, 2008), past experience (Absher & Lee, 1981; Armistead & Ramthun, 1995; Arnberger & Brandenburg, 2007; Budruk et al., 2002; Budruk et al., 2008), and coping strategy implementation (Arnberger & Brandenburg, 2007; Hall & Shelby, 2000; Manning & Valliere, 2001; Schuster et al., 2006). These variables have been broadly categorized as situational characteristics, characteristics of others encountered and personal characteristics (Manning, 2011). One such personal characteristic is personality which has been suggested as influential when considering crowding and related variables (Iwata, 1979; Khew & Brebner, 1984; Katsikitis & Brebner, 1980; Miller & Nardini, 1977; Schmidt & Keating, 1979).

It has been suggested that adverse reactions to density is a result of loss of personal control. This loss can be attributed to goal interference, activity interruption, and overstimulation (Schmidt & Keating, 1979; Stokols, 1972). The interference with goals and activities can be directly related to the actual physical level of density. Certain activities and behaviors are dependent on the availability of physical space free of other inhabitants. However, when considering goals such as relaxation and solitude the amount of actual physical space free of other

inhabitants is relative to the individual. For some activities, additional people may add to an experience or even be dependent on them. A study that evaluated perceived-crowding across several natural resources recreational activities (Vaske & Shelby, 2008) demonstrated the subjective nature of crowding perceptions. A considerable difference in crowding valuation was observed between canoers and floaters. Results suggest that 71% of canoers reported some level of crowding as opposed to 17% of floaters. These results may partially be attributed to the highly social nature of floating in comparison to the technical and utilitarian nature of canoeing. In this situation, canoers may expect and require less density to achieve a desired experience. However, situational factors beyond their control may limit their freedoms, thus contributing to a feeling of loss of personal control over that situation.

Personality and overstimulation have been indicated as contributing factors to the loss of personal control and consequent crowding valuation (Schmidt & Keating, 1979). Locus-of-control, related to personal control, is a personality related construct that refers to the level of control people feel they have over outcomes of events in their life. This is referred to as internal and external locus-of-control. As such, people with internal locus of control feel they have control over outcomes and people with external locus-of-control feel that outcomes are a result of things beyond their control (Mannell & Kleiber, 1997). This suggests that people's perceptions of crowding may vary as a result of internal psychological differences which influence perceptions of control and personal-space needs.

Empirical research in non-leisure fields has suggested links between personality and crowded conditions. Specifically, it has been suggested that the personality traits E and N are associated with the number of people a college student is willing to share a room with. In certain situations, depending on the different types of people the student would have to share the room (e.g. male/female, same ethnicity/different ethnicity, adults/children, disabled/non-disabled), students with high N, and those with and low E chose a fewer number of roommates than low N and high E, respectively (Iwata, 1979). Examining hypothetical crowding situations represented by a diorama, Miller and Nardini (1977) failed to find a connection between E and perceived crowding. They did however observe a relationship between a related variable, affiliation (i.e. those who prefer to be alone), and crowding.

Studies have also suggested that the personality traits E and N may be influential in completing timed tasks when a person's personal space has been violated. These studies have indicated that extraverts performed significantly worse on tasks than introverts in crowded conditions (Katsikitis & Brebner, 1980; Khew & Brebner, 1984). It is important to emphasize that invasion of personal space is different from the negative perception of density levels. However, these studies do suggest a possible link between increased density, crowding-perceptions, and personality.

Crowding studies have suggested that complex cognitive and affective processes influence perceived-crowding. Relationships have been suggested between levels of perceived-crowding and location, activity type, and coping

strategy implementation. Additionally, the personality related variables locus-of-control, E, N, and affiliation, were also suggested as influential when considering crowding and related variables. It seems likely that the relationship between personality and crowding will manifest itself in recreation and leisure context.

Another personal characteristic, experience-use-history has also been shown to influence crowding perceptions. Experience-use-history, and its relationship with crowding is discussed in the following sections.

Experience-Use-History

Natural resource recreation literature often refers to past experience as experience-use-history, henceforth referred to as EUH. EUH is defined as the amount of past experience an individual has with a given location (Hammitt, Backlund, & Bixler, 2004). It may be related to a specific activity or activities. This construct has been measured with as few as one item (White, Virden & van Riper, 2008) to as many as six (Hammitt, Backlund, & Bixler, 2004). Items may refer to both the study area and similar areas that a respondent may frequent. For example, Hammitt et al. (2004) used three items that measured total number of times, number of years, and total number of times over the previous year that a respondent had fished the Chattooga River. Also measured were the total number of times, number of years, and total number of times over the previous year that a respondent had fished other streams in the area. A common method for measuring EUH utilizes only two items, total number of years and frequency of visitation to a specific resource (Budruk et al., 2008; Smith, Moore, & Burr, 2009). These items have been combined to create categorical variables (e.g. Hi/Low EUH)

(Hammitt et al., 2004; Smith et al., 2009) or have been treated as independent measures such as in regression analysis and structural equation modeling studies (e.g. Budruk et al., 2008; White et al, 2008).

Several studies have examined the possible relationship between EUH and perceived-crowding (e.g. Absher & Lee, 1981; Armistead & Ramthun, 1995; Arnberger & Brandenburg, 2007; Budruk et al., 2008; Budruk et al., 2002). The combined results of these studies are inconclusive. Some studies have indicated a positive relationship between EUH and crowding. For instance, experienced visitors to the Blue Ridge Parkway indicated higher levels of perceived-crowding (Armistead & Ramthun, 1995). A positive relationship between EUH and crowding has also been observed among water based recreationists (Arnberger & Brandenburg, 2007; Graefe & Moore, 1992**;** Vaske, Donnelly, & Heberlein, 1980). Others have reported the lack of a relationship between EUH and crowding. This has been reported among backcountry visitors at Yosemite National Park (Absher &Lee, 1981) as well as a more developed setting such as the Arizona-Sonora Desert Museum (Budruk et al., 2002). In an attempt to further explore this inconsistent relationship between EUH and crowding, Budruk et al. (2008) evaluated the moderating effects of place-attachment dimensions (i.e. place-identity and place-dependence) in the EUH-crowding relationship. This moderating effect was observed in only one of the eight relationships tested, leading the authors to suggest that additional research into the EUH-crowding relationship was needed

Crowding and Satisfaction

The theoretical connection between perceived crowding and satisfaction has garnered much attention. It is assumed that crowding response is formulated, at least in part, by stress induced through overstimulation or the perception of limitation to either functional or emotional needs (Manning, 2011; Schmidt & Keating, 1979). This negative reaction to human density has the potential to negatively affect satisfaction levels.

While exploring this theoretical connection, studies have indicated an inverse relationship between crowding and satisfaction among water based recreationists (Shelby, 1980; Whisman & Hollenhorst, 1998) and visitors of a scenic roadway located in the Appalachian Mountains (Armistead & Ramthum, 1996). Others have failed to find a relationship (Budruk et al., 2002; Bultena, Field, Womble & Albrecht, 1981**).** Although Budruk et al. failed to find a relationship between crowding and satisfaction, they did observe an inverse relationship between a related variable, i.e. expected crowding, and satisfaction. As such, as people expected higher levels of crowding, satisfaction levels decreased.

Other studies have revealed an indirect inverse relationship between crowding and satisfaction. One such study, among visitors to the Great Gulf Wilderness, New Hampshire, indicated that higher perceived crowding elevated coping strategy use (i.e. emotional-focused; product shift, rationalization and problem-focused; use-displacement) which in turn decreased satisfaction (Schuster et al., 2006). An indirect relationship between the two variables was

also revealed in a study among boaters of three lakes in Texas. Here, crowding acted as a partial mediator in the expectation-satisfaction paradigm (Tseng et al, 2009).

These studies evaluating the possible direct relationship between crowding and satisfaction have returned mixed results. Accordingly, a direct relationship between crowding and satisfaction is debatable. Indirect inverse relationships indicate that crowding may be related to coping strategy use and crowding expectations, thus, affecting satisfaction levels. A possible direct relationship between expected crowding and satisfaction has also been suggested. Further research of this relationship is warranted. Another variable that has a potential relationship with satisfaction is EUH.

Experience-Use-History and Satisfaction

Recreation and leisure and consumer marketing research have evaluated the potential relationship between past experience and satisfaction (Petrick, 2002; Smith et al., 2009; Soderlund, 2002; Tam, 2008). A significant difference in satisfaction with a golf vacation was observed between golfers with little experience and those with considerably more experience. This relationship suggested that as experience increased satisfaction decreased (Petrick, 2002). Another recreation and leisure related study failed to find a connection between past experience and satisfaction among off highway vehicle users in Utah (Smith et al., 2009).

