

PERSONAL SPACE: INTERPERSONAL DISTANCES IN LATE ADULTHOOD
FOR CAUCASIANS RESIDING IN OKLAHOMA

By

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CHAPTER I

INTRODUCTION

Statement of the Problem

Individuals maintain a personal space that impacts human interaction in a variety of physical settings and social contexts. Originating in animal behavior, the concept of personal space has spread to a multitude of disciplines including biological, behavioral, and social sciences and an equally diverse range of variables have been examined to better understand this phenomena. The impact of the aging process on personal space is growing in importance; as baby boomers approach retirement, products and services for older populations increased in demand (Judy & D'Amico, 1997). A primary design component of the goods and services is personal space.

A number of empirical studies indicated that personal space changes during the early stages of human development. However, limited research has been conducted with persons during the middle and later adult years. Older adults experience physical, social and psychological changes which differentiate them from younger individuals (Erikson, 1980). This study examined personal space during the later adult years. Human factors, comprised of auditory and visual acuity and mobility, and status, comprised of occupational and socioeconomic prestige, were examined to determine their relationship to the personal space preferences of the elderly.

Purpose of the Study

The purpose of this study was to examine the relationship between older adults' human factors and status and preferred interpersonal distance. Specific objectives for this research project were to:

1. Define the personal space preferences of older Oklahoman Caucasian adults.
2. Determine whether older Oklahoman Caucasian adults personal space varied according to (a) age, (b) gender, (c) visual acuity, (d) hearing acuity, (e) mobility, (f) occupational prestige, (g) work status, and (h) socioeconomic class.

3. Discern proxemic zones for an aging population which would expand previously developed personal space parameters.

Limitations and Assumptions

This study involved a voluntary sample of Caucasian adults residing in Oklahoma over the age of 55 who participated in local professional, civic or church organizations or were contacted through activities organized by their living facility during the winter of 1999. Ethnicity or culture was specifically excluded from the study. Existing research does not indicate consistent findings for elderly populations; therefore, the baseline data in this study is Caucasian. Additional research is required in order to generalize to a more diverse population. Therefore, results may not be generalized to a larger population in other states, to other cultural or ethnic groups or to persons who do not participate in external activities and/or organizations.

The demographic and health information used in this study were gathered by a self-report. Therefore, the quality of the data were limited to the accuracy and honesty of the respondents. The experimental components of the study were dependent upon naive responses and it is assumed that the respondents were unacquainted with the specific hypotheses being tested and were unbiased in their responses.

Due to the cross-sectional research design, the data reflected the current personal space of individuals at a variety of ages at a single point in time compared to the developmental nature of a longitudinal study (Schaie, Campbell, Meredith, & Rawlings, 1988). This study does not represent actual developmental changes in personal space for older adults.

Such events or personal differences resulting from cognitive ability, mood, life experiences, or the physical differences resulting from the aging process, illness or medication may have influenced the respondents' answers. It can not be known for sure which, if any, exogenous variables may have affected the findings.

Assumptions included three areas. First, it was assumed that the participants responded truthfully and that they responded to the situations in a naive manner. Second, it was assumed that the use of a scale model accurately represented a full scale environment and helped to control for variation in responses resulting from the full scale setting. Finally, the respondents were assumed to be representative of older

Caucasian persons residing in Oklahoma with similar physical, social and psychological variations and life experiences.

Definition of Terms

Terms for this study were defined in order to clarify their meaning. Definitions were derived from personal space research to maintain consistency in this research effort.

1. Affiliation - the type of relationship shared between individuals and defined as relative, intimate, friend, acquaintance, or stranger (Argyle & Dean, 1965; Hall, 1976).
2. Compensatory Behavior - behaviors resulting from preceding action by another individual (i.e. moving closer to or further away from someone due to stimulus).
3. Contact Culture or Subculture - cultures more involved with one another on a sensory level (Hall, 1959) such as standing close together, exhibiting more touching behaviors, more direct body orientations and direct eye contact (Aiello & Jones, 1971; Albas & Albas, 1989)
4. Dominance Hierarchies - the rank order of animals from the most dominant to the most subordinate; these hierarchies control access to resources such as food, water and mates as well as the size and location of territory (Drickamer & Vessey, 1992).
5. Dyad - a pair of interacting persons of the same or different genders.
6. Elderly or Old - older populations have been defined as young-old (60 - 74 years) and old-old (75+ years) (Neugarten, 1976). Chronological age typically has little meaning due to the great diversity with in the 25.5 million older persons in the US (Myers, 1990). For this project, a person was considered to be elderly if 60 years or older.
7. Employment status – the current state of employment (working full or part time or unemployed generally interpreted as wanting to work but unable to find a job).
8. Ethology (Ethological) - the biology of behavior and exploration of functional and evolutionary questions as well as the mechanisms of animal behavior (Drickamer & Vessey, 1992).
9. Gene Pool - the complete set of genes of a particular species (Drickamer & Vessey, 1992).
10. Latency Time - the elapse of time between the introduction of a novel stimulus and the organism's response (De Long, Greenberg, & Keaney, 1986).

11. Noncontact Culture or Subculture - cultures which are less involved with one another on a sensory level (Hall, 1959); behaviors may include greater interpersonal distances, less direct body orientation, less eye contact and lower voice volume (Albas & Albas, 1989)
12. Orientation - the orientation of the subjects bodies to each other in which each person rotates 180 degrees from back-to-back to face-to-face in ten stages (Hall, 1976).
13. Personal Distance - the spacing humans typically maintain between themselves and others (Hall, 1966).
14. Personal Space - the invisible bubble of space which one carries with him or herself and which regulates social interaction with others (Sommer, 1969)
15. Proxemics - "man's use of space" as an outcome of culture (Hall, 1969); the interactional patterns of space used by humans (Holmes, Karst, & Erhart, 1990)
16. Occupational prestige -- the societal value associated with a particular type of work (Ganzeboom & Treimann, 1996). This was measured using the Standard International Occupational Prestige Scale (SIOPS) and indicated the amount of prestige based on popular evaluation.
17. Sociobiology (Sociobiological) - the application of evolutionary biology to the study of social behavior in animals (Drickamer & Vessey, 1993).
18. Socioeconomic status -- the status associated with the ownership of goods, property or money.. This was measured by current annual income and with the International Socio-Economic Index of Occupational Status (ISEI) which is a combination of income and educational level for a particular career (Ganzeboom & Treiman, 1996).
19. Subculture -- a group which maintains a distinct culture from the larger population (Albas & Albas, 1989). For example, Asian Americans are part of the larger culture in North America but maintain a separate culture beyond that of North Americans.

CHAPTER II

THEORETICAL FRAMEWORKS AND SUPPORTING EMPIRICAL RESEARCH

A variety of theories have been used to structure personal space investigations and they range from animal behavior to current interpretations of human status and culture. This chapter includes summaries and models of the more notable theories and the related empirical studies. Variables examined in personal space studies have been summarized and a model illustrating the relationships between the individual characteristics and personal space behavior was developed to test the hypotheses of this project.

Theories and Frameworks

Theories and models used to structure personal space research have been gathered from a wide range of disciplines. Each theory is introduced, empirical research based on each theory is presented and the apparent strengths and weaknesses of the theory are discussed.

Ethological and sociobiological theory. This theory is the foundation for most of the animal behavior research. Animal behaviorists such as Tinbergen (1951) and Lorenz (1952) described unique spacing patterns which occurred in many species; these observations often serve as the metaphorical foundation of human behavior. This model emphasizes genetically determined behaviors refined through the natural selection process. Behaviors are triggered by innate mechanisms which vary only in that the genetic composition of the species varies (Figure 1). Two subtheories include the concept of spatial ownership established through status or as a permeable boundary encompassing the animal and which moves where the animal moves. This theory typically is carried one step further and states that societal parameters are defined by the biological foundations of the species and therefore all behaviors are genetically predetermined.

Several studies have examined the roles of density, dominance, competition, affiliation and intrusion in personal space research and utilized the sociobiological theory. Harris, Luginbuhl and Fishbein (1978) investigated the impact of density on responses to invasion of personal space. The data indicate that low density conditions result in males being more likely to react when their space was invaded by another

male and that gender differences in responses were found in low density conditions. Mahoney (1974) investigated compensatory behaviors in invasion and non-invasion contexts and found that as distance between persons decreased, leaning and blocking behaviors increased. Greater distances resulted in reduced or no apparent response and gender did influence the type and frequency of responses.

Patterson and Sechrest (1970) found that ratings of dominance and aggression increased as interpersonal distance decreased in test settings. Conversely, ratings of friendliness and extroversion

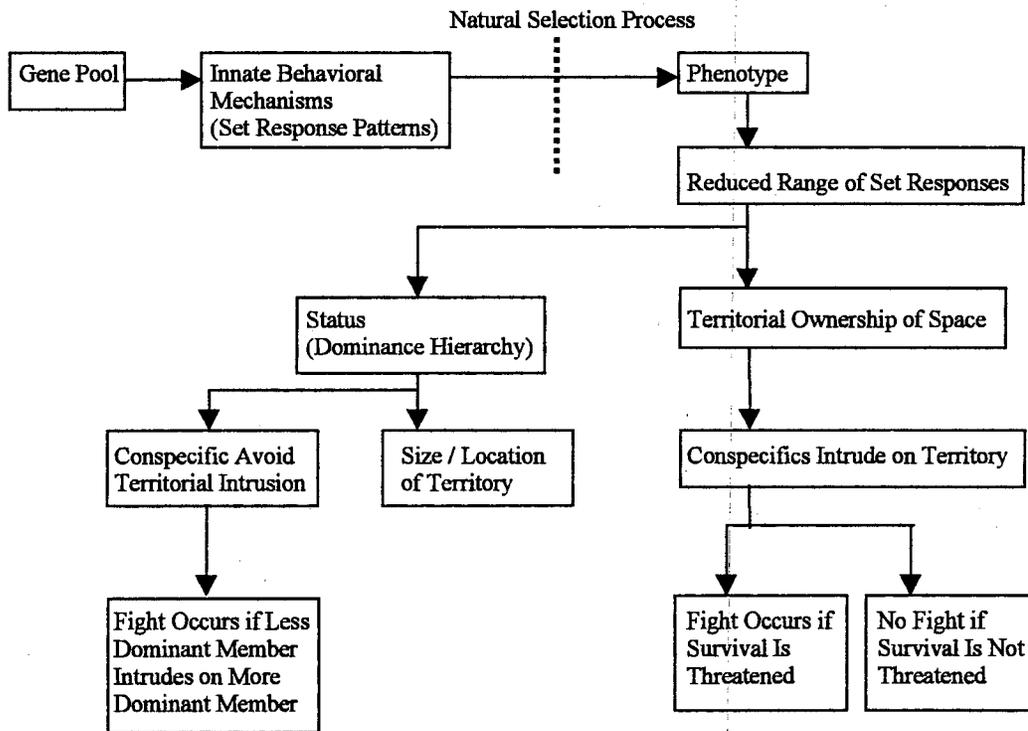


Figure 1. Ethological/Sociobiological Model

decreased as interpersonal space increased. Cheyan and Efran (1972) found that non-interacting dyads were significantly more likely to be invaded by passersby than interacting dyads. Female-female and female-male dyads were more likely to be invaded than male-male dyads, perhaps a result of a recognized gender hierarchy.

Tedesco and Fromme (1974) examined the relationship between cooperation or competitiveness and the establishment of interpersonal distance. The researchers suggested that the social hierarchy is the

evolutionary product of spatial ownership hierarchies. The research findings indicated that persons involved in a collaborative problem solving scenario will maintain smaller interpersonal distances than persons involved in a competitive scenario. Animal behaviorists would compare this scenario to the competition for resources in the natural environment.

Nesbitt and Steven (1974) investigated the effect of stimulus intensity on interpersonal distance. Findings indicate that the persons maintained a greater distance from a man or woman dressed in brightly colored clothing with strong perfume/cologne than a man or woman dressed in neutral colored clothing with no perfume/cologne. Attention, enhanced through sensory stimulus, is a primary defense mechanism (Drickamer & Vessey, 1992).

A number of studies have been conducted which examine the affiliation relationship (close friends, acquaintances, strangers) which may be appropriately categorized under this theoretical framework. Cook (1970) found that as the level of acquaintanceship increased, seating distance decreased and these differences occurred across gender pairings. Four African subcultures were examined for interpersonal spacing differences in Edwards' (1973) experiment. Friends were placed at closer distances than acquaintances in all subcultures. Gender of the dyads resulted in significant differences in orientation for some subcultures. Heshka and Nelson (1972) found that strangers generally stand farther apart than friends or acquaintances although males maintained approximately the same distance regardless of relationship.

The theory has been criticized on several issues. A primary weakness has been described as the operationalization of flight and fight behaviors (Gillespie & Leffler, 1983). These behaviors have been described, according to the authors, as anything ranging from eye movement to the erection of barriers. Operationalization was further critiqued due to the fact that humans do not react in a consistent manner in identical conditions; the sociobiological theory allows for variation in response due only to genetic variation. Other authors (Patterson & Sechrest, 1970; Scherer, 1974) critiqued the theory on the basis of single faceted analysis and the absence of context or social structure.

The theory does have some strengths, however. The other person's behavior is included in the overall evaluation; certainly, the spatial boundary is established and maintained in a dynamic process and not by a single individual. Further, animal behaviorists would support the premise that human survival is

the product of a natural selection process and genetically encoded behaviors have proven to be very effective.

Enculturation theory. Edward Hall, considered by many to be the father of proxemic research, established culture as the primary means by which personal spacing is learned (1968). This theory purports that information about another person, the physical environment and the context is interpreted based on the individual's social or cultural norms. If the norms are shared, an appropriate distance is established and maintained but if the norms are different, interpersonal distance remains in flux and conflict and discomfort is experienced by each person (Figure 2). Hall's (1966) own work relies heavily on sociobiological theory and his explanations rely on the cultural interpretation of physical information in the conceptualization of personal space.

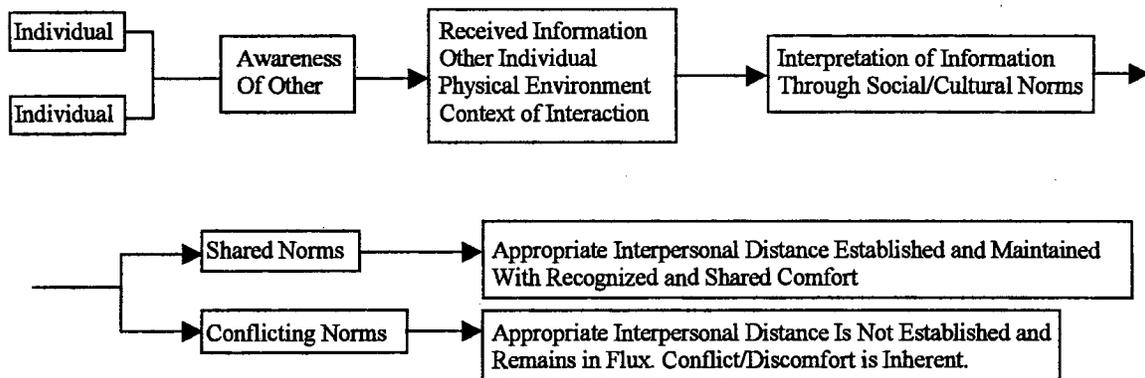


Figure 2. Enculturation Model

A variety of studies that examined personal space variation explained by this model include race, contact/noncontact, subcultures, and location of subculture. Existing research based on the enculturation theory includes the study by Aiello and Jones (1971) that examined the subcultural differences between white, black, and Puerto Rican children's interpersonal spacing. Findings indicate the existence of differences; white children stand further apart than black or Puerto Rican children. Potentially confounding variables in this study include socioeconomic class and gender. The enculturation framework was used to develop the research hypotheses while the confounding variables interpreted by the researchers are better addressed in the situational resource theory (Gillespie & Leffler, 1983). Jones (1971) examined

interpersonal distance in six, overpopulated, lower-income neighborhoods in New York City; the subcultures selected for the study maintained well defined community boundaries and included black, Puerto Rican, Italian, and Chinese ethnic groups. Results indicated no support for interpersonal distances on the basis of cultural identity yet gender differences did become apparent. Women stand closer together than men and the findings appear to be generalizable across cultures.

Albas and Albas (1989) investigated the proxemic behaviors of contact and noncontact subcultures in Canada; the enculturation model was used in defining the research populations. The findings supported the model in overall interaction patterns yet the authors suggest that proxemic interaction must allow for the development of reciprocity, a component missing from Hall's framework. Remland, Jones and Brinkman (1991) explored the relationship between contact and noncontact cultures; findings only partially supported Hall's theory. French dyads maintained smaller distances and more direct orientations only when seated; Dutch dyads maintained the greatest interpersonal distance followed by the French and then the English.

In studies examining the role of race, Ruback and Snow (1993) examined the relationship between culture and latency time to flight when intruded upon at a water fountain. Findings show that different-race intruders waited longer before intruding than did same-race intruders. Bauer (1973) explored the establishment of interpersonal distance between black and white cultures. Black females and males approached a same sex, same race experimenter more closely than white females and males. Black males, black females, white males and white females maintained increasingly smaller distances. Baxter (1970) examined interpersonal spacing as determined by ethnic identity, age, gender, and setting; findings indicate that Mexicans, whites and blacks maintain increasingly greater distances. Gender compositions of dyads also resulted in significant differences: male-female, female-female and male-male dyads maintained increasingly greater distances.

