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The Relationship between Control-Based Personality Variables and Transportation Attitudes and Behavior

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LOYOLA UNIVERSITY OF CHICAGO

THE RELATIONSHIP BETWEEN CONTROL-BASED PERSONALITY VARIABLES
AND TRANSPORTATION ATTITUDES AND BEHAVIOR

A THESIS SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS
DEPARTMENT OF PSYCHOLOGY

BY
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CHICAGO, ILLINOIS

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CHAPTER I

INTRODUCTION

In recent years, transportation researchers have acknowledged the importance of psychological theory in understanding and predicting transportation behavior (Belohlav, 1976; Belohlav & Shell, 1980; Dobson, Dunbar, Smith, Reibstein, & Lovelock, 1978; Golob, 1973; Hartgen, 1974; Hartgen, 1981; Kreindler, 1979; Levin & Louviere, 1981; Michaels, 1980; Spear, 1981). It was recognized that transportation systems need to be considered from a human perspective rather than from an exclusively technological view (Everett & Watson, 1987). Researchers began to develop travel demand models that were more “behavioral,” that is, models that reflect more accurately how persons make travel decisions (Gilbert & Foerster, 1976). These behavioral models included attitudinal variables to better understand a person’s travel decision-making process. The models were used to design transportation systems that were suitable to the public, and to develop marketing strategies for transportation modes that emphasized the values and preferences of specific groups. Researchers often asked subjects to rate the importance of and satisfaction with specific transportation attributes, such as convenience, flexibility, cost, and comfort. Some studies asked respondents to provide separate ratings for different modes such as bus, car, train, and public transit in general (Dobson, 1975; Fenwick, Heeler, & Simmie, 1983; Golob & Recker, 1977; Hille, Paine, Nash, & Brunner, 1968; Mitchelson & Gauthier, 1980; Prousaloglou & Koppelman, 1989; Paine,

Nash, Hille, & Brunner, 1969). These ratings or rankings represent the non-objective or attitudinal component of transportation behavior.

However, some findings in the transportation literature suggest that attitudes and behavior may have deeper psychological meaning and may be related to aspects of personality and individual difference variables.

Kenneth Craik from the Institute of Personality Assessment and Research at the University of California, Berkeley stated:

“Individuals form the immediate constituency of a society’s total transportation system. Progress will be made in studying the acquisition, development and structure of a person’s entire array of transportation behaviors, including relevant dispositions, beliefs, attitudes, values, habits, and roles” (Craik, 1969, p. 86).

Craik also recommended that “research designs establish broadly based transportation-user topologies, with the data inputs for factor analysis including the assessment of a wide range of transportation dispositions, combined with assessment of standard personality traits and variables” (Craik, 1969, p.89).

Thus, in addition to attitudes there may be other psychological variables such as personality traits that may affect transportation behavior. Although attitudes and relevant demographic and sociometric variables have been examined extensively in the transportation literature, personality and other individual difference variables have received little attention. This study examined whether individual differences in personality, as well as attitudes and situational variables, are related to transportation decisions. Specific attention was given to the concept of psychological control and the decision to ride or not to ride public transportation to get to work and/or school. For the

purposes of this study, public transportation is defined as transportation by bus, rail, or any other conveyance that provides the public with general or specific service on a regular and continuing basis (Regional Transportation Authority Act). Common examples of public transportation include buses and commuter trains such as the Chicago CTA trains and buses, the Metra trains and Pace suburban buses. Transportation by aircraft, taxicab or intra-city rail lines such as Amtrak was not addressed in this study.

CHAPTER II

PSYCHOLOGICAL VARIABLES RELATED TO TRANSPORTATION DECISIONS: A REVIEW OF THE LITERATURE AND RELATED RESEARCH

Psychological Control

The concept of control has received much attention in the psychological literature. A popular control construct, locus of control (Rotter, 1966), reflects the degree to which individuals perceive that the consequences of their behavior and other life events are controllable by personal effort as opposed to external forces.

Control-related variables have been found to affect behavior in a variety of settings and circumstances (Lefcourt, 1976; Rotter, 1966). It may prove useful to examine the effects of several control-related variables that may be relevant to the understanding of transportation behavior. Variables such as general desire for control, privacy control, environmental control, and crime/safety control may be important variables of interest because they are related to the aforementioned transportation attributes examined in travel demand modeling. The following paragraphs will discuss these concepts in greater detail.

Desire for Control

Burger and Cooper (1979) have suggested the existence of a stable personality trait reflecting the extent to which individuals generally are motivated to control the

events in their lives. This trait is called the desire for control and is built around the concept of control motivation. Psychometric data suggest that some people hold a strong desire to control many events in their environments a great deal of the time, while others seem to report a consistently low desire to exercise such control (Burger, 1984). The level of control motivation can vary from situation to situation. However, there is research to suggest a general motive to control the events in one's life (Burger & Arkin, 1980; Burger, Oakman & Bullard, 1983; Schmidt & Keating, 1979). Burger and Cooper have developed a measure which reliably identifies individual differences in desire for control.

Desire for control may prove useful for understanding transportation behavior. Some transportation researchers have incorporated items in their questionnaires that suggest the concept of control in their travel demand models and consumer segmentation studies (Hille & Martin, 1967; Hille, Paine, Nash, & Brunner, 1968; Mitchelson & Gauthier; Pace, 1995). Several of the transport mode attributes that have been identified in various studies include autonomy, independence of control, challenge (feeling of mastery control), sense of freedom (escape from routine), control/freedom from schedules, flexibility, control of situation, and freedom of action, among others. These researchers have found that control-related attributes were important to individuals when making mode choice decisions. Although these factors were often vague and poorly defined, they do suggest that control is an important variable in understanding transportation attitudes and behavior.

This study investigated how an individual's desire for control affects his or her

transportation decisions. Specifically, this study examined how desire for control was related to attitudes toward public transportation utilization. It was hypothesized that individuals high in desire for control would react differently to public transportation utilization than individuals low in desire for control. Individuals high in desire for control may have less favorable attitudes toward using public transportation if they perceive that the system does not allow for much personal control. These individuals may prefer other modes of transportation such as a personal automobile which allows more freedom. However, if individuals perceive that the public transportation system allows for adequate control, and control is something that they desire or value, then more favorable attitudes and behavior will be evident. People high in general need for control may see public transportation as less controllable than people low in need for control. Need for control and perceived controllability may be related separately or in an interactive way to attitudes.

Privacy Control

Another control-related concept that may be relevant to understanding transportation attitudes and behavior is the need for privacy or privacy control. Although privacy lacks a simple and universal definition, there is a general consensus that privacy involves some level of withdrawal and solitude. Irwin Altman (1975, p. 17) defines privacy as “the selective control of access to self or one’s group.” Altman’s model of privacy states that people compare ideal and actual privacy and feel either satisfied, isolated or controlled (Altman, 1975). Another privacy researcher, Nancy Marshall (1974, p. 255) defines privacy as “the ability to control the degree to which people and

institutions encroach upon one's life, and to adjust the level of privacy to changing needs.”

Four major dimensions of privacy have been identified in previous research: solitude, anonymity, intimacy, and reserve (Westin, 1967; Proshansky, Ittelson & Rivlin, 1970; Pastalan, 1970). According to Marshall, privacy can be achieved by placing physical barriers between self and others (solitude/seclusion), placing mental barriers between self and others (reserve/disclosure), or by surrounding oneself with strangers (anonymity), family members, or close friends (intimacy).

Marshall (1974) has developed a valid measure of privacy preferences, the Privacy Preference Scale (PPS), and her research has shown that there are individual differences in privacy and privacy control. Some individuals need or desire more privacy than others and people will engage in behaviors which are consistent with their privacy needs. Privacy preferences may vary from situation from situation, but Marshall has demonstrated that there is a generalized need for privacy control.

In addition, other researchers (Hammit & Madden, 1989) have developed a measure for exploring the meaning of privacy and solitude in wilderness settings. Their research was based on the philosophical writings of Westin (1967) and other privacy investigators (Stankey, 1973; Altman, 1975). They developed a 20-item measure that was based on Westin's four categories of privacy (solitude, intimacy, anonymity and reserve). They demonstrated that similar dimensions operate for people who reside or frequently recreate in the wilderness. These dimensions are also similar in context to the scales of Marshall's Privacy Preference measure.

Privacy is a factor in transportation research that has been found to be important in mode choice decisions (Belohlav & Shell, 1980; Hartgen, 1974; Hille, Paine, Nash & Brunner, 1968; Paine, Nash, Hille & Brunner, 1969; Wallin & Wright, 1975). Some privacy-related variables in transportation research include travel with other people, with friends, with people you like, in an uncrowded vehicle, avoid riding with strangers, guarantee of individual seating, ability to arrange in-vehicle seating, and ability to restrict passengers.

Individual differences in privacy preferences may affect transportation attitudes and behavior. For example, individuals high in preference for privacy may have less favorable attitudes toward riding public transportation. These individuals may rate the importance of privacy-related attributes of a transportation system as high, and satisfaction with these attributes as low. However, a person's standing on each dimension of privacy might have opposite effects based on whether it is something a person desires or wants to avoid. For example, a person could either seek out or try to avoid solitude. Some individuals may avoid riding public transportation because of the high exposure to other people. However, other individuals may enjoy interacting with people in public places and seek out these activities.

To better understand how privacy preferences are related to transportation attitudes and behavior, this study examined how need for solitude affects transportation decisions. The solitude dimension of privacy was selected because need for solitude may have a direct impact on attitudes and behavior related to public places such as riding public transit.

Environmental Attitudes and Environmental Control

The deteriorating physical condition of our natural environment is a growing social problem that has received considerable attention in recent years. Traditionally, environmentalists relied on technological approaches to solving environmental problems. However, more recent efforts have turned to the understanding of knowledge, attitudes, and other aspects of the person to change behavior and ultimately improve environmental conditions (Borden & Francis, 1978; Craik, 1976; Evans & Jacobs, 1981; Maloney & Ward, 1973; McKechnie, 1977; Stokols & Altman, 1987).

Public transportation has been recognized as a technological innovation to alleviate several significant environmental problems such as air pollution, fuel consumption, road deterioration, and traffic congestion. However, without a proper understanding of attitudes, knowledge, personality, and behavior related to transportation decisions, it will be difficult to change behavior to reduce these environmental problems.

Environmental attitudes and knowledge have been examined extensively in previous studies (Buckout, 1972; Evans, Jacobs & Frager, 1979; Hohm, 1976; Maloney & Ward, 1973; Rankin, 1969; Swan, 1972; Pettus & Giles, 1987). Environmental researchers found that accurate knowledge, and perceptions of the severity and importance of the problem predicts whether an individual will engage in an environmentally preserving act (Arbuthnot, 1977; Hohm, 1976; Evans et al., 1979; VanLiere & Dunlap, 1978, 1980). Transportation researchers have found that clean air was one factor that people considered important in making transportation decisions (Hohm, 1976; Mitchelson & Gauthier, 1980). Individuals have cited “clean air” as a

reason for riding public transportation or some other form of ride sharing (Evans, Jacobs & Frager, 1979; Hartgen, 1977; Hohm, 1976).

Some researchers have found that, in addition to attitudes, there are personality variables related to environmentally conscious behavior. For example, Borden and Francis (1978) found that some scales on the California Personality Inventory (CPI; Gough, 1957) were related to environmental concern. Persons who were more ethically, morally, and socially conscious exhibited higher levels of environmental concern. These individuals were also found to hold greater internal locus of control beliefs.

Locus of control is another personality variable that has been shown to predict environmentally conscious behavior. For example, Trigg, Perlman, Perry & Janisse (1976) found that internally-oriented individuals had more accurate information about environmental pollution, and when internals perceived a high probability of success, they engaged in more anti-pollution activities. Arbuthnot (1977) found that internal locus of control was predictive of use of a community recycling center, and concluded that personality and attitudinal traits play a moderating role in behavioral responses to environmental issues. Evans, Jacobs and Frager (1979) found that subjects who scored high on an internal locus of control measure actively sought out information about smog and expressed more favorable attitudes about using public transportation to reduce smog. These researchers concluded that the concept of control, either real or perceived, may be crucial in understanding public responses to air pollution.

Other researchers have touched on the concept of control in their research on environmental attitudes (Little, 1987). For example, Sewell (1971) found that the view

that “man is in control of nature” accounted for nearly half of the explained variance in the environmental perceptions and attitudes of a sample of engineers and public health officials (Arbuthnot, 1977). In an informative investigation on air pollution, Rankin (1969, p. 569) concluded that “the average citizen, while recognizing the air pollution problem, was unfamiliar with what could be done, or what has been done, and appeared to be apathetic or pessimistic regarding his/her own role and the likelihood of control.” Thus, the concept of control may be a significant factor in the understanding of environmentally-conscious behavior.

This study investigated whether environmental control was an important factor in transport mode choice decisions. Environmental control was operationalized as a situation-specific locus of control measure designed to determine the extent to which individuals attribute environmental problems to internal or external factors. Specifically, six questions were examined: 1) Does the individual perceive that his/her actions will affect his/her environmental conditions? 2) Does the individual assume responsibility for environmental protection and preservation? 3) How do environmental locus of control beliefs relate to transportation attitudes and behavior? 4) Do individuals who hold internal beliefs in environmental control have more favorable attitudes toward using public transportation? 5) Do these individuals perceive a direct relationship between riding public transportation and helping the environment? 6) Are these individuals more frequent users of public transportation?

Crime and Safety Control

Fear of crime and desire for personal safety are additional factors that have been

found to affect transportation attitudes and mode choice decisions (Ball, 1989; Belohlav & Shell, 1980; Feldman & Vellenga, 1977; Golob & Recker, 1977; Proussaloglou & Koppelman, 1989). A recent article on public transportation states that “safety fears are often the most serious deterrent of all to the use of any form of transit” (Middletown & Smerk, 1993, p. 46). Transportation researchers found that many individuals rated safety as an important attribute of a transportation system, and people were more likely to utilize modes that provided them with the greatest amount of safety and security (Patterson, 1985; Wallin & Wright, 1975).

However, there may be individual differences in personality that can be examined to better understand safety-related attitudes and behavior. For example, Jones (1984) found that individuals who were identified as having “internal” safety locus of control orientations were more likely to engage in safety-related behaviors. These individuals acknowledged a contingent relationship between personal actions and accidents/injuries, and attributed the causes of accidents to internal factors. On the other hand, persons with “external” safety control orientations perceived no cause and effect relationship between personal actions and safety. These individuals perceived that accidents were determined by forces outside their control such as chance events or bad luck, and were less likely to take safety precautions.

This study examined the effects of crime and safety control beliefs on transportation attitudes and behavior. Safety beliefs may be based on direct or indirect personal experience or vague feelings associated with specific modes such as the Chicago Transit Authority buses and trains. It was hypothesized that individuals’ attitudes toward

public transportation would be consistent with their safety control beliefs. For example, internally-oriented individuals may be less likely to utilize public transportation if they think it may threaten their personal safety. Internally-oriented individuals often perceive a direct link between their actions and the consequences of their behavior, and they may be more concerned about the likelihood of being threatened or attacked when using public transportation. On the other hand, externally-oriented individuals do not always perceive a relationship between their actions and life circumstances, and they may not consider the importance of safety when making transportation decisions. Specifically, five research questions were examined: 1) Does the individual perceive that his/her actions will affect his/her personal safety? 2) How do safety locus of control beliefs relate to transportation attitudes and behavior? 3) Do individuals who hold internal beliefs in safety control have less favorable attitudes toward using public transportation? 4) Do these individuals perceive a direct relationship between riding public transportation and their personal safety? 5) Are these individuals less frequent users of public transportation?

In summary, it was hypothesized that four aspects of psychological control: Desire for control, environmental control, privacy control, and safety control, would be related to transportation attitudes and behavior. These psychological traits may relate to transportation attitudes in both direct and indirect ways. That is, people who differ with respect to control traits may simply have different attitudes. Whether they do so, however, may depend on a perceived link between personal needs and relevant attributes of transportation modes. In order to understand these possible effects of personality, a

brief explanation of psychological attitudes is provided to further develop and illustrate the study hypotheses.

Attitude Theory

Attitudes as unidimensional constructs. Over the years, psychologists have developed many different definitions of attitudes. In early attitude theory and research, attitudes were thought of as unidimensional constructs dealing only with affect or feelings. For example, Thurstone (1931, p. 261) defined attitude as “the intensity of positive or negative affect for or against a psychological object.” Most attitude researchers held the general consensus that a person’s attitude toward some object would predispose him/her to respond either favorably or unfavorably toward that object. However, when the relationship between attitudes and overt behavior was found to be weaker than expected, researchers began to critique and reevaluate their view of attitudes as unidimensional constructs. Some researchers began to look for a more reasonable explanation of the attitude-behavior relationship.

Attitudes as multi-dimensional constructs. Allport (1935) thought that unidimensional affective or evaluative measures of attitudes did not do justice to the complexity of the attitude concept (Ajzen & Fishbein, 1980). Allport (1935, p. 37) defined an attitude as “a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related.” This definition led to the conceptualization of attitudes as multifaceted. For example, in their influential textbook, Krech and Crutchfield (1948) defined attitudes as “an enduring organization of

motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world" (Ajzen & Fishbein, 1980, p. 19). Further enhancement of this theory lead to the widely-accepted view that attitudes contain three distinct components: The affective component - a person's emotions or feelings toward the attitude object; the cognitive component - a person's thoughts, perceptions, understanding/knowledge/awareness, or beliefs about the attitude object; and a behavioral or conative component - a person's overt actions or intended actions pertaining to the attitude object (Rosenberg, 1956). Overt behavior is mediated by attitudes which are made up of these components.

Applications

Attitudes and transportation research. Transportation researchers have recognized the importance of attitudinal variables in transportation mode choice decisions. Most recent transportation research has adopted a multidimensional conceptualization of attitudes. Survey respondents are often asked to provide ratings of the importance and perceived satisfaction with attributes of various transportation alternatives such as convenience, cost, flexibility, and comfort. The importance rating is regarded as the cognitive component and the satisfaction rating is said to represent the affective component. The satisfaction rating for each attribute is often weighted or multiplied by the respective importance rating and these values are summed to form an overall "attitude." The conative or behavioral component is usually assessed by asking respondents to indicate their actual or intended use of various transportation modes such as buses or automobiles. The linear combination of these components is said to yield the

best profile of attitudes for understanding how attitudes affect transportation behavior.