Evaluating a similar concept as EUH, i.e. familiarity, marketing research has evaluated relationships between perceived-performance, disconfirmation (i.e.

a feeling that their needs had been met), and satisfaction for groups of restaurant customers with hi, medium, and low levels of familiarity (Tam, 2008). Results suggested that high and medium familiarity customer's satisfaction was related to perceived-performance rather than disconfirmation. That is, as perceptions of a restaurants performance increased so did patrons satisfaction levels. For the low the familiarity group this relationship was also observed as well as a relationship between disconfirmation and satisfaction. That is, as the feeling that their needs had been met increased so did patrons satisfaction levels. A similar study evaluated familiarity with restaurants and hypothetical restaurant experiences and resulting satisfaction levels (Soderlund, 2002). Respondents were asked to rate their level of satisfaction had they experienced either a high performance scenario (i.e. high level of service quality) or a low performance scenario (i.e. low level of service quality). Results indicated that individuals with high levels a restaurant familiarity reported they would be more satisfied with the high performance scenario than the low performance scenario. A significant difference in satisfaction across scenarios was not observed for respondents with low levels of restaurant familiarity.

As previously discussed, a relationship between EUH and crowding has been suggested. This concept partially rests on the assumption that past experience gives a person a benchmark to create density level expectations. If these expectations are exceeded, higher crowding levels may result. As conceptualized this is part of the disconfirmation process of satisfaction

formation. This implies possible relationships between EUH and crowding, crowding and satisfaction, and EUH and satisfaction.

These studies indicated a possible relationship between past experience and satisfaction valuation. Specifically, disconfirmation is referenced as a possible explanation for this relationship. As such, relationships between EUH, crowding, and satisfaction may be partially explained through the disconfirmation process.

In conclusion, this review suggests the possibility of item order bias on item response. Additionally, the review suggests that personality traits are likely to manifest in recreation and leisure contexts and influence behavior. As such, it is important to consider the influence of personality traits on variables on interest. EUH, crowding, satisfaction and the relationships among them have received considerable attention; however the influence of personality traits on these relationships has never been examined. This study contributes to the literature by filling these gaps.

Chapter 3

METHODS

This chapter describes the study area, data collection methods, data collection instruments, hypotheses, and analyses used in this study.

Study Area

South Mountain Park/Preserve (SMP) is a 16,000 acre municipal park in Phoenix, Arizona. Although three quarters of the park is surrounded by densely populated urban areas, the park offers approximately 51 miles of multi-use trails through natural desert landscape. Seventeen trailheads located at various points around the park provide access to trails of varying difficulty levels. These trails offer an opportunity for a wide range of recreational activities (City of Phoenix, 2011). Hiking, running, mountain biking, and horseback riding are some of the most common activities participated in.

Data Collection

The population for this study is SMP trail users. Prior to data collection, South Mountain Park management was consulted on approximate park use-levels for varied trailheads throughout the park. It was determined that high-use trailheads had approximately 80% of visitor use while low-use trailheads received the remaining 20%. Five trailheads were selected for data collection to represent these use-levels; two high-use trailheads and three low-use trailheads. The selected high-use trailheads were Telegraph Pass and Pima Canyon. The selected low-use trailheads were Beverly Canyon, Holbert, and Mormon. It was also determined that 80% of visitor usage occurred on weekend days (Saturday and

Sunday) and 20% on weekdays. A data collection plan was developed to reflect these use patterns.

A pre-test of the survey instrument was performed at Telegraph Pass prior to data collection (n=50). Respondents were asked to provide feedback on structure and wording of the survey. The pre-test indicated respondents had little problems filling out the survey and that it was easily understood. Data collection began October 15, 2010 and continued through December 4, 2010. Self response questionnaires were administered on 15 days; 8 weekend days and 7 weekdays. Visitors were approached by a trained researcher and asked to participate in the study as they exited the trail. To achieve a maximum level of population representativeness, data were collected based on trailhead use and type of day. Specifically, data was collected from every third person or group from high-use trailheads on weekend days, every other person or group from high-use trailheads on weekdays and low-use trailheads on weekend days, and every person or group from low-use trailheads on weekdays. If a group was approached, one person from that group was randomly selected to participate in the study. Two survey versions were administered, A and B, alternating between versions so that equal numbers of each were collected under equivalent study area conditions.

Data Collection Instruments

The 4 page questionnaire was designed to be completed in 7-10 minutes. Questions included items that measured personality (E and N), EUH, crowding, satisfaction, visitor use and demographics. Other questions measured place attachment; however, place attachment data was not used in this study.

The personality dimensions of E and N were measured using eight items adapted from the Mini-IPIP (Mini-International Personality Item Pool) (Donnellan et al., 2006). The Mini-IPIP was developed from the Big Five 50 item personality scale (Goldberg, 1999) for use in large scale studies where small reliable scales are needed for survey brevity to reduce respondent burden. Each of the eight items was measured using a five point scale (1="Very Inaccurate"; 5="Very Accurate"). Four items were used to measure E: i) "I am the life of the party", ii) "I don't talk a lot", iii) "I talk to a lot of different people at parties", and iv) "I keep in the background". Likewise, four items were used to measure N: v) "I have frequent mood swings", vi) "I am relaxed most of the time", vii) "I get upset easily", and viii) "I seldom feel blue". Personality items ii, iv, vi and viii are reverse coded. In other words, higher scores on these items are equal to lower scores on the variable in question. As such, these items were adjusted (1=5, 2=4, 3=3, 4=2, 5=1) prior to analysis. After adjusting for reverse coding, higher scores on the E scales indicate higher levels of E and higher scores on the N scales indicate higher levels of N.

Past experience or EUH was measured using two items used in previous literature, "How many years have you been recreating at South Mountain Park?" and "How many times in the last twelve months have you recreated here?" (Hammitt et al., 2004).

Perceived-crowding was measured using a single item nine-point (1= "Not at all crowded"; 9="Extremely crowded") scale. Respondents were asked to "Please circle the number that best represents how crowded you felt during your

visit to South Mountain Park". This scale was adapted from Heberlein and Vaske (1977).

Satisfaction was measured using three items adapted from del Bosque and San Martin (2008): i) "I have really enjoyed my experience at South Mountain Park today", ii) "It was a good choice to come to South Mountain Park today", and iii) "Overall, how satisfied are you with your visit today". Satisfaction items i and ii were measured on a seven point scale (1="Strongly disagree"; 7="Strongly agree"). Item iii was measured on a similar seven point scale (1="Very dissatisfied"; 7="Very satisfied").

Demographic information was also collected to include information on sex, age, group size, education level, annual household income, race/ethnicity, and location of residence.

As previously mentioned, two versions of the questionnaire were developed. In survey A, the crowding item was placed directly before the satisfaction items. In survey B, the crowding item was placed directly after the satisfaction items.

Hypotheses

The following hypotheses were tested:

H1a: The mean crowding score on survey version A will be significantly different from that on survey version B.

H1b: The mean satisfaction score on survey version A will be significantly different from that on survey version B.

H2a: Extraversion as compared to introversion positively influences EUH.

H2b: Neuroticism as compared to emotional stability negatively influences EUH.

H2c: Extraversion as compared to introversion negatively influences crowding.

H2d: Neuroticism as compared to emotional stability positively influences crowding.

H2e: Extraversion as compared to introversion positively influences satisfaction.

H2f: Neuroticism as compared to emotional stability negatively influences satisfaction.

H3a: EUH influences crowding.

H3b: EUH influences satisfaction.

H4: Crowding negatively influences satisfaction.

Hypothesized Model

The path model below represents these hypothesized relationships.

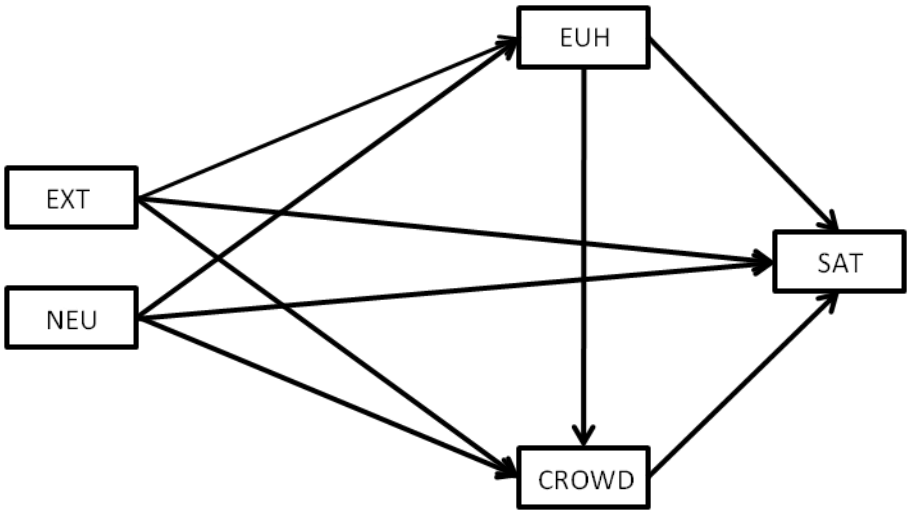


Figure 1. Path model representing hypothesized relationships between the variables EXT (E), NEU (N), EUH, CROWD (crowding), and SAT (satisfaction).