This model was critiqued by several authors. Gillespie and Leffler (1983) stated that the model's greatest weakness was in the ambiguous definition and description of culture and subculture. Watson (1970) was cited by Gillespie and Leffler as proof of the ambiguity and he himself stated the economic and geographic parameters of his research populations were arbitrary. Hansen (1976) reviewed Hall's Handbook on Proxemic Research (1976) and critiqued the methodology because of Hall's apparent

inability to define cultural parameters and the contextual interpretations which define spatial behavior. Spradley (1980), Berg (1995) and other ethnographic researchers have detailed the necessarily extended periods of time required to provide accurate behavioral interpretations by outsiders. The research cited above did not indicate the level of cultural familiarity. A primary strength of this model, however, was in the recognition that interpersonal distance is established and maintained by two individuals in a dynamic process. Further, the theory accounted for the intake and interpretation of physical information about the other individual as well as the physical environment.

Internal states theory. The two previous theories examined personal spacing as a group or population characteristic. The internal states theory focuses on the individual's characteristics such as introvert/extrovert, self-concept, or other specific personality measures. The individual's mood, however, overrides these specific characteristics at a specific point in time. The model combined some elements of the sociobiological theory (traits or characteristics may be genetically predetermined) as well as elements from the enculturation model (for example, cultural development of self-concept). Figure 3 illustrates the influence of individual characteristics influenced by mood which then results in an established distance.

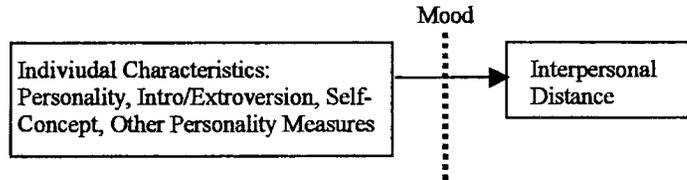


Figure 3. Internal States Model

Existing research includes Mehrabian's study (1968) of the relationship between gender and personal liking of an addressee to level of eye contact, distance, orientation, and relaxation. Distance and the level of relaxation significantly effected the liking of the addressee. Dosey and Meisels (1969) investigated the relationships between stress, personality factors, and personal space. Mehrabian and Diamond (1971) conducted a study on the relationship between sensitivity to rejection, tendency for affiliation, and distance to length of conversation. Findings indicated that increased sensitivity and conversational distance interacted to impact the length of conversation. Buller (1987) examined seating

distance, level of apprehension, initiator attractiveness, and gender on compliance using Burgoon's violations of nonverbal expectations model. Apprehensive subjects were more likely to comply when the initiator sat at a close distance compared to non-apprehensive subjects. Stratton, Tekippe, and Flick (1973) discovered that students with a high self confidence approached a male student more closely than students with low or medium self confidence.

Again, there was criticism for this particular theory. One area of concern was the confounding of internal states with relationship or status (Gillespie & Leffler, 1983). Further, mood is difficult to determine exclusive of the interaction context. The model also indicates that spatial distance is established and maintained by a single individual instead of the dynamic process which exists in daily living.

Situational resource theory. This theory attributes proxemic behaviors to social relationships within and between groups. An individual maintains memberships in more than one group (socioeconomic class, occupational rank, age, gender, culture or subculture) and each of these memberships interact with each other when the individual establishes interpersonal distance with another individual. This theory relied heavily on the social or cultural interpretation of status, an element in the sociobiological model as well as the enculturation model. This theory does incorporate the contextual aspect of the interaction as well as the dynamic process inherent between two individuals (Figure 4).

Studies falling under this theoretical framework could include those examining age, gender, culture/race, or status. Kenner and Katsimaglis's (1993) examined of the impact of gender on taxi seat choice. Findings indicate that gender strongly impacts seating choice; males select seats in closer proximity to the driver than women. The situational resource model offered the best framework for this study as a result of the significant effect of status and role.

Dean, Willis and Hewitt (1975) investigated the relationship between initial interaction distance and military rank. When a subordinate initiated conversation with a superior, the distance increased as the distance in rank increased; when a superior initiates conversation with a subordinate, no distancing pattern was apparent. Subjects were also found to maintain smaller distances between themselves in same-sex dyads than to a high status experimenter (Smith, 1980). Barash (1973) discovered that faculty attire (high status) prompted more frequent and more rapid departures than did student attire (low status) in a spatial invasion experiment on a college campus.

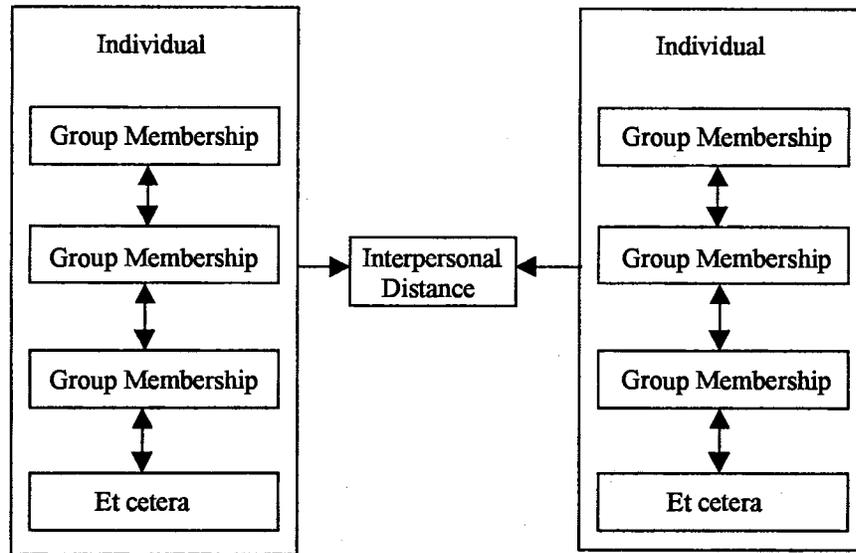


Figure 4. Situational Resource Model

A potential weakness of this theory was the interpretation of status cues; upon initial interaction, many indicators for socioeconomic, occupational and cultural status are not easily discernable and therefore may not be realistic factors for determining interpersonal distance. For example, Dabbs and Stokes (1975) found that neatness of attire significantly impacted approach distance; neatness may be considered a characteristic of a lower socioeconomic status, age or other characteristic and this interpretation can be very subjective upon initial visual evaluation.

Symbolic interaction theory. This theory used as its foundation many principles of communication theory. Human beings are capable of creating meaningful symbols and transmitting those symbols to others (Goffman, 1956). Further, humans are also capable of perceiving and interpreting the symbols created by others. This sequence requires that the individuals involved in the communication process be involved in reciprocal behaviors that share meaning interpreted in the context of the interaction (Hansen, 1976).

Gillespie and Leffler (1983) support this theory as having a strong foundation in group behavior and leadership studies. Examples of interpersonal distance, group behavior and leadership include Batchelor and Goethals (1972) study on individuals involved in group decision making.

Existing research included Albas's (1991) exploration of the relationship between the maintained interpersonal distance when the experimenter remained in a fixed position or retreated. In examining the respondents' reactions, smaller distances were maintained in the fixed condition compared to the retreating condition. Subjects reported feeling the interviewer was uncomfortable when retreating so they allowed a larger distance to be established. Albas suggested the symbolic interaction theory as an appropriate framework from which to conduct proxemic research.

Supporting Empirical Research

Hundreds of studies examining the role of personal space in human behavior have been conducted (Evans & Howard, 1973; Hayduk, 1983). The majority of the studies were completed in the late 1960s and 1970's. During the 1980's and 1990's there has been a decrease in the number of studies completed; however, those that have been undertaken typically focus on new permutations of human behavior. These include studies examining cultural variation, physical setting and even weightlessness (Summit, Westfall, Sommer & Harrison, 1992). These studies have employed interpersonal distance as both a dependent variable as well as an independent variable. The following summaries are arranged by variable and include affiliation, age, anxiety/dominance, culture, gender, mobility, personality, physical setting, sensation and status. These were selected due to the potential to the aging person. Appendix J offers another summary of personal space studies including dependent variables, theoretical framework, measurement technique and summary of findings.

Affiliation. The relationship between individuals has a consistent impact on interpersonal distance (Edwards, 1973). In general, the findings indicated that as the level of intimacy increases, interpersonal distance decreases (Heshka & Nelson, 1972). Findings varied as a result of gender; male dyads frequently do not fit the inverse relationship previously described.

Age. Hayduk (1983) completed an extensive survey of interpersonal distance studies which examined age. In more than 20 studies, reported findings on the whole indicated that between the ages of 2 and 20 personal space gradually increases. Some of the studies suggest intrusion was tolerated better when the intruder was of similar age (Mishara, Brawley, Cheevers, Kitover, Knowles, Rautila, & Sukajian, 1974; Willis, 1966; and Latta, 1978). Dolphin (1988) compared the findings of six studies mentioned previously and noted that the positive relationship between age and interpersonal distance is constant in all studies.

Remland, Jones and Brinkman (1991) did not find significant differences in the distances in naturally occurring adult dyads in several European countries.

A number of studies have examined the interaction of age and gender for three-year old children and young adults in the second year of college. Baxter (1970) examined the relationship between interpersonal distance and subculture, age, gender, and setting. The data indicated significant subculture differences as well as age differences; children, adolescents and adults maintained increasingly greater distances and the amount of the variation due to age was approximately 10%. Pagan and Aiello (1982) examined the distancing patterns of children in the first, sixth and eleventh grade in New York and Puerto Rico. Findings indicated that interpersonal distance increased as the children grew older although these differences occurred later for the Puerto Rican children compared to American and northern European cultures.

Lerner, Karabenick and Meisels (1975) examined the personal space of school age children as a function of age, sex and body type. The findings indicated that as the children grew older, the mean interpersonal distance increased and they tended to maintain larger distances with the opposite sex. The study was replicated with Japanese children and similar results were found (Lerner, Iwawaki and Chihara, 1976).

Lomranz, Shapira, Choresh and Gilat (1975) investigated the interpersonal distance of children; 3-year-old children maintained a significantly smaller distance from their age peers than did 5- and 7-year-olds. Examining the personal space scores for children in grades one through six, Pedersen (1973a) found that males maintained a greater distance than females and this remained true for all grades although the distance decreased as age increased. In an examination of interpersonal distance for students between the first grade and the second year of college, established distances for males and females were approximately the same during the first grade but distances for males increased sharply between the first and fifth grade (Tennis & Dabbs, 1975). Distances for males remained higher than females and distances for both increased gradually until grade twelve. Children in the third through the tenth grade preferred increasingly smaller interpersonal distances (Meisels & Guardo, 1969). At a young age, children placed themselves closer to same-sex peers but closer to opposite-sex peers as they grew older.

Fry and Willis (1971) explored the relationship between adult responses when personal space was invaded by 5, 8, and 10-year-olds. 5-year-olds elicited positive friendly responses, 8-year-olds elicited neutral responses, and 10-year-olds elicited defensive or blocking responses. Significant gender interactions were also found yet the age effect was stronger. In a similar experiment, Dean, Willis and La Rocco (1976) found that 5-year-olds received facilitative behaviors and 8-year-olds received no responses; 10-year-olds elicited avoidance or aggressive behaviors or prompted more frequent activity such as weight shifting.

Some researchers examined the interpersonal distances of the elderly although the findings in general are not conclusive. Aiello, Headley and Thompson (1978) found that elderly persons were more tolerant of crowded conditions than were younger persons. Heshka and Nelson (1972) found that personal space varied throughout the lifespan; dyads in a natural setting were observed and findings indicate that younger and older dyads stand significantly closer together compared to middle aged dyads (mean age equaled 40). The authors theorized that it is the shift in dependency throughout the lifespan which results in the curvilinear shape of the data. Leibman (1970) discovered that younger and older women occupying a spacious bench resulted in similar distances for 17 to 59-year-olds. However, if intrusion was necessary, older women maintained smaller distances compared to younger females. Winograd (1981) compared young white females (19 - 24) to older white females (63 - 85) and older black females (53 - 86). Findings indicate that the young women maintained smaller distances than the elderly white women but greater distances than the elderly black women.

Several studies examining the elderly in institutions have been completed. De Long (1980) found that elderly preferred smaller distances in a hospital setting and that one should consider the context of interaction may differ for the two people interaction with one another. In an examination of cognitively intact females, Kruckas (1986) found that those residing in a nursing home had a significantly smaller interpersonal distance compared to a similar group living independently. Hayduk and Mainprize (1980) examined the personal space of institutionalized and uninstitutionalized blind persons with sighted persons. The personal space of the institutionalized blind, mean age of 63, did not differ significantly from the sighted group, mean age of 45, and uninstitutionalized blind, mean age of 51. Geden & Begeman (1981) examined the personal distance of adults in a hospital setting using a doll placement technique. The researchers found that while role (nurse, doctor, family, or stranger) and setting (home or hospital) had

significant effects in interpersonal distance, age did not have a significant effect on personal space preferences.

In general, the studies show that interpersonal distance increases as age increases for children although the findings were confounded by gender and the gender composition of the dyad. Studies which examined the personal space of the elderly indicated that as age increased, interpersonal distance tended to decrease, especially in institutional settings.

Anxiety/dominance. Feelings of vulnerability as a result of perceived aggression or dominance may trigger a need for protection. Bailey, Caffrey, and Hartnett (1976) investigated the impact of perceived aggression, physical strength and body type (muscularity) on personal space. Ratings on these qualities were not significantly correlated with personal space measures. Patterson and Sechrest (1970) found that ratings of dominance and aggression decreased as interpersonal distance increased. In a related study, Burgoon (1991) found that open posture conveyed feelings of intimacy, composure, informality and less dominance.

Anxiety or stress also result in the individual feeling vulnerable. Brady & Walker (1978) researched anxiety states and found a positive relationship between anxiety level and interpersonal distance. Dosey and Meisels (1969) studied the effects of stress conditions on personal space and found that in two of the three experiments subjects established greater distances in high stress conditions compared to low stress conditions. Examining the individual's own feelings of aggression and hostility, Greenberg, Aronow and Rauchway (1977) found significant, positive correlations between interpersonal distance and anxiety/hostility scores on the Rorschach barrier scale.

Not only can perceived aggression or feelings of anxiety result in greater personal space but perceptions of physical dominance can also influence the need for space. Caplan & Goldman (1981) observed the intrusion patterns of subjects on short and tall confederates; findings indicate that both males and females invaded the space of short confederates more frequently than tall confederates. Harnett, Bailey and Hartley (1974) found that male and female subjects approached a short object more closely than a tall object. Gender did interact with the established differences; females approached seated objects more closely than males and males approached standing objects more closely than females. Phillips (1979) investigated the relationships between perceived body size and personal space in the elderly. Results

indicate that elderly persons who maintain a small personal space have a larger perception of large body size compared to those who maintain a large personal space. Sanders (1976) found a positive correlation between body boundary (feelings of protectiveness) and interpersonal distance. These studies indicate that the size of the other individual influences space as well as your perception of your own size may result in the establishment of different spatial relationships.

These studies indicate that mental anxiety, stress or feelings of physical domination result in larger interpersonal distances. Gender plays an important role both in the individual's own response and the person eliciting the response.

Culture. Many studies have resulted from Hall's description of contact and non-contact cultures (Aiello & Jones, 1971; Albas & Albas, 1989; Baxter, 1970; Jones, 1971). Support has been found for smaller distances maintained in contact cultures compared to non-contact cultures and other studies have found no significant differences. Findings may be confounded by gender, status, or other variables.

Aiello and Jones (1971) examined the subcultural differences between white, black, and Puerto Rican children's interpersonal spacing. Findings indicate the existence of differences; white children stand further apart than black or Puerto Rican children. Potentially confounding variables in this study include socioeconomic class and gender. Albas and Albas (1989) investigated the proxemic behaviors of contact and noncontact subcultures in Canada. The findings suggested that proxemic interaction must allow for the development of reciprocity, a component missing from Hall's framework. Remland, Jones and Brinkman (1991) explored the relationship between contact and noncontact cultures in three European countries. French dyads maintained smaller distances and more direct orientations only when seated; Dutch dyads maintained the greatest interpersonal distance followed by the French and then the English. Jones (1971) examined interpersonal distance in overpopulated, lower-income neighborhoods in New York City; the subcultures selected for the study maintained well defined community boundaries and included black, Puerto Rican, Italian, and Chinese ethnic groups. Results indicated no support for interpersonal distances on the basis of cultural identity yet gender differences did become apparent.

Ruback and Snow (1993) examined the relationship between culture and latency time to flight when intruded upon at a water fountain. Findings show that different-race intruders waited longer before intruding than did same-race intruders. Bauer (1973) explored the establishment of interpersonal distance

between black and white cultures. Black females and males approached a same sex, same race experimenter more closely than white females and males. Black and white males maintained a greater distance than black and white females, respectively. Baxter (1970) examined interpersonal spacing as determined by ethnic identity, age, gender, and setting; findings indicate that Mexicans, whites and blacks maintain increasingly greater distances. Further, as age increased (children, adolescents, and adults) the interpersonal distance increased across ethnic group, gender and setting. Gender compositions of dyads also resulted in significant differences: male-female, female-female and male-male dyads maintained increasingly greater distances.

In general, results indicate that cultural patterns of interpersonal distance do exist. Findings may be confounded by gender and context of interaction.

Gender. A number of studies have examined interpersonal distance and gender. This may be because gender interacts with many of the other variables of interest. Status and gender are tightly interwoven through the concepts of labor and contemporary concepts of value and productivity. Additionally, sex is a factor in most of the studies investigating physical characteristics. Women are generally perceived as being less physically threatening and therefore ratings of aggression and strength may be significantly different. The socialization process for men and women are also very different and impacts many of the attitudes of older generations.