The approach used by transportation researchers parallels the class of attitude theories commonly referred to as expectancy-value models (Ajzen & Fishbein, 1980). Fishbein (1963) conceptualized attitudes as a linear combination of beliefs about an object and the evaluation of those beliefs. Another attitude theorist (Rosenberg, 1956) hypothesized that an individual's affect toward an object is a summation, over a number of values (desired characteristics or attributes), of the object's perceived instrumentality for achieving each value, times the worth or importance of that characteristic to the individual (Hartgen, 1974). In summary, these and other expectancy-value theories all operationally define attitude in terms of the combination of attributes of the attitude object, how good or bad those attributes are and how strongly they are associated with the attitude object.

Attitudes and marketing research. Market researchers have often applied attitudinal models to consumer buying behavior. Kotler (1984, p. 463) defines a product as "a bundle of physical, service, and symbolic particulars expected to yield satisfactions or benefits to the buyer." In the transportation context, services such as public transit bus or rail can be regarded as products consisting of various attributes such as comfortable seats, low costs, adequate spacing, and so forth. The consumer's satisfaction or attitude toward a product is determined, in part, by beliefs that the product fulfills certain needs. Transportation marketing research professionals are beginning to apply these theories to understand and encourage various forms of transportation behavior. Dissaggregate models of consumer behavior have been used to allow for the identification of the relative

contributions of the perceived attributes of the object toward formulation of the consumer's attitude. These factors or components are important for promotional planning and new service developments. In addition, transportation marketing professionals apply attitude theory and research to formulate transit market segmentations based on customer needs and expectations. This technique has been useful for developing public transportation services and marketing efforts targeted toward specific types of individuals.

Personality and marketing research. Marketing research has recently begun to apply personality variables in understanding consumer behavior. This approach is often referred to as "psychographic research or psychological segmentation." In psychographic studies, advertising and marketing researchers have successfully characterized consumers according to key personality and lifestyle variables that drive buying decisions. For example, the Washington Metropolitan Area Transit Authority (WMATA, 1993) used a psychographic segmentation procedure to characterize its transit service markets. They found that certain types of individuals were more likely to ride transit and have more favorable attitudes toward using transit than others. For example, a group of individuals characterized as Metro Enthusiasts expressed favorable attitudes and were frequent users of public transit. These individuals were more likely to be younger, single males who are active in political organizations, participate in competitive sports, work late in the evening, seek adventure and enjoy taking risks. WMATA has successfully applied their research findings to develop advertising and marketing campaigns that target or appeal to specific groups of individuals to encourage and increase use of public transit. Although

some transportation agencies are more progressive in applying psychological theories to understand transportation behavior, most public transportation research has been slow in incorporating these strategies. The current research expands on previous efforts by examining how control-based personality variables are related to transportation attitudes and behavior.

Attitude - personality relationships. Some personality theorists have considered attitudes a facet of personality (e.g., Allport, 1937; Cattell, 1950; Guilford, 1964; Murray, 1938). However, few studies have directly examined the relationship between attitudes and personality as separate constructs. The lack of research in this area is surprising, considering the theoretical-relevancy of many personality variables to attitudes and the potential implications for a better understanding of behavior.

Attitudes and personality traits have been defined as acquired behavioral dispositions (Campbell, 1963). One way of differentiating these dispositions is to say that personality refers to a broad tendency to respond in a certain way to various objects in different situations, whereas attitude refers to the evaluative aspect of responding to specific objects in specific situations. That is, a personality trait is usually viewed as a predisposition to perform a broad spectrum or class of behaviors, whereas attitudes relate to a specific behavior or action toward a particular attitude object (Ajzen & Fishbein, 1980).

A better understanding of an individual's personality may shed light on how the attitude is formed. The evaluative component of the attitude may be determined, in part, by psychodynamic and largely unconscious motives or personality characteristics such as

need for control or privacy (Ajzen & Fishbein, 1980). Thus, how an individual rates the importance of an attitude object and evaluates whether the attitude object possesses or gratifies some need may be driven by his or her relevant personality characteristics. In other words, people will have more positive attitudes toward attitude objects (e.g., public transportation) that are seen as possessing attributes that are relevant to their personality. For example, an individual who has a high need for control should have more favorable attitudes toward objects and circumstances that allow for greater control (automobile travel) than things that are less controllable (public transportation). On the other hand, people who are low in desire for control will probably not form their attitudes based on controllability criteria, and their attitudes about things that differ in controllability should be about the same. Thus, individual differences in attitudes may be partly attributable to personality, and the strength of the attitude may be determined, in part, by the strength of the personality characteristic related to the attributes of the attitude object. Personality may interact with attitudes and subsequently direct the behavior. A better understanding of how personality affects the formulation of an attitude would be useful for understanding the broader behavioral disposition and the behavior toward the attitude object itself.

Research on attitude - personality relationships. Few studies have examined the relationship between attitudes and personality. Most personality-attitude research has been conducted on political attitudes and attitudes toward authority (Heaven, 1988; Heaven & Furnham, 1991; Riemann, Grubich, Hempel, Mergl & Richter, 1993; Rigby, 1986; Rump, 1985). Some studies have focused on how political attitudes are affected by

traits such as authoritarianism, dogmatism, Machiavellianism, and psychoticism (Eysenck, 1954; Furnham, 1985; Ray, 1979; Smithers & Loblely, 1978; Wilson & Brazendale, 1973). Other studies have also found significant relationships between the authoritarian personality, anti-Semitic attitudes and related behavior (Adorno, Frenkel-Brunswik, Levinson & Sanford, 1950).

Some researchers have found meaningful relationships between personality and attitudes toward the environment. One study investigated the relationship between attitudes toward environmental issues and personality variables such as locus of control, openness of belief system and perceptions of self (Pettus & Giles, 1987). These researchers hypothesized that an individual's personal disposition may have an environmental attitude component that affects behavior toward the environment. Results indicated that self-controlled, well organized, and goal-oriented individuals were more likely to display favorable environmental behaviors, and individuals who had an internal locus of control were less likely to favor laws or restrictive measures designed to preserve or improve the environment. Thus, internals felt responsible for their environmental conditions and thought they did not need to be governed or forced by law to protect their surroundings.

Another researcher hypothesized that personality and attitudinal traits play a moderating role in the individual's perceptions of and behavioral responses to environmental issues (Arbuthnot, 1977). Subjects were recruited from two groups likely to demonstrate divergent sets of values, interests, attitudes and personality traits - users of a recycling center and members of relatively conservative rural churches. The researcher

found substantial individual differences between the recyclers and the more conservative church members. Individuals who had more favorable attitudes toward recycling were generally more liberal-minded, more flexible in their behaviors and beliefs, less traditionally oriented, and expressed greater belief in their ability to exercise control over events in their own lives.

As in the above study, the interaction between the personality type and the attitude is of central interest in the present work. Most studies found in the literature have examined the simple relationship between personality characteristics and overall attitudes. However, to the current researcher's knowledge, the relationship between potentially-relevant personality characteristics and the components of an attitude object has not been examined in previous research. This study attempted to expand knowledge in this area by exploring how personality affects the formation of an attitude toward an object or behavior that possesses distinct attributes related to one's personality characteristics. In this study, the attitude objects were using public transportation and the automobile for commuting to work/school, and the relevant personality characteristics were desire for control, safety control, privacy control and environmental control. These personality characteristics were selected because of their theoretical relevance to the attitude objects. Attitudes toward two mutually exclusive and somewhat opposing attitude objects (automobile vs. public transportation) were assessed to enhance validity.

CHAPTER III

PURPOSE OF STUDY, RESEARCH QUESTIONS AND STUDY HYPOTHESES

The purpose of this study was to examine the effects of control-related personality variables on transportation attitudes and behavior. This study addressed the following general research questions and specific hypotheses. The Method Section presents these research questions and corresponding analysis procedures in greater detail.

General Research Questions

- 1) Is psychological control an important factor in understanding transportation attitudes and behavior?
- 2) How is psychological control related to attitudes toward public transportation utilization for work/school trips and beliefs about transportation attributes?
- 3) What control-based personality variables are relevant for understanding transportation behavior? Which variables have implications for transit marketing?
- 4) Are there any significant differences in personality and attitudes between public transportation users and nonusers?

Specific Hypotheses

Hypothesis 1. People who score higher on a measure of desire for control will place more emphasis on the importance of control-related transportation attributes than people who are low in desire for control, and their attitudes will be different toward

transportation modes that differ in perceived controllability.

Hypothesis 2. People who score higher on a measure of need for privacy will place more emphasis on the importance of privacy-related transportation attributes than people who are low in need for privacy, and their attitudes will be different toward transportation modes that differ in the amount of privacy they offer.

Hypothesis 3. People who express greater internal beliefs in safety control will place more emphasis on the importance of safety-related transportation attributes than people who are lower in safety control, and their attitudes will be different toward transportation modes that differ in perceived safety performance.

Hypothesis 4. People who express greater internal beliefs in environmental control will place more emphasis on the importance of transportation attributes related to environmental conservation/protection than people who are lower in environmental control, and their attitudes will be different toward transportation modes that differ in perceived environmental performance.

Hypothesis 5. Differences in transportation attitudes and related personality characteristics will exist for different levels of transit use. Individuals who choose to use public transportation frequently will express the most favorable attitudes toward using public transportation, and the attributes of public transportation will be perceived as satisfying their control needs. Individuals who choose to use public transportation less often will express less favorable attitudes toward using public transportation, and the attributes of the system will not be perceived as satisfying their control needs.

CHAPTER IV

METHOD

The research was conducted in two phases. The first phase was a pilot study that took place in the Summer of 1995. During this phase, a small sample was obtained to refine the survey instrument and begin to explore the research hypotheses. The second phase began in the Fall of 1996 after the pilot work was completed. Phase II consisted of a much larger sample so that study hypotheses could be examined in greater detail.

Study 1: Pilot

Method

Participants. Forty people completed the preliminary measure. Questionnaires were distributed to a sample of Introductory Psychology students at Loyola University. To enhance representativeness, individuals from local businesses in both the suburbs and the city of Chicago were also asked to complete questionnaires.

Instrumentation. A self-administered questionnaire was used for this study instead of than an interview because of the large scope and somewhat sensitive nature of the research questions, and the ease of administration. The instrument was composed of a number of scales and sub-scales. In addition, demographic items were included to explore relationships with the personality and attitude variables. The questionnaire was modified based on the pilot work. The content domains of the survey items include the

following:

1. Desire for control: Desire for control was assessed by the 20-item scale developed and validated by Burger & Cooper (1979). The authors defined desire for control as “a stable personality trait reflecting the extent to which individuals generally are motivated to control the events in their lives” (Burger & Cooper, 1979). Higher scores on this measure indicate greater desire or need for control.

2. Desire for privacy control: Desire for privacy control is the extent to which individuals are motivated to control personal contact or exposure to others. Desire for privacy control was assessed by a 11-item scale designed to measure solitude, a relevant dimension of privacy. Solitude is the desire to be alone, mentally and/or physically away from others. Higher scores on this measure indicate greater need for solitude or privacy control. Several items were adopted from the solitude sub-scale of Marshall’s (1974) measure of Privacy Preferences. Control-related items were also adopted from the Wilderness Privacy Preferences Scale (Hammit & Madden, 1989). In addition, new items were included to enhance this measure.

3. Environmental control: Environmental control is a 21-item scale designed to measure the extent to which individuals attribute environmental problems to internal or external factors. This scale translates generalized expectancies of control to a measure of specific expectancies dealing with environmentally-related behaviors. Items for this scale were adapted from Rotter’s (1966) generalized measure of locus of control. Control-related items were also adapted from Weigel’s (1978) Environmental Concern Scale, Maloney and Ward’s (1973) Ecological Attitude/Knowledge Scale, and Pettus and Giles’

(1987) Environmental Attitude Instrument. Higher scores on the measure indicate stronger internal environmental control beliefs, and lower scores indicate more external beliefs. If one is high in internal control, it means that the individual assumes personal responsibility for environmental conditions. Individuals low in environmental control attribute environmental conditions to external factors such as fate or powerful others.

4. Crime and safety control: Similar to the environmental control scale, 20 items were developed to measure the extent to which individuals attribute crime and personal safety to internal or external factors. Some items were adapted from the Employee Safety Inventory (Jones, 1984) which assesses internal/external control beliefs for personal accidents and injuries. In addition, items were developed to assess crime and safety control beliefs in general, and beliefs related to public transportation utilization. Higher scores on this measure indicate more internal safety locus of control beliefs, and lower scores indicate more external beliefs. High internal safety control means that the individual assumes responsibility for his or her personal safety. Individuals low in safety control attribute the causes of accidents and other safety-hazards to external factors such as fate or powerful others.

5. Transportation attitudes: Attitudes toward public transportation and the automobile were assessed by two different measures. Ajzen & Fishbein (1980) argue that when the estimate of attitude is based on salient beliefs, it must be validated by showing that it correlates with an independent measure of the same attitude. This procedure is often neglected in marketing research where the assessment of attitudes is used widely. Thus, two measures of attitudes were included to enhance construct validity. The first

measure reflects general beliefs and feelings about driving and using public transportation. The 20 items on this scale were developed by the current researcher and adapted from background research on transportation attitudes (Belohlav, 1976; Belohlav & Shell, 1980; Dobson, 1975; Gilbert & Forester, 1976; Golob & Recker, 1977). Higher scores on this scale indicate more favorable attitudes toward riding public transportation.

A second transportation attitudes measure was developed to assess specific beliefs about the importance of control-related transportation attributes (e.g., convenience, privacy, safety), and perceptions of the performance of automobiles and public transit with respect to those attributes. This 26-item scale was written to determine how evaluations of specific transportation attributes correlate with overall attitudes, and to explore how these evaluations are related to theoretically-relevant personality variables. The specific transportation attitudes measure was developed to approximate Fishbein's (1967) model. According to this model, attitudes are a function of beliefs about (the attributes of) an object and the evaluation of those beliefs. In this study, beliefs were defined as the extent to which transportation attributes apply to automobiles and public transit (performance), and evaluations were judgments about the perceived importance of the transportation attributes. Items on this measure were scaled so that the overall attitude toward automobiles and public transit is the sum across attributes of the performance rating of each mode weighted (multiplied) by the importance rating.

This measure also contains sub-scales to examine importance ratings of each attribute domain (e.g., safety-related attributes, privacy-related attributes), and performance ratings of automobiles and public transportation with respect to each

attribute area. For the importance sub-scales, higher scores indicate increased importance of the attribute area. For the automobile and public transportation performance sub-scales, higher scores indicate that the transportation mode is likely to perform well in that attribute area. Thus, a very positive attitude indicates that a person believes a transportation mode performs well on an important attribute.

6. Transportation behavior: The behavioral measure identifies the most commonly-used mode of transportation and contains several questions about respondents' use of public transportation. In Phase II of this study, frequency of transit use served as a quota variable to assess differences in attitudes and personality between frequent transit users, occasional users, and nonusers. Frequency of transit use also served as a criterion variable to be "predicted" by the attitudes and personality variables.

7. Demographic and socioeconomic variables: Demographic and socioeconomic data were collected to explore their relationships with the attitude and personality variables. The demographic and socioeconomic variables selected for this study include age, gender, annual household income, educational level, and residential location. These variables were chosen because they may explain part of the variance in the personality and attitude measures. In the larger study, an attempt was made to obtain a balanced number of individuals within each socioeconomic and demographic group to capture the variance in the working population and enhance representativeness of study findings. Auto ownership/availability, transit availability, and ability to drive were also asked so that the moderating effects of these variables on transportation attitudes and transit user status could be identified.

Item formats. The demographic and socio-demographic items contained multiple-choice response formats.

For the desire for control, desire for privacy control, safety, and environmental control measures, respondents were asked to rate their agreement to a series of statements on a seven-step scale ranging from strongly agree to strongly disagree. The items were arranged on a Likert-type format for ease and simplicity of responding. An odd numbered response format was used to allow neutral responding to the items. Some items were reverse-worded to help prevent response set bias.

Items in the attitudinal scales had differential formats. In the general transportation attitudes measure, respondents were asked to rate their agreement with a series of 21 positive and negative statements about public transportation and automobiles on a seven-step scale ranging from strongly agree to strongly disagree.

In the specific attitudes measure, subjects were asked to indicate the importance (evaluations) of transportation attributes on a five-step scale ranging from very important to not at all important. Respondents were also asked to state their beliefs about the specific attributes of automobiles and public transit by responding to a series of statements on a seven-step scale ranging from strongly agree to strongly disagree. The same attributes (e.g., “have a direct route to your destination”) were used for both sets of ratings. A value of zero was allowed for neutral or no opinion responses. Five and seven-step scales were chosen to allow for additional response variance. For example, an individual may think that a transportation attribute is only somewhat important, and a 4-step scale would not allow for this additional response option.

Procedure. Respondents in the pilot study were asked to participate in research to advance scientific knowledge in the fields of psychology, transportation and marketing. They were informed that the study was designed to gather information on their attitudes and experiences related to transportation, and they were asked to answer the questions as openly and honestly as possible. Participants were told they could decline any questions they did not wish to answer, and that their responses were anonymous and confidential. Before completing a questionnaire, participants were asked to sign an informed consent form (see Appendix A). Survey data were entered into an SPSS file and pilot analyses were conducted.

Pilot analyses. Analyses were conducted to examine the psychometric properties of the survey instrument, determine the best set of items for each measure, examine the preliminary results of the analyses that were planned for Phase II, and identify the level of respondent burden that the questionnaire posed. It was determined that the majority of the respondents were able to complete all sections of the questionnaire with no problem. Although some individuals did not complete certain sections or questions, omissions were random and did not pose a threat to the validity of the study.

In the pilot study, reliability analyses were conducted for each scale and sub-scale. Items that did not contribute to the reliability of each measure were eliminated. Subsequently, intercorrelation matrices were produced to explore relationships between the study variables and examine the internal consistency and construct validity of the measures. Preliminary analyses were also conducted to explore study hypotheses and determine the most appropriate analyses for the larger study in Phase II.

Study 2: Transportation Attitudes, Personality and Behavior

Method

Participants. The study sample contained a total of 324 individuals from both the suburbs and the city of Chicago. The survey sites were selected to obtain a sample diverse enough to represent school and work commuters within the greater Chicago area. Individuals in employment offices, transportation centers, schools, churches and other establishments in both the suburbs and Chicago were asked to complete questionnaires. An attempt was made to obtain a balanced number of individuals within each of the gender, age, income, educational and residential groups to enhance the representativeness of study findings and capture the variance in the working population.

Participants were also selected based on quotas for transit user status. This variable was chosen as a sampling criterion so that the hypotheses about the relationships between attitudes, personality and behavior of transit users and nonusers could be adequately tested. The transit user status variable contained five conceptual levels: More frequent users (3 to 5 or more days per week); less frequent users (1 to 3 days per week); occasional users (1 to 4 days per month); rare users (less than one day per month); and staunch nonusers (never used). It was important that sample cell sizes were large enough so that statistical analyses could be conducted. Therefore, quotas were set to at least 40 subjects per cell, and the researcher set out to obtain a minimum of 200 people for this study.