Analysis.

Survey data were entered and cleaned using SPSS 19. Preliminary analysis of the data included visual inspection, frequency tables, descriptive statistics, and histograms. Missing data were evaluated using Missing Data Analysis in SPSS 19. Missing values were replaced using regression.

Single manifest variables were computed from multi-item scales for use in multiple regression path-analyses. The E items were summed to create the variable EXT, the N items were summed to create the variable NEU, and the satisfaction items were summed to create the variable SAT. Factor and reliability analyses were conducted on multi-item scales (i.e. E, N, and satisfaction). A scatter-plot matrix which included the variables EXT, NEU, EUH, crowding (CROWD), and SAT was evaluated to determine the presence, if any, of non-linear relationships.

EUH was calculated in accordance with methods presented by Hammitt et al. (2004). The number of years the respondent has been visiting SMP was added to the number of days they had visited the park in the past twelve months. This was then divided by the sum of the highest number of years visiting SMP and the highest number of days visited in the past 12 months reported in the sample (i.e. $(years + times)/(highest_years + highest_times)$). This creates an EUH ratio that ranges from 0 through 1, with 0 being the lowest level of EUH and 1 being the highest.

Two, one-way ANOVA's were conducted to test H1a and H1b. H2a through H4 were tested via path analysis using AMOS 5. Path analysis was conducted using data from both versions of the survey i.e. Survey A and B.

Chapter 4

RESULTS

This chapter presents participant demographics and other descriptive statistics, and results for missing data analysis, ANOVA's, path analysis, and model comparisons.

Response Rate

Over the course of the survey, 772 people were approached and asked to participate in the study. An 80% response rate was achieved with a final sample size of n=619 (survey A, n=310; survey B, n=309). The majority of people who declined stated that they did not have time to fill out the survey. Approximate use-levels were represented by n=497 (80.3%) from high-use trailheads and n=122 (19.7%) from low-use trailheads. Likewise, use-levels were represented by n=486 (78.5%) from weekend days and n=133 (21.5%) from weekdays. The sample can be further broken down to approximately 80% from high-use and 20% from low-use trailheads on weekend days and the same for weekdays. Final sample sizes for each trailhead are Telegraph Pass n=295, Pima Canyon n=202, Beverly Canyon n=81, Mormon n=35, and Holbert n=6.

Participant Demographics

Participant demographics are presented in Table 1. A little over half of the participants identified as female (53%) followed by males (45%). The remaining participants (2%) declined to provide this information. The mean age of South Mountain visitors surveyed was 44 years old. The youngest was 18 years old and the oldest was 79. No surveys were administered to visitors under the age of 18 in

accordance with study restrictions. A majority of visitors were well educated with the largest percentage of visitors having a college degree (44%), followed by an advanced degree (40%), some college (16%), a high school or GED education (4%), and a tech school education (4%). The remaining participants declined to provide this information. Regarding household income level, the largest percentage of visitors indicated $105,000 or more per year (41%), followed by $45,000-59,999 (13%), 60,000-74,999 (12%), 90,000-104,999 (9%), 75,000-89,999 (7%), 30,000-44,999 (6%), $15,000-29,999 (3%), and less than $15,000 (2%). The remaining participants (7%) declined to provide this information. When asked if they identified with being Latin, Hispanic, or Spanish in origin, the largest percentage of visitors indicated no (86%), followed by yes (11%). The remaining participants declined to provide this information (4%). A race/ethnicity question asked participants to indicate the racial/ethnic groups that they identified with. The largest percentage of visitors identified as being White (80%), followed by Asian (7%), Black or African American (5%), American Indian or Alaska Native (3%), and Native Hawaiian or other Pacific Islander (1%). The remaining participants (5%) indicated other, or declined to provide this information.

Table 1

Participant Demographics

		Frequency	Percent
Sex			
	Male	281	45.4
	Female	326	52.7
	Unknown	12	1.9
Age in years			
	18-30	77	12.4
	31-40	140	22.6
	41-50	203	33.8
	51-60	120	19.4
	> 61	39	6.3
	Unknown	40	6.5
Education level			
	High school/GED	25	4.0
	Some College	98	15.8
	Tech School	21	3.4
	College Degree	274	44.3
	Advanced/Graduate Degree	191	30.9
	Unknown	10	1.6
Household income			
	Less than $30,000	32	5.2
	$30,000 - 59,000	116	18.7
	$60,000 - 89,999	119	19.2
	$90,000 – 104,999	54	8.7
	$105,000 or more	254	41
	Unknown	44	7.1
Latin, Hispanic, or Spanish			
	Yes	67	10.8
	No	530	85.6
	Unknown	22	3.6
Race/ethnicity			
	American Indian or Alaska Native	21	3.4
	Asian	40	6.5
	Black or African American	28	4.5
	White	496	80.1
	Other	40	6.4

Note: n = 619. Some respondents indicated more than one race/ethnicity category.

Visitation Characteristics

Results suggest that SMP park visitors on average had considerable experience with the park. When asked to indicate how many years they had been visiting SMP results ranged from 0 – 60 years with an average of 9.5 years. When asked to indicate how many times they had visited the park in the previous 12 months results ranged from 0 – 750 times with a mean rate of visitation at 46 times. When asked to identify the type of group they were with the largest percentage of visitors (37%) indicated they visited the park alone that day followed by with family (26%), with friends (22%), with friends and family (12%), and with an organized group (2%). Visitors also indicated that on the day they had completed the survey 37% were hiking, 28% running, 11% biking, and 2% indicated some other activity.

Missing Data Analysis

Missing data ranged from 0 through 4.5% of the total sample across items of interest with the exception of one item. This item, "How many times in the last twelve months have you visited South Mountain Park?" was missing 12% of the total sample. Little's MCAR (Missing Completely at Random) test was used to evaluate patterns in the missing data. The tests results indicated failure to reject the null hypothesis that the data is missing completely at random (χ^2 = 174.979, p = .776). Missing data were replaced using regression imputation.

Scale Computation

Factor loadings and Cronbach's alpha were computed for the multi-item scales satisfaction, E, and N. A Cronbach's α of 0.7 or above indicates a reliable

scale (Nunnalley, 1967) although George and Mallery (2003) suggest that $\alpha \geq 0.6$ and < 0.7 is also acceptable but should be viewed with caution. For the satisfaction items factor loadings ranged from .85 to .92 with a scale reliability α =.86. For the E items factor loadings ranged from .72 to .75 with a scale reliability α =.72. Initial analysis of the four N items indicated factor loadings ranging from .43 through .79 with a reliability of α =.58. The item with the lowest factor loading, "I seldom feel blue" (.43), was dropped and analysis was repeated. The resulting factor loadings ranged from .64 through .82 with a reliability of α =.63. Based on factor loadings and Cronbach's α's (Table 2), the satisfaction, E and N scales were considered reliable.

Table 2

Factor Loadings and Cronbach's α for Satisfaction, Extraversion, and Neuroticism Items

	FL	α
Satisfaction		.86
I have really enjoyed my experience at South Mountain Park Today	.916	
It was a good choice to come to South Mountain Park Today	.880	
Overall, how satisfied are you with your visit today?	.851	
Extraversion		.72
I am the life of the party	.745	
I don't talk a lot	.712	
I talk to a lot of different people at parties	.766	
I keep in the background	.738	
Neuroticism		.63
I have frequent mood swings	.802	
I am relaxed most of the time	.635	
I get upset easily	.826	

Note: FL = factor loadings

Extraversion and Neuroticism

Mean levels of E and N observed for each trailhead and the overall sample are presented in Table 3. Overall, the sample tended toward upper middle levels of E (3.34) and middle levels of N (2.47).

Table 3

Mean Extraversion and Neuroticism Levels for Each Trailhead and Overall Sample

	Telegraph	Pima	Beverly	Mormon	Holbert	Overall
Extraversion	3.37	3.35	3.29	2.46	3.34	3.34
I am the life of the party	3.05	3.07	3.09	2.83	3.10	3.06
* I don't talk a lot	3.52	3.44	3.38	2.33	3.54	3.47
I talk to a lot of different people at parties	3.38	3.43	3.42	2.00	3.43	3.39
* I keep in the background	3.52	3.45	3.28	2.67	3.29	3.44
Neuroticism	2.51	2.46	2.37	2.43	2.41	2.47
I have frequent mood swings	2.40	2.40	2.20	2.63	2.49	2.38
* I am relaxed most of the time	2.67	2.53	2.49	2.33	2.34	2.58
I get upset easily	2.48	2.45	2.41	2.33	2.40	2.45

Note: * items have been reverse coded; extraversion and neuroticism items were measured on a five point scale where 1 = very inaccurate and 5 = very accurate

Crowding and Satisfaction

Mean crowding and satisfaction levels for each trailhead are presented in Table 4. Crowding levels were highest for Telegraph trailhead, followed by Pima, Holbert, Beverly, and Mormon respectively. Overall park crowding ratings were medium level at 3.51. Regarding satisfaction, mean ratings were similar across all items and trailheads ranging from 6.62 - 6.83. Overall, satisfaction was high at 6.70.