Alder and Iverson (1974) examined interpersonal distance as a function of sex of partner in an experiment and the results indicated that differences were more reliable in same-sex pairs compared to male-female pairs. They also discovered that male-male dyads were more variable and tended to be more distant compared to female-female dyads. In an examination of praise and status, Adler and Iverson (1975) discovered that males established a greater distance in false praise situations compared to females. A study of small group interaction revealed that women sat closer to one another during a discussion session (Giesen & McClaren, 1976). The study also revealed that subjects sat closer to a female moderator compared to a male moderator.

In an intrusion study, Harris, Luginbuhl and Fishbein (1978) found that men more frequently responded to spatial intrusion in low density settings than in high density settings. Males also exhibited more frequent delayed flight behaviors in low density situations compared to females.

Aiello and Jones (1971) examined established distances in children of three subcultural groups. Results indicated that no gender differences existed for the Puerto Rican and black groups but that white females established significantly greater distances than white males.

In a comparison of race and gender, Bauer (1973) found that white males, white females, black males and black females used increasingly less space in approaching a confederate of the same sex and race. Ahmed (1979) discovered that in an invasive situation, women depart significantly more quickly than men and that they left more quickly when the intruder was a male compared to a female intruder. In a cross-cultural study, Edwards' (1980) study indicated that in South Africa, black females placed a greater distance between themselves and males than any other gender combination.

Hartnett, Bailey and Hartley (1974) examined the approach distance differences between short and tall object persons for both males and females. Females approached both target people seated and standing more closely than males. Kenner and Katsimaglis (1993) found that women selected the taxi seat at the far opposite corner from the driver while males preferred to sit next to the driver in the front seat. Same-sex dyads had a shorter latency time in an intrusion experiment than did mixed-sex dyads (Krail & Leventhal, 1976).

Lerner, Iwawaki and Chihara (1976) investigated the personal space of Japanese children and found that both sexes maintained a larger distance from the opposite sex compared to a same-sex interaction. Lerner, Karabenick and Meisels (1975) examined the spacing patterns for children and found that greater space was used with females compared to males and that less space was required for same-sex pairs compared to opposite-sex pairs. Another study of children's personal space revealed that less distance was kept from girls than from boys by both genders (Lomranz, Shapira, Choresh & Gilat, 1975). Severy, Forsyth and Wagner (1979) found that male-female dyads of children required greater distance than did same-sex dyads in three separate measures. Examining same-sex and opposite-sex pairs, Meisels and Guardo (1969) found that same-sex pairs required less space than opposite-sex pairs until the sixth grade. After the sixth grade, the opposite relationship was discovered. Pedersen (1973) found that males maintained larger distances than females by the third grade and remained so throughout elementary school. Spatial requirements for opposite-sex pairs tended to be smaller than same-sex pairs. Investigating the

personal space of children between the first grade and college, Tennis and Dabbs (1975) found that interpersonal distance was greater for males than females.

The studies examining gender illustrate no clear interaction patterns. Female-female and male-male dyads have been shown to maintain smaller distances compared to male-female dyads but that the findings are confounded by age and affiliation. Other findings are confounded by culture and status. In general, most studies indicate that females maintain a smaller space than for males.

Mobility. The distance established by the fully mobile person from someone using an assistive device has been examined; the distance the person using the device has not been investigated. In studies examining the use of mobility devices, researchers have consistently examined the distance the fully mobile person established from the person using the assistive device; the alternate relationship is typically not examined. People in an airport maintained a greater distance from someone using a wheelchair asking for directions compared to someone not using a wheelchair (Worthington, 1974). On the other hand, Kilbury, Bordieri and Wong (1996) found that subjects allowed less space to persons using a wheelchair compared to those who did not use a wheelchair. The authors suggest that recent legislation has helped to decrease stigmatization of disabled persons. Holmes, Karst and Erhart (1990) suggest that persons with disabilities confront barriers to establishing appropriate social distances because of the disability. Stephens and Clark (1987) found that persons without disabilities do not approach those with disabilities as closely compared to those without disabilities. None of these studies provide an empirical foundation for the personal space of those using wheelchairs or other mobility devices.

Personality. Personality factors such as self concept and locus of control have also been the focus in personal space studies (Aiken, 1990; Dosey & Meisels, 1969; Patterson & Sechrest, 1970; Stratton, Tekippe & Flick, 1973). Many studies have used personality types that were based on the work initiated by Carl Jung and developed into a clinical instrument (referred to as the MBTI) by Myers (1962). Both Jung's theory (Hull, 1971) and Myers and Briggs' typology allows persons to be placed in one of sixteen categories. Of primary interest to personal space researchers has been the quality of intro- or extroversion; this quality refers to a turning-out or a turning-in of oneself in the world. A person falling on the portion of the scale indicating extroversion is recognized as "action oriented,....ease of communication; or sociability" (Hull, 1971). Conversely, someone exhibiting the qualities of an introvert is "thoughtful,....contemplative

detachment; and enjoyment of solitude and privacy” (Hull, 1971). Keirsey (1998) developed an additional instrument which parallels the previous work and allows individuals to be classified on an extroversion/introversion scale similar to that of the MBTI.

Bates (1987) found that although there was significant relationship between the MBTI continuous scores for extroversion-introversion, that only five percent of the variation in nursing students preferred personal space could be predicted from this score. Bates’ conclusions were that this component of personality was not a significant predictor on preferred personal space. Leipold and Williams (as cited by Pedersen, 1973b) conducted separate studies and found that introverted persons maintained larger distances between themselves and others. Comparably, extroversion was not related to the distance measurement (Bowers, 1978; Tolor, 1975). Gotta (1977) found that intelligence, intro/extroversion and neuroticism were not characteristics that significantly influenced personal space measurements. Significant relationships between extroversion, verbal intelligence and violent/non-violent behaviors among delinquents' personal space preferences were not found (Eastwood, 1985).

Patterson and Sechrest (1970) examined another facet of the extroversion measurement. In ratings of approaching persons, subjects rated confederates who established a smaller distance as more extroverted than one who established a large distance.

Locus of control has also been examined and the findings indicated subjects with low locus-of-control scores permitted a closer approach compared to those with high locus-of-control scores (Bowers 1978). Another study indicated high self concept students approached a male confederate more closely than low self concept students (Stratton, Tekippe and Flick, 1973).

These studies indicate no clear pattern on the role of introversion/extroversion in personal space behavior. However, the studies above used different instruments in establishing this quality so that it is difficult to compare results.

Physical setting. A number of variables within the physical setting have been manipulated to determine their impact on interpersonal distance. These factors include lighting and room size (Adams & Zuckerman, 1991), furniture arrangements (De Long, 1978; Smith, 1980), ceiling height (Cochran & Urbanczyk, 1982), indoors/outdoors (Baxter, 1970) and weightlessness (Summit, Westfall, Sommer & Harrison, 1992)

Sensation. Studies examining the role of the sensory perceptual system are limited in number and scope. Mallenby and Mallenby (1975) investigated the personal space of hard-of-hearing children in public schools and institutions for the deaf. Findings revealed that hard of hearing children maintain a greater distance from "normal" peers if they attend a special school compared to those who attend a public school. Hayduk and Mainprize (1980) explored the relationship between personal space and blindness. Significant differences were not found between those completely blind, partially blind or seeing.

Status. A variety of status variables have been examined in personal space research. Some of these variables (title, attire) are indicators of status while others (ethnicity, professional position, gender, business role, age) convey status to the individual.

In a study varying the status of a confederate (professional vs. clerk) and validity of praise, subjects established a significantly smaller distance from the confederate offering appropriate praise, especially if the person had low ascribed status (Adler & Iverson, 1974). Subjects exhibited greater consistency in distance if the confederate was described as high status regardless of the praise condition. Adler and Iverson (1975) replicated their previous study using a felt figure placement activity and found similar results for status and praise conditions.

Barash (1973) discovered that during a "spatial invasion" experiment, subjects used blocking techniques such as chair moving and barrier construction twice as frequently when he dressed in faculty attire compared to student attire. In a similar study examining attire and status, Bouska and Beatty (1978) found that dyads comprised of one person dressed as a business man or a priest were intruded upon significantly fewer times than dyads comprised of two students.

Dean, Willis and Hewitt (1975) discovered that interaction distances in a military setting varied as a function of rank. When the subordinate initiated conversation with a superior, there was a positive relationship between rank and distance; when a superior initiated a conversation there were no patterns in the interaction distances.

Henley (1973) investigated the touching behaviors of persons and categorized the observations on the basis of age, sex and socioeconomic status; older age / male / economic wealth were defined as having higher status. Findings indicated higher status individuals touched lower status individuals more frequently. Another examination of status relationships and touching behaviors indicated that younger legislators of

lower status initiated touching behavior more frequently than older, higher status peers (Goldstein & Jeffords, 1981).

Examining the relationship between room size, status and sex and interpersonal distance, findings indicate that status was not found to have a significant impact (White, 1975). Independently of sex; subjects sat closer to female with equal status than higher status while sitting closer to high status males compared to low status males. Investigating the interaction between sex and status, Wittig and Skolnick (1978) found that low status males maintained a considerably larger interpersonal distance when placing a chair for interaction than did low status females. Interaction analysis revealed that high status males maintained a lesser distance than low status males while high status females maintained a greater distance than low status females.

Kiotas (1990) replicated Duke and Nowicki's (1972) Comfortable Interpersonal Distance Scale with high and low status confederates. Findings indicated that subjects would allow low status persons to approach him/her more closely than a high status person.

In a study examining dominance and seating preference, Lott and Sommer (1967) found that subjects placed persons of a higher status at a greater distance around a table and at a different orientation compared to those of equal or lower status. Subjects were also asked to draw a dominance hierarchy of people on campus with respect to him or herself. A large number of women placed husbands or boyfriends above themselves in the diagram although men never placed wife or girlfriend above himself. In another study of group interaction, Giesen and McClaren's (1976) findings indicated greater distances between the moderator (high status) and other subjects (low status).

Marginal persons, defined as a cultural or ethnic minority, more frequently selected seats at the periphery of college classrooms than dominant or white, Anglo-Saxon Protestants (Haber, 1982). Additionally, the study found that the greater the marginality, the more likely a peripheral seat will be selected. In another classroom experiment, Leffler, Gillespie and Conaty (1982) found that for subjects playing the role of teacher, carrying a high status value, claimed more space with their bodies and intruded upon the student's space by touching and pointing. The study also indicated that males claimed more space and intruded more frequently than did females. For pairs of equal status or disparate status dyads of male employees, findings indicate that equal status pairs maintain a more direct (face-to-face) orientation

compared to dyads of unequal status (Jorgenson, 1975). The study indicated that although distance between the two types of dyads were not significantly different. although low status pairs maintained a significantly closer distance and a more intimate orientation compared to disparate or high status pairs.

Methods of Data Collection.

A variety of data collection methods have been employed to examine variation in interpersonal space. These methods include experimental as well as naturalistic designs. Evans and Howard (1973) commented that a variety of methods are weakened due to the subjective nature of the evaluation and that a need for objective measurement existed. Another concern is the level of awareness experienced by the subject and its ultimate accuracy. Altman and Chemers (1980) summarized past personal space research into four categories. Hayduk (1978) provides summaries of data collection methods as well.

Simulation. Techniques which include the simulation of the physical setting and ask the subject to project him or herself into the context of interaction comprise a large portion of the existing personal space research. These techniques include felt board placement, figurines or dolls, actresses on stage, and scale models. Also included in these studies are those experiments which rely on photographs or other film media such as slides or video.

Felt board activities have been used to determine comfortable approach distances. Developed by Kuethe (1962), subjects are asked to place a figure representing him/her self on a felt board at a comfortable distance to a figure already placed on the board (Cohen, Sherman & Sherman, 1982; Lerner, Iwawaki & Chihara, 1976; Lerner, Karabenick & Meisels, 1975; Kuethe, 1962; Severy, Forsyth & Wagner, 1979). Independent variables used in these studies include gender, body type and level of acquaintance. The reliability of this method has been examined in relationship to full scale environments in which a figure stop technique was employed. Results indicate that correlation between doll placement, felt-board and actual figure stop did not reach significance (Love & Aiello, 1980). The researchers suggest the out-of-awareness of personal space behavior is difficult to replicate. Tolor (1980) found that correlation was high between the subjects' placement of self in relation to others and in placement of other in relation to self. Pederson (1973c) investigated the relationship between the placement of silhouettes, circles on paper and full scale environment. Findings indicate that significant relationships do exist although the more closely the method can represent the actual setting the more accurate the results. Little (1965) found a high

correlation between the placement of plastic figures and the placement of actresses on stage. Little's discovery was verified by Gottheil, Corey and Paredes (1968) by examining the relationship between a projective use of figurines and a full scale measurement.

A similar technique is to have the subject indicate comfortable distance by moving a silhouette or other sticker to create a comfortable relationship (Adler & Iverson, 1975; Meisels & Guardo, 1969; Pedersen, 1973c; Geden & Begeman, 1981). These studies did not compare findings to full scale measurements and the reliability and validity of the measurements can not be stated.

A variety of studies have been completed using a pencil and paper instrument developed by Duke and Nowicki (1972). This method, called the Comfortable Interpersonal Distance Scale, requires the subject to imagine him/herself in the center of a sheet of paper with 8 radiating lines. The subject marks along these radiating lines the closest he/she would care for someone to approach. This has been modified to use front axis or front and rear axis only. Other researchers requested subjects to draw a circle around a figure representing him/herself that indicates the closest someone could approach.

Scale models are different from the placement of figures on a board of piece or paper due to the three dimensional aspect of space. The subject moves a figure representing him or herself in a representation of a three dimensional space and completes a figure stop activity. De Long (1976) and Smith (1980) found that the measurements between full scale and scale model environments during a figure stop activity to be positively correlated. Summit, Westfall, Sommer & Harrison (1992) have used scale models in exploring the relationship between weightlessness and comfortable interpersonal distance. Space is experienced kinesthetically and the ability to move a representation of one's self through the space leads to a better understanding of the spatial relationships.

Experiments. Many researchers have implemented experiments in both laboratory and natural settings. Those experiments in natural settings frequently address intrusive behaviors in which latency time to flight is examined as a function of age, gender, race or attractiveness. Some studies have examined overtly intrusive behaviors such as reading the other persons book, smoking or crowding. One technique requires the researcher to observe reactions when a confederate approaches closely in a variety of settings (Albas & Albas, 1989; Beach & Sokoloff, 1974; Pagan & Aiello, 1982; Graves & Robinson, 1978). Some

studies have examined interaction or conversational distance when approached by an interviewer, someone asking for directions, or a survey. The confederate is frequently varied by gender, subculture or disability.

Laboratory experiments involve seat selection, group activity, and interviews. Frequently confederates initiate activity or engage the subject in a conversation while factors such as room layout, lighting, gender, race, voice loudness or nearness are varied. Mock interviews have also been used by many researchers (Albas & Albas, 1989). A number of experiments have also examined the seating distance selected by a naive subject (Adler & Iverson, 1974; Batchelor & Goethals, 1972; Brady & Walker, 1978; Cronje & Moller, 1976; Leibman, 1970; Lomranz, Shapira, Choresch & Gilat, 1975; Tedesco & Fromme, 1974).

Observation. Observation in natural settings, while providing some of the richest contextual interactions, is confounded by the myriad of variables which are not controlled. Naturally occurring dyads are observed and recorders use data recording sheets, photography (Heshka & Nelson, 1972; Scherer, 1974), or a stable environmental element from which to estimate distances. The observed individuals may or may not be questioned following the observation. In general, these observations are subjective and studies which have implemented multiple observers or highly refined coding guidelines offer the most reliable information.

These methods, as well as a variety of other techniques, have been used in personal space research. While some have been shown to be reliable and others have been correlated with both full scale activities and other methods, the validity of these methods have been questioned. The context of the behavior as well as the unconsciousness of human behavior remain illusive.

An Alternative Model of Interpersonal Distance

The theories previously discussed have strengths and weaknesses. Some of the theories examine space as a dynamic process between two people while others account for only one individual. All of the theories, in some context, account for social or group norms in examining personal space. However, none of the theories adequately address age or other age-related variables in the late adult years. An alternative model was developed which allowed for different variables to be tested and the components of the model were synthesized from common themes in previously developed models. The overall structure was developed to accommodate the cognitive process, the physical dimension of information processing, and

overall structure was developed to accommodate the cognitive process, the physical dimension of information processing, and the social/cultural context of personal space behaviors. Following is an explanation of the model's components and process.

A major component of several theories was that of status. The sociobiological theory contained status as a primary component of spatial ownership and status is identified within a dominance or territorial hierarchy which animal behaviorists purport is a result of genetic evolution. The enculturation model did not directly incorporate status as a variable yet culture defines many of our perceptions of status and allows interpretation of status related cues. The situational resource theory directly addresses the issue of status defined through membership in socioeconomic, gender, occupational and age groups.

Status is associated with age, gender, intelligence, occupation and other socioeconomic indicators. The disengagement theory developed by Cummings and Henry (1961) addresses the aging process and its impact on status. Status changes as a result of retirement; income, occupational prestige, and feelings of usefulness and productivity are altered as a employment changes. Occupational status has a rich history has traditionally influenced socioeconomic status and is frequently an indicator of education level (Ganzeboom & Treiman, 1996; Treiman, 1973). Older females vicariously enjoyed the husbands' prestige and experience a loss of status when their husbands retire or die as a result of the marriage relationship. Certainly, over time, the role of women in the workforce will alter some of the theory's original premises yet it provides a solid foundation for future research. This theory compliments the situational resource theory; both address membership in status groups and the cultural interpretation of the status cues. The disengagement theory helps to explain the impact of the aging process on status.

A second component of the proposed model is that of cognitive processing. Significant elements in the sociobiological and enculturation models are the perception and processing of information about the approaching person and the physical environment. The role of the human body, the sensory perceptual system, and the ability to distance oneself from an intruder is critical to establishing and maintaining comfortable interpersonal distance. The changing health status of older persons suggested that personal space may change as a function of physical health.