Instrumentation. The refined survey instrument from the pilot study was used for

this study. The survey contained a closed-ended response format in which participants selected their answers from several response options. The respondents were asked to darken the boxes for the response option that best represented their opinion or personal information. Refer to Appendix A for a complete version of the questionnaire used in this study.

Procedure. As in the pilot study, respondents were told that the questionnaire was anonymous and confidential. They were informed that the research was being conducted to better understand the relationship between attitudes, personality and transportation behavior, and they were asked to complete the questionnaire as openly and honestly as possible. Names and telephone numbers were recorded for individuals who requested more information about the study so a research summary can be sent to them.

The data were entered into an SPSS file and the demographics were tracked periodically to determine the number of individuals within each user category and demographic group. Participants were recruited until the desired quotas were obtained and a balance of individuals within each of the demographic and socioeconomic groups was achieved.

CHAPTER V

RESULTS

Reliability and Validity of the Personality and Attitudes Measures

Internal consistency. Internal consistency reliability analyses were conducted on all scales and sub-scales. All reliability coefficients for the main scales were above .80, indicating good internal consistency. One item (#8) on the safety locus of control scale was eliminated because it did not contribute to the internal consistency of the measure.

Table 1 presents the reliability coefficients for all the main scales and sub-scales used in the analysis procedures. A supplemental table in Appendix B presents a written description and descriptive statistics for all scales and sub-scales.

Table 1

Scale Reliabilities

Personality Measures			
Scale Name	Abbreviation	Number of Items	Alpha
Desire for Control	CONTROL	21	.82
Need for Privacy Control	PRIVACY	11	.81
Safety Locus of Control	SAFETY	19	.80
Environmental Locus of Control	ENVIRNMT	21	.90

Table 1(continued)

Attitude Measures			
Scale Name	Abbreviation	Number of Items	Alpha
General Transportation Attitudes	TRANSATT	21	.91
Attitudes Toward Public Transportation	PTATT	26	.92
Attitudes Toward Automobiles	AUTOATT	26	.89
Importance Rating Measures			
Importance of Control-Related Transportation Attributes	IMPCNTL	7	.82
Importance of Privacy-Related Transportation Attributes	IMPPRIV	9	.91
Importance of Safety-Related Transportation Attributes	IMPSFTY	6	.91
Importance of Environment-Related Transportation Attributes	IMPENV	4	.94
Performance Rating Measures for Public Transportation			
Performance on Control-Related Transportation Attributes	RTPTCNTL	7	.86
Performance on Privacy-Related Transportation Attributes	RTPTPRIV	9	.89
Performance on Safety-Related Transportation Attributes	RTPTSFTY	6	.88
Performance on Environment-Related Transportation Attributes	RTPTENV	4	.94

Table 1(continued)

Performance Rating Measures for Automobiles			
Scale Name	Abbreviation	Number of Items	Alpha
Performance on Control-Related Transportation Attributes	RTACNTL	7	.77
Performance on Privacy-Related Transportation Attributes	RTAPRIV	9	.91
Performance on Safety-Related Transportation Attributes	RTASFTY	6	.86
Performance on Environment-Related Transportation Attributes	RTAENV	4	.96

Construct validity of the personality measures. An intercorrelation matrix was produced for all four personality measures (Table 2). Because each of the personality measures deals with some aspect of psychological control, it was expected that correlations among these variables would provide some evidence for construct validity.

The desire for control and privacy control constructs were defined as “control needs” in which one desires or seeks out control or privacy. Safety and environmental control were defined as “locus of control” variables in which one attributes the consequences of safety or environmental situations to internal (self) or external (other) factors. As would be expected, the table illustrates that the highest correlation was observed between the environment and safety locus of control measures. This significant correlation provides evidence for construct validity because these two scales are based on the same locus of control construct.

A strong correlation was also observed between the desire for control and safety control variables, and a somewhat weaker correlation was observed between the desire for control and environmental control measures. These correlations show that people with higher desire for control tend to have more internal locus of control beliefs. Correlations with the desire for control measure provide further evidence for the construct validity of the “control” dimension because the desire for control measure has been validated in previous research (Burger & Cooper, 1979).

The need for privacy and desire for control variables did not correlate as highly as expected. This may suggest that need for privacy may not be a matter of control but some other underlying construct. Table 2 shows that privacy control is unrelated to the other three constructs.

In general, if these are distinct constructs, they should be unrelated to each other. However, given the conceptual definitions, one might expect safety locus of control and environmental locus of control to be related (true), and desire for control and need for privacy control to be related (not true). However, desire for control should not be as related to safety or environmental locus of control (not true), and need for privacy control should not be as related to safety control or environmental control (true).

The extent to which these constructs are related (naturally confounded) has implications for the analyses for the main hypotheses. That is, attitudes are expected to vary as a function of attribute-relevant personality variables but not attribute-irrelevant traits. This difference is “watered down” or diminished if the personality variables overlap with each other.

Table 2

Correlation Matrix of Personality Measures

	1	2	3	4
1. Desire for Control	1.00			
2. Need for Privacy Control	.11	1.00		
3. Safety Locus of Control	.33***	-.07	1.00	
4. Environmental Locus of Control	.18**	.02	.38***	1.00

** $p < .01$. *** $p < .001$.

Construct validity of the attitude measures. Three attitude measures were included in this study - the general transportation attitudes measure (TRANSATT), and the specific attitudes toward public transportation (PTATT) and attitudes toward automobiles (AUTOATT) measures that were formed by weighting the performance ratings for each transportation attribute by the corresponding importance rating and summing across all attributes separately for both transportation modes. Higher scores on TRANSATT and PTATT indicated more favorable attitudes toward public transportation, and higher scores on AUTOATT indicated more favorable attitudes toward automobiles.

The specific attitude measures also contain sub-scales for each control dimension. These include attitude toward public transportation on control (CNTLPT), privacy (PRIVPT), safety (SFTYPT) and environmental (ENVPT) components, and attitude toward automobiles on control (CNTLAUTO), privacy (PRIVAUTO), safety (SFTYAUTO) and environmental (ENVAUTO) components.

An intercorrelation matrix was produced to examine the construct validity of the attitude measures (Table 3). Significant positive correlations were obtained between the general transportation attitudes measure (TRANSATT), the specific attitudes toward public transportation measure (PTATT), and all of its sub-scales (CNTLPT, PRIVPT, SFTYPT, ENVPT). Conversely, significant negative correlations were found between the general transportation attitudes measure (TRANSATT), the specific attitudes toward automobiles measure (AUTOATT), and all of its sub-scales (CNTLAUTO, PRIVAUTO, SFTYAUTO, ENVAUTO). These findings lend support to Ajzen & Fishbein's (1980) argument that when an attitude is based on salient beliefs, it should be validated by showing that it correlates positively with an independent measure of the same attitude and negatively with an opposing attitude.

The four attribute component scores are significantly related to each other for both public transportation and automobiles, except for privacy and environment (and control and environment for automobiles). These attitudes are multidimensional, however, they can be represented as a single total score because the components or sub-scales are all significantly related to their respective total scale scores (AUTOATT & PTATT) and the general transportation attitudes measure (TRANSATT).

In addition, there was a small negative correlation between the attitudes toward automobiles measure (AUTOATT) and the attitudes toward public transportation measure (PTATT), and most of the public transportation sub-scales are unrelated or negatively related to the automobile sub-scales. This provides some support for the two separate and opposing attitude object domains.

Table 3

Correlation Matrix of Attitude Measures

	1	2	3	4	5	6	7	8	9	10	11
1. TRANSATT	1.00										
2. PTATT	.42***	1.00									
3. AUTOATT	-.57***	-.10	1.00								
4. CNTLPT	.36***	.82***	-.07	1.00							
5. PRIVPT	.30***	.76***	-.18**	.47***	1.00						
6. SFTYPT	.26***	.77***	.03	.49***	.46***	1.00					
7. ENVPT	.27***	.47***	-.06	.26***	.14	.21***	1.00				
8. CNTLAUTO	-.33***	-.12	.70***	-.14	-.23***	-.03	.15	1.00			
9. PRIVAUTO	-.49***	-.27***	.74***	-.14	-.44***	-.16**	.01	.44***	1.00		
10. SFTYAUTO	-.27***	.08	.71***	-.01	.01	.21***	.02	.51***	.27***	1.00	
11. ENVAUTO	-.38***	.08	.51**	.09	.24***	.09	-.32**	.01	.14	.18**	1.00

p < .01. *p < .001.

Testing Study Hypotheses

The analysis procedure to test the study hypotheses was two-tiered. The first analysis procedure was conducted to explore the hypothesized relationships between attitudes and personality (Hypotheses 1 & 2). The second set of procedures examined the interactive effects of attitudes and personality on behavior (Hypothesis 3). In some cases, several different analysis procedures were conducted to test a single hypothesis. This was done because further support for study hypotheses can be obtained if the same findings result from different methods of analysis that reflect different assumptions about the variables and their relationships. The following section explains the analysis plan for each hypothesis and alternative analysis procedures.

Attitude-Personality Relationships

Hypothesis 1. Individuals who possess higher levels of a personality characteristic should rate the importance of the corresponding theoretically-relevant transportation attribute higher than individuals who possess the personality characteristic to a lesser degree. As a corollary, variations on a personality characteristic should be unrelated to ratings of importance of non-corresponding attributes (except to the extent that the personality characteristics are confounded with each other). For example, variations in desire for control should be positively related to variations in the importance of the control attribute but less so to variations in the other three attributes. Such findings would imply that knowledge about the relationships between personality characteristics and importance ratings for relevant transportation attributes will enhance understanding of how the attitude is formed.

Analysis procedure. An intercorrelation matrix that included all importance sub-scale and personality scale scores was produced (Table 4). Support for this hypothesis can be obtained by examining the correlations between the importance sub-scale and the corresponding theoretically-relevant personality variable. The four correlation coefficients in the main diagonal should be the highest and the most positive in their respective row and column. This was true for all the correlations between the importance ratings and the theoretically-relevant personality variables except for safety. The correlation between the importance of safety-related transportation attributes and desire for control was higher than the correlation between the importance of safety attributes and safety locus of control.

Table 4

Correlations Between Importance Ratings and Personality Variables

	IMPCNTL	IMPPRIV	IMPSFTY	IMPENV
CONTROL	[.28***]	.09	.21***	.10
PRIVACY	.18**	[.21***]	.09	.04
SAFETY	.00	-.21***	[.17**]	.16*
ENVIRONMT	-.03	-.25***	.11	[.54***]

Note. The correlations within brackets were expected to be highest and most positive within each row and column.

** $p < .01$. *** $p < .001$.

Beyond inspecting the pattern of correlations, further support for the hypothesis was obtained by converting the correlation coefficients to z scores and comparing the

average for the correlations between the importance ratings and theoretically-relevant personality variables with the average of the other non-corresponding correlations. The first hypothesis was supported because the average of the four correlations between the importance rating and the corresponding theoretically-relevant personality variables was significantly higher (average $r = .31$) than the average of the twelve correlations between the personality variables and the importance ratings for non-corresponding attributes ($r = .04$; $z = 3.13$, $p < .001$). Thus, as expected, the greater the need for some kind of control or the more internal the locus of control, the more importance people place on trait-related but not trait-irrelevant transportation attributes.

Hypothesis 2. Individuals who possess higher levels of a personality characteristic will express more favorable attitudes toward the transportation mode that is seen as likely to perform well on a related attribute dimension. As a corollary, variations in a personality characteristic should not be associated with variations in attitudes toward a transportation mode that performs well on non-corresponding attribute dimensions. For example, the higher the need for control, the more people should prefer the mode that they see performing well with respect to the control attribute, but they would not necessarily prefer a mode based on its performance with respect to other attributes.

Analysis procedure #1. Sub-scale scores of automobile/public transportation performance (“beliefs”) were calculated separately for each of the transportation attributes. The specific attitude scales for both automobiles and public transportation were formed by multiplying the performance rating by the corresponding importance rating for each attribute and summing across attributes separately for each dimension.

Scale scores were also calculated for the general transportation attitudes measure. Higher scores on this measure indicate more favorable general attitudes toward public transportation and riding public transportation. The general transportation attitudes measure (TRANSATT) was used in this analysis instead of the specific importance x performance attitudes measures (PTATT & AUTOATT) to avoid inflating the correlation coefficient since performance is included in the two variables being correlated.

A median split was used to categorize individuals into high and low groups on the basis of each of their four personality scale scores. The correlation between the general transportation attitudes measure and the attribute performance measures was examined separately for each of the high/low personality groups. Support for the hypothesis would be obtained if the correlation between the transportation attitudes measure and the performance ratings for public transportation with respect to each attribute is significantly higher for those who exhibit greater levels of the (theoretically-relevant) personality characteristic than those who exhibit the personality characteristic to a lesser degree, and the correlation between the transportation attitudes measure and the performance ratings for automobiles with respect to each attribute is significantly lower for those who exhibit greater levels of the (theoretically-relevant) personality characteristic than those who exhibit the personality characteristic to a lesser degree. These correlations are not expected to differ as a function of personality level for performance ratings on the other attributes not relevant to the personality trait (except to the extent that the personality characteristics are naturally confounded).

Table 5 presents the correlation matrix to explore this hypothesis. For public

transportation, it was expected that the correlation between the general transportation attitudes measure (TRANSATT) and public transportation performance ratings would be highly positive for people relatively high on a trait, but less positive or zero for people low on that trait in the case of the relevant performance attribute. This pattern was found for all the variables except for environmental control. However, it was also expected that for the non-relevant attributes, the correlations would be generally lower and not different between people who were high versus low on a trait. As shown in Table 5, this expectation was supported for desire for control but not for the other three traits.

The hypothesis also predicts that for automobiles, the correlation between transportation attitudes (TRANSATT) and automobile performance ratings for the trait-relevant attribute would be most negative for people relatively high on a trait and less negative or zero for people low on that trait. This part was supported. However, the correlations were also expected to be only slightly negative or zero and not different between high versus low trait groups for the non-relevant attributes. Table 5 shows this pattern most clearly for environmental control, to a lesser extent for desire for control and not for the other two traits.

Table 5

Correlation Between General Transportation Attitudes and Auto/Public TransportationPerformance Ratings for High vs. Low Personality Groups

	<u>Desire for Control</u>		<u>Need for Privacy</u>		<u>Safety Control</u>		<u>Envirnmt. Control</u>	
	High	Low	High	Low	High	Low	High	Low
<u>Rating for Automobiles on:</u>								
Control	[-.22**	-.07]	-.25**	-.12	-.21**	-.13	-.23**	-.23**
Privacy	-.03	-.01	[-.16	.05]	-.04	-.07	.00	-.08
Safety	-.29***	-.22**	-.31***	-.21	[-.28***	-.24]	-.29***	-.24**
Environment	-.32***	-.33***	-.36***	-.32***	-.39***	-.30*	[-.40***	-.13]
<u>Rating for Public Transportation on:</u>								
Control	[.53***	.15]	.35***	.38***	.42***	.30**	.33***	.38***
Privacy	.25**	-.04	[.18	.02]	.15	.06	.06	.07
Safety	.35***	.19	.26**	.25**	[.29***	.18]	.26**	.23**
Environment	.26**	.18	.24**	.17	.26***	.24	[.08	.13]

Note. Pairs of correlations within brackets are expected to be the most different in their columns.

** $p < .01$. *** $p < .001$.

After the correlations were obtained, the coefficients were converted to z scores and statistical tests were conducted to determine if the differences between the high/low personality groups were significant.

When examining Table 5, a significant difference in the correlation between the performance of public transportation and overall public transportation attitudes was found between individuals who were high ($r = .53$) vs. low ($r = .15$) in desire for control ($z = 3.72, p < .0001$). Although the correlation between auto performance and the general transportation attitudes measure was more negative for the high desire for control group ($r = -.22$) than for the low group ($r = -.07$), this difference was not significant ($z = -1.28$). However, the correlations between auto performance and the general transportation attitudes measure were negative for both groups and thus, in the expected direction. As hypothesized, the average standardized correlations between the attitude measure and the performance ratings for the other attributes not relevant to the desire for control personality trait did not differ significantly between high and low personality groups on auto performance ($r_1 = -.21, r_2 = -.19, z = -.19$) or public transportation performance ($r_1 = .28, r_2 = .11, z = 1.53$).

When examining the correlations for those high and low in need for privacy, the correlation between the attitudes measure and the performance ratings for public transportation on privacy was higher for the high personality group ($r = .18$) than for the low group ($r = .02$). In addition, the correlation between the transportation attitudes measure and the privacy performance ratings for automobiles was more negative for the high personality group ($r = -.16$) than for the low group ($r = .05$). However, these

differences were not statistically significant ($z = 1.37$ and -1.80). In addition, the difference between the performance ratings for the other attributes not relevant to the privacy personality trait did not differ significantly between high and low personality groups on auto performance ($r_1 = -.30$, $r_2 = -.22$, $z = -.77$) or public transportation performance ($r_1 = .28$, $r_2 = .27$, $z = .14$).

Similar findings were observed for those high and low in safety locus of control. The correlations are in the expected direction, however, no significant differences were observed between the high and low personality groups for either public transportation ($r_1 = .29$, $r_2 = .18$, $z = .93$) or automobile performance ($r_1 = -.28$, $r_2 = -.24$, $z = -.34$) on safety-related attributes. The difference between the performance ratings for the other attributes not relevant to the safety personality trait did not differ significantly between high and low personality groups on auto performance ($r_1 = -.21$, $r_2 = -.16$, $z = -.42$) or public transportation performance ($r_1 = .28$, $r_2 = .20$, $z = .67$).

A significant difference was observed between high ($r = -.40$) and low ($r = -.13$) environmental locus of control groups on auto performance ($z = 2.42$, $p < .01$). However, the correlation between public transportation ratings on environmental performance and transportation attitudes was not higher for the high ($r = .08$) environmental control group than the low group ($r = .13$). The difference between the performance ratings for the other attributes not relevant to the environmental personality trait did not differ significantly between high and low personality groups on auto performance ($r_1 = -.17$, $r_2 = -.18$, $z = -.08$) or public transportation performance ($r_1 = .22$, $r_2 = .23$, $z = .08$).

In summary, support for the second hypothesis was obtained by examining the

correlation between the performance ratings and the attitude rating for high vs. low personality groups on the relevant control dimension. Although most correlations were in the expected direction, statistically significant differences between high and low personality groups were found for desire for control on public transportation performance and environmental control on automobile performance but not for the safety and privacy constructs. The lack of difference between high vs. low personality groups in correlations between attitudes and trait-irrelevant performance ratings is as expected, although subject to alternative explanations.