Table 4

Mean Crowding and Satisfaction Levels for Each Trailhead and Overall Sample

	Telegraph	Pima	Beverly	Mormon	Holbert	Overall
Crowding	3.98	3.32	2.56	2.50	3.09	3.51
Satisfaction	6.70	6.71	6.64	6.78	6.70	6.70
I have really enjoyed my experience at South Mountain Park today	6.66	6.66	6.62	6.67	6.66	6.66
It was a good choice to come to South Mountain Park Today	6.76	6.78	6.67	6.83	6.80	6.76
Overall, how satisfied are you with your visit today?	6.67	6.69	6.64	6.83	6.63	6.67

Note: crowding was measured on a nine point scale, where 1 = not at all crowded and 9 = extremely crowded; satisfaction items were measured on a seven point scale where 1 = strongly disagree/very dissatisfied and 7 = strongly agree/very satisfied

Outliers and Normality

Once manifest variables were computed, box-plots of EXT, NEU, EUH, CROWD, and SAT were evaluated for outliers. One extreme outlier in the SAT variable was identified. This case was removed from the data set prior to further analysis. Descriptive statistics and histograms were used to evaluate normality.

Kline (1998) suggested maximum levels of 3.0 skewness and 8.0 kurtosis to assume normality; however, West, Finch, and Curran (1995) suggested a more conservative estimate of 2.0 and 7.0. The study variables exhibited skewness ranging from -1.585 to .370 and kurtosis from -1.017 to 3.311 with the exception of EUH (Table 5). For EUH, kurtosis (6.69) falls within the suggested conservative limit; however, skewness (2.44) exceeds the maximum suggested by West et al. but falls below the maximum suggested by Kline. Based on these results, variables were considered normal. Acknowledging the skewness associated with EUH, results pertaining to this variable will be viewed with caution.

Table 5

Normaility Diagnostics for the Variables EXT, NEU, EUH, CROWD, and SAT

	Skewness	Kurtosis
EXT	-.102	-.372
NEU	.284	-.339
EUH	2.44	6.69
CROWD	.370	-1.017
SAT	-1.585	3.311

Note: skewness standard error = .098
kurtosis standard error =.196

Non-linear Evaluation

Personality literature suggests that when considering the complex influence of personality on human cognition and behavior, non-linear

relationships may exist (Vallacher et al., 2002). To evaluate possible non-linear relationships between EXT and NEU and the dependent variables EUH, CROWD, and SAT, bivariate scatterplots were examined. Separate scatterplots were created for each data set (Survey A and B). Plots indicate possible quadratic relationships between NEU and CROWD for survey A and between EXT and CROWD for survey B (Figure 2). In survey A data, quadratic fit lines suggest that respondents who reported lower and higher levels of E also reported lower crowding levels and respondents who reported mid level E levels reported higher crowding levels. In survey B data, quadratic fit lines suggest that respondents who reported lower and higher levels of N also reported lower crowding levels and respondents who reported mid level N levels reported higher crowding levels. Non-linear relationships were not observed between EXT and NEU and EUH or SAT.

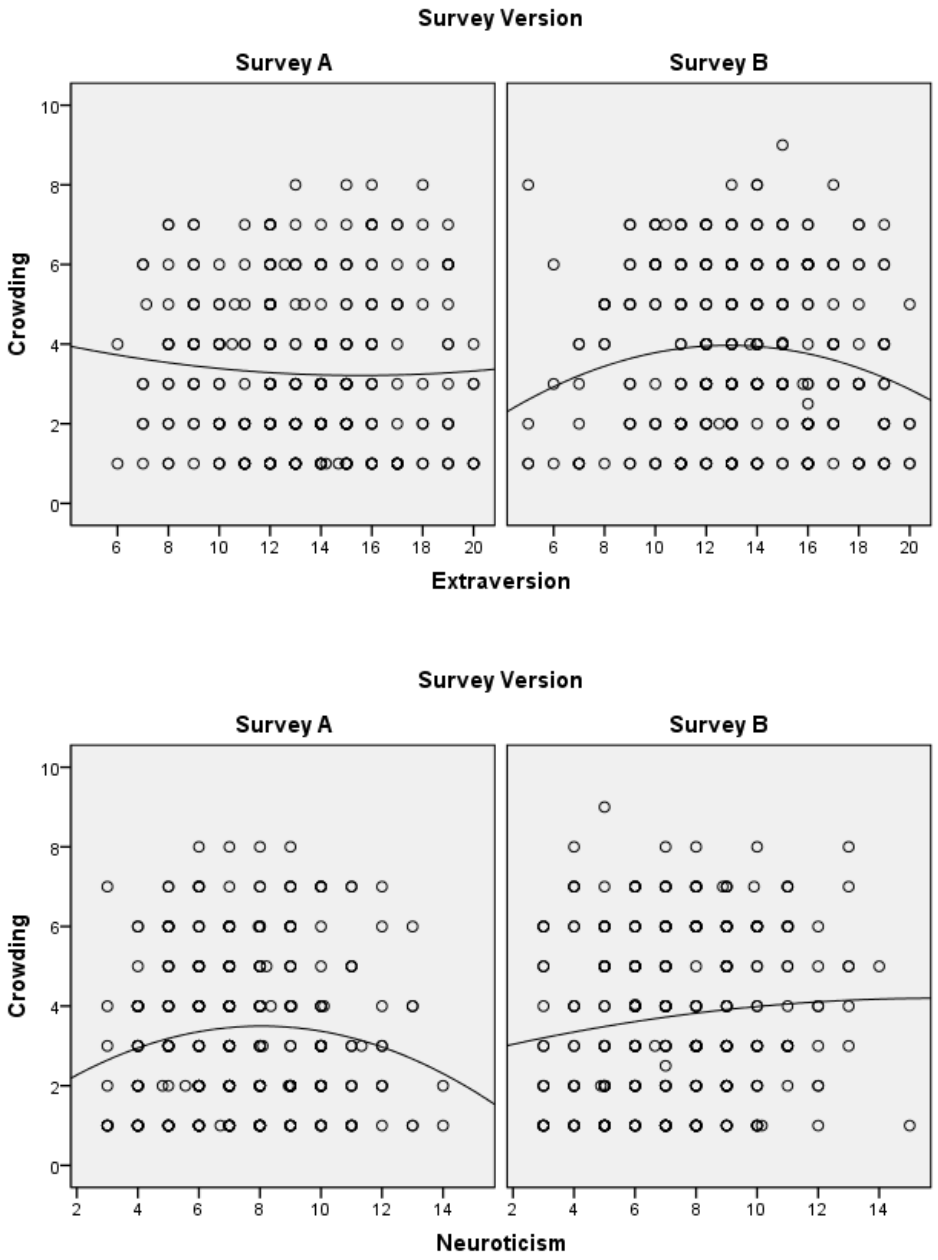


Figure 2. Bivariate scatterplots depicting quadratic non-linear relationships for extraversion (EXT) and neuroticism (NEU) and crowding (CROWD).

Based on these findings, non-linear quadratic terms for EXT and NEU were calculated and added to the model in accordance with methods presented by Cohen, Cohen, West & Aiken (2003). Specifically, the variables EXT and NEU

were first centered by subtracting respective means from variable scores (i.e. $ext - M_{ext}$; $neu - M_{neu}$). The quadratic terms, EXT2 and NEU2, were then calculated by squaring the centered variables (i.e. $(ext - M_{ext})^2$; $(neu - M_{neu})^2$). Centering the lower order predictor prior to calculating the higher order predictor removes unnecessary multicolinearity induced by the calculation and introduction of the addition of a polynomial term. Additionally, although regression analysis of a polynomial equation is possible without centering, the interpretation of resulting regression coefficients is problematic. By centering the unstandardized regression coefficient of the lower ordered linear predictor becomes meaningful and may be interpreted as the overall direction of the relationship (positive or negative). The higher order predictor represents the curvature, however, only after partialling out the lower order predictor. Therefore, the lower order and higher order predictors must be included in the regression equation. If the lower order predictor is not included, the variance attributed to that predictor is not partialled out which results in an inaccurate representation of the variance attributed to the higher order predictor (Cohen et al., 2003). For a more detailed explanation of centering variables for inclusion in polynomial equations see Cohen et al. (2003).