For the purpose of this study, an alternative model representing a synthesis of the models previously reviewed was developed (Figure 5). Overall, the model accounts for the presence of two

individuals; determining comfortable interpersonal distance can not be reliably established without a stimulus person (Hayduk, 1994). Additionally, information about the other person must be received and encoded; for this reason, the participant's physical characteristics (vision, hearing, mobility, health) were included as independent variables in the model. Stimulus perception is a vital component of the sociobiological and the enculturation theories. The situational resources model is combined with the disengagement theory to define the social concept of status within the proxemic interaction. The model allows the tacit components of age-, gender- and socioeconomic-status and occupational prestige to be accommodated. The individual's ability to reciprocate or compensate the symbolic act of physical proximity, is identified as the outcome of this negotiation process.

This study examined the relationship between age, gender, visual/auditory acuity, mobility and status variables (employment status, occupational prestige and socioeconomic level) with interpersonal space. Empirical evidence was used to verify the model's strengths and allowed the weaknesses to be reconfigured so that future examinations of personal space could be refined.

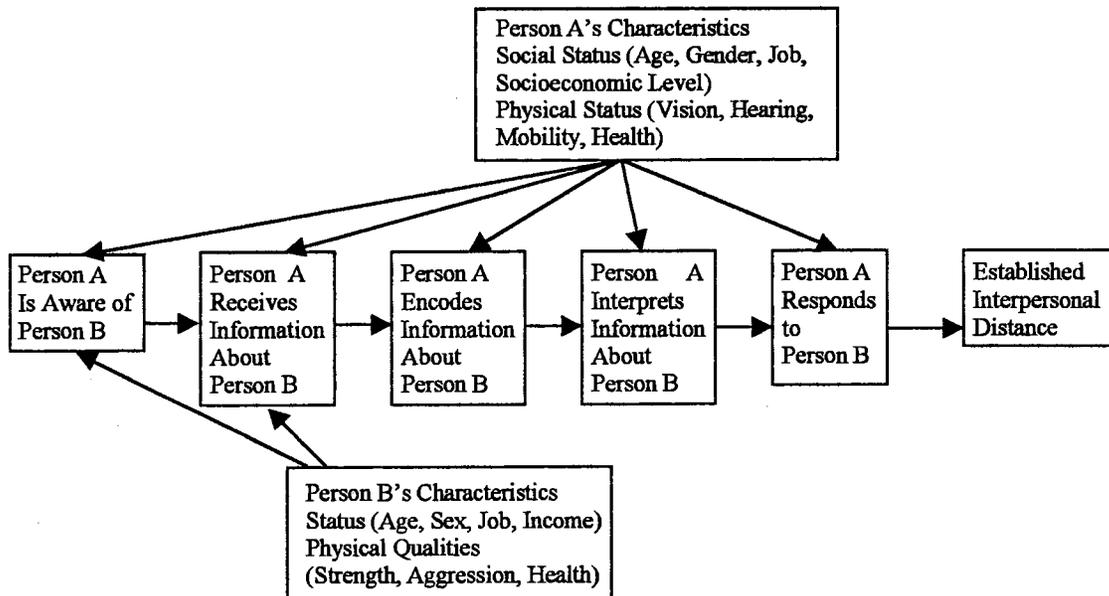


Figure 5. Alternative Model of Personal Space

CHAPTER III

METHODS

Introduction

The purpose of this study was to examine the relationship between older adults' human factors and status and preferred interpersonal distance. This chapter describes the methods and procedures implemented in the study. Included is the description of the sample and selection method, the instruments, data collection procedures and hypotheses.

Type of Research

This study was exploratory in nature. Although personal space research has been undertaken by a great number and variety of researchers, elderly persons were studied in only a few instances. A cross-sectional design was implemented to establish a foundation for future research because the study was exploratory in nature. The findings reflect the current personal space of individuals at a variety of ages at a single point in time compared to the developmental nature of a longitudinal study (Schaie, Campbell, Meredith, & Rawlings, 1988). This study does not represent actual developmental changes in personal space for older adults.

Sample

Sample parameters were determined using several guidelines. First, 55 was selected as the minimum age. Neugarten (1976) defined young-old as the ages of 60 to 74. Because of the interest in employment status, the minimal limit was set at 55 years old so that persons just before the recognized retirement age of 60 could be sampled. Second, it was determined that a sample comprised of equal numbers of men and women would be targeted; approximately 70% of the participating sample was female and this did reflect American demographic trends. Older women typically outnumber older men. Third, a variety of socioeconomic levels was of interest; for this reason, a variety of groups in different parts of the geographical region and groups that were organized for different reasons were contacted for participation (Table 1).

Table 1.

Summary of Sample Demographics

	Males n = 35	Females n = 73
Age	69	75
(Range)	(50-88)	(56-94)
Occupation		
SIOPS*	53.03	50.75
ISEI**	59.15	54.71
Years Retired	11.34	12.31
Annual Household Income		
Less than \$10,000	3.7%	6.0%
\$10,000 - \$19,999	18.5%	14.9%
\$20,000 - \$34,999	37.0%	20.9%
\$35,000 - \$49,999	22.2%	13.4%
\$50,000 - \$64,999	7.4%	16.4%
\$65,000 - \$74,999	3.7%	3.0%
Over \$75,000	7.4%	9.0%
Does not know	0.0%	16.4%
Marital Status		
Married	88%	32%
Widowed	12%	53%
Other	0%	15%
Employment Status		
Full Time	15%	7%
Part Time	7%	7%
Retired	78%	60%
Never Worked	0%	26%

*SIOPS = Standard International Occupational Prestige Scale

**ISEI = Socio-Economic Index of Occupational Status

The final sample was comprised of volunteers recruited from local church, civic, and social organizations and assisted living facilities. The researcher visited each group personally and requested assistance with the project. Any person over the age of 55 not suffering from dementia was included in the

study. A sample of 108 persons ranging in age from 56 to 94 participated in the study. Variation in visual and hearing acuity and mobility did exist (Table 2). All participants were Caucasian Americans who had lived primarily in the Oklahoma region.

Table 2.
Summary of Checklist of Activities

Difficulty	Affirmative Responses	
	n	Percentage
Difficulty keeping my balance when standing still (M)	20	21%
Difficulty seeing in bright lights or bright sunlight (V)	32	33%
Difficulty hearing others in a small group (H)	26	27%
Weakness in my legs when rising from a chair (M)	34	35%
Difficulty hearing others in noisy settings (H)	51	53%
Difficulty walking short distances (i.e. to your mailbox) (M)	13	13%
Difficulty seeing individuals standing 2 to 3 feet away (V)	1	1%
Difficulty reading the newspaper without extra light (V)	28	29%
Dizziness or unsteadiness when walking (M)	18	19%
Difficulty seeing when driving at night (V)	51	53%
Difficulty seeing individuals standing 4 to 7 feet away (V)	7	7%
Difficulty walking moderate distances (i.e. around a shopping mall) (M)	25	26%
Difficulty seeing individuals who are more than 8 feet away (V)	10	10%
Difficulty hearing the telephone or doorbell (H)	9	9%
Difficulty hearing someone speak if I can not see their mouth (H)	17	18%

Note: V = Vision, H = Hearing, M = Mobility

Instruments

Several different instruments/apparatus were used to collect the necessary data on interpersonal distance and the variables of interest.

Personality Sorter

The Keirsey Temperament Sorter (Keirsey, 1998) was used to determine the general personality type (introversion/extroversion) of the sample. This 70-question instrument categorized each participant into one of 16 groupings based on Jungian theory (Hull, 1971). The sorter was completed in a pencil-and-paper format and the instrument was scored using Keirsey web site on the Internet.

Scale Figures and Model

In the figure-stop activity, participants held a scale figure representing him/herself and was approached by another scale figure held by the researcher. The approaching figure represented people with different descriptions (age, gender, job). For the figure-stop activity, a generic interior space and figures were created to control for variation in the data collection sites.

The scale figures were cut from unfinished basswood and consisted of two silhouettes with layers of basswood between to vary the thickness and were constructed at 1" = 1' - 0" scale (Figure 6). The figures ranged in height from 5' - 0" to 6' - 3" and from 19" to 26" in width (elbow to elbow). Profiles were created that suggested a person with clothing and varied in the roundness of the shoulder, shape of the head and the width of the pant leg. Overall dimensions were developed from data collected on human factors and the 95% measurements were used (Panero & Zelnick, 1979). Prior to the experiment, the figures were pilot tested for appropriate ethnicity, gender and size with a similar sample (Appendix F). In the figure-stop activity, participants were approached by scale figures that varied by description. These figures were 5'3" and 5'9" tall and represented a female and a male respectively. The figures were pilot tested and the sample indicated that size, shape and gender were all adequately portrayed for the age, gender and job described for the purpose of the experiment.

The model, scaled at 1" = 1'0", was constructed from a Styrofoam base that was 24" x 36" and was covered in an off-white fabric and was framed with unfinished basswood. Walls were constructed on three sides; they were 10" high and were made of 1/8" foam core. The walls and floor of the model were left white or off-white and devoid of any decoration (Figure 7).

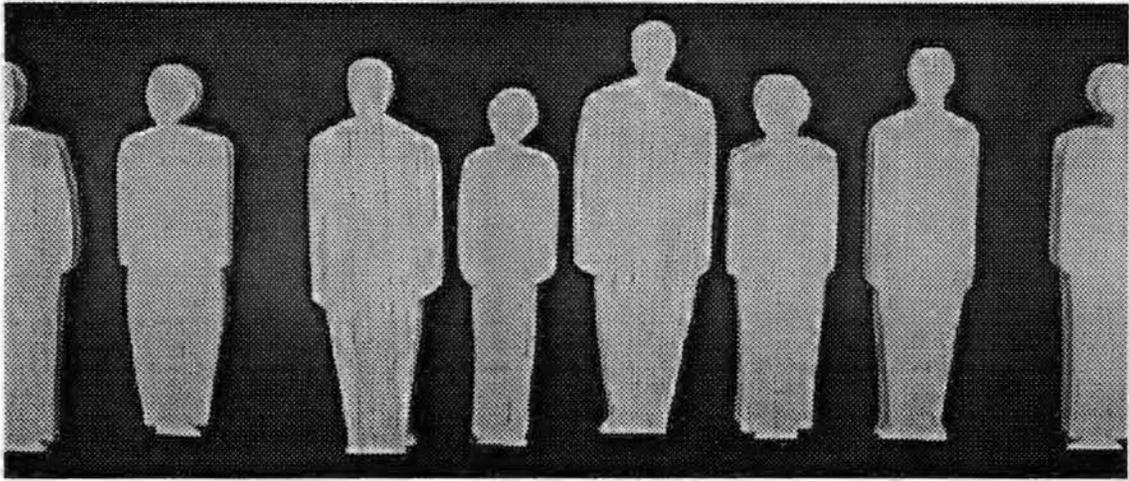


Figure 6. Photo of Representative Scale Figures.

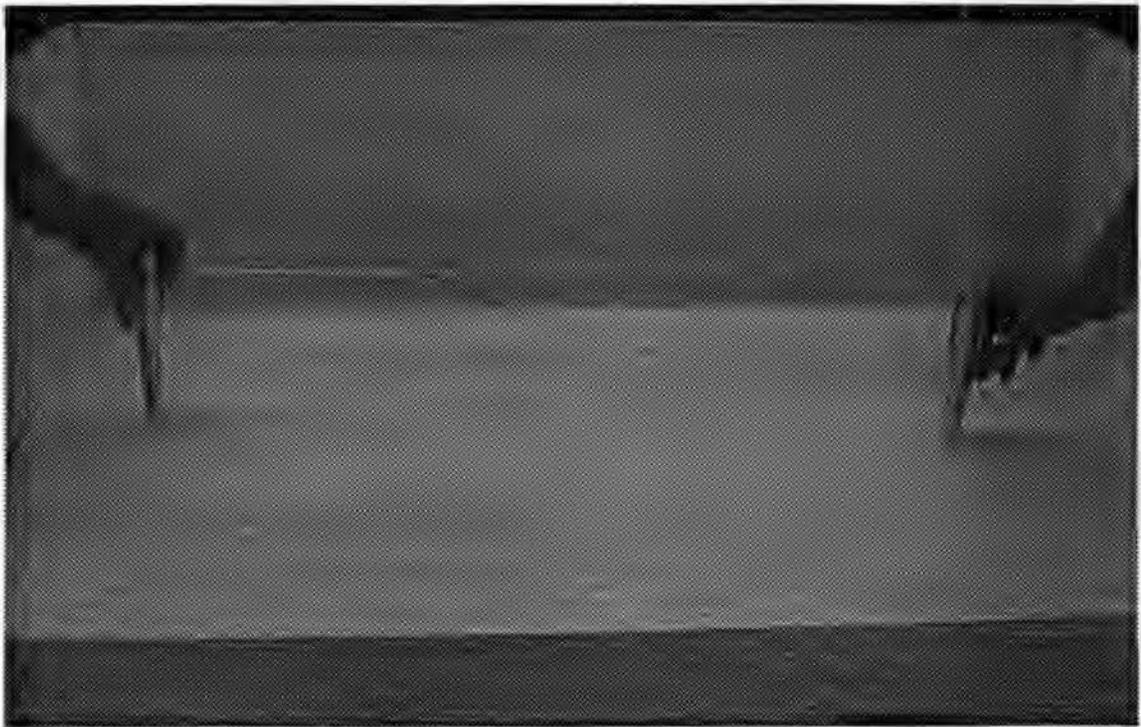


Figure 7. Photo of Scale Model.

Unobtrusive Measurement

The researcher was interested in determining if an unobtrusive measurement could be established between herself and the participating sample. Previous studies had requested the participant to place a chair in a naïve setting and this technique was implemented. The researcher provided a rolling office task chair and requested that the participant bring the chair over to the table for the interview. The researcher placed her chair at a predetermined location and measured the distance between the two chairs after the participant departed.

Demographic Interview

A demographic instrument was designed to be administered in the interview setting (Appendix C). The information included personal data, information about employment and careers, living arrangements, and information on visual and hearing acuity and ease of mobility as well as assistive devices. The interview also included an activities of daily living check list to determine degree of autonomy. The participant's career and that of his/her spouse was evaluated on two separate scales (Ganzeboom & Treiman, 1996). The first scale was the Standard International Occupational Prestige Scale (SIOPS) and indicated the amount of prestige based on popular evaluation. The second scale was the International Socio-Economic Index of Occupational Status (ISEI) and indicated the interaction level of income and education associated with that type of career (Ganzeboom & Treiman, 1996). Both scales should be interpreted so that lower scores equal higher prestige and income/education.

Characteristic Rating Form

In order to determine the participant's perceptions of the approaching person simulated by the scale figure, each participant was asked to rate the people that approached them in the scale model activity (Appendix D). The rating form included the brief description provided to them during the activity (i.e. 45-year-old woman who is a school teacher) and a list of the eight characteristics (intelligence, income, age-related status, physical strength, sex-related status, aggression, general health, and job-related status). The participant rated each of the four persons on a scale from 1 (low) to 5 (high) for each of the eight characteristics. Each characteristic and scale were clearly labeled in 14 point type.

Data Collection

Due to the limited mobility of the sample and to increase participation, data were collected at location sites convenient to the participating sample. These sites included exercise facilities, activity rooms in living facilities, public libraries, churches and community centers, and conference or lounge areas on the university campus. The participant was allowed to select the site most convenient; no participant was introduced to a site that he/she was not familiar. The physical spaces varied in the degree of publicness and overall size although lighting and thermal conditions were similar across conditions. Attention to lighting, orientation to space and arrangement of furniture was adjusted when possible by the researcher. Data collection occurred during January through April, 1999 between 8 a.m. and 7 p.m.

Each participant was met individually by the researcher upon arrival. Each participant completed the personality sorter and was then introduced to scale model activity. The researcher explained that scale figures would be used in the experiment and that he/she would need to select a figure that he/she was comfortable with to represent him/herself. The researcher invited the participant to pick up the figures, touch them and move them about; the researcher demonstrated this with one figure. Following this selection, the participant was asked to view the model and to imagine that it was a large empty room such as a classroom or activity room in a community center. The script included the explanation that the walls and floor were bare and that there was no furniture.