Analysis procedure #2. Instead of using the raw performance or “belief” scores for ratings of automobiles and public transportation separately with respect to transportation attributes, a difference score was calculated in which public transportation attribute ratings were subtracted from auto ratings so that greater difference scores indicate higher automobile performance. Thus, performance can be defined as the difference between the ratings of automobiles and public transportation with respect to the transportation attributes.

To examine Hypothesis 2, individuals again were separated into two groups based on their personality scores, and the general transportation attitudes measure was correlated with each of the performance difference score sub-scales. The correlation between the general transportation attitudes measure and the performance difference score was examined for each of the four high/low personality groups. Support for the hypothesis would be obtained if correlation between the attitude measure and the performance measure for the (theoretically-relevant) transportation attribute is higher for

those who exhibit greater levels of the (theoretically-relevant) personality characteristic than those who exhibit the personality characteristic to a lesser degree. This difference in relationship for a given attribute domain should occur for the relevant personality trait but not for the other personality traits.

Table 6 presents the results of this analysis procedure. Because the performance scale used in this analysis was coded so that higher scores indicated better automobile performance, it was expected that the correlations with the transportation attitudes measure (where higher scores indicated more favorable attitudes toward public transportation utilization) would be negative. Results confirmed that all of the performance sub-scales correlated negatively with the transportation attitudes measure, except for privacy performance.

The predictions for this analysis of performance difference scores were parallel to those for the preceding analysis of separate scores for the two transportation modes. In this case, people who scored high on a trait were expected to have a strong negative correlation and people low on that trait were expected to have a less negative or zero correlation between TRANSATT and the performance difference score for the trait-relevant attribute. These correlations were expected to be close to zero and not different between high versus low personality groups on the other attributes. This expected pattern was obtained, in part, for the desire for control trait, but not for the other three traits. In general, the correlations were higher than expected for the attributes that were supposedly not relevant to the traits.

Table 6

Correlation Between General Transportation Attitudes and Auto/Public TransportationPerformance Ratings for High vs. Low Personality Groups Using Difference Scores as a Measure of Performance

	<u>Desire for Control</u>		<u>Need for Privacy</u>		<u>Safety Control</u>		<u>Environmt. Control</u>	
	High	Low	High	Low	High	Low	High	Low
<u>Performance:</u>								
Control	[-.54***	-.17]	-.39***	-.39***	-.45***	-.32***	-.37***	-.44***
Privacy	-.20	.02	[-.22**	.02]	-.13	-.08	-.04	-.36***
Safety	-.46***	-.34***	-.43***	-.37***	[-.44***	-.32***]	-.41***	-.09
Environment	-.36***	-.33***	-.40***	-.30***	-.42***	-.33***	[-.32**	-.17]

Note. Pairs of correlations in brackets are expected to be the most different in their columns.

** $p < .01$. *** $p < .001$.

When describing “performance” as a difference score, the correlations between the transportation attitudes measure and the performance measure were higher for the high personality group than the low group for all variables. However, when the Pearson correlation coefficients were converted to z scores and an analysis was conducted to determine if these differences were significant, the only significant difference between high and low personality groups was obtained for the desire for control personality construct ($z = 3.65, p < .05$).

It was also hypothesized that significant differences would exist between the relevant personality trait but not for the other personality traits. To test this hypothesis, the correlation coefficients were converted to z scores and the coefficients were averaged across the other three performance dimensions for each of the high/low personality groups. The standardized correlation coefficients for the unrelated variables were compared between the high vs. low personality groups. The difference was not significant between high vs. low groups on desire for control ($r_1 = -.34, r_2 = -.22, z = -.71$), privacy control ($r_1 = -.41, r_2 = -.35, z = -.32$), safety control ($r_1 = -.33, r_2 = -.24, z = -.84$) or environmental control ($r_1 = -.27, r_2 = -.30, z = -.19$). However, these correlations were higher than expected.

In summary, this analysis procedure provides some evidence for the hypothesis in that the correlations were in the expected directions. However, significant differences were only found between high vs. low groups on the desire for control personality construct.

Analysis procedure #3. The preceding two analysis procedures represent direct

translations of the research hypothesis by comparing within group correlations between attitudes and performance separately for high versus low personality groups. In so doing, however, personality variables are treated as discrete, dichotomous categories rather than as continuous variables. Treating them as continuous as they were measured offers an alternative analytic method.

Regression analyses were conducted to test for significant main effects as well as the interactive effects of personality and performance on transportation attitudes. Four sets of hierarchical regressions were conducted, one for each control dimension. As in the other analysis procedures, the general transportation attitudes scale (TRANSATT) was used as the dependent measure instead of the specific importance x performance attitudes scales (AUTOATT/PTATT).

In the first step of each regression analysis, attitudes toward public transportation were regressed on to each personality trait and the performance of public transportation and automobiles with respect to each control-related attribute. In the second step, the interaction between the performance dimension and the theoretically relevant personality trait was entered. This analysis procedure was conducted separately for each of the four linked personality x attribute domains using the raw performance scores as measures of performance and as part of the interaction term. It was hypothesized that the addition of the interaction terms would enhance the predictive power of the model.

In the first regression analysis, attitudes toward public transportation (TRANSATT) were regressed on to desire for control (CONTROL), the performance of automobiles on control-related transportation attributes (RTACNTL), and the performance of public transportation on control-related transportation attributes (RTPTCNTL). In the second step, the interaction of desire for control with auto control performance ratings (INTACNTL) and the interaction of desire for control with public transportation performance ratings on control (INTPTCNTL) were entered. Results indicated that the R Square Change was not significant when the interaction terms were entered in the second step and there were no significant main effects (Table 7).

It appears that the main effects and the interactions were so highly correlated that, since the main effects of both public transportation and automobile performance significantly contributed to the model in the first step, there was little variance left for the interaction terms in the second step. In this equation, the correlation between the ratings of automobiles on control (RTACNTL) and the interaction of desire for control with the ratings of automobiles on control (INTACNTL) was .88; the correlation between the ratings of public transportation on control (RTPTCNTL) and the interaction of desire for control with the ratings of public transportation on control (INTPTCNTL) was .99; and the correlation between the desire for control (CONTROL) and the interaction of desire for control with the ratings of automobiles on control (INTACNTL) was .61. Considering that the main effects are part of the interaction terms, there is little chance that the addition of the interaction terms in the second step would change the model when the main effects in the first step have already explained most of the variance in the dependent

variable (TRANSATT). In addition, the variances for the main effects and interaction terms were dispersed among all terms in the final model, resulting in none of the variables being significant.

It also appears that there was a restriction of range in the automobile control performance measure. None of the study participants rated automobiles low on control which reduced the likelihood of finding significant effects for the automobile measures.

Table 7

Regression Analysis Testing the Effects of Desire for Control and Ratings of Automobile/Public Transportation Control Performance on Transportation Attitudes

DEP. VAR. = TRANSATT	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.16	.16	17.73*****
RTACNTL	-.24	.10	-.13	5.70*			
RTPTCNTL	.28	.04	.36	43.62*****			
CONTROL	-.03	.08	-.02	.11			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.17	.01	1.34
RTACNTL	.45	.77	.25	.35			
RTPTCNTL	-.16	.33	-.21	.25			
CONTROL	.30	.37	.21	.67			
INTPTCNTL	.08	.06	.57	1.84			
INTACNTL	-.13	.15	-.48	.80			

* $p < .05$. ***** $p < .00001$.

In the second regression analysis, attitudes toward public transportation (TRANSATT) were regressed on to need for privacy control (PRIVACY), the performance of automobiles on privacy-related transportation attributes (RTAPRIV), and the performance of public transportation on privacy-related transportation attributes (RTPTPRIV). In the second step, the interaction of need for privacy control with automobile privacy performance ratings (INTAPRIV) and the interaction of need for privacy control with public transportation performance ratings on privacy (INTPTPRIV) were entered. Results indicated that the R Square Change for the interaction terms was not significant and there were no significant main effects (Table 8). Again, the multicollinearity among the variables in the model greatly reduced the likelihood of finding significant interaction terms. The correlation between the automobile privacy performance rating (RTAPRIV) and the interaction of this variable with privacy control (INTAPRIV) was .87; the correlation between the public transportation privacy performance rating (RTPTPRIV) and the interaction of this variable with privacy control (INTPTPRIV) was .96; and the correlation between privacy control (PRIVACY) and the interaction of this variable and automobile privacy ratings (INTAPRIV) was .64. In addition, the variances for the main effects and interaction terms were dispersed among all terms in the final model, resulting in none of the variables being significant.

Another factor that affected this regression analysis was a restriction of range in the automobile privacy performance measure. Only three study participants rated automobiles low on privacy which reduced the likelihood of finding significant effects for any of the measures pertaining to automobiles.

Table 8

Regression Analysis Testing the Effects of Need for Privacy Control and Ratings of Automobile/Public Transportation Privacy Performance on Transportation Attitudes

DEP. VAR. = TRANSATT	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.02	.02	1.59
RTAPRIV	-.02	.07	-.02	.08			
RTPTPRIV	.09	.05	.11	3.66 ⁺			
PRIVACY	-.04	.07	-.04	.43			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.02	.01	.89
RTAPRIV	.59	.46	.49	1.61			
RTPTPRIV	.11	.28	.14	.17			
PRIVACY	.31	.28	.27	1.23			
INTPTPRIV	-.01	.06	-.03	.01			
INTAPRIV	-.14	.10	-.65	1.76			

Note. The plus symbol (⁺) denotes that this variable was marginally significant at $p < .06$.

In the third regression analysis, attitudes toward public transportation (TRANSATT) were regressed on to safety control (SAFETY), the performance of automobiles on safety-related transportation attributes (RTASFTY), and performance of public transportation on safety-related transportation attributes (RTPTSFTY) in the first step. In the second step, the interaction of safety control with auto safety performance ratings (INTASFTY) and the interaction of need for safety control with public

transportation performance ratings (INTPTSFTY) on safety. Results indicated that the R Square Change for the interaction terms was not significant. However, when all variables were entered, a significant main effect was found for the safety locus of control personality variable ($F = 4.75, p < .03$) (Table 9).

The main effects explained so much of the variance in the first step of the equation that there was little left when the interaction terms were entered. The effects of the interactions were diminished because of the multicollinearity among the variables, particularly with reference to the main effects and their correlation with the interaction terms. The correlation between the ratings of automobiles on safety (RTASFTY) and the interaction of safety control with the ratings of automobiles on control (INTASFTY) was .96, and the correlation between the ratings of public transportation on safety (RTPTSFTY) and the interaction of safety control with the ratings of public transportation on safety (INTPTSFTY) was .98. Considering that the main effects are part of the interaction terms, there is little chance that the addition of the interaction terms would explain additional variance beyond that accounted for by the main effects in the first step.

Table 9

Regression Analysis Testing the Effects of Safety Locus of Control and Ratings of Automobile/Public Transportation Safety Performance on Transportation Attitudes

DEP. VAR. = TRANSATT	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.20	.20	22.96*****
RTASFTY	-.35	.06	-.32	34.77*****			
RTPTSFTY	.23	.05	.28	24.67*****			
SAFETY	.27	.08	.18	11.17***			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.20	.00	.59
RTASFTY	.07	.44	.06	.02			
RTPTSFTY	.11	.26	.14	.19			
SAFETY	.41	.19	.28	4.75*			
INTPTSFTY	.02	.05	.15	.21			
INTASFTY	-.08	.09	-.40	.89			

* $p < .05$. *** $p < .001$. ***** $p < .00001$.

In the fourth regression analysis, attitudes toward public transportation (TRANSATT) were regressed on to environmental control (ENVIRNMT), the performance of automobiles on environment-related transportation attributes (RTAENV), the performance of public transportation on environment-related transportation attributes (RTPTENV), and, in the second step, the interaction of environmental control with auto

environment performance ratings (INTAENV) and the interaction of environmental control with public transportation performance ratings on environment (INTPTENV). In step two, results showed a significant R Square Change for the interaction terms, with a significant effect for the interaction of environmental control with automobile environment ratings (INTAENV), and significant main effects for both the raw performance on auto rating ($p < .004$) and the personality variable ($p < .0004$) (Table 10). These results suggest that environment may be a salient concern regarding automobiles but not public transportation - contrary to expectation.

Table 10

Regression Analysis Testing the Effects of Environmental Locus of Control and Ratings of Automobile/Public Transportation Environmental Performance on Transportation

Attitudes

DEP. VAR. = TRANSATT	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.25	.25	31.93*****
RTAENV	-.13	.03	-.22	15.90****			
RTPTENV	.04	.04	.05	.88			
ENVIRNMT	.46	.07	.38	48.07*****			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.29	.03	6.45**
RTAENV	.64	.22	1.05	8.48**			
RTPTENV	.43	.28	.57	2.40			
ENVIRNMT	.38	.13	.31	8.08**			
INTPTENV	-.08	.06	-.56	1.96			
INTAENV	-.15	.04	-1.35	12.69***			

** $p < .01$. *** $p < .001$. **** $p < .0001$. ** $p < .00001$.

Analysis Procedure #4. The final analysis procedure to test hypothesis #2 was conducted to examine the mean scores on the general transportation attitudes measure (TRANSATT) for the high vs. low personality and performance ratings groups. Where possible, 2-way ANOVAs were conducted for each of the control-related personality/performance content domains. This analysis provides another way of looking at the

interaction of the performance rating with the theoretically-relevant personality variable.

For all of the ANOVA procedures, a median split on the personality scale scores was used to divide individuals into high and low groups. In addition, the performance ratings for auto/public transportation were dichotomized at the midpoint or neutral point. Scores on the performance scales ranged from a high of +3 to a low of -3. Those individuals who rated public transportation/automobiles above zero in performance for the specific attribute dimension (e.g., control, safety) were included in the high or favorable ratings group and those who rated public transportation/automobiles below zero on the attribute dimension were included in the low or unfavorable ratings group. For simplicity of understanding and presentation, those who provided neutral ratings were left out of the analysis.

The first ANOVA examined the interactive effects of desire for control and perceived performance of public transportation control on transportation attitudes. The general transportation attitudes measure was defined as the dependent variable and the “dichotomized” desire for control personality variable (CONTROL) and the “dichotomized” ratings of public transportation control (RTPTCNTL) variable were the independent measures. The ANOVA yielded a significant main effect for public transportation performance ratings on control and a significant interaction between desire for control and ratings of public transportation control (Table 11). The findings from this procedure mirrored the findings from the first and second analysis procedures in which a significant difference in transportation attitudes was found between high and low desire for control personality groups on public transportation control performance.

Table 11

Two-Way Analysis of Variance: Desire for Control and Ratings for Public Transportation on Control-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
CONTROL	1	.46	.62
RTPTCNTL	1	36.41	49.29****
Interactions:			
CONTROL * RTPTCNTL	1	6.32	8.56**
Residual:	267	.74	

** $p < .01$. **** $p < .0001$

Post-hoc comparisons involving Duncan's multiple-range test revealed that, as expected, individuals who were high in desire for control and rated public transportation high on control-related transportation attributes had more favorable attitudes toward public transportation than those who were high in desire for control and provided low ratings for public transportation on control performance. However contrary to expectation, a significant difference was also found for individuals who were low in desire for control and rated the performance of public transportation low on control and those who were low in desire for control and rated the performance of public transportation high on control. This difference, while smaller than the above, was not

predicted. Support for Hypothesis #2 can be obtained by examining the mean scores for the transportation attitudes measure (TRANSATT) within each cell (Table 12).

Transportation attitude scores (TRANSATT) were highest for those who were high in desire for control and rated public transportation high in controllability. The lowest mean score was observed for people who were high in desire for control and perceived that public transportation could not effectively meet their control needs. This finding suggests that ratings of control performance may be an important factor in the formation of transportation attitudes, especially for those high in need for control.

Table 12

Post-Hoc Comparisons - Differences on TRANSATT for Levels of Desire for Control and Perceived Public Transportation Control Performance

CONTROL	RTPTCNTL			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	4.25	56	4.66	74
High	3.91	73	4.94	68

An ANOVA examining the effects of safety control and automobile safety performance on transportation attitudes was not able to be conducted because of restriction of range in the auto control performance measure. Only one person provided unfavorable ratings for automobiles on control. Homogeneity of variance could not be assumed and means could not be compared for the groups because of small cell sizes,

particularly for the low auto control performance measure. This may explain why a significant difference in transportation attitudes was found between high and low desire for control personality groups on public transportation performance but not for automobile performance in Analysis Procedures 1 and 2.

The second ANOVA examined the effects of need for privacy control and ratings of public transportation privacy on transportation attitudes. The general transportation attitudes measure was defined as the dependent variable and the independent variables included the “dichotomized” need for privacy control personality variable (PRIVACY) and the “dichotomized” ratings of public transportation privacy (RTPTPRIV) variable. The ANOVA yielded no significant main effects or interactions (Table 13). The findings from this procedure mirrored the findings from the first and second analysis procedures in which no significant differences in transportation attitudes were found between high and low need for privacy control personality groups, on public transportation privacy or auto privacy.

Table 13

Two-Way Analysis of Variance: Need for Privacy Control and Ratings for Public Transportation on Privacy-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
PRIVACY	1	0.00	0.00
RTPTPRIV	1	1.71	1.95
Interactions:			
PRIVACY * RTPTPRIV	1	1.97	2.24
Residual:	279	.88	

Although the ANOVA yielded no significant findings, an examination of cell means provides some support for the hypothesis (Table 14). Individuals who were high in need for privacy and provided more favorable ratings for public transportation on privacy-related transportation attributes had more favorable attitudes toward public transportation than those who were high in need for privacy control and provided lower ratings for public transportation on privacy performance. In addition, the mean TRANSATT score for individuals who were low in need for privacy control was not very different between high and low performance groups. The findings for the privacy control construct may have been limited by a restriction of range in the ratings for public transportation privacy. Considerably fewer individuals provided favorable ratings for public transportation privacy than automobile privacy. More variability in the measures

may have been obtained if the researcher had included other another potentially-relevant dimension of privacy, anonymity, in addition to the solitude measure.

Table 14

Post-Hoc Comparisons - Differences on TRANSATT for Levels of Need for Privacy Control and Perceived Public Transportation Privacy Performance

PRIVACY	RTPTPRIV			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	4.46	111	4.40	18
High	4.39	129	4.80	25

An examination of the effects of ratings of automobile privacy and need for privacy control on transportation attitudes was not possible because only three people rated automobiles unfavorably in privacy performance. Therefore, the ANOVA and subsequent comparisons of cell means would not have been meaningful.