Hypotheses Testing

ANOVA. The ordering of survey items has been shown to bias respondent response (e.g. Lau et al., 1990; Schomaker & Knopf, 1982; Schuman et al., 1981). Crowding has been defined as the negative valuation of human density levels and may be related to loss of personal control (Schmidt & Keating, 1979; Stokols,

1972). The negative nature of the commonly used single item crowding measure (Heberlein & Vaske, 1977) in combination with mixed results from previously discussed crowding and satisfaction studies raised question to the possibility of item order bias.

As a preliminary step to gain an a better understanding of reported crowding and satisfaction levels, two one-way ANOVA's were conducted on crowding and satisfaction by trailhead use-level (i.e. high-use and low-use). As expected, results indicated a significant difference in crowding valuation across use-levels ($F(1,616) = 25.23$, $p = .000$). The mean reported crowding level for low-use trails was 2.7 and the high-use crowding mean was 3.7. Results of the ANOVA evaluating satisfaction by use-level failed to indicate a significant difference across low-use and high-use trailheads (F $(1,616) = .031$, $p = .861$).

To specifically test item order bias, two one-way ANOVA's were conducted to evaluate the effects of item order, i.e. crowding asked before the satisfaction items (survey A) and crowding asked after the satisfaction items (survey B), on the dependent variables crowding (CROWD) and satisfaction (SAT). Levene's test indicated a possible violation of the homogeneity of variance assumption for the SAT variable ($p < .05$); therefore, Welch test statistics which are robust to this violation are reported in this analysis. Results indicate item order had significant effects on CROWD ($F(1,613.1) = 7.18$, $p = .008$) and on SAT($F(1,594.9) = 6.59$, $p = .011$). As a result, the null hypotheses that item order has no effect on crowding and satisfaction levels were rejected. CROWD and SAT were both higher for survey B. Means, standard deviations, and 95%

confidence intervals for ANOVA's evaluating item order bias are reported in Table 6.

Table 6

Means, Standard Deviations and 95% Confidence Intervals for Crowding and Satisfaction

	Survey A		Survey B	
Condition	M(SD)	95% CI	M(SD)	95% CI
Crowding	3.30(1.96)	[3.08.3.52]	3.73(2.08)	[3.50,3.97]
Satisfaction	19.95(1.49)	[19.78, 20.11]	20.23(1.23)	[20.09, 20.36]

Note: CI = confidence interval, Survey A = crowding asked prior to satisfaction, Survey B = crowding asked after satisfaction

Path Analysis. One path model was developed to evaluate hypothesized relationships between the variables EXT, NEU, EUH, CROWD, and SAT (Figure 1). ANOVA results indicated significant differences for both crowding and satisfaction for survey versions A and B. As a result, survey version specific data is evaluated separately (A and B). Data obtained from survey A is evaluated in Model A and from survey B in Model B. Because plots indicated possible non-linear relationships between EXT and NEU with CROWD, a model comparison approach was used to evaluate whether the full model, that freely allows relationships between the quadratic predictors (i.e. EXT2, NEU2) and CROWD, provides a better fit to the data than the restricted model which restricts any influence the quadratic terms might have on CROWD. This was done by setting the path coefficients from EXT2 and NEU2 to CROWD to zero in the restricted model (Bentler, 1990). This is similar to testing model fit using basic least squares

regression procedures where the error associated with a full model is compared to the error of a restricted model (Hu & Bentler, 1998). In regression, all of the predictor variables in the restricted model are restricted by predicting with their mean to produce the maximum amount of error. However, in path analysis it is possible to restrict individual relationships between pairs of variables within a model. Additionally, rather than predicting error, path analysis evaluates the differences between population covariance's (estimated from the sample data) and the covariance's identified in the hypothesized model. This difference is represented by the chi squared (X^2) test statistic. Unlike the *F*- test used in multiple regression where the null hypothesis may be rejected in favor of an alternative identified by the researcher, by rejecting the null hypothesis of an X^2 test the researcher is stating that there is a significant difference between the population covariance and the hypothesized model which suggests a poor fit (Iacobucci, 2009). However, X^2 is highly sensitive to sample size and many other fit indices have been developed based on X^2 to correct for this and other issues (e.g. CFI – comparative-fit-index, RMSEA – root mean square error of approximation) (Bentler, 1990; Iacobucci, 2009). In a model comparison approach two or more models are compared and the hypothesized model which better matches the observed covariance's in the data is a better fit.

As previously discussed, many different methods for evaluating model fit has been developed. Hu and Benter (1998) evaluated many of these indices and suggested that each have inherent problems. For this reason, three methods have been chosen to evaluate model comparisons as not to capitalize on the

shortcomings of any one method. The first method will evaluate RMSEA and CFI for competing models. A good fit using these indices have been defined as RMSEA < 0.05 (Browne & Cudeck, 1993) and CFI > 0.95 (Hu & Bentler, 1998). The second is a process for evaluating nested models using a bootstraping method which compares mean maximum likelihood discrepancies of competing models (Arbuckle, 2007; Bollen & Stine, 1992). The final method, which evaluates competing models without the use of fit indices, is a comparison of R^2 for competing models. Two sets of models were evaluated using these procedures; Restricted Model A and Model A, and Restricted Model B and Model B.

Restricted Model A. For Restricted Model A, fit indices indicate good fit to the data (CFI =. 960, RMSEA = .052). Significant negative relationships were observed between NEU and EUH (β = -.14, p = .015) and CROWD and SAT (β = -.30, p <.01). A significant positive relationship was observed between EUH and CROWD (β =.14, p = .011) (Table 7). The R^2 suggests that this model accounts for 2% of the variance in EUH, 2% of the variance in CROWD, and 9% of the variance in SAT.

Model A. For Model A fit indices indicate good fit to the data (CFI =. 983, RMSEA = .041). Significant negative relationships were observed between NEU and EUH (β = -.14, p = .015) and CROWD and SAT (β = -.30, p <.001) a significant positive relationship between EUH and CROWD (β =.15, p = .010) and a significant non-linear quadratic relationship between NEU2 and CROWD (β =-.13, p = .036) (Table 7). The R^2 suggests that this model accounts for 2% of

the variance in EUH, 4% of the variance in CROWD, and 9% of the variance in SAT.

Table 7

Significance Levels and Unstandardized and Standardized Regression Coefficients for Restricted Model A and Model A

			Restricted Model A			Model A		
			b	β	P	*b*	β	P
Direct effects								
EUH	<---	EXT	.00	-.02	.730	.00	-.02	.730
EUH	<---	NEU	-.01	-.14	.015	-.01	-.14	.015
CROWD	<---	EXT	-.02	-04	.513	-.02	-.03	.542
CROWD	<---	EXT2				.01	.05	.360
CROWD	<---	NEU	.03	.04	.512	.09	.11	.102
CROWD	<---	NEU2				-.03	-.13	.036
CROWD	<---	EUH	1.82	.14	.011	1.83	.15	.010
SAT	<---	EXT	.00	.01	.899	.00	.01	.899
SAT	<---	NEU	-.01	-.02	.780	-.01	-.02	.780
SAT	<---	EUH	.50	.05	.350	.50	.05	.350
SAT	<---	CROWD	-.23	-.30	***	-.23	-.30	***
Indirect effects								
CROWD	<---	EXT	.00	.00		.00	.00	
CROWD	<---	EXT2				.00	.00	
CROWD	<---	NEU	-.02	-.02		-.02	-.02	
CROWD	<---	NEU2				.00	.00	
SAT	<---	EXT	.01	.01		.01	.01	
SAT	<---	EXT2				.00	-.02	
SAT	<---	NEU	-.01	-.01		-.03	-.03	
SAT	<---	NEU2				.00	.04	
SAT	<---	EUH	-.41	-.04		-.42	-.04	

Note: *** = $p<.001$

Restricted Model B. For Restricted Model B, fit indices indicate good fit to the data (CFI =. 982, RMSEA = .026). Significant positive relationships were observed between EXT and SAT (β = -.12, p = .026) and EUH and SAT (β = ,14, p <.015) (Table 8). The R^2 suggests that this model accounts for none of the variance in EUH, 2% of the variance in CROWD, and 4% of the variance in SAT.

Model B. For Model B fit indices indicate good fit to the data (CFI =. 1, RMSEA = .000). Significant positive relationships were observed between EXT and SAT (β = .12, p = .026) and EUH and SAT (β = .14, p = .015) and a significant non-linear quadratic relationship between EXT2 and CROWD (β = -.14, p = .010) (Table 8). The R^2 suggests that this model accounts for none of the variance in EUH, 5% of the variance in CROWD, and 4% of the variance in SAT.