For the figure stop activity, verbal instructions were patterned after Duke and Nowicki's Comfortable Interpersonal Distance Scale (1972). The participant was instructed to hold the figure at one end of the room approximately five feet from the wall and was told that he/she was facing the other end of the room. The script explained that four different people were going to approach the participant from across the room while the participant remained in one position (Figure 8). The approaching people simulated by the scale figures varied by age (28-, 45- and 65-year-olds), gender, and job (grocery clerk, school teacher, and doctor). Of the eighteen possible variations, previously developed templates of four profiles were selected and then the template was randomly selected for each participant (Appendix E). This was designed to decrease order effects (Keppel, 1991). The researcher explained that these individuals were present to help with the experiment, meant no harm to the participant and that the only thing they would do was walk toward him/her. The participant was told that the approaching person would be described and that

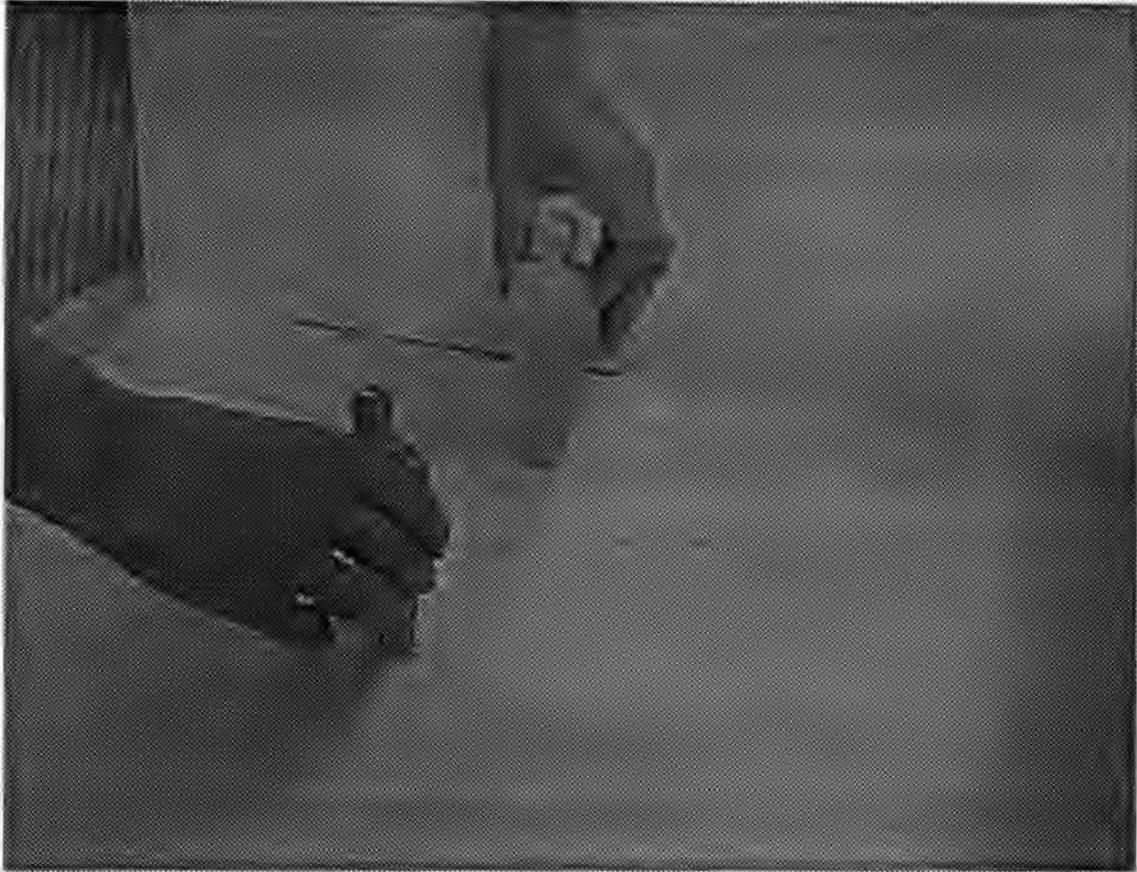


Figure 8. Photo of Figure-Stop Activity

as the person approached them, he/she should tell the person to stop when the person was "too close for comfort." When the respondent said "stop," the researcher measured the distance with an architectural scale and recorded the distance.

After the scale model activity was complete, the participant was invited to be seated so that the demographic interview could be completed. After the participant placed the rolling chair near the table, he/she was interviewed by the researcher and the demographic questionnaire was completed. This interview was casual and many of the questions were answered during the informal discussion.

Following the interview, the participant was asked to think about the people that had approached them from across the room. The researcher explained that she was interested in how the respondent had envisioned these people and what types of characteristics they might have envisioned. The rating form was presented to the participant and they were instructed to rate each person on the eight characteristics. If the

respondent indicated that a particular quality had not been considered, he/she was told that it was appropriate to leave that score blank. If a characteristic was left blank, the researcher coded the question as missing data and it was not used in the final analysis.

Methods of Analysis

Following are the research hypotheses and method of analysis. All statistical tests were evaluated at the $p < .05$ significance level. All analysis was completed using SAS version 6. For regression analysis, significant level for entry and retention were set at $p < .50$ and a backward selection process was implemented. Satterthwaite adjustments were used for all Analysis of Variance to control for unequal variances and small n 's in some cells.

Hypothesis 1

There will be no significant differences in the interpretation of the approaching person's gender-associated status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 2

There will be no significant differences in the interpretation of the approaching person's intelligence as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 3

There will be no significant differences in the interpretation of the approaching person's age-related status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 4

There will be no significant differences in the interpretation of the approaching person's general health as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 5

There will be no significant differences in the interpretation of the approaching person's physical strength as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Hypothesis 6

There will be no significant differences in the interpretation of the approaching person's aggression as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 7

There will be no significant differences in the interpretation of the approaching person's income as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 8:

There will be no significant differences in the interpretation of the approaching person's job-associated status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility). Multiple regression was used to

examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Hypothesis 9

There will be no significant relationship between the participant's established interpersonal distance and the perceived income level of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 10

There will be no significant relationship between the participant's established interpersonal distance and the perceived intelligence level of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 11

There will be no significant relationship between the participant's established interpersonal distance and the perceived gender-related status of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 12

There will be no significant relationship between the participant's established interpersonal distance and the perceived age-associated status the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 13

There will be no significant relationship between the participant's established interpersonal distance and the perceived job-related status of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 14

There will be no significant relationship between the participant's established interpersonal distance and the perceived aggression level of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 15

There will be no significant relationship between the participant's established interpersonal distance and the perceived strength of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 16

There will be no significant relationship between the participant's established interpersonal distance and the perceived general health of the approaching person. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Hypothesis 17

There will be significant differences in the established interpersonal distance as a function of individual differences in the interpretation of perceived income level, intelligence, gender-associated status, aggressiveness, physical strength, age-associated status, general health and job-related status of the approaching person. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure.

Summary of hypotheses. The model was synthesized from common elements of existing theories and the variables to be tested were selected because of their role in the aging process. Older adults generally hold more traditional concepts on gender roles, job appropriateness, and the importance of work and productivity (Gerson, 1993; Wilkie, 1993; Zuo, 1997). Additionally, changes in the physical status of individuals are associated with the aging process (Ferrini & Ferrini, 1993; Rogers, 1997). Summaries of the statistical analysis are included in Appendix I.

CHAPTER IV

GENDER, AGE, AND SOCIOECONOMIC STATUS OF THE ELDERLY AND ESTABLISHED
INTERPERSONAL DISTANCE

MANUSCRIPT FOR PUBLICATION

JOURNAL TITLE: JOURNAL OF ENVIRONMENTAL PSYCHOLOGY

Abstract

The personal space parameters of an elderly sample were examined in the context of changing status variables. The elderly's own status and their perception of approaching people's status (occupation, gender, age) were examined in relation to established interpersonal distances. A figure-stop technique was employed in a scale model environment to determine the change in personal space requirements. Regression analysis indicated age, gender, income, and occupational prestige accounted for 22% of the variation in personal space.

Introduction

The importance personal space plays in human behavior has been recognized and empirically documented for well over 30 years. During the last decades, interest has peaked and hundreds of permutations of the forces impacting personal space have been investigated by researchers in all disciplines and paradigms. Today, however, cultural norms and population demographics have changed and it is this evolving world which prompts fresh investigation into a well-established field. Concepts of gender, work, and age are undergoing slow but inevitable change which, in turn, impact human behaviors in ways previously undocumented. In addition to these changing social norms, we are also anticipating different living and working environments and different populations that must be accommodated. Personal space is an important component of the built environment and we must re-evaluate our standards for the next millennium. The existing literature, although 20 to 30 years old, is the existing foundation for existing design parameters and provides a solid footing upon which to examine potential changes in personal space behavior and future design parameters.

Today, the impact of the aging process on personal space is growing in importance. Demographic trends indicate that more than 66 million people will be over the age of 65 by the year 2030 (Howell, 1997). This population segment is forcing changes in work and retirement policies, healthcare policy and the built environment and represents billions of dollars in spending annually (Shapiro, 1994). Determining what attracts and retains this consumer group is of increasing concern.

Although a number of studies have examined the role of status in personal space and others have examined the role of age, there is no existing research to date that examines the relationship between the changing status of elderly persons and potential variation in personal space patterns. The purpose of this

research was to examine the relationship between the status variables of age, gender, socioeconomic level and occupational prestige and established interpersonal distances of Caucasian adults over the age of 55.

Theoretical Model

Individuals maintain a personal space that impacts human interaction in a variety of physical and social contexts. The study of spacing patterns originated in animal behavior and addressed concepts such as dominance hierarchies and territoriality. Hediger (1961) initiated studies in animal behavior which led to the definition of "flight distance" and identified these spacing patterns as protective mechanisms. The concept of the "body buffer zone" was developed by Horowitz, Duff and Stratton (1964) and furthered the idea that these maintained distances had protective functions, even in man. Edward Hall (1963, 1966, 1968) coined the term "proxemics" in reference to the commonly recognized patterns and zones of human behavior; these zones prescribe the social context for and type of interaction to be permitted. Robert Sommer (1969) applied the concepts of personal space and his observations to the design of the constructed environment. These early researchers made the connection between observed animal behaviors to contemporary man's highly stylized conduct.

A primary component of spacing behaviors in animals is related to the defense of one's home and, ultimately, the well-being of the individual. Dominance hierarchies ensure survival of the species by facilitating the best-adapted animal access to necessary resources within a specific area. In the animal kingdom, dominance is established through strength and often physical aggression (Drickamer & Vessey, 1992). Comparatively, man has evolved in such a way that dominance over conspecifics and access to resources is now relegated to social and economic dominance (Mehrabian, 1976). The elderly experience changes in their social and economic dominance and therefore may experience changes in their use or control of personal space.

A model was created to guide the investigation between age, status, and personal space. The model includes characteristics of the individual as well as an approaching person. The structure is based on a cognitive processing model which includes both the perception of as well as the interpretation of the stimulus (Figure 2).

Existing Studies

Age and status. Any given status or social position has one or more qualities that allows the individual to achieve that particular rank (Hughes, 1967). Hughes continues to explain that these characteristics are often formal or legal such as the licensed physician but may also be attributed at birth. Additionally, these primary characteristics are typically accompanied by secondary qualities which, over time, create mental concept of that role in society. Some of the characteristics discussed in the literature include professional or occupational training, gender, age or experience, culture, family position and religion. Hughes offers a variety of examples of these stereotypes and the social affordances available to individuals as a result.

Elderly persons confront many status related changes during the latter adult years. While many aspire to comfortable and leisurely retirements, there is at the same time a loss of status due to shift from producer to consumer (Cox, 1990). In an examination of the changing status of the elderly throughout recorded history, Cox explains that the status of the elderly has shifted in response to changing physiological and economic demands for a variety of different Western societies. As nomadic tribes, cultures rid themselves of the elderly when they slowed the group's search for resources. With the coming of the agrarian age, the elderly were owners of the land and therefore controllers of the resources and received great deference from the extended family. The industrial age saw the loss of dependence on the extended family and the elderly person experienced loss of status when children sought employment in cities. Today, we are at the cusp of the information age where anyone has access to information and therefore power; the evolving status of the elderly has yet to be indicated (Cox, 1990).

American culture today is perceived as holding the elderly in low esteem, presuming that old age is accompanied by financial and physical decline, intellectual incompetence and emotional dependency (Levine, 1988). While some older persons may be held in great esteem for past accomplishments, this attitude does not typically apply equally to all elderly.

Occupational prestige, socioeconomic status and gender. Since the division of labor, some occupations have assumed greater prestige. This has occurred because some occupational roles "differ with

respect to their control over scarce resources -- knowledge, authority, and property, all of which can be thought of as aspects of power" (Treiman, 1977, p. 223).

There is a long history of ranking occupations on the basis of socioeconomic factors and prestige and there are benefits to using occupation as a measurement for other socioeconomic variables (Hauser & Warren, 1997). Occupation describes the context in which time away from home is spent, the technical and social skills one has developed and the types of friends and social relationships (Warren, Sheridan & Hauser, 1998). The researchers also point out that questions concerning occupation are more readily answered by participants compared to more private issues such as income.

Although Hauser and Warren state that occupations are increasingly genderless, problems do exist in the standardized scales and evaluative methods. In the context of gender and occupational status, Hauser and Warren (1997) discuss that some scales are based on characteristics of males while others are based on characteristics of all workers. A review of the scales offered by Hauser and Warren (1997), Treiman (1977), Ganzeboom and Treiman (1996), and Warren, Sheridan, and Hauser (1998) do not include the role of homemaker as a result of its unpaid status. There is conflict in the adequacy of the scales as a result of the unequal socioeconomic positions held by women. Further, there is no accommodation made for part-time or part-year work.

Gender and occupation are also closely intertwined in social contexts (Zuo, 1997). The traditional male role has been defined through his ability to provide for the family (Gerson, 1993). Conventional beliefs concerning men's status as provider have been associated with age; an inverse relationship between age and conventional beliefs on work roles have been found (Wilkie, 1993). For these reasons, comparison between genders becomes difficult, especially for the older age groups where fewer females were employed outside the home.

Interpersonal Distance

Status. A variety of status variables have been examined in personal space research. Some of these variables (title, attire) are indicators of status while others (ethnicity, professional position, gender, business role, age) convey status to the individual. Many of these studies were conducted in the 1970's and few have been conducted since. The changing demographic trends are indicators for more current studies.

Adler and Iverson (1974) varied the status descriptors of an evaluator (professional versus clerk) and validity of praise and found that subjects established a significantly smaller distance from the confederate offering appropriate praise, especially if the person had low ascribed status. Subjects exhibited greater consistency and established greater distance if the confederate was described as high status regardless of the praise condition. In a replication of their study, the researchers obtained similar results using a felt figure placement activity (Adler & Iverson, 1975). Smaller distances were established from a low-status individual offering valid praise and greater distances from high status individuals, regardless of praise condition.

Barash (1973) discovered that during a "spatial invasion" experiment, subjects used blocking techniques such as chair moving and barrier construction twice as frequently when he dressed as a faculty compared to student attire. In a similar study examining attire and status, Bouska and Beatty (1978) found that dyads comprised of one person dressed as a business man or a priest were intruded upon significantly fewer times than dyads comprised of two students.

Dean, Willis and Hewitt (1975) discovered that interaction distances in a military setting varied as a function of rank. When the subordinant initiated conversation with a superior, there was a positive relationship between the superior's rank and distance; when a superior initiated a conversation there were no patterns in the interaction distances.

Henley (1973) investigated the touching behaviors of persons and categorized the observations on the basis of age, sex and socioeconomic status; older age / male / economic wealth were defined as having higher status. Findings indicated higher status individuals touched lower status individuals more frequently. Another examination of status relationships and touching behaviors did not support Henley's findings (Goldstein & Jeffords, 1981). The results indicated that young legislators of low status initiated touching behavior more frequently toward older, higher status peers compared to the initiated touching behavior of the older, high status legislator.

Examining the relationship between room size, status and gender and interpersonal distance, findings indicate that status was not found to have a significant impact (White, 1975). Independently of sex; subjects sat closer to females with equal status than higher status while sitting closer to high status males compared to low status males. Investigating the interaction between sex and status, Wittig and

Skolnick (1978) found that low status males maintained a considerably larger interpersonal distance when placing a chair for interaction than did low status females. Interaction analysis revealed that high status males maintained a lesser distance than low status males while high status females maintained a greater distance than low status females.

Kiotas (1990) replicated Duke and Nowicki's (1972) Comfortable Interpersonal Distance Scale with high and low status confederates. Findings indicated that subjects would allow low status persons to approach him/her more closely than a high status person.

In a study examining dominance and seating preference, Lott and Sommer (1967) found that subjects placed persons of a higher status at a greater distance around a table and at a different orientation compared to those of equal or lower status. Subjects were also asked to draw a dominance hierarchy of people on campus with respect to him or herself. A large number of women placed husbands or boyfriends above themselves in the diagram although men never placed a wife or girlfriend above himself. In another study of group interaction, Giesen and McClaren's (1976) findings indicated greater distances between the moderator (high status) and other subjects (low status).

Marginal persons, defined as a cultural or ethnic minority, more frequently selected seats at the periphery of college classrooms than dominant or white, Anglo-Saxon Protestants (Haber, 1982). Additionally, the study found that the greater the marginality, the more likely a peripheral seat will be selected. In another classroom experiment, Leffler, Gillespie and Conaty (1982) found that subjects playing the role of teacher (with a high status value) claimed more space compared to the student with their bodies and intruded upon the student's space by touching and pointing. The study also indicated that males claimed more space and intruded more frequently than did females. For pairs of equal status or disparate status dyads of male employees, findings indicate that equal status pairs maintain a more direct (face-to-face) orientation compared to dyads of unequal status (Jorgenson, 1975). The study indicated that although distance between the two types of dyads were not significantly different, low status pairs maintained a significantly closer distance and a more intimate orientation compared to disparate or high status pairs.

Worthington (1974) compared the approach distance to people asking for directions. Subjects approached significantly closer when summoned by a standing person compared to those summoned by a person seated in a wheelchair. In a related study, researchers found that during an

experimental interview scenario, subjects established a significantly greater distance from someone described as socially stigmatized compared to someone with no such stigma (Barrios, Corbitt, Estes and Topping, 1976).

In summary, these studies indicate that low status is generally associated with smaller interpersonal distance. This does not hold true for the studies investigating touch although the very disparate methods and contexts may have an impact in these studies. Gender also appears to be a confounding factor when combined with status; females tend to be approached more closely than males, although this may change when the female is described as high status.

Age. Hayduk (1983) completed an extensive survey of interpersonal distance studies which examined age. In more than 20 studies, reported findings on the whole indicated that between the ages of 2 and 20 personal space gradually increases. Some of the studies suggest intrusion is tolerated better when the intruder is of similar age (Mishara, Brawley, Cheevers, Kitover, Knowles, Rautiala & Survajian, 1974; Willis, 1966; and Latta, 1978). Dolphin (1988) compared the findings of six studies mentioned previously and notes that the positive relationship between age and interpersonal distance is constant in all studies.