The next ANOVA examined the interactive effects of safety locus of control and public transportation safety on transportation attitudes. The independent variables were the safety locus of control personality variable (SAFETY) and the ratings of public transportation safety (RTPTSFTY). The ANOVA yielded significant main effects for public transportation ratings on safety and safety locus of control (Table 15). The findings from this procedure were similar to the findings of the regression analysis in

which a significant main effect was found for safety locus of control, however, the interaction term was not significant.

Table 15

Two-Way Analysis of Variance: Safety Locus of Control and Ratings for Public Transportation on Safety-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
SAFETY	1	5.65	6.63**
RTPTSFTY	1	9.27	10.86***
Interactions:			
SAFETY * RTPTSFTY	1	.37	.51
Residual:	262	.85	

** $p < .01$. *** $p < .001$.

Subsequent comparisons of cell means revealed that individuals who were high in safety locus of control and rated public transportation high on safety-related transportation attributes had more favorable attitudes toward public transportation than those who were high in safety control and provided low ratings for public transportation on safety performance (Table 16). Although the interaction was not significant, the results were in the expected direction.

Table 16

Differences on TRANSATT for Levels of Safety Locus of Control and Perceived Public Transportation Safety Performance

SAFETY	RTPTSFTY			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	3.99	24	4.35	81
High	4.11	28	4.67	133

Another ANOVA was conducted to examine effects of safety locus of control and ratings of auto safety on transportation attitudes. Like the previous analysis, the ANOVA yielded significant main effects for the safety ratings measure and safety locus of control, however, the interaction was not significant (Table 17). One threat to the validity of these findings is that the range on the safety ratings measure was restricted. Only nine people rated automobiles low in safety. However, the sample sizes within the high automobile ratings cells were large enough to draw conclusions about the significance of the main effect. Significant differences in transportation attitudes were found between individuals who were high ($M = 4.67$) and low ($M = 4.35$) in safety control and who rated the performance of autos high on safety ($p < .05$).

Table 17

Two-Way Analysis of Variance: Safety Locus of Control and Ratings for Automobiles on Safety-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
SAFETY	1	3.84	4.50*
RTASFTY	1	3.59	4.21*
Interactions:			
SAFETY * RTASFTY	1	.71	.83
Residual:	275	.85	

* $p < .05$

The last ANOVAs examined the interactive effects of environmental locus of control and ratings for auto/public transportation environmental performance on transportation attitudes. There was a highly significant main effect for the environmental control personality variable with regard to public transportation performance but the main effect for the ratings measure and the interaction were not significant (Table 18). People who were high in environmental control had more favorable attitudes toward public transportation than those low in environmental control. This analysis may again have been threatened by the lack of variance in the independent ratings measure because only 19 individuals rated public transportation low on environmental performance. Thus, the main effect for environmental locus of control can be detected, but the interaction is

questionable given the low incidence of unfavorable ratings for public transportation on this attribute.

Table 18

Two-Way Analysis of Variance: Environmental Locus of Control and Ratings for Public Transportation on Environment-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
ENVIRNMT	1	44.23	57.84****
RTPTENV	1	.33	.43
Interactions:			
ENVIRNMT * RTPTENV	1	.04	.05
Residual:	271	.77	

**** $p < .0001$

The final analysis for Hypothesis #2 examined the effects of environmental locus of control and performance ratings for automobiles on transportation attitudes. Like the regression analysis for the environmental variables described previously, there was a significant main effect for the environmental control personality variable, a significant main effect for the environmental ratings measure, and a significant interaction (Table 19).

Table 19

Two-Way Analysis of Variance: Environmental Locus of Control and Ratings for
Automobiles on Environment-Related Transportation Attributes

Dependent Variable: TRANSATT	df	MS	F
Main Effects:			
ENVIRNMT	1	36.96	53.44****
RTAENV	1	7.76	11.22***
Interactions:			
ENVIRNMT * RTAENV	1	6.78	9.81***
Residual:	264	.88	

*** $p < .001$, **** $p < .0001$

Post-hoc comparisons involving Duncan's multiple-range test revealed that individuals who were high in environmental locus of control and rated autos high on environmental transportation attributes had less favorable attitudes toward public transportation than those who were high in environmental control and provided low ratings for automobiles on environmental attributes. As anticipated, there were no significant differences between high and low auto performance ratings groups for individuals who were low in environmental locus of control (Table 20). This finding provides some support for the hypothesis on the relationship between environmental control and transportation attitudes, however, due to the disproportionate sample sizes within each cell, the findings should be interpreted with caution.

Table 20

Post-Hoc Comparisons - Differences on TRANSATT for Levels of Environmental Locus of Control and Perceived Automobile Environmental Performance

ENVIRNMT	RTAENV			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	4.13	95	3.99	28
High	4.94	131	3.88	14

Attitude-Personality-Behavior Relationships

The next analyses were conducted to determine the effect of attitudes and personality on transportation behavior.

Hypothesis 3. Individuals who perceive that public transportation satisfies their control needs will have more favorable attitudes toward using public transportation and will be more frequent users of public transportation. In other words, knowing about one's transportation attitudes and related personality characteristics will help to explain or predict their behavior. In addition, the attitude-behavior relationship will be stronger when the behavior is under voluntary control. In other words, individuals who are able to drive and have an automobile available to them but choose to ride public transportation will have more favorable attitudes toward public transportation than individuals who are not able to drive and have no other transportation alternative.

Analysis Procedure #1. The frequency of transit use measure (FREQUSE) was transformed into a quasi-continuous variable in which the groups were re-coded into an approximate frequency of transit use per month measure. Individuals who indicated that they never used public transportation received a value of zero (0); individuals who indicated they used public transportation less than one day a month received a value of one (1); those who used public transportation 1-4 days per month received a value of three (3); those who reported using public transportation 1-3 days per week were assigned a value of eight (8); those who indicated use at 3-5 days per week were assigned a value of sixteen (16); and those who indicated they used public transportation more than 5 days per week were assigned a value of twenty (20). For all of the analysis procedures that involved frequency of public transportation use as the dependent variable, only “choice riders” were included in the analysis. The current researcher selected out only those individuals who were capable of driving and had automobiles available to them because Ajzen & Fishbein (1980) reported that effects of attitudes on behavior are much stronger for those who have a choice to execute the behavior, that is, when the behavior is under “voluntary control.” The attitude-behavior relationship will not necessarily be consistent for individuals who do not have a choice to engage in the behavior. Thus, attitude-behavior consistency can only be expected if the behavior is under voluntary control.

In order to test this hypothesis, frequency of transit use was correlated with the general transportation attitudes measure (TRANSATT), the specific attitudes toward automobiles measure (AUTOATT) and the specific attitudes toward public transportation measure (PTATT) for choice and non-choice transit riders. Choice riders were defined as

those individuals who were able to drive (i.e., had a valid drivers license) and had an automobile available to drive more or less whenever they want it. Non-choice did not have an automobile available to them whenever they want. Results confirmed that the correlation between the general transportation attitudes measure (TRANSATT) and frequency of transit use was higher for the choice riders than the non-choice riders, and the correlation between frequency of transit use and the specific automobile attitudes measure (AUTOATT) was more negative for choice than non-choice riders. However, the correlation between frequency of transit use and the specific public transportation attitudes measure (PTATT) was lower for the choice versus non-choice group and none of these differences were significant (Table 21).

Table 21

Correlation Between Frequency of Transit Use and Transportation Attitude Measures for Choice and Non-Choice Riders

Attitudes Measure	Choice Riders	Non-Choice Riders
TRANSATT	.58***	.45***
AUTOATT	-.21**	-.13
PTATT	.28***	.39***

** $p < .01$. *** $p < .001$.

The next analysis procedures examined the interactive effects of personality and attitudes on behavior. The same analysis procedures were conducted as in the previous regression analyses, except that frequency of transit use now served as the dependent

measure, and only choice riders were selected for the analysis. Four separate hierarchical multiple regressions were conducted in which frequency of transit use was regressed on to each control-related personality variable and the corresponding performance rating measure in the first step, and the interaction between the performance and the personality measure was included in the second step.

In the first regression, frequency of transit use was regressed on to the desire for control variable and the performance ratings for automobiles and public transportation on control-related transportation attributes in the first step, and in the second step, the interactions between the personality trait and the performance rating for both autos (INTACNTL) and public transportation (INTPTCNTL) were entered. Although the addition of the interaction terms did not contribute significantly to the model, results revealed a significant interaction between desire for control and the performance of public transportation on control-related transportation attributes ($F = 4.27, p < .05$) (Table 22). This finding is consistent with the previous ANOVA analysis in which a significant interaction was found between desire for control and public transportation ratings on control in the prediction of transportation attitudes. However, the control x performance interaction was not significant in the transportation attitudes regression analysis.

Table 22

Regression Analysis Testing the Effects of Desire for Control and Ratings of Automobile/Public Transportation Control Performance on Frequency of Transit Use

DEP. VAR. = FREQUSE	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
RTACNTL	.27	.63	.03	.18	.11	.11	9.53*****
RTPTCNTL	1.49	.29	.33	27.18*****			
CONTROL	.71	.53	.09	1.76			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.13	.02	2.14
RTACNTL	.94	4.57	.10	.04			
RTPTCNTL	-3.10	2.24	-.68	1.92			
CONTROL	1.16	2.31	.14	.25			
INTPTCNTL	.84	.40	1.02	4.27*			
INTACNTL	-.11	.89	-.08	.02			

* $p < .05$. ***** $p < .00001$.

The second regression analysis examined the interactive effects of need for privacy control and the privacy performance ratings for autos/public transportation on frequency of transit use. Findings yielded no significant main effects or interactions (Table 23). As in the analysis on transportation attitudes, the lack of variance in the performance ratings measure may have reduced the likelihood of finding any significant main effects or interactions.

Table 23

Regression Analysis Testing the Effects of Need for Privacy Control and Ratings of Automobile/Public Transportation Privacy on Frequency of Transit Use

DEP. VAR. = FREQUSE	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
RTAPRIV	.41	.50	.06	.69	.01	.01	1.00
RTPTPRIV	-.36	.31	-.08	1.30			
PRIVACY	.19	.43	.03	.20			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.02	.00	.28
RTAPRIV	1.94	2.98	.27	.42			
RTPTPRIV	.71	1.75	.15	.17			
PRIVACY	.77	1.83	.12	.18			
INTPTPRIV	-.23	.37	-.25	.39			
INTAPRIV	-.35	.68	-.29	.27			

When frequency of use was regressed on to safety locus of control and ratings of automobile and public transportation safety performance in the first step, there was a significant main effect for the public transportation safety ratings measure. However, when the interactions were entered in the second step, they did not significantly explain additional variance in the model and there were no significant main effects (Table 24). Restriction of range in the performance ratings measures may have also watered down the effects in this analysis. In addition, the correlations between the interaction terms and the main effects were so high that there was little explainable variance left for the interaction

terms. The correlation between ratings of public transportation safety performance (RTPTSFTY) and the interaction between safety locus of control and the safety ratings measure (INTPTSFTY) was .98, and the correlation between ratings of automobile safety performance (RTASFTY) and the interaction between safety locus of control and the automobile safety ratings measure (INTASFTY) was .95.

Table 24

Regression Analysis Testing the Effects of Safety Locus of Control and Ratings of Automobile/Public Transportation Safety Performance on Frequency of Transit Use

DEP. VAR. = FREQUSE	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
RTASFTY	-.62	.47	-.09	1.76	.06	.06	4.67**
RTPTSFTY	.99	.31	.22	10.31***			
SAFETY	.72	.56	.08	1.64			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.06	.00	.54
RTASFTY	.23	3.50	.03	.00			
RTPTSFTY	-.59	1.71	-.13	.12			
SAFETY	.85	1.50	.10	.32			
INTPTSFTY	.32	.34	.36	.89			
INTASFTY	-.17	.69	-.13	.06			

p < .01. *p < .001.

In the last regression analysis, frequency of transit use was regressed on to environmental locus of control and the performance ratings for autos/public transportation with respect to environmental attributes in the first step. In the second step, the interaction of environmental locus of control with performance ratings for automobiles on environmental attributes (INTAENV) and the interaction of the personality variable with performance ratings for public transportation were entered into the equation (INTPTENV). As in the transportation attitudes analyses, results showed a significant R Square Change for the interaction terms. However, instead of auto performance coming out as significant, significant main effects were found for the public transportation performance rating ($F = 5.54, p < .02$), the interaction of privacy control with the performance ratings for public transportation ($F = 7.37, p < .007$), and a marginally significant effect for the personality variable ($F = 2.78, p < .10$) (Table 25).

Table 25

Regression Analysis Testing the Effects of Environmental Locus of Control and Ratings of Automobile/Public Transportation Environmental Performance on Frequency of Transit Use

DEP. VAR. = FREQUSE	B	SE B	Beta	F			
Step 1					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
RTAENV	-.33	.24	-.09	1.89	.08	.08	6.05***
RTPTENV	.53	.30	.12	3.17 ⁺			
ENVIRNMT	1.09	.48	.16	5.10*			
Step 2					<u>R²</u>	<u>R² Ch</u>	<u>F Ch</u>
					.12	.04	5.69***
RTAENV	2.38	1.51	.69	2.50			
RTPTENV	-3.80	1.62	-.88	5.54*			
ENVIRNMT	-1.50	.90	-.22	2.78 ⁺			
INTPTENV	.90	.33	1.12	7.37**			
INTAENV	-.53	.30	-.81	3.09			

Note. The plus symbol (⁺) denotes that this variable was marginally significant at $p < .10$.

* $p < .05$. ** $p < .01$. *** $p < .001$

Analysis Procedure #2. Although statistical regression is oftentimes a more powerful test of linear relationships, the likelihood of finding significant effects in this study was greatly reduced because of restriction of range in the independent measures, particularly for automobiles on control and safety, and public transportation on privacy and environmental attributes. Therefore, additional analyses were conducted to examine

the relationships in greater detail. Where sample sizes permitted, 2-way ANOVAS were conducted to examine the mean scores on the frequency of transit use measure (FREQUSE) for the high vs. low personality and performance ratings groups. As in the previous regression analyses, only choice riders were included. Where appropriate, post-hoc tests were conducted to examine group differences. This procedure provides a way of looking at the interaction of the performance rating with the theoretically-relevant personality variable. More support for the hypothesis will be obtained if findings are consistent across statistical analysis procedures.

Like the other ANOVAs used to test Hypothesis #2, a median split on the personality scale scores was used to divide individuals into high and low groups. In addition, the performance ratings for auto/public transportation were dichotomized at the midpoint or neutral point. Scores on the performance scales ranged from a high of +3 to a low of -3. Those individuals who rated public transportation/automobiles above zero in performance for the specific attribute dimension (e.g., control, safety) were included in the high or favorable ratings group and those who rated public transportation/automobiles below zero on the attribute dimension were included in the low or unfavorable ratings group. For simplicity of understanding and presentation, those who provided neutral ratings were left out of the analysis.

The first ANOVA examined the interactive effects of desire for control and perceived performance of public transportation control on transportation behavior. The continuous frequency of transit use measure (FREQUSE) was defined as the dependent variable and the “dichotomized” desire for control personality variable (CONTROL) and

the “dichotomized” ratings of public transportation control (RTPTCNTL) variable were the independent measures. The ANOVA yielded a highly significant main effect for public transportation ratings on control and a significant interaction between desire for control and ratings of public transportation control (Table 26). The findings from this procedure were consistent with the regression analysis in which a significant interaction was found between desire for control and public transportation ratings on control. However, a significant main effect for public transportation ratings on control was not found in the regression analysis in the second step.

This finding was also consistent with the analysis of Hypothesis #2 in which a significant difference in transportation attitudes was found between high and low desire for control personality groups, particularly on public transportation control performance. In the ANOVA analysis that defined transportation attitudes as the dependent variable, a significant main effect was found for ratings of public transportation on control and a significant interaction was found between desire for control and ratings of public transportation on control. This consistency in research findings lends greater support to the hypotheses about the relationship between desire for control, transportation attitudes and behavior.

Table 26

Two-Way Analysis of Variance: Desire for Control and Ratings for Public Transportation on Control-Related Transportation Attributes

Dependent Variable: FREQUSE	df	MS	F
Main Effects:			
CONTROL	1	.32	1.24
RTPTCNTL	1	719.29	28.24****
Interactions:			
CONTROL * RTPTCNTL	1	119.80	4.70*
Residual:	214	25.47	

* $p < .05$. **** $p < .0001$

Post-hoc comparisons involving Duncan's multiple-range test were conducted to examine the interaction term. Results revealed that individuals who were high in desire for control and rated public transportation high on control-related transportation attributes reported significantly higher frequency of transit use than those who were high in desire for control and provided low ratings for public transportation on control performance. The hypothesis also posited that there would be no difference between the high and low performance ratings groups for those who were low in desire for control. However, this was not the case. A significant difference was found for individuals who were low in desire for control and rated the performance of public transportation low on control and

those who were low in desire for control and rated the performance of public transportation high on control. This finding implies that perception of public transportation control is a factor, even for those who are low in desire for control.

Further support for Hypothesis #3 can be obtained by examining the mean scores for the frequency of transit use measure (FREQUSE) within each cell (Table 27). Frequency of use scores were highest for those who were high in desire for control and rated public transportation high in controllability. The lowest mean score was observed for people who were high in desire for control and perceived that public transportation could not effectively meet their control needs. This finding suggests that ratings of control performance may be an important factor not only in the formation of transportation attitudes, but for public transportation utilization, especially for those high in need for control.

Table 27

Post-Hoc Comparisons - Differences in FREQUSE for Levels of Desire for Control and Perceived Public Transportation Control Performance

CONTROL	RTPTCNTL			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	2.71	49	4.78	51
High	2.47	70	7.54	48

An examination of the interactive effects of desire for control and perceived performance of automobile control on transportation behavior was not possible because of severe restriction of range in the automobile control performance rating measure. Only one person provided low ratings for automobiles on control. This lack of variance may explain why the effects of the independent variables relating to automobile control performance were not significant in this analysis or any of the other analyses.

The second ANOVA examined the effects of need for privacy control and ratings of public transportation privacy on transportation behavior. The frequency of transit use measure (FREQUSE) was defined as the dependent variable and the independent variables included the “dichotomized” need for privacy control personality variable (PRIVACY) and the “dichotomized” ratings of public transportation privacy (RTPTPRIV) variable. The ANOVA yielded no significant main effects or interactions (Table 28). The findings from this procedure mirrored the findings from the regression analysis in which no significant main effects or interactions were found. In addition, these results also were similar to the findings from the analysis procedures for hypothesis #2 in which no significant differences in transportation attitudes were found between high and low need for privacy control personality groups, on public transportation privacy or auto privacy. As in the other analyses, the findings for the privacy control construct were limited by a restriction of range in the ratings for public transportation privacy. Few individuals provided favorable ratings for public transportation on privacy-related transportation attributes, and the sample sizes within the cells were quite disproportionate.