Table 8

Significance levels and unstandardized and standardized regression coefficients for Restricted Model B and Model B

				Restricted Model B			Model B		
				b	β	P	*b*	β	P
Direct effects									
	EUH	<---	EXT	.00	-.02	.785	.00	-.02	.785
	EUH	<---	NEU	.00	-.01	.896	.00	-.01	.896
	CROWD	<---	EXT	-.01	-.01	.973	.00	.00	.973
	CROWD	<---	EXT2				-.02	-.14	.010
	CROWD	<---	NEU	.10	.12	.055	.10	.12	.055
	CROWD	<---	NEU2				.00	-.01	.908
	CROWD	<---	EUH	1.54	.11	.054	1.56	.11	.054
	SAT	<---	EXT	.05	.12	.026	.05	.12	.026
	SAT	<---	NEU	.00	.00	.988	.00	.00	.988
	SAT	<---	EUH	1.17	.14	.015	1.17	.14	.015
	SAT	<---	CROWD	-.03	-.06	.325	-.03	-.06	.325
Indirect effects									
	CROWD	<---	EXT	.00	.00		.00	.00	
	CROWD	<---	EXT2				.00	.00	
	CROWD	<---	NEU	.00	.00		.00	.00	
	CROWD	<---	NEU2				.00	.00	
	SAT	<---	EXT	.00	.00		.00	.00	
	SAT	<---	EXT2				.00	.01	
	SAT	<---	NEU	.00	.00		.00	-.01	
	SAT	<---	NEU2				.00	.00	
	SAT	<---	EUH	-.05	-.01		-.05	-.01	

Note: *** = p<.001

Model Comparisons.

The first method employed compared non-centrality based fit indices, CFI and RMSEA, for competing models. CFI and RMSEA for Restricted Model A were .960 and 052 respectively and .983 and .041 for Model A. CFI and RMSEA for Restricted Model B were .982 and .026 respectively and 1.0 and .000 for Model B (Table 9). As CFI increases, model fit is assumed to increase. Likewise, as RMSEA deceases, model fit is assumed to increase. The increase in CFI and decrease of RMSEA in both comparisons suggests Models A and B are better fits to the data than the restricted models.

The second method follows a course of action for the use of bootstrapping in nested model comparisons. This has been described by Arbuckle (2007) and Bollen and Stine (1992). Maximum likelihood discrepancies are calculated for 1000 bootstrap samples. Mean discrepancies (M.D.) and absolute fit indices (AIC and BCC) are then evaluated. The models with the smallest M.D., AIC, and BCC are considered a better fit to the data. In both comparisons, M.D., AIC, and BCC are all smaller for models A and B in comparison to the restricted models (Table 9).

Table 9

Fit Indices and Maximum Likelihood Discrepancy (Implied vs. Population) for Model A and B Comparisons

	RMSEA	CFI	AIC	BCC	M. D.	S.e.
Restricted Model A	.052	.960	55.05	56.21	56.80	.645
Model A	.041	.983	54.10	55.37	53.99	.647
Restricted Model B	.026	.982	51.26	52.44	52.00	.690
Model B	.000	1.00	48.56	49.84	47.54	.698

Note: M.D. = mean discrepancy of 1000 bootstrap samples; S.e. = standard error of discrepancy

The third method employed evaluated model R^2's from competing models. In Restricted Model A R^2 = .02 for EUH, R^2 = .02 for CROWD, and R^2 = .09 for SAT. The R^2 increased to .05 for CROWD in Model A which is a 3% increase over the restricted model. In Restricted model B R^2 = .00 for EUH, R^2 = .02 for CROWD, and R^2 = .04 for SAT. The R^2 increased to .04 for CROWD Model B which is a 2% increase over the restricted model. The increase in R^2 for the full models suggests that the relationships identified account for more variance (less error) in the predicted variable CROWD than the restricted models. Unlike multiple regression analysis, using this technique to evaluate model fit in AMOS 5 does not provide a test statistic to evaluate the significance of the R^2 change and cannot be used by itself to evaluate model fit. However, in combination with the previous comparison methods it provides a more holistic view of the changes between models.

All three methods employed suggest that Model A and B, are superior to the restricted models.

Hypotheses Results

Results of the two, one-way ANOVA's which evaluated the effects of survey version on crowding and satisfaction levels supported H1a and H1b. Crowding and satisfaction levels were both higher for survey version B data.

Path analyses of Model A and B were conducted to evaluate the remaining hypotheses (H2a-H4). H2a (E as compared to introversion positively influences EUH) was not supported in either model. H2b (N as compared to emotional stability negatively influences EUH) was supported in Model A and not Model B. H2c (E as compared to introversion negatively influences crowding) was partially supported partially in Model B and not Model A. A quadratic relationship was observed rather than the negative linear relationship that was hypothesized. H2d (N as compared to emotional stability positively influences crowding) was partially supported in Model A and not Model B. A quadratic relationship was observed rather than the positive linear relationship that was hypothesized. H2e (E as compared to introversion positively influences satisfaction) was supported in Model B and not Model A. H2f (N as compared to emotional stability negatively influences satisfaction) was not supported in either model. H3a (EUH influences crowding) was supported in Model A and not Model B. H3b (EUH influences satisfaction) was supported in Model B and not Model A. H4 (crowding negatively influences satisfaction) was supported in Model A and not Model B. Results of accepted models are presented in Figure 3.

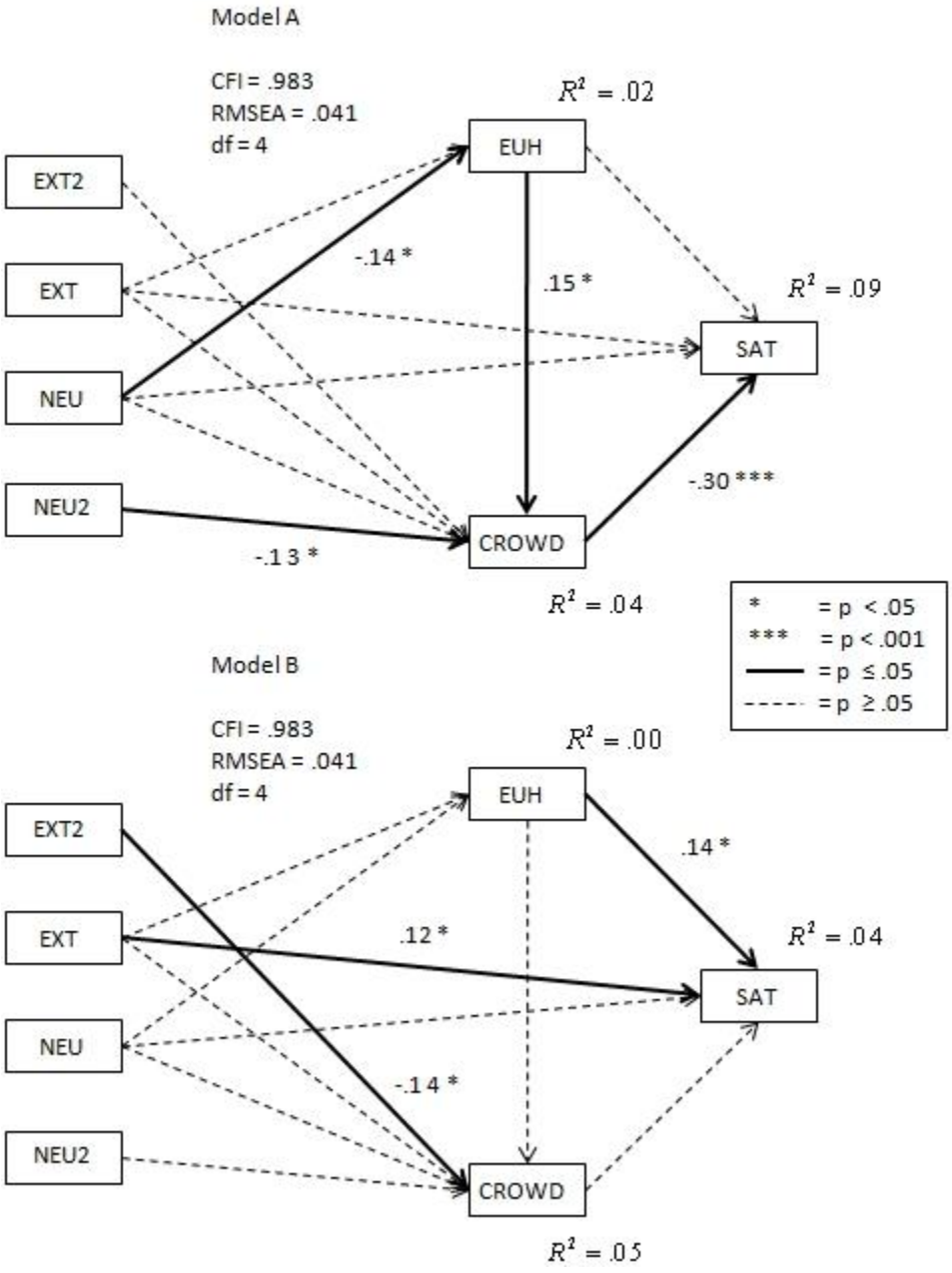


Figure 3. CFI, RMSEA, df, R^2, and standardized regression coefficients (β) for accepted models A and B.