A number of studies have examined the interaction of age and gender for children between three-year-olds and the second year of college. Lomranz, Shapira, Choresh and Gilat (1975) investigated the interpersonal distance of children; 3-year-old children maintained a significantly smaller distance from their age peers than did 5- and 7-year-olds. Examining the personal space scores for children in grades one through six, Pedersen (1973) found that males maintained a greater distance than females and this remained true for all grades although the distance decreased as age increased. In an examination of interpersonal distance for students between the first grade and the second year of college, established distances for males and females were approximately the same during the first grade but distances for males increased sharply between the first and fifth grade (Tennis & Dabbs, 1975). Distances for males remained higher than females and distances for both increased gradually until grade twelve. Children in the third through the tenth grade preferred increasingly smaller interpersonal distances (Meisels & Guardo, 1969). At a young age, children placed themselves closer to same-sex peers but closer to opposite-sex peers as they grew older.

Baxter (1970) examined the relationship between interpersonal distance and subculture, age, gender, and setting. The data indicate significant subculture differences as well as age differences; children, adolescents and adults maintained increasingly greater distances and the amount of the variation due to age was approximately 10%. Pagan and Aiello (1982) examined the distancing patterns of children in the first, sixth and eleventh grade in New York and Puerto Rico. Findings indicate that interpersonal distance increased as the children grew older although these differences occurred later for the Puerto Rican children compared to American and northern European cultures.

Fry and Willis (1971) explored the relationship between adult responses when personal space was invaded by 5-, 8-, and 10- year olds. Five-year olds elicited positive friendly responses, 8-year olds elicited neutral responses, and 10-year olds elicited defensive or blocking responses. Significant gender interactions were also found yet the age effect was stronger. In a similar experiment, Dean, Willis and La Rocco (1976) found that 5-year olds received facilitative behaviors and 8-year olds received no responses; 10-year olds elicited avoidance or aggressive behaviors or prompted more frequent activity such as weight shifting.

Lerner, Karabenick and Meisels (1975) examined the personal space of school age children as a function of age, sex and body type. The findings indicate that as the children grew older, the mean interpersonal distance increased and they tended to maintain larger distances with the opposite sex. The study was replicated with Japanese children and similar results were found (Lerner, Iwawaki and Chihara, 1976).

Two studies examining adults and interpersonal distance both indicated that age was not a significant factor. Remland, Jones and Brinkman (1991) did not find significant differences in the distances in naturally occurring adult dyads in several European countries. Geden & Begeman (1981) examined the personal distance of adults in a hospital setting using a doll placement technique. The researchers found that while role (nurse, doctor, family, or stranger) and setting (home or hospital) had significant effects in interpersonal distance, age did not have a significant effect on personal space preferences.

Some studies have examined the interpersonal distances of the elderly although the findings in general are not conclusive. Aiello, Headley and Thompson (1978) found that elderly persons were more tolerant of crowded conditions than were younger persons. Heshka and Nelson (1972) found that personal space varied throughout the lifespan; dyads in a natural setting were observed and findings indicate that

younger and older dyads stand significantly closer together compared to middle aged dyads (mean age = 40). The authors theorize that it is the shift in dependency throughout the lifespan which results in the curvilinear shape of the data.

Several studies examining the elderly in institutions have been completed. De Long (1980) found that elderly preferred smaller distances in a hospital setting. His findings also indicated that the context of interaction may differ for the patient and care provider interacting with one another and therefore result in discomfort by one or both individuals. In an examination of cognitively intact females, Kruckas (1986) found that those residing in a nursing home had a significantly smaller interpersonal distance compared to a similar group living independently. Hayduk and Mainprize (1980) examined the personal space of institutionalized and uninstitutionalized blind persons with sighted persons. The personal space of the institutionalized blind, mean age of 63, did not differ significantly from the sighted group, mean age of 45, and uninstitutionalized blind, mean age of 51.

Leibman (1970) discovered that younger and older women occupying a spacious bench resulted in similar distances for 17 to 59-year-olds. However, if intrusion was necessary, older women maintained smaller distances compared to younger females. Winograd compared young white females (19 - 24) to older white females (63 - 85) and older black females (53 - 86). Findings indicate that the young women maintained smaller distances than the elderly white women but greater distances than the elderly black women.

In summary, the findings indicate that larger personal space boundaries are developed during childhood and adolescence. Results for adults and the elderly are less clear and indicate that factors such as context or culture could confound the interpretation.

Gender. Gender as a function of interpersonal distance has perhaps been the most frequently investigated of all the potential factors in personal space research. This may be because gender interacts with many of the other variables of interest. Status and gender are tightly interwoven through the concepts of division of labor and contemporary concepts of value and productivity. Sex is also a factor in most of the physical qualities; women are generally not perceived as being as physically threatening as men and therefore ratings of aggression and strength may be significantly different. Additionally, the socialization

process for men and women are so different and the perception of women being the weaker sex permeates the attitudes of older generations.

Some researchers have examined same-sex and opposite-sex dyads. Lerner, Iwawaki and Chihara (1976) investigated the personal space of Japanese children and found that both sexes maintained a larger distance from the opposite sex compared to a same-sex interaction. Lerner, Karabenick and Meisels (1975) examined the spacing patterns for children and found that greater space was used with females compared to males and that less space was required for same sex pairs compared to opposite sex pairs. Examining same-sex and opposite-sex pairs, Meisels and Guardo (1969) found that same-sex pairs required less space than opposite-sex pairs until the sixth grade. After the sixth grade, opposite-sex pairs were significantly closer than same-sex pairs. Severy, Forsyth and Wagner (1979) found that male-female dyads of children required greater distance than did same sex dyads in three separate measures. Pedersen (1973) found that males maintained larger distances than females by the third grade and remained so throughout elementary school. Spatial requirements for opposite-sex pairs tended to be smaller than same-sex pairs. Adler and Iverson (1974) examined interpersonal distance as a function of sex of partner in an experiment and the results indicated that differences were more reliable in same-sex pairs compared to male-female pairs. Same-sex dyads had a shorter latency time in an intrusion experiment than did opposite sex dyads (Krail & Leventhal, 1976).

In an examination of praise and status, Adler and Iverson (1975) discovered that males established a greater distance in false praise situations compared to females. A study of small group interaction revealed that women sat closer to one another during a discussion session (Giesen & McClaren, 1976). The study also revealed that subjects sat closer to female moderator compared to a male moderator.

In an intrusion study, Harris, Luginbuhl and Fishbein (1978) found that men more frequently responded to spatial intrusion in low density settings than in high density settings. Men also exhibited more frequent delayed flight behaviors in low density situations compared to females.

In a comparison of race and gender, Bauer (1973) found that white males, white females, black males and black females used increasingly less space in approaching a someone of the same sex and race. Ahmed (1979) discovered that in an invasive situation, women depart significantly more quickly than men and that they left more quickly when the intruder was a male compared to a female intruder. In a cross-

cultural study, Edwards (1980) found in South black females placed a greater distance between themselves and males compared to any other sex combination.

Hartnett, Bailey and Hartley (1974) examined approach distance differences between short and tall objects for both males and females. Females approached both objects more closely than males in both a seated and a standing position. Kenner and Katsimaglis (1993) found that women selected the taxi seat at the far opposite corner from the driver while men preferred to sit next to the driver in the front seat. Aiello and Jones (1971) examined established distances in children of three subcultural groups. Results indicated that no gender differences existed for the Puerto Rican and Black groups but that white females established a significantly greater distance than white males.

Another study of children's personal space revealed that less distance was kept from girls than from boys for both sexes (Lomranz, Shapira, Chores, & Gilat, 1975). Investigating the personal space of children between the first grade and college, Tennis and Dabbs (1975) found that interpersonal distance was greater for males than females.

The relationship between gender and interpersonal distance is varied. Same sex dyads typically maintain smaller distances than opposite sex dyads and most all studies indicate women establish closer distances than men and are approached more closely than men.

Hypotheses

To determine the relationship between status variables and interpersonal distance, three research hypotheses were developed:

Hypothesis 1: The participant's evaluation of the approaching person's sex-, age-, and job-related status and income will differ as a result of his/her own gender, age, income, and occupational prestige.

Hypothesis 2: The participant's established interpersonal distance will differ as a result of his/her evaluation of the approaching person's sex-, age-, and job-related status and income.

Hypothesis 3: The established interpersonal distance would vary as a function of the interaction between the individual's own gender, age, income and occupational prestige and the of the approaching person.

Procedure

Subjects. Participants were volunteers recruited from local church, civic, and social organizations. The researcher visited each group personally and requested assistance with the project. Any person over the age of 55 not suffering from dementia was included in the study. The sample consisted of 108 persons ranging in age from 56 to 94; all participants were Caucasian Americans who had lived primarily in the Oklahoma region.

Scale figures and model. In the figure-stop activity, participants held a scale figure representing him/herself and was approached by another scale figure held by the researcher. The approaching figure represented people with different descriptions (age, gender, job). For the figure-stop activity, a generic interior space and figures were created to control for variation in the data collection sites.

The scale figures were cut from unfinished basswood and consisted of two silhouettes with layers of basswood between to vary the thickness and were constructed at 1" = 1' - 0" scale (Figure 10). The figures ranged in height from 5' - 0" to 6' - 3" and from 19" to 26" in width (elbow to elbow). Profiles were created that suggested a person with clothing and varied in the roundness of the shoulder, shape of the head and the width of the pant leg. Overall dimensions were taken from Human Dimensions and Interior Space (Panero & Zelnick, 1979) and the 95 percentile was used in the creation of the figures. Prior to the experiment, the figures were pilot tested for appropriate ethnicity, gender and size with a similar sample. The shape of the figure (head, shoulders) were found to be significant factors in the selection; gender and size were of less importance in the pilot test.

In the figure-stop activity, participants were approached by scale figures that varied by description. These figures were 5'3" and 5'9" tall and represented a female and a male respectively. The figures were pilot tested and the sample indicated that size, shape and gender were all adequately portrayed for the age, gender and job described for the purpose of the experiment.

The model environment was constructed at 1" = 1' - 0" scale and was made from a Styrofoam base that was 24" x 36". The model was covered in an off-white fabric and was framed with unfinished basswood. Walls were constructed on three sides; they were 10' - 0" high and were made of 1/8" foam core. The walls and floor of the model were left white or off-white and devoid of any decoration.

Demographic instrument. A demographic instrument was designed to be administered in an interview setting. The information included personal data, information about employment and careers, living arrangements, and information on visual and hearing acuity and ease of mobility as well as any assistive device used. The interview also included an activities of daily living check list to determine degree of autonomy. The participant's career and that of his/her spouse was evaluated on two separate scales (Ganzeboom & Treiman, 1996). The first scale was the Standard International Occupational Prestige Scale (SIOPS) and indicated the amount of prestige based on popular opinion. The second scale was the International Socio-Economic Index of Occupational Status (ISEI) and indicated the interaction level of income and education associated with that type of career (Ganzeboom & Treiman, 1996). Both scales are interpreted so that lower scores equal higher prestige and income/education.

Characteristic rating forms. Each participant was asked to rate the simulated people that approached them in the scale model activity. The rating form included the brief description provided to them during the activity (i.e. a 45-year-old woman who is a school teacher) and a list of the eight characteristics (intelligence, income, age-related status, physical strength, sex-related status, aggression, general health, and job-related status). The participant rated each of the four persons on a scale from 1 (low) to 5 (high) for characteristics. Each characteristic and scale were clearly labeled in large type.

Data collection sequence. Each participant was met individually by the researcher and she explained that scale figures would be used in the experiment and that he/she would need to select a figure that he/she was comfortable with to represent him/herself. The researcher invited the participant to pick up the figures, touch them and move them about; the researcher demonstrated this with one figure. Following this selection, the participant was asked to view the model and to imagine that it was a large empty room such as a classroom or activity room in a community center. The script included the explanation that the walls and floor were bare and that there was no furniture.

The participant was instructed to hold the figure at one end of the room approximately five feet from the wall and was told that he/she was facing the other end of the room (Figure 11). The script explained that four different people were going to approach them from across the room. The verbal instructions were patterned after Duke and Nowicki's Comfortable Interpersonal Distance Scale (1972). The participant was "approached" by four described persons that varied by age (28-, 45- and 65-year-olds),

gender, and job (grocery clerk, school teacher, and doctor). Of the eighteen possible profiles, templates were made of four randomly selected people to decrease order effects (Keppel, 1991) and each participant was randomly assigned one of the templates. The researcher explained that these individuals were present to help with the experiment, meant no harm to the participant and that the only thing they would do was walk toward him/her. The participant was told that the approaching person would be described and that as the person approached them, he/she should tell the person to stop when the person was "too close for comfort." When the respondent said "stop" the researcher measured the distance with an architectural scale and recorded the distance.

After the figure stop activity was complete, the participant was interviewed by the researcher and the demographic questionnaire was completed. This interview was casual and many of the questions were answered during the informal discussion.

Following the interview, the participant was asked to think about the people that had approached them from across the room. The researcher explained that she was interested in how the respondent had envisioned these people and what types of characteristics they might have envisioned. The rating form was presented to the participant and they were instructed to rate each person on the eight characteristics. If the respondent indicated that a particular quality had not been considered, he/she was told that it was appropriate to leave that score blank. Blank scores were not included in the final analysis.

Data collection. Due to the limited mobility of the sample and to increase participation, data were collected at the location where the researcher met the participant. These sites included exercise facilities, activity rooms in living facilities, churches and community centers, and conference or lounge areas on the university campus. The participant was allowed to select the site most convenient; no participant was introduced to a site that he/she was not familiar. The physical spaces varied in the degree of publicness and overall size although lighting and thermal conditions were similar across conditions. Attention to lighting, orientation to space and arrangement of furniture was adjusted when possible by the researcher. Data collection occurred during January through April, 1999 between 8 a.m. and 7 p.m.

Measures and Analysis

The participants' status characteristics have been summarized in Tables 3, 4 and 5. The results are in keeping with general demographic trends. Women are more frequently widowed compared to men and

typically live longer. This sample may not be representative of the work status of women in this age cohort; the number of women working outside of the home is typically smaller and this trend may reflect the larger number of respondents from a university campus.

Hypothesis 1. The participant's evaluation of the approaching person's sex-, age-, and job-related status and income will differ as a result of his/her own gender, age, income, and occupational prestige.

Multiple regression analysis was completed using SAS and a PROC REG with a backward selection procedure was used to test the hypotheses. The participants' evaluation of age-related status were examined and the analysis indicates the scores did differ significantly as function of the participants' status characteristics, $F(5, 193) = 3.64, p < .0036$. The significant predictors included the participant's age and ISEI level and that approximately 8% of the variation can be attributed to these factors. There was a positive relationship between age, ISEI and age-related status ratings.

The participants' evaluation of sex-related status were examined and the analysis indicates the scores did differ significantly as function of the participants' status characteristics, $F(5, 191) = 6.41, p < .0001$. The significant predictors included the participant's age, SIOPS and ISEI level and that approximately 15% of the variation can be attributed to these factors. The relationship between age, SIOPS and ISEI was positive.

The participants' evaluation of job-related status were examined and the analysis indicates the scores did differ significantly as function of the participants' status characteristics, $F(5, 196) = 30.1, p < .0122$. The significant predictors included the participant's sex, SIOPS and ISEI level and that approximately 7% of the variation can be attributed to these factors. The analysis indicates that males scored job-related status lower than females and that a positive relationship existed between SIOPS and ISEI levels.

The participants' evaluation of income were examined and the analysis indicates the scores did not differ significantly as function of the participants' status characteristics, $F(5, 203) = 1.19, p < .3133$. None of the predictors approached significance and the amount of variation explained by the predictors was less than 1%.

It is significant to note that support for Hypothesis 1 was found for three of the four variables (age-, sex- and job-related status). The participants' own status characteristics (age, gender, ISEI and

SIOPS) significantly influenced their perception and subsequent evaluation of the approaching person's status with the exception of income. One explanation for the difference in income may be that the information available about the person's job (grocery clerk, school teacher, and doctor) provided significant external reference and the participant did not rely on his or her own interpretation. The three variables (age-, sex-, and job-status), being more intrinsically related to culture and experience, may have been processed more deeply and therefore influenced by the participants' own characteristics and experiences.

Hypothesis 2. Differences in the established interpersonal distance as a function of the participants' evaluation of status-related characteristics were examined.

A multiple regression technique in SAS was used with a backward selection process to examine the model. The analysis modeled each of the four status variables against established interpersonal distance. The results indicated a significant relationship did not exist, $F(4, 234) = 0.73, p < .5706$. The overall structure of the theoretical model was designed to illustrate a process from stimulus awareness through processing and finally to response. Analysis revealed that the necessary statistical relationships required for these to be significant mediating variables were not present (Baron & Kenny, 1986). Without significant mediating relationships, the analysis for hypothesis three becomes more important as it may indicate a more direct relationship between status and personal space.

Hypothesis 3. Differences in the established interpersonal distance as a function of the participants own status and the perceived status of the approaching person were examined.

A multiple regression in SAS was used with a backward selection process to examine the model. The analysis modeled the individual's own status characteristics and the ratings of the status characteristics of the approaching person were modeled against the established interpersonal distance. The results indicated a significant relationship did exist, $F(9, 179) = 5.55, p < .0001$ (Table 3). Significant predictors in the model included the participant's own sex, age, income level and their rating of the approaching person's income; the model explained 22% of the variation in interpersonal distance.

Conclusions

The purpose of this study was to examine the relationship between the status variables of age, gender, socioeconomic level and occupational prestige and the established interpersonal distances of Caucasian adults over the age of 55. The relationship was assumed to be mediated by the

perception/evaluation of the approaching individual. Partial support for the hypotheses were found and the analysis leads one to make some observations and conclusions concerning both the experimental process and personal space.