Table 28

Two-Way Analysis of Variance: Need for Privacy Control and Ratings for Public Transportation on Privacy-Related Transportation Attributes

Dependent Variable: FREQUSE	df	MS	F
Main Effects:			
PRIVACY	1	66.42	2.20
RTPTPRIV	1	28.86	.96
Interactions:			
PRIVACY * RTPTPRIV	1	3.73	.12
Residual:	216	33.18	

An examination of the effects of automobile privacy on transportation behavior was not possible because the findings for the privacy control construct were limited by a restriction of range in the performance measure. Only one person rated automobiles unfavorably in privacy performance. Therefore, a comparison of means was not possible.

The next ANOVA examined the interactive effects of safety locus of control and public transportation safety on transportation behavior. The independent variables were the safety locus of control personality variable (SAFETY) and the ratings of public transportation safety (RTPTSFTY). The ANOVA yielded a significant main effect for public transportation ratings on safety (Table 29). Individuals who rated public transportation high in safety were more frequent users of public transportation. Although

regression analysis on safety and transportation behavior found no significant main effects or interactions, the findings from this procedure were similar to the transportation attitudes regression analysis in which a significant main effect was found for safety locus of control.

Table 29

Two-Way Analysis of Variance: Safety Locus of Control and Ratings for Public Transportation on Safety-Related Transportation Attributes

Dependent Variable: FREQUSE	df	MS	F
Main Effects:			
SAFETY	1	6.60	.22
RTPTSFTY	1	237.35	7.94**
Interactions:			
SAFETY * RTPTSFTY	1	1.98	.07
Residual	210	29.90	

** $p < .01$

It was not possible to conduct an ANOVA to examine the effects of safety locus of control and ratings of auto safety on transportation behavior because there was not enough variance in the independent measures to draw conclusions about the relationship between personality, performance ratings and behavior. There were only five individuals who rated automobiles low in safety. Thus, it is inclusive as to whether ratings of

automobile safety and safety locus of control influence transportation behavior.

The last ANOVAs examined the interactive effects of environmental locus of control and performance ratings for auto/public transportation environmental attributes on transportation behavior. For the public transportation analysis, there was a highly significant main effect for the environmental control personality variable and a marginally significant effect for the interaction term (Table 30). This finding is somewhat consistent with the regression analysis that revealed significant main effects for the public transportation ratings measure, the environmental control personality measure and the interaction term. In addition, a significant main effect was found for the environmental control personality variable when the transportation attitudes measure was defined as the dependent variable.

Table 30

Two-Way Analysis of Variance: Environmental Locus of Control and Ratings for Public Transportation on Environment-Related Transportation Attributes

Dependent Variable: FREQUSE	df	MS	F
Main Effects:			
ENVIRNMT	1	493.31	17.15****
RTPTENV	1	1.03	.04
Interactions:			
ENVIRNMT * RTPTENV	1	81.83	2.84 ⁺
Residual:	213	28.76	

Note. The plus sign (⁺) indicates a marginally significant interaction at $p < .10$ and should be interpreted with caution.

**** $p < .0001$

Duncan's Multiple Range test revealed a significant difference in frequency of transit use between individuals who were high and low in environmental control and rated the performance of public transportation high on environmental attributes.

However, restriction of range and unequal sample sizes threatened the validity of this analysis. Only 15 people rated public transportation low in environmental performance and only three individuals fell into the low ratings/high environmental control category.

Therefore, the results should be interpreted with extreme caution (Table 31).

As in the other analysis with transportation attitudes defined as the dependent measure, this analysis was threatened by the lack of variance in the public transportation ratings measure. Thus, the main effect for environmental locus of control can be detected, but the interaction is questionable given the low incidence of unfavorable ratings for public transportation on this attribute.

Table 31

Post-Hoc Comparisons - Differences in FREQUSE for Levels of Environmental Locus of Control and Perceived Public Transportation Environmental Performance

ENVIRNMT	RTPTEENV			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	4.33	12	2.78	99
High	1.67	3	6.09	103

The final analysis for Hypothesis #3 examined the effects of environmental locus of control and performance ratings for automobiles on transportation behavior. It was expected that those high in environmental control who rated automobiles negatively on environmental attributes would have more favorable attitudes toward public transportation and would be more frequent users of public transportation. This interaction was supported for the analysis involving transportation attitudes. Individuals who were high in environmental control and rated automobiles poorly had more favorable

attitudes toward public transportation. However, the interaction term was not significant in the ANOVA behavior analysis. Like the previous analyses on public transportation performance, there was only a significant main effect for the environmental control personality variable (Table 32). This finding is consistent with the regression analysis which found a significant main effect for environmental control but no significant interaction between automobile performance ratings and the personality characteristic.

Table 32

Two-Way Analysis of Variance: Environmental Locus of Control and Ratings for Automobiles on Environment-Related Transportation Attributes

Dependent Variable: FREQUSE	df	MS	F
Main Effects:			
ENVIRNMT	1	414.08	13.65****
RTAENV	1	6.53	.21
Interactions:			
ENVIRNMT * RTAENV	1	50.64	1.67
Residual:	207	30.34	

**** $p < .0001$

A comparison of cell means revealed that individuals who were high in environmental locus of control and rated autos low environmental transportation attributes were more frequent transit users than those who were high in environmental

control and provided high ratings for automobiles on environmental attributes. As anticipated, there was not much difference between high and low performance ratings for individuals who were low in environmental locus of control (Table 33). Again, these findings should be interpreted with caution because the disproportionate sample sizes.

Table 33

Differences in FREOUSE for Levels of Environmental Locus of Control and Perceived Automobile Environmental Performance

ENVIRNMT	RTAENV			
	<u>Low</u>		<u>High</u>	
	<u>Mean</u>	<u>n</u>	<u>Mean</u>	<u>n</u>
Low	3.08	79	3.52	27
High	6.23	94	3.91	11

Other Relationships

Several analyses were conducted to explore relationships between study variables and examine differences between groups of individuals.

Attitude sub-scales. The first analysis examined the average scale scores for each of the specific (importance x performance) attitude sub-scales for public transportation and automobiles. In general, study participants had more favorable attitudes (higher median scores) toward automobiles on control, privacy, safety and overall attitudes. Participants had more favorable attitudes toward public transportation on environmental attributes (Table 34).

Table 34

Median Sub-Scale Scores for Public Transportation and Automobile Attitude Measures

	<u>Control</u>	<u>Privacy</u>	<u>Safety</u>	<u>Environment</u>	<u>Overall</u>
Public Transportation	.43	3.33	-2.11	6.00	1.04
Automobiles	8.36	6.67	4.33	-4.50	4.46

Demographic differences. Additional analyses were conducted to explore differences in attitudes, personality and performance ratings between participants who lived in suburbs of Chicago (suburbanites) and those who lived in the city (urbanites). The results of the t-tests revealed that urbanites had more favorable general attitudes toward public transportation (i.e., higher TRANSATT scores) ($M = 4.55$) than suburbanites ($M = 4.33$), $t(304) = 2.00$, $p < .04$, but they did not differ on any of the personality measures. When examining the sub-components of the specific attitudes measures, suburbanites and urbanites were found to differ on attitudes toward public transportation on control (CNTLPT) and perceived controllability of public transportation (RTPTCNTL). The residents of Chicago rated public transportation much higher in controllability (RTPTCNTL: $M_1 = .32$, $M_2 = -.11$), $t(315) = 3.23$, $p < .001$ and had much more favorable attitudes toward public transportation control than the suburbanites (CNTLPT: $M_1 = 1.00$, $M_2 = -.21$), $t(312) = 2.55$, $p < .01$. Urbanities also rated the importance of control-related transportation attributes (IMPCNTL: $M_1 = 3.36$, $M_2 = 3.23$), $t(318) = 1.98$, $p < .05$ and safety-related transportation attributes significantly higher than suburbanites (IMPSFTY: $M_1 = 3.72$, $M_2 = 3.59$), $t(322) = 2.44$, $p < .02$.

CHAPTER VI

SUMMARY OF RESULTS AND DISCUSSION

Background

This study attempted to improve our understanding of relationships between personality and attitudes and subsequent behavior. The study examined how theoretically-relevant personality characteristics interact with perceptions of the attributes of an attitude object to better understand how the attitude is formed. The research was based on the work of Ajzen and Fishbein's (1980) expectancy-value theory which states that an attitude is the sum total of the beliefs about the attributes of an attitude object weighted by the evaluation of those beliefs. Marketing research and other applications have used this conceptualization of attitudes to better understand the factors that drive consumer behavior. However, little information about the interactive effects of personality on attitudes and subsequent behavior was found in any of the psychological or market research literature. Learning more about what factors affect the components of attitudes will facilitate understanding of how the attitude is formed. This understanding will help to identify what factors can be changed to alter the attitude, thus having an effect on a related behavior. In marketing research, the behavior oftentimes involves purchasing a product or utilizing a service.

The attitude objects selected for this study were two mutually exclusive and

somewhat opposing transportation modes, automobiles and public transportation. These two objects were selected because they represent two distinct and somewhat contrasting ideas that can be placed within discrete categories in which a judgement or opinion may be made (i.e., blacks vs. whites; conservatives vs. liberals; good vs. evil). This kind of comparison can sharpen the understanding of the main issue of interest which, in this case, was attitudes toward and use of automobiles vs. public transportation.

Using transportation as a theme for study and automobiles vs. public transportation as the attitude objects, the researcher selected factors or attributes that have been shown in previous research to be important facets of the transportation experience and are related to transportation decisions. These factors include personal control, safety, privacy and the environment.

In order to understand the effects of personality on attitudes and subsequent behavior, the current researcher postulated that four different personality characteristics, all with control as an underlying theme or construct, would be related to transportation attitudes. These four personality characteristics include desire for control, need for privacy control, safety locus of control and environmental locus of control. Of course, there are many other attributes and related personality characteristics that could be studied. However, the focus of this research was to examine the personality-attitude-behavior relationship which could be reasonably assessed with four attribute domains. Future research could address other attributes of the transportation experience that may also be key determinants of transportation attitudes and behavior.

Desire for control is a stable personality trait that indicates how much control an

individual wants or needs. The measure, developed by Burger and Cooper in 1979, measures generalized need for control and applies to different settings and circumstances. Higher scores on this measure indicate greater need for control.

Need for privacy was operationalized by a measure designed to address one relevant dimension of privacy, solitude. The researcher adapted items from other popular privacy measures and included some customized items based on privacy theory. Higher scores on this measure indicate greater need for privacy. Other potentially relevant dimensions of privacy (e.g., anonymity) were not included because of additional response burden. However, future research may examine the effects of other privacy dimensions on transportation attitudes.

The safety and environmental locus of control scales were based on the concept of Rotter's (1966) generalized expectancies for internal vs. external control. However, items on this measure were modeled after situation-specific locus of control measures such as the Employee Safety Inventory (Jones, 1984) and the Health Locus of Control Scale (Wallston, et al., 1977). The safety and environmental locus control scales assess whether individuals attribute personal safety and environmental hazards to internal or external factors. Higher scores indicate more internal control beliefs.

Although all four personality measures were based on the construct of control, they contained some subtle differences. The desire for control and need for privacy scales measure the extent to which an individual is motivated to gratify some need, in this case, control and privacy. On the other hand, the safety and environmental control measures are designed to assess causal attributions or perceived responsibility for

personal safety and environmental occurrences as being internal/personal or external/circumstantial.

All scales showed good internal consistency and were somewhat intercorrelated, supporting the common control theme. The safety and environmental locus of control scales correlated positively and significantly, providing support for the construct validity of the locus of control dimension. However, the need for privacy and desire for control scales did not correlate as highly as expected, raising question as to the construct validity of the validity of the “needs” dimension, especially for the privacy.

Because the desire for control measure was prevalidated, significant correlations with this measure provided further support for construct validity. Safety and environmental control correlated positively and significantly with the desire for control measure. However, the correlation between desire for control and privacy was not as high as the correlation between desire of control and the other personality measures. Furthermore, the need for privacy scale was not highly correlated with any of the other measures, indicating that it may be measuring something other than control. Future studies will be necessary to show that these scales are valid. Correlating these measures with other measures of locus of control and privacy is recommended. Criterion-related validity studies would provide further support for the true existence of the personality constructs, and test-retest studies should be conducted to assess the temporal stability of the measures. While on the one hand, correlations among the personality traits seem to indicate the common theme of control, the extent of correlation complicated the task of examining their distinct effects on attitudes alone and in interaction with perceptions of

transportation performance.

Assuming that these four scales were valid and reliable measures of personality, the researcher set out to understand how these seemingly relevant personality characteristics were related to transportation attitudes.

Hypothesis 1

The first hypothesis suggested that these personality traits would be significantly related to the evaluative component of the attitude. For example, if people are high in need for control, they will rate the importance of the control-related transportation attributes higher than those low in need for control. In addition, the relationship between the importance rating and the relevant personality characteristic would be higher than the relationship between the personality characteristic and the importance ratings for the other attributes.

The first hypothesis was somewhat confirmed. All of the personality characteristics had relatively high significant correlations with the corresponding importance rating, and the average of the correlations between the importance rating and the corresponding personality variable was significantly higher than the average of the correlations between the personality variables and the importance ratings for other attributes.

Implications for Hypothesis 1

This finding suggests that personality can be used to understand what attributes of an attitude object would be important to an individual. Thus, if one knows about an individual's personality, one may be able to predict what transportation attributes or

characteristics the individual will value or consider important. These importance ratings are an integral part of the attitude because they form the weight of the measure.

Knowledge of the personality characteristics of the target market or subject group may hint at what attributes should be emphasized when trying to market a product or service, or change an attitude or behavior. In addition, importance ratings may provide some insight into personality when the characteristics of the individuals are unknown or uncertain.

The development and application of psychographics in market research has recently begun to touch on this area, although the direct connection of personality characteristics with importance ratings has not been emphasized. In the functional theory of attitudes, Shavitt (1989) indicated that people are most persuaded by messages that are matched up with their needs, defined in terms of personality characteristics. To influence an attitude, one should have an appeal that relates to the needs being served by the attitude object. In addition, she indicates that different communications will have different degrees of affect, depending on the level of the personality characteristic that the receiver of the message possesses. Thus, a better understanding of the relationship between attitudes and personality will enable advertising and marketing media to tailor communications messages to attract specific individuals that may not otherwise be attuned to the message about the benefits or functions of the product or service.

The importance ratings are also a good way to understand the implications of personality for behavior, especially when combined with beliefs about the performance of the attitude object with respect to the specific attributes. How one rates the importance of

the specific attributes of an attitude object can be used to identify the underlying personality characteristics that influence those importance ratings and subsequent behavior. When this understanding is combined with an assessment of how the object performs on those attributes, the behavior becomes more predictable.

Hypothesis 2

Knowledge about the relationship between personality and attitudes may also enhance the understanding of how the attitude is formed. The importance ratings combined with evaluations of the performance of the transportation mode with respect to the attributes contributes to the formulation of the overall attitude. This statement leads to Hypothesis #2 which posits that people who are higher on a given personality trait will express more favorable attitudes toward the transportation mode that is seen as likely to perform well on a related attribute dimension. This hypothesis ties in the other component of the attitude as defined by Ajzen and Fishbein in their expectancy-value theory. This is the belief that the attitude object will perform well on a given attribute or attribute dimension. In marketing research, this “belief” component is often called “satisfaction.” The satisfaction or performance of an attitude object with respect to specific attributes is often weighted by the importance rating of the attribute to form the attitude toward the object, product, service or behavior. The hypothesis states that the personality characteristic will interact with the ratings or belief component of the attitude and subsequently direct the behavior. The strength of the attitude may be determined partially by the strength of the personality characteristic related to the attitude object. For example, if an individual is high in desire for control and rates the performance of public

transportation favorably with respect to the control-related attributes, then the individual will have more favorable attitudes toward riding public transportation than an individual who is high on desire for control and feels that public transportation is not very controllable.

Several different types of analysis procedures were conducted to test this hypothesis. Different analysis procedures were used because they provided the researcher with different ways of looking at the data and understanding how the distribution of scores on the attitude and personality measures affected the study results. In addition, if the same research findings resulted from different analysis procedures, the researcher could be more confident in drawing conclusions about the relationships between study variables.

The first and second analysis procedures used a correlational approach and were the most direct translations of the research hypothesis. The third analysis used statistical regression to allow more precision in testing for main effects and interactions. However, in applied research, it is difficult to find interaction terms in regression analysis when the factors are correlated (Jaccard, 1990). Therefore, a fourth approach used a 2 X 2 analysis of variance (ANOVA) to test for main effects and interactions and to examine the data in greater detail.

In all of the analysis procedures, an independent measure of transportation attitudes was used instead of the expectancy-value (importance x performance) attitude measure to avoid inflating the correlation coefficient. This scale consisted of 21 positive and negative statements about driving and using public transportation. Higher scores on

this measure indicated more favorable attitudes toward public transportation. The general transportation attitudes measure was shown to have good construct validity in that it correlated significantly and in the expected direction with the other expectancy-value attitude measures (PTATT and AUTOATT).

Although the results of the analysis procedures revealed somewhat different findings, some general patterns emerged. The following section will summarize these findings in terms of each of the four personality constructs.

Desire for Control

Analysis procedures 1 and 2. In analysis procedure 1, it was hypothesized that for public transportation, the correlation between the attitude measure and the performance rating for the control attribute dimension would be higher for the high desire for control group than the low group, and for automobiles, the correlation would be most negative for people relatively high on a trait and less negative or zero for people low on the trait. In analysis procedure 2, it was expected that the correlations would be more negative for the high personality group than the low group. In addition, the average of the correlations between the attitude measure and performance ratings for the other non-relevant attributes would be lower than the correlation between the attitude measure and the performance rating for the relevant control attribute.

This analysis was performed two different ways, each using a different measure of performance. In analysis procedure #1, the raw performance measures for both automobiles and public transportation were used. In analysis procedure #2, the public transportation performance ratings were subtracted from the automobile performance

ratings to obtain a difference score as a measure of performance. Higher difference scores indicated better automobile performance.

Results from these analysis procedures yielded consistent findings.

In both analysis procedures, the correlation between the transportation attitudes measure and the control performance dimension was stronger for the high desire for control group than the low group. However, a significant difference was found only with reference to public transportation control. A restriction of range in the automobile control performance rating measure reduced the likelihood of finding any significant differences between high and low personality groups for automobiles on control. As expected, the average of the correlations between the attitudes measure and the performance ratings for the non-related attributes were not significantly different between the high and low personality groups in any of the analysis procedures.