Chapter 5

DISCUSSION

In this thesis, the possible influence of survey item order or placement on reported crowding and satisfaction levels was evaluated. Additionally, hypothesized relationships between the personality traits E and N, EUH, perceived-crowding, and recreational-satisfaction were tested. Results are discussed.

Given evidence from previous literature regarding the likelihood of item order bias (Huber, G.P., 1985; Lau, et al., 1990; Schomaker & Knopf, 1982; Schuman, et al., 1981; Sears & Lau, 1983), differences among crowding and satisfaction levels between the two survey versions was not surprising. Reasons for item order bias have been offered by Huber (1985), who states that the order in which questions are presented may influence the way other questions are interpreted. It is likely that a similar phenomenon is occurring among the crowding and satisfaction items. Crowding has been defined as the negative valuation of human density levels (Stokols, 1972) that may be linked to loss of personal control (Schmidt & Keating, 1979). Thus, in survey A, where respondents are first cued to think about crowding during their visit, responses most likely reflect the negative subjective evaluation of density levels on the trails. In survey B, where respondents were asked the crowding question after the satisfaction question, respondents are more likely responding to the crowding question in relation to the satisfaction questions. In other words, respondents are most likely thinking "given my satisfaction level with my experience here, how

crowded do I feel?" As such, in Survey B, the crowding question does not directly capture an evaluation of the density levels on the trail, and responses to the crowding question are likely confounded by responses to the satisfaction items. To minimize any biases, item ordering on a survey (especially when examining crowding and satisfaction), needs to be carefully thought out by researchers. In situations where the researcher is interested in a subjective evaluation of density levels, it is suggested that the crowding item be placed before any measures of satisfaction. However, it is important to consider the effect this may have on the satisfaction items. When asked in this manner, respondents are most likely thinking "given how crowded I felt during my experience, how satisfied do I feel?" Research also suggests that this bias dissipates the further items are placed from each other (Lau et al., 1990; Sears & Lau, 1983). As such, it is suggested that if possible, the crowding and satisfaction items are not placed directly after each other or closely together.

Of interest was the influence of this item-order bias on the relationships between EUH, crowding and satisfaction. Path analysis results for Model A and B suggest the bias had a significant effect on study results. In model A, EUH positively influenced crowding which in turn negatively influenced satisfaction. This is similar to previous studies such as Arnberger and Brandenburg (2007) and Armistead and Ramthun (1995) which have indicated that more experienced respondents are likely to be more critical of crowds. Additionally, the significant negative relationship between crowding and satisfaction mirrors previous literature such as Whisman and Hollenhorst (1998) and Shelby (1980) that has

reported satisfaction levels being negatively impacted among those respondents who feel crowded. The influence of EUH on crowding may be explained using disconfirmation theory. It should be clarified that disconfirmation was not measured directly in this study and therefore its influence on the EUH crowding and EUH satisfaction relationship in this study is only speculation. Disconfirmation theory assumes that experiential expectations are compared to current experiences (Oliver, 1993; Oliver & DeSarbo, 1988). Positive disconfirmation occurs when current crowding levels are lower than experienced during past visits Negative disconfirmation occurs when current crowding levels are higher than experienced during past visits. Here, past experience with a setting may serve as base-line information which respondents use to evaluate current experiences. In Model A, by prompting respondents to consider their past experience (EUH), followed by asking them to provide a crowding rating, we may be triggering disconfirmation with an emphasis on density levels. It was observed that as crowding ratings increased satisfaction levels decreased. This suggests EUH has an indirect effect on satisfaction levels.

Interestingly, in model B, EUH did not affect crowding, nor did crowding affect satisfaction. It is likely that by prompting individuals to consider their past experience, followed by asking them to provide a satisfaction rating; we are allowing a disconfirmation process related to multiple satisfaction-related experiential variables (e.g. weather, facility conditions, past emotional experiences at the park) without an emphasis on density levels, as in Model A. Thus, past experience did not influence how crowded a respondent felt. Rather,

respondents past experience with the setting influenced their satisfaction levels directly, rather than indirectly through crowding. This could also explain a lack of a relationship between crowding and satisfaction.

In addition to the above mentioned relationships, the influence of personality traits E and N on EUH, crowding, and satisfaction were evaluated. It has been suggested that in social science research, non-linear relationships may exist and should be evaluated (Cohen et al., 2003; Vallacher et al., 2002). Specifically, Vallacher et al., (2002) suggested that personality is part of dynamic and constantly evolving processes which influence cognition and not all relationships within this framework can be adequately explained when approached from a linear view. In the current study, bivariate scatter-plots indicated possible quadratic relationships between E and N and crowding (Figure 2). These non-linear relationships suggest that respondents who reported low and high levels of E and N indicated lower crowding levels and those reporting mid-range E and N levels reported higher levels of crowding. Thus, confirming Vallacher et al's proposition that personality traits may exhibit non-linear relationships with other variables.

The overall direction of the relationships in Model A suggested that as E increases, respondents become less critical of elevated density levels and as N increases, respondents become more critical of elevated density levels. In other words, extraverted, as opposed to introverted, people are less critical of density levels and neurotic people, as opposed to emotionally stable, are more critical of density levels. Considering the nature of these traits this is not surprising. E is

related to sociability and N is related to anxiety and fear (Ajzen, 2005; Eysenck, 1967; Goldberg, 1990; Tupes & Christal, 1961, 1992). Additionally, theory suggests that extraverts have a naturally lower arousal level and may seek out stimulation in order to reach their optimum level of arousal. Theory also suggests that neurotic's nervous systems are more sensitive to external stimuli (Eysenck, 1967). As such, those with high E may enjoy the increased stimulation of additional people. Neurotics on the other hand may become anxious with the addition of people which pushes them beyond their comfort level. Similar results were observed in Model B for N; however, in this model, E, displayed neither a positive nor negative overall direction.

Beyond the non-linear relationships between personality traits and variables of interest, the influence of these personality traits on EUH, crowding, and satisfaction suggest that this influence varied by survey version. In Model A, a significant quadratic relationship was observed between N, but not E, and crowding. The opposite was true for Model B, whereby a significant quadratic relationship was observed between E, but not N, and crowding. An explanation for this finding may be traced to the literature on personality traits and information processing. Previous literature has suggested a relationship between E and positive emotional information as well as N and negative emotional information processing (Gomez et al., 2002). In the current study, all satisfaction items were worded positively: "I have really <u>enjoyed</u> my experience …", "It was a <u>good</u> choice to come to south mountain …", "Overall, how <u>satisfied</u> were you …". Crowding on the other hand was negatively worded, "Please circle… how

crowded you felt …". In survey A, by introducing a negatively worded valuation (crowding) prior to a positively worded valuation (satisfaction), N may have been triggered to become the dominant trait in crowding valuation. The satisfaction items were positively worded; thus, failing to induce N as an influential factor.

If the link between positive and negative information processing was the sole reason for a relationship between E and N and crowding, a significant relationship would most likely not have been observed between E and crowding as seen in Model B. However, E has been identified as a highly social trait (Ajzen, 2005; Goldberg, 1990; Tupes & Christal, 1961, 1992). Crowding is directly related to human density and social atmosphere which provides basis for a theoretical connection between E and crowding beyond that of information processing. As such, introducing a positive valuation (satisfaction) prior to a negative valuation (crowding), as in survey B, may trigger E to become the dominant trait in satisfaction and crowding valuation. If E were not a highly social trait we may have failed to observe this relationship between E and crowding (Model B) as we failed to see a connection between N and satisfaction for either model (A or B). This suggests that not only may item order affect how individuals interpret survey questions, the negative or positive wording or nature of a question may evoke a particular personality trait to become dominant in the cognitive process. Thus, depending on the relationships between E and N and variables of interest, if any beyond that of information processing, this may set a psychological precedent that carries over to subsequent questions.

The following directions are suggested for future research. Studies evaluating item order bias not only with crowding and satisfaction but other variables too are also needed. By separating the crowding and satisfaction items ordering bias may become negligible. However, the question of "which item should come first?" remains. If crowding truly does affect satisfaction levels, the ordering should not matter. Results suggest that it is when a person is induced to think about crowding that it becomes influential in satisfaction response. Additional exploration of this is necessary. Results also suggest that the single item nine point crowding scale (Heberlein & Vaske, 1977) may not be the most suitable measure when evaluating front country or natural resource locations with a social atmosphere. This crowding item (Heberlein & Vaske, 1977) suggests that crowding is a negative situational variable (i.e. how crowded you felt). However, as expected, crowding valuations varied significantly across low and high use trails. Yet, there was no difference in satisfaction levels across low and high use trails. This suggests that some recreationists may prefer or self select locations with higher density levels. Further evaluation of user preference in relation to density levels may help clarify this and develop a more suitable item or items for density level valuation for these situations.