The participants' age, gender, income and occupational prestige (SIOPS) were found to be significant factors in the evaluation of the approaching person's perceived status. The participants quite possibly used his or her own characteristics as a "measuring" device in the evaluation of others similar or dissimilar to him/herself. This does not appear to be an unusual finding in the context of tacit knowledge (Reber, 1993). Tacit knowledge is that knowledge that one is not aware of possessing and is used in the cognitive process without the individual's awareness. Using oneself as baseline for evaluation seems quite plausible in this context.

The evaluations of the approaching persons were not significantly related to the established interpersonal distance. These findings suggest that the approaching person is not important in the establishment of interpersonal distance and this is not consistent with other studies. Researchers have found that established distance does vary as a result of gender (Hartnett, Bailey, & Hartley, 1974; Giesen & McClaren, 1976; Kenner & Katsimaglis, 1993), race (Remland, Jones & Brinkman, 1991; Rubak & Snow, 1993), appearance (Barash, 1973; Bouska & Beatty, 1978) and age (see Hayduk, 1983). Why, then, do these results differ?

One reason these results may differ from previous findings may be the level of processing required of the study's participants. The participants were asked to evaluate the approaching person's status on the basis of a brief description including age, gender, and type of job. The scale figures had no facial features, clothing, or other physical qualities other than size. During the data collection, approximately 22% of the participants commented that they "did not know" the approaching person and many did not feel comfortable rating them on such a scale. Previous studies compared distances on the basis of more clearly defined parameters and therefore the responses may have been based on less subjective qualities.

This reasoning is supported by the findings associated with the third hypothesis. The analysis indicated that significant relationships between the participant's sex, age and income level were significant predictors in addition to the approaching person's income. Conversely, the participants stated that there was not enough information on which to evaluate the approaching individual. In considering the role of tacit

knowledge, it is reasonable to conclude that the individual's own qualities (what the individual "knows" best) are used when the qualities of the other individual cannot be adequately evaluated. This would support the idea that the approaching person's income was more easily evaluated based on external information as a result of the job description and therefore became significant in this model.

Additional methodological questions should also be addressed in future studies. While the use of scale models provided a good representation of the scale of the space, the results indicate some weaknesses may exist. The scale model was used to control of exogenous variables in the physical environment and this remains important as the physical environment has been shown to influence personal space (Bell & Bernard, 1984; Cochran & Urbanczyk, 1982; Leventhal, Schanerman & Maturro, 1978; Smith, 1980b). However, both the scenario and the model were devoid of detail concerning the interaction and for this reason the participants may have had difficulty understanding the context of interaction. A scenario which was richer in detail would help to balance the detail missing from the scale environment. Additionally, the scale figures have a lack of detail and a number of the study's participants commented that they could not see their face, clothes or expression. Some studies have examined the role of clothing (Barash, 1973; Bouska & Beatty, 1978) and found this to significantly impact personal space; future studies should account for this as a way of eliciting richer behavioral patterns.

Implications for Design

If the individual uses him or herself as the referent measurement in absence of information about the other person, how can these findings be applied to the built environment? The role of affiliation and the context of interaction and type of space become important elements in the interpretation of findings.

A variety of studies examined the role of affiliation and the degree of closeness in personal space. Findings indicate that the more familiar the individuals are, the smaller the distance maintained (Edwards, 1973, Heshka & Nelson, 1972). In the design of spaces for the elderly, and particularly spaces such as congregate living environments or work places, one must consider the relationships that may or may not exist. Particularly in congregate living environments, friendships are made and lost as a result of life and death. Providing a variety of public spaces which have different levels of intimacy, therefore, can enhance comfort levels between older persons. More simply, providing the ability to adjust closeness would be effective in the design of such spaces.

The type of space or context of interaction must also be considered. Public versus private spaces require different design parameters as persons. If persons prefer to maintain greater distances between themselves and individuals with whom they are unfamiliar, providing ample circulation space and multiple points of egress may enhance comfort.

De Long (1980) and Kruckas (1986) found that persons in nursing homes preferred smaller interaction distances. During the data collection, it was discovered through observation that the persons residing in an assisted living facility approached their participation in the study very differently from those living independently. Near the data collection times, those individuals in an assisted living environment frequently gathered in public areas to visit with other participants. These participants frequently held the researcher's hands/arms or hugged her before and after the experiment and on subsequent days would stop for a chat with the researcher. In contrast, those participants living independently arrived and departed quickly, seldom touched the researcher or initiated conversations. These behaviors may indicate that those living in a congregate setting experience fewer social interactions such as visits or engage in fewer interactions as a result of limited mobility. Therefore, the research project may have been viewed as a social opportunity by those participants. Future studies should examine more closely the living environment, the context of interaction and the reasons for participation in such studies to enhance the interpretation of results.

Baldassare and Feller (1976) suggest that spatial behavior is acquired in early cultural learning although it is probably maintained or altered through similar processes in later contexts and situations. When considering personal space and the elderly, this brings into question historical and experiential qualities that are so difficult to capture in an experimental context. Future studies should be designed to tap more deeply into the tacit knowledge of the participants before clear predictions concerning the personal space of the elderly are made. Additionally, the type of living environment should be more closely examined for variation.

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Table 3.

Summary of Status Measurement Means by Gender

	Males	Females
	n = 35	n = 73
Age	69.00	75.00
(Range)	(50 – 88)	(56 – 94)
Occupation		
SIOPS*	53.03	50.75
ISEI**	59.15	54.71
Years Retired	11.34	12.31

*SIOPS = Standard International Occupational Prestige Scale

**ISEI = Socio-Economic Index of Occupational Status

Table 4.

Percentages of Marital and Employment Status of Participating Sample.

	Males	Females
	n = 35	n = 73
<hr/>		
Marital Status		
Married	88%	32%
Widowed	12%	53%
Other	0%	15%
Employment Status		
Full Time	15%	7%
Part Time	7%	7%
Retired	8%	60%
Never Worked	0%	26%

Table 5.

Percentages of Annual Income Level by Gender.

Income Level	Males n = 35	Females n = 73
Less than \$10,000	3.7%	6.0%
\$10,000 - \$19,999	18.5%	14.9%
\$20,000 - \$34,999	37.0%	20.9%
\$35,000 - \$49,999	22.2%	13.4%
\$50,000 - \$64,999	7.4%	16.4%
\$65,000 - \$74,999	3.7%	9.0%
Over \$75,000	7.4%	9.0%
Does not know	0.0%	16.4%

Table 6.

Summary of Backward Regression Analysis for Status Variables (N= 288).

Variable	B	Standard Error	F
Step 1			
Participant's Sex	16.1774	4.4375	*14.64
Participant's Age	1.3018	0.1792	**52.78
Participant's Income	- 1.0060	1.2808	0.62
Participant's SIOPS	- 0.1986	0.1754	1.28

Note. R2 = .19 for Step 0.

*p<.0002

**p<.0001

Figure 9.

Theoretical Model of Personal Space.

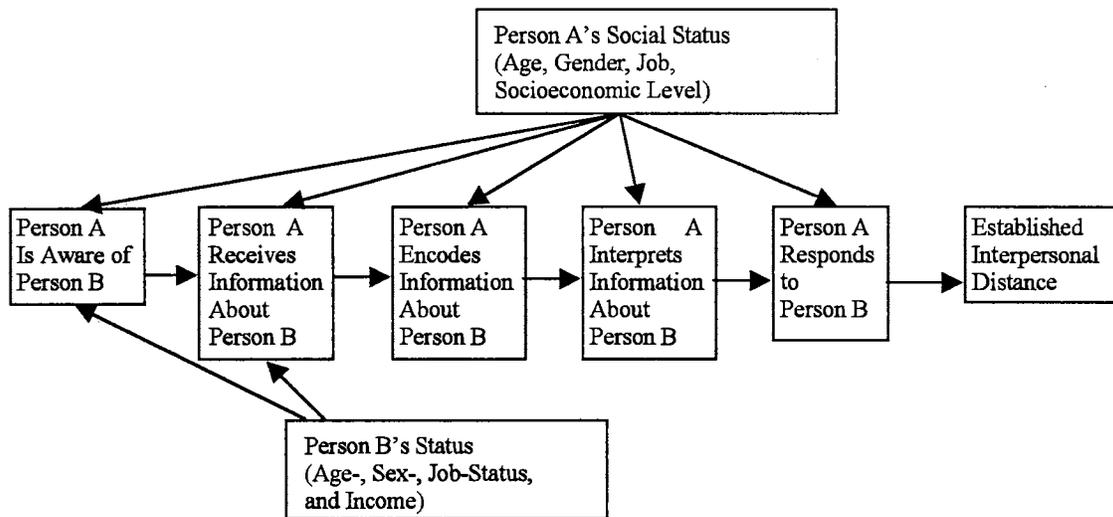


Figure 10.

Photo of Representative Scale Figures.

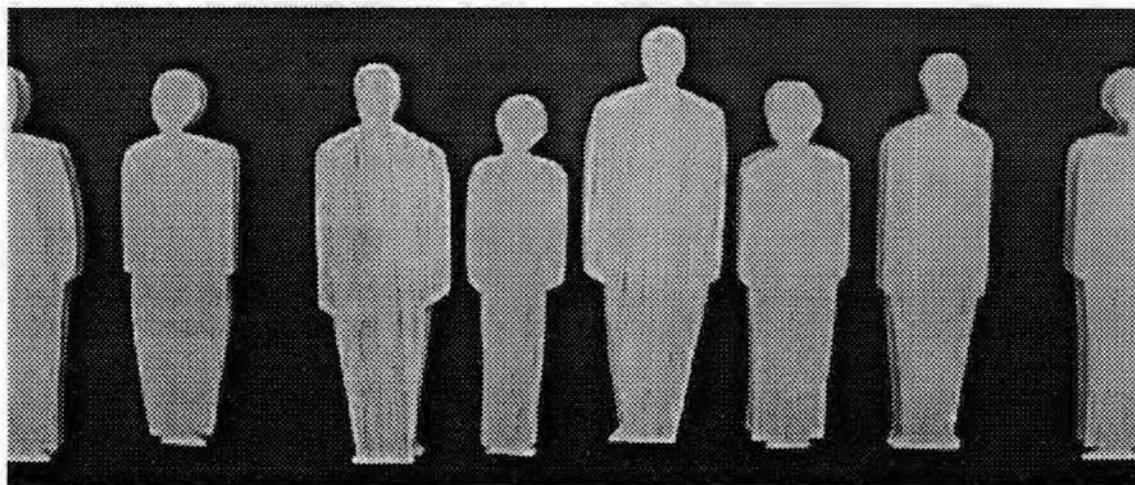


Figure 11.

Photo of Figure Stop Activity



CHAPTER V

THE INFLUENCE OF HUMAN FACTORS ON THE PERSONAL SPACE OF ELDERLY

MANUSCRIPT FOR PUBLICATION

JOURNAL TITLE: ENVIRONMENT AND BEHAVIOR

Abstract

The function of human factors in personal space research has been all but neglected. Elderly people experience a decline in human factors functioning as a result of the aging process or illness. Vision, hearing, and mobility were examined in relation to an elderly sample's perception of strength and aggression and established interpersonal distance. Results indicate no significant relationships existed; however methodological findings offer insights for future studies in personal space research.

Introduction

Personal space is a protective mechanism founded on the ability of the individual to perceive signals from one's physical and social environment (Hall, 1966; Horowitz, Duff & Stratton, 1964; Sommer, 1969). The protective role of space in human behavior serves two functions. The first type of space is territory and typically contains necessary resources for the animals' survival and is defended against intruders of the same species. The second type of space is actually an extension of one's body and moves with the animal. It is this distance which results in the spacing behaviors and patterns one can observe within and between species.

Edward Hall (1966) paints vivid pictures when he describes what is perceived about the other person when one establishes different spatial relationships or proxemic zones. At the furthest distance, body posture and orientation can be determined while at the closest distance one can see the pores of the other person's skin, smell the other's breath and perhaps feel the heat from the other's body. Kaplan (1972) proceeds one step further when he explains that sensory information is critical to one's existence:

“One must know what is happening, where one is in one's environment, before one can ascertain what might happen next. To these two basic skills of recognition and prediction must be added the capacity to evaluate outcomes and the capacity to select suitable actions.” (p. 30-6-1).

Therefore, what one is capable of sensing directly impacts the individual's ability to predict events and react with an appropriate response in an adequate time.

For this reason, the human factors of vision, hearing, and mobility are of special interest in personal space research. These are significant because of the role they play in receiving, processing and responding to the information used in establishing distance from other persons (Hall, 1966). In light of

recent demographic trends, it is more significant to consider elderly persons and the general degradation of vision, hearing and mobility experienced this population. Howell (1997) reminds us that our knowledge of the elderly and the aging process is very recent and still filled with considerable gaps. It is also important to remember that persons typically considered to be elderly (anyone over the age of 65) are part of an incredibly diverse group and that chronological age is not an accurate descriptor (Schaie, Campbell, Meredith, & Rawlings, (1988).

The role of personal space as a protective mechanism has long been established. However, this mechanism may become faulty over time if information is not received or correctly interpreted (Kaplan, 1982) and result in inappropriate or delayed responses threatening the wellbeing of the individual. Past research has examined the role of age in personal space behavior but has overlooked the physical components of aging and the potential impact on spacing behaviors. The purpose of this study was to investigate the relationship between age-related changes in vision, hearing, and mobility and established interpersonal distance.

Theoretical Model

Individuals maintain a personal space that impacts human interaction in a variety of physical and social contexts. The study of spacing patterns originated in animal behavior and addressed concepts such as dominance hierarchies and territoriality. Hediger (1961) initiated studies in animal behavior which led to the definition of "flight distance" and identified these spacing patterns as protective mechanisms. The concept of the "body buffer zone" was developed by Horowitz, Duff and Stratton (1964) and furthered the idea that these maintained distances had protective functions, even in man. Edward Hall (1963, 1966, 1968) coined the term "proxemics" in reference to the commonly recognized patterns and zones of human behavior; these zones prescribe the social context for and type of interaction to be permitted. Robert Sommer (1969) applied the concepts of personal space and his observations to the design of the constructed environment. These early researchers made the connection between observed animal behaviors to contemporary man's highly stylized conduct.

A primary component of spacing behaviors in animals is related to the defense of one's home and, ultimately, the well-being of the individual. Dominance hierarchies ensure survival of the species by facilitating the best-adapted animal access to necessary resources within a specific area. In the animal

kingdom, dominance is established through strength and often physical aggression (Drickamer & Vessey, 1992). The elderly experience changes in their physical ability and therefore may experience changes in their use or control of personal space.

A model was created to guide the investigation between age, status, and personal space. The model includes characteristics of the individual as well as an approaching person. The structure is based on a cognitive processing model which includes both the perception of as well as the interpretation of the stimulus (Figure 12).

Personal Space and Protective Mechanisms

The elderly often experience changes in their perceptual system which may negatively impact their ability to respond to pertinent environmental signals. Additionally, without appropriate stimuli, the individual is unable to establish appropriate spatial boundaries. If one considers personal space to be a protective mechanism, several groups of studies provide support for potential variation in the personal space of the elderly.

Feelings of vulnerability as a result of perceived aggression or dominance may trigger a need for protection. Bailey, Caffrey, and Hartnett (1976) investigated the impact of perceived aggression, physical strength and body type (muscularity) on personal space. Ratings on these qualities were not significantly correlated with personal space measures. Patterson and Sechrest (1970) found that ratings of dominance and aggression decreased as interpersonal distance increased. In a related study, Burgoon (1991) found that open posture conveyed feelings of intimacy, composure, informality and less dominance.

Anxiety or stress also result in the individual feeling vulnerable. Brady & Walker (1978) researched anxiety states and found a positive relationship between anxiety level and interpersonal distance. Dosey and Meisels (1969) studied the effects of stress conditions on personal space and found that in two of the three experiments subjects established greater distances in high stress conditions compared to low stress conditions. Examining the individual's own feelings of aggression and hostility, Greenberg, Aronow and Rauchway (1977) found significant, positive correlations between interpersonal distance and anxiety/hostility scores on the Rorschach barrier scale.

Not only can perceived aggression or feelings of anxiety result in greater personal space but perceptions of physical dominance can also influence the need for space. Caplan & Goldman (1981)

observed the intrusion patterns of subjects on short and tall confederates; findings indicate that both males and females invaded the space of short confederates more frequently than tall confederates. Harnett, Bailey and Hartley (1974) found that male and female subjects approached a short object more closely than a tall object. Gender did interact with the established differences; females approached seated objects more closely than males and males approached standing objects more closely than females. Phillips (1979) investigated the relationships between perceived body size and personal space in the elderly. Results indicate that elderly persons who maintain a small personal space have a larger perception of large body size compared to those who maintain a large personal space. Sanders (1976) found a positive correlation between body boundary (feelings of protectiveness) and interpersonal distance. These studies indicate that the size of the other individual influences space as well as your perception of your own size may result in the establishment of different spatial relationships.

Aggression and physical dominance represents only one side of the relationship between personal space and vulnerability. The inability to determine or perceive if the approaching person is aggressive or larger may result in feelings of uneasiness. Additionally, the ability to flee also impacts the critical distance (Hediger, 1961).

Studies examining the role of the sensory perceptual system are limited in number and scope. Mallenby and Mallenby (1975) investigated the personal space of hard-of-hearing children in public schools and institutions for the deaf. Findings revealed that hard of hearing children maintain a greater distance from "normal" peers if they attend a special school compared to those who attend a public school. Hayduk and Mainprize (1980) explored the relationship between personal space and blindness. Significant differences were not found between those completely blind, partially blind or seeing.