In summary, the results from analysis procedures 1 and 2 provided some support for the hypothesis in that the correlations were generally stronger for the high desire for control group than the low group. However, a significant difference was found for the desire for control personality variable, only with regards to public transportation control.

Analysis procedure 3. Hierarchical multiple linear regression analyses were conducted to allow more precision in testing for significant main effects as well as interactive effects of personality and performance on attitudes. Support for the hypothesis would be obtained if the interaction terms (personality x performance), entered in the second step, significantly contributed to explaining variance in the model. However, results of the analysis on the desire for control personality construct indicated

that the R Square Change was not significant when the interaction terms were entered in the equation and there were no significant main effects. This lack of effect is understandable in view of the very high correlation between the main effect of performance on control and the interaction of this variable with the control trait.

Analysis procedure 4. Because the regression analyses were not consistent with the results of Analysis Procedures 1 and 2, additional analyses were conducted to examine the data in greater detail. Two separate 2 X 2 analysis of variance tests were conducted to examine the average transportation attitudes score (TRANSATT) for both levels of the personality variable and the performance ratings for both automobiles and public transportation. The ANOVAs resulted in four categories or cells - High personality/high performance ratings; high personality/low performance ratings; low personality/high performance ratings; and low personality/low performance ratings. Respondents who gave neutral performance ratings were eliminated for simplicity of understanding. It was hypothesized that there would be significant interactions between the performance ratings and the personality measures.

The ANOVA findings were consistent with the regression analyses in that both showed a significant effect of control performance ratings on attitudes, but in the ANOVA analysis, there was also a significant interaction between performance ratings and personality as predicted.

The ANOVA results are consistent with Analysis Procedures 1 and 2 which found significant differences between high and low personality groups on desire for control. Post-hoc tests revealed that individuals who were high on desire for control and rated the

performance of public transportation high on control-related transportation attributes had more favorable attitudes toward public transportation than individuals who were high on desire for control and rated public transportation low on control. Individuals who were low on desire for control also had more favorable attitudes toward public transportation, but the relationship was not as strong as in the high personality group. Further support for the hypothesis was obtained by examining the cell means which consisted of the mean TRANSATT score for each of the high vs. low personality/performance groups.

Individuals who were high on desire for control and provided favorable ratings for public transportation on control had the highest TRANSATT score and individuals who were high on desire for control and provided low ratings for public transportation on control had the lowest TRANSATT score.

The ANOVA that was to be used to test the effect of automobile performance ratings on control and desire for control on transportation attitudes could not be done because there were no individuals who rated automobiles unfavorably on control-related transportation attributes. A restriction of range in the performance rating measure for automobiles on control severely limited the likelihood of finding any significant effects or significant differences in any of the analyses involving automobiles and control.

Need for Privacy

Analysis procedures 1 and 2. The correlation between the transportation attitudes measure and the privacy performance ratings for public transportation and automobiles was not significantly different for high vs. low need for privacy groups. However, the correlation was higher for the high personality group than the low group in the public

transportation performance analysis and the correlation was more negative for the high personality group than the low group for the automobile performance analysis. Thus, some support for the hypothesis was obtained in that the correlations were in the expected direction; however, the differences were not significant.

Analysis procedure 3. Neither the main effects nor the interaction of privacy control with privacy performance were predictive of transportation attitudes according to the regression analysis.

Analysis procedure 4. No significant main effects or interactions were found in the public transportation or automobile analysis of variance procedures. However, an examination of the cell means revealed that individuals who were high in need for privacy and rated public transportation high on privacy had the most favorable attitudes toward public transportation, and individuals who were high in need for privacy and rated public transportation low on privacy had the lowest transportation attitudes scores. These results are consistent with the findings in Analysis procedures 1 and 2. When cell means were examined, it was also apparent that restriction of range in the automobile privacy performance ratings reduced the likelihood of finding any significant effects in the analyses involving automobiles and privacy. Only three people rated automobiles low on privacy. This limitation affected all of the analyses involving the privacy control construct. A better range of responses may have been obtained if the researcher had included another potentially relevant dimension of privacy, anonymity in the privacy personality and performance measures.

Safety Locus of Control

Analysis procedures 1 and 2. The correlation between the transportation attitudes measure and the safety performance ratings for public transportation and automobiles was not significantly different for high vs. low safety locus of control groups. However, the correlation was higher for the high personality group than the low group in the public transportation performance analysis and the correlation was more negative for the high personality group than the low group for the automobile performance analysis. Thus, some support for hypotheses was obtained in that the correlations were in the expected direction; however, like the privacy analysis, the differences were not significant.

Analysis procedure 3. The interaction of safety locus of control with safety performance in the regression equation did not significantly contribute to the model. However, there were main effects for the safety locus of control personality variable as well as for performance ratings of both public transportation and automobiles.

Analysis procedure 4. In the public transportation analysis, significant main effects were found for safety locus of control and the performance ratings for public transportation on safety-related transportation attributes. Individuals who were high in safety control and rated public transportation high in safety had more positive attitudes toward public transportation than individuals who were high in safety control and rated public transportation low in safety. Although the interaction was not significant, the results were in the expected direction.

In the automobile analysis, significant main effects were found again for safety locus of control and the performance ratings for public transportation on safety-related

transportation attributes. However, this difference was not significant. When examining the cell sample sizes, it became apparent that there was restriction of range in the automobile safety performance measure that limited the possibility of finding significant interactions. Only nine people rated automobiles low in safety. This finding is surprising, given the incidence of automobile accidents and other potential hazards one may face while driving. Nevertheless, this restriction of range on the safety performance measure may have affected the research findings.

Environmental Locus of Control

Analysis procedures 1 and 2. The correlation between the transportation attitudes measure and the environmental performance ratings was significant for automobiles but not for public transportation. However, the correlation was higher for the high personality group than the low group in the public transportation performance analysis. Thus, some support for hypotheses was obtained in that the difference for the automobiles was significant and the correlations for the public transportation analysis were in the expected direction.

Analysis procedure 3. This was the only regression procedure that confirmed the research hypothesis. The interaction of environmental locus of control with environmental performance in the regression equation significantly contributed to the model, and there was a significant interaction between the automobile ratings and environmental control personality variable. In addition, there were significant main effects for the automobile ratings measure and the environmental control personality variable.

Analysis procedure 4. In the public transportation analysis of variance, highly significant main effects were found for environmental locus of control personality variable. However the effects of the ratings measure for public transportation and the interaction were not significant. An examination of the sample sizes revealed that there was a problem with restriction of range in the public transportation ratings measure. Only 19 people rated public transportation low on environmental attributes, and only five participants were in the high environmental control/low ratings group. This lack of variance limits the chances of finding any significant effects or interactions involving the performance ratings measure in any of the analyses on public transportation. However, the influence of the main effect was detectable and in the expected direction. Individuals who were high in environmental control had more favorable attitudes toward public transportation than individuals who were low in environmental control.

The automobile analysis was more conclusive because it contained a better distribution of scores across the automobile ratings measure. Although there were not as many individuals rating automobiles high on environmental attributes, there were enough individuals in the high ratings group to detect an effect. The results of the ANOVA revealed significant main effects for the environmental control and automobile ratings measures and a significant interaction. Post-hoc tests provided support for the hypothesis in that those who were high in environmental control and rated automobiles low on environmental attributes had more favorable attitudes toward public transportation and less favorable attitudes toward automobiles. In addition, those who were high in environmental control and rated automobiles favorable on environmental attributes had

less favorable attitudes toward public transportation. As expected, the difference between the high vs. low ratings groups for those low in environmental control was not significant.

Implications for Hypothesis 2

The combination of the different analysis procedures used to test Hypothesis 2 provided a comprehensive picture of the potential relationships between attitudes and personality. However, problems with restriction of range, particularly in the performance ratings measures for automobiles on privacy, public transportation on environment, and automobiles on control severely limited the chances of finding any significant main effects or interactions. There was a much better distribution of scores on the public transportation ratings measure for control and the automobile ratings measure on environmental attributes than the other performance measures. Therefore, the likelihood of finding a significant interaction or seeing the effects of the control and environment ratings was much greater.

The cumulative results of all the analysis procedures seem to suggest that the hypothesized relationship between attitudes and personality may exist. In general, more favorable attitudes toward public transportation were found for the high ratings/high personality group than the low ratings/high personality group. Conversely, less favorable attitudes toward public transportation were found for the high automobile ratings/high personality group than the low ratings/high personality group. And in most cases, the difference between the high vs. low ratings groups was not significant for those low on a personality trait.

These results tend to suggest that people who were high in a personality trait and rated the specific transportation mode high in performance had more favorable attitudes toward that mode than people who were high on the trait and rated the mode low in performance. However, this difference was only significant for the desire for control and the environmental control dimensions. It appears that need for control combined with perceptions of perceived controllability may be a central factor in forming attitudes about public transportation. In addition, less favorable attitudes toward automobiles resulted from feelings that automobiles do not perform well on environmental attributes. These effects may have been detected because there was a better distribution of responses on the performance ratings measures for public transportation on control and automobiles on environment.

The results for Hypothesis 2 are promising but inconclusive at this time. Future research with more sensitive measures of performance will be needed to adequately test this hypothesis. Perhaps a 10-step measure of performance or a satisfaction scale should be used. In addition, several points mentioned by Shavitt should be considered. In her book on the functional theory of attitudes, Shavitt (1989) states that situational factors will have a stronger impact on the functions of attitudes toward objects that can readily engage the attitude functions to be elicited than for objects that cannot. The effectiveness of personality variables as variations of attitude functions may be limited to attitudes toward objects that can engage the functions relevant to the corresponding personality type. Need for control and privacy may not readily engage the relevant functions of attitudes toward automobiles, however, these factors may become an issue when

considering the implications for control on public transportation. In addition, these factors may be secondary to other factors that would be more likely to elicit a response toward the attitude object. For example, need for status and recognition may more readily elicit a response in attitudes toward automobiles than control or privacy factors. The lack of variance in the ratings measures for these attributes may be an indication that these factors are not particularly relevant to the formation of attitudes toward automobiles.

Hypothesis 3

The third hypothesis examines the interactive effects of attitudes and personality on behavior. The hypothesis states that if an individual is high on a personality trait and perceives that the attitude object can meet those needs relevant to the personality trait, the individual will have more favorable attitudes toward the attitude object and be more likely to engage in behavior consistent with the attitude. In addition, the attitude-behavior relationship is expected to be more consistent when the behavior is under voluntary control. For example, if an individual is high in need for control and perceives that public transportation can satisfy his/her control needs, then the individual will express more favorable attitudes toward public transportation and be a more frequent user of public transportation. However, if the individual has no other transportation option, the attitude may not be as consistent with the behavior. That is, they may not have more positive attitudes toward using public transportation.

Analysis procedure 1 and 2. To explore the relationship between attitudes and behavior for choice vs. non-choice riders, the correlation between the frequency of transit

use measure and each of the transportation attitudes measures were examined for individuals who had automobiles available to them and were able to drive vs. individuals who did not have available automobiles. The correlation between attitudes and behavior measure was generally higher for the choice than the non-choice riders. Therefore, subsequent behavior analyses only included those who had the option of making the transportation decision.

The analysis procedures used to test Hypothesis 3 were the same as the regression analysis procedure and the follow-up ANOVAs used to examine attitude-personality relationships. Hierarchical multiple linear regressions were conducted for each of the four personality/performance content domains. As in the attitudes analyses, the interaction terms for the ratings and personality measures were entered in the second step, and support for the hypothesis would be obtained if the interaction terms significantly contributed to explaining variance in dependent measure. The dependent measure in the behavior analysis was frequency of transit use. The following section will briefly review the findings for each of the four personality dimensions.

Desire for control. There was a significant effect on public transit use of the interaction between desire for control and the performance of public transportation on control-related transportation attributes. This finding is consistent with the ANOVA analysis in which a significant interaction was found between desire for control and public transportation ratings on control in the prediction of transportation attitudes. When the analysis was converted to an ANOVA and the cells were examined for each of the high vs. low personality/ratings groups, frequency of transit use was found to be

highest for the high personality control/high ratings group and lowest for the high personality/low ratings group. In other words, individuals who were high in desire for control and perceived that public transportation could meet their control needs had more favorable attitudes toward using public transportation and were more frequent users of public transportation than individuals who were high on the trait and perceived that public transportation could not adequately meet their control needs. Also, in both the regression and ANOVA analyses there was a significant main effect of ratings of control performance on transit use.

As in the behavior analysis, restriction of range on the automobile performance ratings measure limited the likelihood of finding any significant main effects or interactions for the automobile control analysis.

Need for privacy. Consistent with the results of the attitudes analysis, no significant main effects or interactions were found. The findings for automobile privacy performance were uninterpretable because only one person provided unfavorable ratings for automobiles on privacy. Thus, as operationally defined in the present study, need for privacy control was not a salient factor in transportation attitudes and behavior. It can be recalled that need for privacy was not related to the other three personality constructs, although it was somewhat related to importance of privacy as a transportation attribute.

Safety locus of control. The regression showed a significant main effect of safety performance but the interaction terms did not significantly contribute variance to the model. However, when an ANOVA was run on this variable, a significant main effect was found for ratings of safety performance. This finding was similar to the attitudes

analyses which found significant main effects for safety performance and for safety locus of control. These findings also were limited by a restriction of range in the performance ratings measure. Disproportionate cell sample sizes were a threat to statistical conclusion validity.

Environmental locus of control. As in the transportation attitudes analysis, results showed a significant R Square Change for the interaction terms. However, instead of auto performance being significant, results showed a significant main effect for public transportation performance, and the interaction of public transportation performance with the privacy control trait. An examination of cell means through ANOVA revealed that individuals who were high on environmental control and rated public transportation high on environmental attributes were much more frequent users of public transportation than individuals who were high on environmental control and rated public transportation poorly on environmental transportation attributes. As expected, there was not much difference in transit use between the low personality/high ratings group and the low personality/low ratings group.

Although the findings in the regression on automobile performance were not significant, the ANOVA showed that individuals who were higher on the trait and rated automobiles low on environmental attributes were more frequent users of public transportation. However, the findings should be interpreted with caution because the unequal sample sizes are not robust to violations of homogeneity.

Implications for Hypothesis 3

The results for the analyses that explored the personality-attitude-behavior

relationships were similar to the results for the personality-attitude relationships explored in Hypothesis 2. The hypothesis was supported for the desire for control and environmental control personality constructs but not for the safety and privacy constructs. Restriction of range in the performance ratings measure also prevented these analyses from finding significant effects or interactions, and, in some cases the procedures were not meaningful or severely threatened by disproportionate cell sample sizes. It may be that the hypothesis would be supported with more sensitive measures of performance. Frequency of transit use does seem to be higher when there is consistency between the attitudes and performance ratings, however, in most cases, the interaction was not statistically significant. Future research would be necessary to further examine the interactive effects of attitudes and personality on behavior.

Other Relationships

General attitudinal differences. Participants had more favorable attitudes toward automobiles on control, privacy and safety, and public transportation elicited more favorable attitudes on environmental attributes. This finding is consistent with previous transportation research that examined attitudinal differences between automobiles and public transportation. Automobiles are often rated more favorably on most attributes because of the costs or disincentives involved with using public transportation (Levin & Louviere, 1981).

Suburban-urban differences. There were some interesting findings on the difference in perceptions and attitudes between individuals who reside in the suburbs and those who reside in the city. First, urbanites generally had more favorable attitudes

toward public transportation. This finding seems plausible given that urban culture and infrastructure are more amenable to public transportation. Further illustration of this finding can be seen by examining the attitude sub-components. Suburbanites appear to be affected by the control dimension. Suburbanites had less favorable attitudes on transportation control and perceived controllability of public transportation than urbanites. This finding is consistent with a recent study by the Regional Transportation Authority that indicated that perceptions of public transportation control represent the primary barriers to increased use of public transit in the suburbs (RTA, 1996). This implies that the current system does not allow suburbanites enough control to feel comfortable riding. Additional advertising and marketing efforts that focus on the control-related benefits of the suburban bus and rail system may be needed. Programs can be designed to enhance knowledge and awareness of the system so that suburbanites can see the system as more controllable, and alternative transit services such as vanpools and subscription bus programs can continue to provide a more control-oriented service in the suburbs.

Another interesting finding is that urbanites rated the importance of control and safety-related transportation attributes higher than suburbanites. However, no significant differences were found between these individuals on any of the personality variables.

Limitations of the Study and Suggestions for Future Research

Although the results of this study provide some support for the hypotheses, there are several factors that merit further explanation and/or investigation. First, three of the personality measures were developed by the current researcher (desire for privacy,

environmental control, and safety control) and have not yet been formally validated. Although items were derived from theoretically-relevant research and contain some evidence of construct validity, further psychometric analysis, scale refinement and validation are needed.

Second, the sampling methodology utilized a non-probability sample, which threatens the generalizability of study results. Although it may be difficult to do, a stratified random sampling of individuals within each suburban area and in Chicago would be recommended to obtain a more representative mix of individuals from the area. In addition, a study that sampled individuals from other locations in the United States and in Europe would be recommended to enhance generalizability of study results.

Third, this study examines attitudes toward automobiles and public transportation in general. An analysis of the relationship between personality and attitudes toward specific modes of public transportation such as subway trains, buses, and taxi cabs may prove useful in future research.

Fourth, this study is particularly weak with respect to statistical conclusion validity that is mostly due to the restriction of range on the performance rating measures. It appears that effects can only be detected if there is a full range of scores on the independent measures. More sensitive measures of performance or measures of satisfaction instead of performance will be necessary for future studies on this topic. In addition, there was a problem with the regression analyses because the performance measures were very highly correlated with the performance x personality interaction terms. This problem reduced the likelihood of finding significant interaction effects.

Practical Implications

It was hoped that the results of this study will expand knowledge of the relationships between attitudes and behavior by determining if control-based personality variables can provide a better understanding of the factors that influence positive attitudes toward public transportation and public transportation utilization. An enhanced understanding of the relationship between control-based personality variables and transportation attitudes and behavior will help public transportation professionals design services and marketing/advertising strategies to meet specific needs. To date, few transportation studies have examined the effects of personality dispositions on transportation choices, particularly those personality variables that imply a desire or internal orientation for control.

In addition, these findings may contribute to a better understanding of “transportation psychographics” - knowledge of the individual-difference characteristics that are related to attitudes and beliefs about products and product preferences. Psychographics are often used to help marketers to develop more targeted and effective advertising campaigns to increase product use. For example, advertising campaigns can be developed to influence individuals who are high in need for control to ride public transportation by emphasizing the control-related features/enhancements of a transportation system.