Next, this study evaluated only two of the five personality traits of the "Big Five" personality construct (Goldberg, 1999). Additional studies that include all five personality factors may provide a more holistic view of the psychological processes involved in leisure experiences. Within the context of natural resource recreation, Donnellan et al's (2006) Mini-IPIP scale exhibited a

relatively low reliability (α =.63) for the N personality trait. It may be helpful to evaluate the 50 item "Big Five" IPIP scale for other reliable items useful for tapping into the N trait. Finally, further research evaluating the relationships between EUH and crowding and satisfaction are needed. Several studies have indicated mixed results (e.g. Andreck & Virden, 2002; Armistead & Ramthun, 1995; Arnberger & Brandenburg, 2007; Budruk et al., 2008; Budruk et al., 2002). Considering the disconfirmation theory of satisfaction formation, past experience with a location may provide benchmarks with which to make comparisons. Results of the current study suggests that the order that questions are presented may influence which aspects of past experience are considered in the disconfirmation process. As suggested, placing the crowding question after EUH and prior to satisfaction may have induced disconfirmation with an emphasis on density levels. Further evaluation of personality traits, EUH, and related variables may provide further insight into recreational satisfaction formation.

Conclusion

Findings revealed that survey item ordering and the personality traits E and N may influence crowding and satisfaction levels. From an empirically driven research perspective, item ordering, if not carefully thought through by researchers, may present substantial problems and produce confounding results. Additionally, considering that personality traits are potentially sensitive to negative and positive valuation responses, researchers need to be aware of issues related to this especially when examining these traits in relation to asymmetrical scales such as the single item, nine-point crowding scale. Finally, it is important

to note that personality traits are inferred (cannot be directly seen) and are a function of both heredity and social environments (Mannell & Kleiber, 1997); therefore, people may be inherently susceptible to certain external stimuli while others are more tolerant.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	Megha Budruk UCENT
From:	Mark Roosa, Chair SPM Soc Beh IRB
Date:	09/20/2010
Committee Action:	**Exemption Granted**
IRB Action Date:	09/20/2010
IRB Protocol #:	1009005511
Study Title:	Personality in natural resource recreation: Examining trait influence on crowding, user-satisfaction and place-attachment.

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B

CITY OF PHOENIX PERMISSION LETTER

September 16, 2010

To Arizona State University Human Subjects Institutional Review Board:

This letter grants permission to Andrew Holloway and Arizona State University to collect data pertaining to place attachment, crowding, satisfaction, personality, and general demographic information at South Mountain Park, Phoenix AZ. As outlined in the study proposal, data will be collected through self-response questionnaires administered at various trailheads throughout the park from October 2010 through January, 2011.

Rob Blaney 9/15/10
Park Supervisor South Mt Park

APPENDIX C

SURVEY A

Survey Number: _____ Date____/____/_____ Trail Head_____ A

South Mountain Park Visitor Survey

Arizona State University researchers are conducting this study in an effort to learn more about your recreation experience at South Mountain Park. All participants must be 18 years of age or older. This survey is completely voluntary and strictly anonymous.

Is this your first visit to the South Mountain Park? ___Yes ___No

If No,

How many years have you been recreating at South Mountain Park? ___Years

How many times in the last twelve months have you recreated here? ___Times

What activities did you participate in today? *(Check all that apply)*

___Hiking ___Biking ___ Running ____Other (*please describe*) _____

Please circle the number that best represents how crowded you felt during your visit to South Mountain Park today.

Not at all crowded			Slightly crowded		Moderately crowded		Extremely crowded	
1	2	3	4	5	6	7	8	9

Please evaluate the following statements about your experience today (*Circle one number for each statement*)

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I have really enjoyed my experience at South Mountain Park today	1	2	3	4	5	6	7
It was a good choice to come to South Mountain park today	1	2	3	4	5	6	7
This experience was exactly what I needed	1	2	3	4	5	6	7

Please circle one number for the following question

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied
Overall, how satisfied are you with your visit today?	1	2	3	4	5	6	7

In order to plan for the future, we are attempting to better understand what makes an experience satisfying for different personality types. Please evaluate the following statements (*Circle one number for each statement*)

	Very Inaccurate	Moderately Inaccurate	Neither Accurate nor Inaccurate	Moderately Accurate	Very Accurate
I am the life of the party	1	2	3	4	5
I sympathize with others' feelings	1	2	3	4	5
I get chores done right away	1	2	3	4	5
I have frequent mood swings	1	2	3	4	5
I have a vivid imagination	1	2	3	4	5
I don't talk a lot	1	2	3	4	5
I am not interested in other people's problems	1	2	3	4	5
I often forget to put things back in their proper place	1	2	3	4	5
I am relaxed most of the time	1	2	3	4	5
I am not interested in abstract ideas	1	2	3	4	5
I talk to a lot of different people at parties	1	2	3	4	5
I feel others' emotions	1	2	3	4	5
I like order	1	2	3	4	5
I get upset easily	1	2	3	4	5
I have difficulty understanding abstract ideas	1	2	3	4	5
I keep in the background	1	2	3	4	5
I am not really interested in others	1	2	3	4	5
I make a mess of things	1	2	3	4	5
I seldom feel blue	1	2	3	4	5
I do not have a good imagination	1	2	3	4	5

A

Please indicate the extent to which you agree or disagree with the following statements about South Mountain Park (*circle one number for each statement*)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This park means a lot to me	1	2	3	4	5
I am very attached to South Mountain Park	1	2	3	4	5
I identify strongly with this park	1	2	3	4	5
I feel no commitment to this park	1	2	3	4	5
I enjoy recreating at this park more than any other park	1	2	3	4	5
I get more satisfaction out of visiting this park than any other park	1	2	3	4	5
Recreating here is more important to me than any other place	1	2	3	4	5
I wouldn't substitute any other park for the type of recreation I do here	1	2	3	4	5
I have a lot of fond memories about this park	1	2	3	4	5
I have a special connection to the park and the people who recreate here	1	2	3	4	5
I don't tell many people about this park	1	2	3	4	5
I would (do) bring my children to this park	1	2	3	4	5

Please evaluate the following statements about your satisfaction with the condition of the park facilities and trails (*Circle one number for each item*)

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Trails	1	2	3	4	5
Picnic tables	1	2	3	4	5
Picnic shelters	1	2	3	4	5
Restrooms	1	2	3	4	5
Amount of litter	1	2	3	4	5
Roads/parking areas	1	2	3	4	5
Overall condition of the park	1	2	3	4	5

Finally, we would like some general information about you:

Which category best describes your group today?

___Alone ___Family ___Friends
___Family & Friends ___Organized Group ___Other (*specify*)_____

What is the highest level of education you have completed?

___Eight grade or less ___High school/GED ___Tech school
___Some college ___College degree ___Advanced degree

What is your annual household income?

___Less than $15,000 ___$15,000-29,999 ___$30,000-44,999
___$45,000-59,999 ___$60,000-74,999 ___$75,000-89,999
___$90,000-104,999 ___$105,000 or more

Do you consider yourself to be of Latin, Hispanic, or Spanish origin?

___Yes ___No

With which racial/ethnic group(s) do you identify? (*Please check all that apply*)

___American Indian or Alaska Native ___Native Hawaiian or other Pacific Islander
___Asian ___Black or African American
___White ___Other (please describe) _____

What year were you born? ___

What is your sex? ___Male ___Female

What is your zip code? _____

If you are an international visitor, what country are you from? _____

Please share any other comments about South Mountain Park:

Thank you for your participation!!

APPENDIX D

SATISFACTION AND CROWDING ITEMS: SURVEY B

Survey Number: _____ Date____/____/_____ Trail Head_____ B

South Mountain Park Visitor Survey

Arizona State University researchers are conducting this study in an effort to learn more about your recreation experience at South Mountain Park. All participants must be 18 years of age or older. This survey is completely voluntary and strictly anonymous.

Is this your first visit to the South Mountain Park? ___Yes ___No

If No,

How many years have you been recreating at South Mountain Park? ___Years

How many times in the last twelve months have you recreated here? ___Times

What activities did you participate in today? *(Check all that apply)*

___Hiking ___Biking ___Running ____Other (*please describe*) _____

Please evaluate the following statements about your experience today (*Circle one number for each statement*)

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I have really enjoyed my experience at South Mountain Park today	1	2	3	4	5	6	7
It was a good choice to come to South Mountain park today	1	2	3	4	5	6	7
This experience was exactly what I needed	1	2	3	4	5	6	7

Please circle one number for the following question

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied
Overall, how satisfied are you with your visit today?	1	2	3	4	5	6	7

Please circle the number that best represents how crowded you felt during your visit to South Mountain Park today.

Not at all crowded		Slightly crowded		Moderately crowded			Extremely crowded	
1	2	3	4	5	6	7	8	9