Finally, this research has attempted to advance understanding in the broader field of Social Psychology and the study of attitudes. The theory and research findings have implications for the functional theory of attitudes. This theory implies that to influence

an attitude, one should have an appeal that relates to the needs being served by the attitude object (Shavitt, 1989). The current research has shown that these needs or measures of importance are related to the personality characteristics of the individual. Previous research in this area has concluded that the effects of personality on attitudes and related behavior will only be consistent when the research is guided by an appropriate theoretical perspective (Fry, 1971). It is important to identify which personality traits are important and to define the conditions under which these variables will be effective (Gunter & Furnham, 1992). This study examined several personality factors that may be relevant in forming attitudes about transportation modes and transportation mode choices. Personality and attitudes may directly affect attitudes and subsequent behavior. In addition, perceptions of attribute importance and object performance were found to correlate with general attitudes. However, the combination of personality dispositions and perceptions of attributes should have the largest impact on attitudes. In this study, the personality variables that appeared to be the most relevant to transportation attitudes and behavior were desire for control and environmental control.

In conclusion, this study has sought to advance general knowledge about the separate and combined effects of both personality and related perceptions of attributes on attitude formation by examining whether control-based personality variables can provide a better understanding of transportation attitudes and mode-choice decisions. Although findings were not definitive, this investigator hopes that the study will provide some groundwork with which to conduct further research.

APPENDIX A

INFORMED CONSENT FORM
AND TRANSPORTATION QUESTIONNAIRE

Informed Consent Form

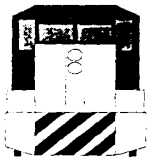
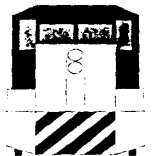
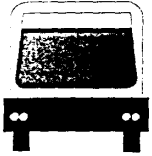
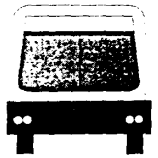
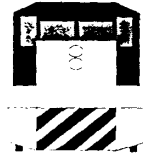
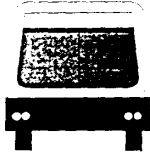
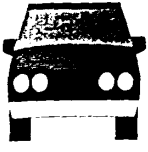
The attached questionnaire is designed to gather information about some of your beliefs, attitudes and experiences related to transportation as well as your personal characteristics and background. Your participation in this study will help to advance scientific knowledge in the fields of psychology, transportation, and marketing. The questionnaire should take no more than 30 minutes to complete. Your participation is voluntary and you may decline any questions that you do not wish to answer. The survey is also anonymous and all data will be kept confidential. If you agree to participate, please sign this form on the line below, remove this page and return it to the survey administrator. Do not write your name on the questionnaire. Thank you very much for your valuable input.

I agree to participate in this study on personality, attitudes and transportation behavior.

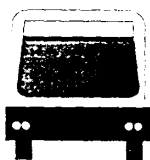
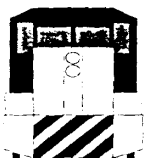
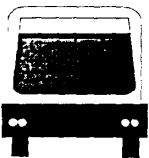
Signed,

(please sign here)

(date)



TRANSPORTATION
QUESTIONNAIRE



Transportation Questionnaire Part I

Directions: The following questions pertain to your feelings about using public transportation. This is not a measure of knowledge, we are interested in your thoughtful opinion. Please darken the box from the scale that indicates how much you agree or disagree with the following statements.

	<i>Strongly Disagree</i>						<i>Disagree</i>
							<i>Slightly Disagree</i>
							<i>Neutral</i>
							<i>Slightly Agree</i>
							<i>Agree</i>
							<i>Strongly Agree</i>
1. It is necessary to reduce the use of automobiles by supplying an effective network of public transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. To be honest, there is no public transportation I can think of that would make me give up using an automobile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I do not think the government should invest money in improving the quality of mass transit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Traffic congestion is a real problem that should be addressed by encouraging people to use public transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I would just as soon do without an automobile if public transportation met my needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. If do not have a car to get around, I feel trapped	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Riding public transportation is okay for other people but not for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I don't mind riding public transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I prefer to use a car to get around	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I would not use public transportation under any circumstances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I don't mind riding public transportation once in a while, but I would not want to use it every day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Riding public transportation does not fit in with my lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I'm not the kind of person who rides public transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I am afraid to ride public transportation, especially at night	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Riding public transportation is more relaxing than driving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I have considered using public transportation to get to work or school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I would dislike having to depend on public transportation to get to work or school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I prefer to use a car to get to work or school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Riding public transportation to get to work or school is stressful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Public transportation is not convenient for me to use to get to work or school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Riding public transportation to get to work or school is better than driving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transportation Questionnaire Part II

Directions: The following is a list of things that may be important to you in influencing you to use a particular mode of transportation. Please darken the box from the scale that indicates how important each of these things are to you when commuting to work or school.

	Very Important	Important	Somewhat Important	Not Very Important	Not at All Important
<i>When you travel to work or school, how important is it for you to:</i>					
get there as fast as possible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
be able to arrive at your intended time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
be able to get to many places	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
be able to go where you want to go	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have a direct route to your destination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have transportation available whenever you want it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
set your own schedule to come and go as you wish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>When you travel to work or school, how important is it for you to:</i>					
feel confident that the vehicle will get you to your destination without an accident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
feel confident the vehicle will not need to be stopped for repairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have a safe vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
feel safe from crime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
not have to worry about being harmed by others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
avoid the possibility of personal injury	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>When you travel to work or school, how important is it for you to:</i>					
avoid riding with or talking to strangers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ride with people you know/like	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have the ability to decide who rides with you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ride with people who are like yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ride in an uncrowded vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have your own private section in the vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have some time to yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
be by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have a feeling of privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>How important is it to:</i>					
help reduce air pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
help reduce traffic congestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
save fuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
conserve energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transportation Questionnaire Part III

Directions: Now I would like you to think about how you feel about using different modes of transportation to get to work or school. In the first column, please write the number from the scale that best represents how you feel about the automobile. In the second column, please pick the number that best indicates how you feel about public transportation. If you are not familiar with public transportation, try to state your opinion based on how you think public transportation would be.

	7 <i>Strongly Agree</i>	6 <i>Agree</i>	5 <i>Slightly Agree</i>	4 <i>Neutral</i>	3 <i>Slightly Disagree</i>	2 <i>Disagree</i>	1 <i>Strongly Disagree</i>
AUTOMOBILE RATING							
PUBLIC TRANSPORTATION RATING							
_____							Can get there as fast as possible
_____							Can arrive at intended time
_____							Can get to many places
_____							Can go where you want to go
_____							Can have a direct route to your destination
_____							Can have transportation available whenever you want it
_____							Can set your own schedule
_____							Can feel confident that you will get you to your destination without an accident
_____							Can feel confident the vehicle will not need to be stopped for repairs
_____							Can feel that the vehicle is safe
_____							Can be protected from crime
_____							Do not have to worry about being harmed by others
_____							Can avoid the possibility of personal injury
_____							Can avoid riding with or talking to strangers
_____							Can ride with people you know/like
_____							Can decide who rides with you
_____							Can ride with people who are like yourself
_____							Can ride in an uncrowded vehicle
_____							Can have your own private section in the vehicle
_____							Can have some time to yourself
_____							Can be by yourself
_____							Can have a feeling of privacy
_____							Helps reduce air pollution
_____							Helps reduce traffic congestion
_____							Helps to save fuel
_____							Helps to save energy

Transportation Questionnaire Part IV

Directions: For the following questions, please pick the most appropriate response.

1. *What mode of transportation do you use most frequently to get to and from work or school? (Mark all that apply)*

- | | | |
|----------------------------------------------|----------------------------------|--------------------------------------|
| <input type="checkbox"/> Personal Automobile | <input type="checkbox"/> Taxi | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Bus | <input type="checkbox"/> Walk | |
| <input type="checkbox"/> Train | <input type="checkbox"/> Bicycle | |

2. *Have you ever used public transportation for any reason?*

- Yes No

3. *In a typical month, how often do you ride public transportation?*

- | | |
|----------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> 1-3 days per week |
| <input type="checkbox"/> Less than 1 day per month | <input type="checkbox"/> 3-5 days per week |
| <input type="checkbox"/> 1-4 days per month | <input type="checkbox"/> More than 5 days per week |

4. *Is public transportation readily available in the area where you live?*

- Yes No

5. *Do you live in the Chicago or the suburbs?*

- I live in Chicago
- I live in the suburbs of Chicago. What suburb do you live in? _____

6. *Are you able to drive an automobile?*

- Yes No

7. *Do you have a valid drivers' license?*

- Yes No

8. *Do you usually have an automobile available to drive more or less whenever you want it?*

- Yes No

9. *How many cars are available for members of your household to drive?*

- None
- One
- Two
- Three or more

Transportation Questionnaire Part V

Directions: The last half of this questionnaire pertains to your personal characteristics and your background. Please darken the box from the scale that indicates how much you agree or disagree with each statement.

	<i>Strongly Disagree</i>						
		<i>Disagree</i>					
			<i>Slightly Disagree</i>				
				<i>Neutral</i>			
					<i>Slightly Agree</i>		
						<i>Agree</i>	
							<i>Strongly Agree</i>
1. I prefer a job where I have a lot of control over what I do and when I do it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I enjoy political participation because I want to have as much of a say in running government as possible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I try to avoid situations where someone else tells me what to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I would prefer to be a leader rather than a follower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I enjoy being able to influence the actions of others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I am careful to check everything on an automobile before leaving for a long trip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Others usually know what is best for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I enjoy making my own decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I enjoy having control over my own destiny	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I'd prefer that someone else take over the leadership role when I'm involved in a group project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I consider myself to be generally more capable of handling situations than others are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I'd rather run my own business and make my own mistakes than listen to someone else's orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I like to get a good idea of what a job is all about before I begin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. When I see a problem, I prefer to do something about it rather than sit by and let it continue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. When it comes to orders, I would rather give them than receive them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I wish I could push many of life's daily decisions off on someone else	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. When driving, I try to avoid putting myself in a situation where I could be hurt by someone else's mistake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I prefer to avoid situations where someone else has to tell me what it is that I should be doing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. There are many situations in which I would prefer only one choice rather than having to make a decision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered by it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transportation Questionnaire Part VI

Strongly Disagree

Disagree

Slightly Disagree

Neutral

Slightly Agree

Agree

Strongly Agree

Directions: The following statements refer to your opinions about privacy. Please darken the box from the scale that indicates how much you agree or disagree with each statement.

- 1. It is important for me to be alone when I want to be
- 2. I really don't need much time to myself
- 3. I sometimes want to get away from everyone for a while, even my close friends
- 4. There are times when I really want other people to leave me alone and not intrude on my thought even though we are in the same room
- 5. I dislike being completely alone, either in a house or in the wilderness
- 6. It is important for me to have the freedom to choose when and to what extent I have to speak and interact with others
- 7. I don't like crowds very much
- 8. I avoid public situations where there is not much privacy
- 9. Having privacy is not very important to me
- 10. I prefer to have people around me most of the time
- 11. My need to be alone is not that great

Transportation Questionnaire Part VII

Directions: The following statements refer to opinions about the environment. Please darken the box from the scale that indicates how much you agree or disagree with each of these statements.

		<i>Strongly Disagree</i>		<i>Disagree</i>		<i>Slightly Disagree</i>		<i>Neutral</i>		<i>Slightly Agree</i>		<i>Agree</i>		<i>Strongly Agree</i>
1. There are actions I can take to help keep the air clean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. There is nothing I can do to prevent pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I'd be willing to make personal sacrifices to help stop pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The average person can have an influence on environmental air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I'd be willing to use public transportation to reduce air pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Reducing the amount of my driving will not do much to improve the quality of the air we breath	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I have tried to find out information on what I can do to help stop pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. People can change the world around them if they take a definite course of action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I have taken steps to prevent pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I feel responsible for environmental air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. What happens to our environment is a matter of fate or chance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I feel I can contribute to improved air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I'm really not willing to go out of my way to help stop pollution since that's the Government's job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. It is not too important to conserve the world's resources because the laws of nature say that there will always be enough for everyone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I am concerned about environmental conditions in the world today	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I try to recycle whenever I can	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I believe I must do my part to conserve the earth's resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I can help keep the air clean by driving my car less often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. People who are affected by pollution are just plain unlucky	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I am willing to make economic sacrifices for a better environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. The inconvenience of using public transportation where it is available is a small price to pay for cleaner air and the conservation of resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transportation Questionnaire Part VIII

Directions: The following statements refer to your opinions about safety. Please darken the box from the scale that indicates how much you agree or disagree with these statements.

	<i>Strongly Disagree</i>						
		<i>Disagree</i>					
			<i>Slightly Disagree</i>				
				<i>Neutral</i>			
					<i>Slightly Agree</i>		
						<i>Agree</i>	
							<i>Strongly Agree</i>
1. I feel in control of my personal safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. There is nothing I can do to prevent a crime from happening to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I can enhance my safety if I do not expose myself to dangerous circumstances or places	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. People who get "jumped" or attacked are just plain unlucky	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I can usually prevent crimes from happening to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Crime on the subway is inevitable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. If I take the subway enough, I am likely to have my wallet or purse stolen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I fear that I may get hurt if I am not careful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. There is nothing I can do to prevent myself from getting hurt or injured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. If I get hurt or injured it is because I have bad luck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Most crimes can be avoided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. There are so many dangerous people in this world that I never know how or when I might be a victim of crime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. For me, avoiding crimes is a matter of luck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Most people would probably <i>not</i> benefit from safety training and crime prevention techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I can avoid getting injured if I am careful and aware of potential dangers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. With my luck, I will probably be a victim of crime in the near future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I can do very little to avoid crimes from happening to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Some situations are so dangerous that there is no way to avoid crimes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I can avoid crimes by taking proper safety precautions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Crime victims are true victims of circumstance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transportation Questionnaire Part IX

Directions: For the following questions, please pick the most appropriate response.

10. What is the highest level of education you have completed?

- Less than high school graduate
- High school graduate
- Some college
- Trade/technical/vocational training
- College graduate
- Some post-graduate work
- Advanced degree (Masters, Doctorate)

11. What is your age?

- Under 18
- 18-21
- 22-29
- 30-39
- 40-49
- 50-59
- Over 60

12. What is your gender?

- Male Female

13. What is your annual household income?

- | | |
|---------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> less than \$20,000 | <input type="checkbox"/> \$60,000-\$69,999 |
| <input type="checkbox"/> \$20,000-\$29,999 | <input type="checkbox"/> \$70,000- \$79,999 |
| <input type="checkbox"/> \$30,000-\$39,999 | <input type="checkbox"/> \$80,000- \$89,999 |
| <input type="checkbox"/> \$40,000-\$49,999 | <input type="checkbox"/> \$90,000- \$99,999 |
| <input type="checkbox"/> \$50,000-\$59,999 | <input type="checkbox"/> \$100,00 or more |

Thank you very much for your time and cooperation!

APPENDIX B
SCALE DESCRIPTIONS AND STATISTICS

APPENDIX B

Scale Descriptions and Statistics

Personality Measures						
Scale Name	Description	Abbreviation	Mean	MD	Min	Max
Desire for Control	Measures desire/need for control. Prevalidated.	CONTROL	5.23	5.25	3.45	6.75
Need for Privacy Control	Measures need for solitude, a dimension of privacy.	PRIVACY	4.69	4.64	1.00	6.73
Safety Locus of Control	Measures extent to which individuals attribute personal safety to internal or external factors.	SAFETY	4.95	4.89	2.58	6.89
Environmental Locus of Control	Measures extent to which individuals attribute environmental conditions to internal or external factors.	ENVIRNMT	5.14	5.14	2.33	2.00

APPENDIX B (continued)

Attitude Measures						
Scale Name	Description	Abbreviation	Mean	MD	Min	Max
General Transportation Attitudes	Measures general feelings about driving and using public transportation.	TRANSATT	4.44	4.43	-1.69	11.08
Specific Attitudes Towards Public Transportation	Contains the performance ratings for public transportation attributes weighted by the corresponding importance rating and summed over all transportation attributes	PTATT	1.05	1.04	-10.15	10.88
Specific Attitudes Towards the Automobile	Contains the performance ratings for the automobile attributes weighted by the corresponding importance rating and summed over all transportation attributes	AUTOATT	4.68	4.46	-1.69	11.08

APPENDIX B (continued)

Importance Rating Measures						
Scale Name	Description	Abbreviation	Mean	MD	Min	Max
Importance of Control-Related Transportation Attributes	Contains the importance ratings of the control-related transportation attributes	IMPCNTL	3.30	3.43	1.57	4.00
Importance of Privacy-Related Transportation Attributes	Contains the importance ratings of the privacy-related transportation attributes	IMPPRIV	1.88	1.78	.00	4.00
Importance of Safety-Related Transportation Attributes	Contains the importance ratings of the safety-related transportation attributes	IMPSFTY	3.66	4.00	1.50	4.00
Importance of Environment-Related Transportation Attributes	Contains the importance ratings of the environment-related transportation attributes	IMPENV	3.04	3.00	.00	4.00

APPENDIX B (continued)

Performance Rating Measures for Public Transportation						
Scale Name	Description	Abbreviation	Mean	MD	Min	Max
Performance on Control-Related Transportation Attributes	Contains the performance ratings for public transportation on the control-related transportation attributes	RTPTCNTL	.11	.14	-3.00	3.00
Performance on Privacy-Related Transportation Attributes	Contains the performance ratings for public transportation on the privacy-related transportation attributes	RTPTPRIV	-1.24	-1.44	-3.00	2.44
Performance on Safety-Related Transportation Attributes	Contains the performance ratings for public transportation on the safety-related transportation attributes	RTPTSFTY	.85	.83	-3.00	3.00
Performance on Environment-Related Transportation Attributes	Contains the performance ratings for public transportation on the environment-related transportation attributes	RTPTENV	1.91	2.00	-3.00	3.00

APPENDIX B

Performance Rating Measures for Automobiles						
Scale Name	Description	Abbreviation	Mean	MD	Min	Max
Performance on Control-Related Transportation Attributes	Contains the performance ratings for automobiles on the control-related transportation attributes	RTACNTL	2.45	2.57	-1.00	3.00
Performance on Privacy-Related Transportation Attributes	Contains the performance ratings for automobiles on the privacy-related transportation attributes	RTAPRIV	2.41	2.67	-1.11	3.44
Performance on Safety-Related Transportation Attributes	Contains the performance ratings for automobiles on the safety-related transportation attributes	RTASFTY	1.75	1.83	-1.83	3.00
Performance on Environment-Related Transportation Attributes	Contains the performance ratings for automobiles on the environment-related transportation attributes	RTAENV	-1.30	-1.87	-3.00	3.00

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APPROVAL SHEET

The thesis submitted by Cynthia F. Britton has been read and approved by the following committee:

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts in Psychology.

April 7, 1997

Date

John D. Edwards

Director's Signature