The distance established by the full mobile person is examined from someone using an assistive device has been examined; the distance the person using the device has not been investigated. In studies examining the use of mobility devices, the relationship the mobile person establishes from someone using a wheelchair and not the reverse relationship. People in an airport maintained a greater distance from someone using a wheelchair asking for directions compared to someone not using a wheelchair (Worthington, 1974). On the other hand, Kilbury, Bordieri and Wong (1996) found that subjects allowed less space to persons using a wheelchair compared to those who did not use a wheelchair. The authors

suggest that recent legislation has helped to decrease stigmatization of disabled persons. Holmes, Karst and Erhart (1990) suggest that persons with disabilities confront barriers to establishing appropriate social distances because of the disability. Stephens and Clark (1987) found that persons without disabilities do not approach those with disabilities as closely compared to those without disabilities. None of these studies provide an empirical foundation for the personal space of those using wheelchairs or other mobility devices.

In general, these studies suggest that when the perception of aggression or dominance is high, personal space increases. Also, those who feel physically smaller desire larger personal spaces perhaps as a method of adjusting the critical distance for flight.

Sensory Perceptual System and the Elderly

The elderly are an increasingly diverse population and virtually everyone over the age of 65 has experienced at least one age-related change in his/her physical person. Some estimates indicate that 46% of the legally blind are over the age of 65 (Kline & Scialfa, 1997) and others report that although hearing loss is mild to moderate it is wide spread among elderly populations (Fozard, 1990). Some changes occur as the result of illness, disease or even accident while others are a part of the gradual decline that frequently accompanies the aging process (Ferrini & Ferrini, 1992).

Vision. As an individual ages, several things happen gradually that affect visual health. The cornea of the eye gradually thickens and becomes yellow and allows less light to enter the fovea of the eye. This causes color perception to change; for example, blue may become greenish in hue and purples or violets will become gray (Hiatt, 1981). The pupil has a smaller resting diameter (Kline & Scialfa, 1997) and this may result in the elderly individual being less able to adjust to changes in the lighting levels and therefore discern less detail about the people and things around them (Fozard, 1990). A reduced scanning ability and difficulty in target identification within a cluttered field may also confound other problems in the sensory perceptual system (Fozard, 1990; Sanders & McCormick, 1993b). The elderly may be unable to select the speaker in a crowd or to identify someone or something they are looking for within a given environment. Reduced depth perception may result in slow recognition of individuals as well (Sanders and McCormick, 1993b).

Hearing. A decrease in hearing acuity is also widespread among the elderly, especially among men. This is most prevalent in the inability to tune out background noise room (Fozard, 1990; Sanders & McCormick, 1993a) and therefore the elderly may not understand what is spoken directly to them in a crowded or noisy. High frequency detection has also been shown to decline with age and recognition of consonants also deteriorated with age (Fozard, 1990).

Posture and mobility. The elderly also experience several changes in their overall physical ability and posture which may affect their interactions with others. A reduced range of motion (Panero & Zelnik, 1979) and reduced strength (Kroemer, 1997) may result in a reduced ability to move around or to avoid particular individuals or environments which cause them to feel vulnerable (Hiatt, 1993). The elderly also become smaller over time due to loss of muscle mass and changes in posture (Carpman and Grant, 1993). This may make other individuals feel threatening or their view of these individuals may change in such in a way that interaction becomes uncomfortable at particular distances

Human factors data has been collected and evaluated in light of industrial and work settings or product design. Application of human factors data to behavioral research has been limited and additional research is required in these areas before conclusions can be formulated.

Hypotheses

To determine the relationship between the factors of vision, hearing and mobility, and personal space five hypotheses were developed:

Hypothesis 1: Perceived aggression about an approaching person will vary as a function of the participant's own characteristics (age, sex, vision, hearing, mobility).

Hypothesis 2: Perceived strength about an approaching person will vary as a function of the participant's own characteristics (age, sex, vision, hearing, mobility).

Hypothesis 3: Interpersonal distance will vary as a function of perceived aggression.

Hypothesis 4: Interpersonal distance will vary as a function of perceived strength.

Hypothesis 5: Interpersonal distance will vary as a function of the participant's own characteristics (age, sex, vision, hearing, and mobility).

Methods

Subjects. Participants were volunteers recruited from local church, civic, and social organizations. The researcher visited each group personally and requested assistance with the project. Any person over the age of 55 not suffering from dementia was included in the study. The sample consisted of 108 persons ranging in age from 56 to 94. All participants were Caucasian Americans who had lived primarily in the Oklahoma region (Table 7).

Scale figures and model. In the figure-stop activity, participants held a scale figure representing him/herself and was approached by another scale figure held by the researcher. The approaching figure represented people with different descriptions (age, gender, job). For the figure-stop activity, a generic interior space and figures were created to control for variation in the data collection sites.

The scale figures were cut from unfinished basswood and consisted of two silhouettes with layers of basswood between to vary the thickness and were constructed at 1" = 1' - 0" scale (Figure 13). The figures ranged in height from 5' - 0" to 6' - 3" and from 19" to 26" in width (elbow to elbow). Profiles were created that suggested a person with clothing and varied in the roundness of the shoulder, shape of the head and the width of the pant leg. Overall dimensions were taken from Human Dimensions and Interior Space (Panero & Zelnick, 1979) and the 95 percentile was used in the creation of the figures. Prior to the experiment, the figures were pilot tested for appropriate ethnicity, gender and size with a similar sample. The shape of the figure (head, shoulders) were found to be significant factors in the selection; gender and size were of less importance in the pilot test.

The approaching figures were represented by two scale figures constructed in the same manner. These figures were 5'3" and 5'9" tall and represented a female and a male respectively. The figures were pilot tested and the sample indicated that size, shape and gender were all adequately portrayed for the age, gender and job described for the purpose of the experiment.

The scale model was constructed at 1" = 1' - 0" scale and was constructed of a Styrofoam base that was 24" x 36", was covered in an off-white fabric and was framed with unfinished basswood. Walls were constructed on three sides; they were scaled to 10' - 0" high and were made of 1/8" foam core. The walls and floor of the model were left white or off-white and devoid of any decoration.

Demographic instrument. A demographic instrument was designed to be administered in an interview setting. The information included personal data, information about employment and careers, living arrangements, and information on visual and hearing acuity and ease of mobility as well as any assistive device used. The interview also included an activities checklist which indicated common problems often faced by the elderly (Table 8). These categories were grouped into the three areas of vision, hearing and mobility.

Characteristic rating forms. Each participant was asked to rate the people that approached them in the scale model activity. The rating form included the brief description provided to them during the activity (i.e. a 45-year-old woman who is a school teacher) and a list of characteristics (physical strength, aggression). The participant rated each of the four persons on a scale from 1 (low) to 5 (high) for each of the characteristics.

Data collection sequence. Each participant was met individually by the researcher and introduced to the scale model and figures used in a figure-stop activity. The researcher explained that scale figures would be used in the experiment and that he/she would need to that he/she was comfortable with to represent him/herself. Following this selection, the participant was asked to view the model and to imagine that it was a large empty room such as a classroom or activity room in a community center. The script included the explanation that the walls and floor were bare and that there was no furniture.

The participant was instructed to hold the figure at one end of the room approximately five feet from the wall and was told that he/she was facing the other end of the room (Figure 14). The script explained that several different people were going to approach them from across the room. The verbal instructions were patterned after those in Duke and Nowicki's Comfortable Interpersonal Distance Scale (1972). The participant was "approached" by four different persons. These people varied by age (28-, 45- and 65-year-olds), gender, and job (grocery clerk, school teacher, and doctor). Of the eighteen possible variations, templates were made of four randomly selected persons to decrease order effects (Keppel, 1991). Each participant was randomly assigned one of the templates. The researcher explained that these individuals were present to help with the experiment, meant no harm to the participant and that the only thing they would do was walk toward him/her. The participant was told that the approaching person would be described and that as the person approached them, he/she should tell the person to stop when the person

was "too close for comfort." When the respondent said "stop," the researcher measured the distance with an architectural scale and recorded the distance.

After the scale model activity was complete, the participant was interviewed by the researcher and the demographic questionnaire was completed. This interview was informal and many of the questions were answered during the casual discussion.

Following the interview, the participant was asked to think about the people that had approached them from across the room. The researcher explained that she was interested in how the respondent had envisioned these people and what types of characteristics they might have imagined. The rating form was presented to the participant and they were instructed to rate each person on physical strength, aggression and general health. If the respondent indicated that a particular quality had not been considered, he/she was told that it was appropriate to leave that score blank.

Data collection. Due to the limited mobility of the sample and to increase participation, data were collected at the location the researcher met the participant. These sites included exercise facilities, activity rooms in living facilities, churches and community centers, and conference or lounge areas on the university campus. The participant was allowed to select the site most convenient; no participant was introduced to a site that he/she was not familiar. The physical spaces varied in the degree of publicness and overall size although lighting and thermal conditions were similar across conditions. Attention to lighting, orientation to space and arrangement of furniture was adjusted when possible by the researcher. Data collection occurred during January through April, 1999 between 8 a.m. and 7 p.m.

Results

The activities checklist was used to determine what common problems the participants may experience. There were six items for vision, four items for hearing and five items for mobility. For each problem that received an affirmative response, one point was scored and the responses in each area were totaled (Table 9). Data concerning the use of assistive devices such as eye glasses, hearing aids and canes were also collected and summarized (Table 10).

Hypothesis 1: Perceived aggression about an approaching person will vary as a function of the participant's own characteristics (age, sex, vision, hearing, mobility).

Regression analysis with a backward selection process in SAS was used to examine the model. The results indicate that a significant relationship did exist, $F(7,194) = 2.80$, $p < .0086$. The significant predictors in the model were the participant's age and sex, and mobility approached significance; approximately 9% of the variation could be accounted for in the model (Table 11).

Hypothesis 2: Perceived strength about an approaching person will vary as a function of the participant's own characteristics (age, sex, vision, hearing, mobility).

Regression analysis with a backward selection process in SAS was used to examine the model. The results indicate that a significant relationship did exist, $F(7,192) = 7.60$, $p < .0001$. The significant predictors in the model were the participant's sex and mobility; 22% of the variation could be accounted for in the model (Table 12).

Hypothesis 3: Interpersonal distance will vary as a function of perceived aggression. Pearson's product moment correlation indicated that a weak, positive relationship existed between aggression evaluations and established interpersonal distance, $R = .1178$, $p < .0594$.

Hypothesis 4: Interpersonal distance will vary as a function of perceived strength. Pearson's product moment correlation indicated a that a weak, positive relationship did exist between physical strength evaluations and established interpersonal distance, $R = .1207$, $p < .0538$.

Hypothesis 5: Interpersonal distance will vary as a function of the participant's own characteristics (age, sex, vision, hearing, and mobility).

Regression analysis with a backward selection process in SAS was used to examine the model. The results indicate that a significant relationship did exist, $F(7,288) = 9.65$, $p < .0001$. The significant predictors in the model were the participant's gender, age, and mobility (Table 13).

Conclusions

The findings partially support the proposed model and hypotheses. The individual's own characteristics of age, gender, and mobility affect the perception of aggression and physical strength. Perception of physical strength and aggression, while not significantly related to interpersonal distance, cannot be discounted. The weak relationships found are supported by other research findings on aggression and strength (Bailey, Caffrey, & Hartnett, 1976; Greenberg, Aronow, & Rauchway, 1977; Patterson &

Sechrest, 1970). Finally, the individual's own characteristics were found to be significant predictors of established interpersonal distance.

Previous research suggested that perceived aggression or physical strength would influence interpersonal distance (Bailey, Caffrey & Harnett, 1976; Cavallin & Houston, 1980; Harnett, Bailey & Hartley, 1974; Lerner, Karabenick & Meisels, 1975). The results may have been influenced by the instructions read to the sample during the figure stop activity. The participants were instructed that the approaching person meant them no harm and were approaching them only for the purpose of the experiment. This may have weakened any perception of aggressiveness and diluted the responses. Second, the scale figures, which varied in height and weight, did not illustrate an overly muscular physique and therefore may not have adequately communicated strength to the participants. This would suggest that before conclusions could be reached, additional research is required.

It was also anticipated that the human factors of vision and hearing would be significant predictors in establishing personal space. This was not supported by the findings and there are two potential explanations for this. First, the measurements of visual and hearing acuity were based on self-report of difficulties in activities of daily living. The researcher observed that participants often denied difficulty with these activities yet exhibited the opposite behavior during the experiment. For example, when asked about hearing without seeing someone's mouth, the participant would reply "no" although he/she would be staring intently at the researcher's mouth. Other observations included the request for additional light to complete paperwork, difficulty in rising from chair, and holding to handrails or furniture for support or balance. Additionally, the scale model did not "test" the role of vision and hearing and full scale environments may be more appropriate in determining this relationship. The lack of research in this area does not allow for additional interpretation beyond this one study.

The findings suggest the individual uses knowledge about him/herself in establishing a comfortable interpersonal distance. When the scale figures and model did not provide a reasonable stimulus for response, the significance of the individual's age, gender, and mobility become more important. Future research should investigate the relationships between the individual's feelings of aggression and strength and the established distance.

The role of mobility is the most significant finding in the study. The ability to flee is the most basic protective mechanism and its significance should not be surprising. The results indicate that as mobility decreases, interpersonal space increases. Future research should examine more closely the use of mobility devices and the distances established by the users and not the fully mobile person. The person using a mobility device may experience increased comfort when in a space that supports his/her needs. This may include finishes which provide good traction and good contrast between levels, multiple egresses, and ample circulation space. Exits should be clearly marked and pathways clear and direct.

When one considers the aging person, there is a tendency to classify persons ranging from 60 to over 100 years of age in the same category. In truth, the onset of age-related change is unique to each individual (Schaie, et al, 1988). Each person, and indeed each system within the human body, ages at an independent rate and this is confounded by individual differences such as motivation, locus of control, and risk taking (Rogers, 1997). For this reason, individuals develop compensatory skills which allow them to overcome weaknesses (Lawton & Nahmow, 1973). In addition to personal variation and compensation, the human sensory perceptual system involves a complex system of checks and balances (Sanders & McCormick, 1993). This allows the individual with decreased visual acuity to rely more on auditory information or tactile sensation thereby maintaining an optimal level of functioning (Rogers, 1997). Additional research is necessary to establish the role of perception in personal space behaviors for both the young and the elderly alike.

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Table 7.

Demographic Summary of Participating Sample.

	Males	Females
	n = 35	n = 73
Age	M = 69	M = 75
(Range)	(50 – 88)	(56 – 94)
Marital Status		
Married	88%	32%
Widowed	12%	53%
Other	0%	15%
Living Arrangement		
Independent	76%	44%
Assisted	24%	55%

Table 8.

Summary of Checklist of Activities

Difficulty	Affirmative Responses	
	n	Percentage
Difficulty keeping my balance when standing still (M)	20	21%
Difficulty seeing in bright lights or bright sunlight (V)	32	33%
Difficulty hearing others in a small group (H)	26	27%
Weakness in my legs when rising from a chair (M)	34	35%
Difficulty hearing others in noisy settings (H)	51	53%
Difficulty walking short distances (i.e. to your mailbox) (M)	13	13%
Difficulty seeing individuals standing 2 to 3 feet away (V)	1	1%
Difficulty reading the newspaper without extra light (V)	28	29%
Dizziness or unsteadiness when walking (M)	18	19%
Difficulty seeing when driving at night (V)	51	53%
Difficulty seeing individuals standing 4 to 7 feet away (V)	7	7%
Difficulty walking moderate distances (i.e. around a shopping mall) (M)	25	26%
Difficulty seeing individuals who are more than 8 feet away (V)	10	10%
Difficulty hearing the telephone or doorbell (H)	9	9%
Difficulty hearing someone speak if I can not see their mouth (H)	17	18%

Note: V = Vision, H = Hearing, M = Mobility

Table 9.

Mean Scores for Activities Checklist

	M	SD	n
Vision	1.33	1.1500	
Hearing	1.06	1.0645	
Mobility	1.12	1.4329	

Note. One point scored for each of 6 vision activities, 4 hearing activities and 4 mobility activities.

Table 10.

Visual, Hearing and Mobility Checklist.

Do you wear glasses for reading or close work all of the time?	53.7%	(n=58)
Less than 100% of the time?	10.2%	(n=11)
Do you wear glasses for distance seeing all of the time?	59.3%	(n=64)
Less than 100% of the time?	16.6%	(n=18)
Do you use a cane to assist you in walking all of the time?	2.7%	(n= 3)
Less than 100% of the time?	14.8%	(n=16)
Do you use a walker to assist you in walking all of the time?	0.0%	(n= 0)
Less than 100% of the time?	5.5%	(n= 6)
Do you any other type of mobility device all of the time?	0.8%	(n= 1)
Less than 100% of the time?	3.7%	(n= 4)
Do you use a hearing aid all of the time?	8.3%	(n= 9)
Less than 100% of the time?	14.8%	(n=16)

Note: For those participants using mobility assistance less than 100% of the time, most stated that they used the device when away from home, in unfamiliar territory, or at night. Those participants who using eye glasses less than 100% of the time indicated they were for specific purposes such as reading or watching television.

Table 11.

Summary of Backward Regression Analysis for Variables Predicting Variation the Perceived Aggression.

Variable	R	Standard Error	F	p
Step One*				
Subject's Sex	-0.3195	0.1311	5.94	0.0157
Subject's Age	0.0121	0.0049	5.97	0.0154
Vision	-0.0022	0.0222	0.01	0.9215
Hearing	-0.0165	0.0358	0.21	0.6459
Mobility	0.0611	0.0348	3.08	0.0810

Note: R2 = 0.09 for Step One;

*p < .0086.

Table 12.

Summary of Backward Regression Analysis for Variables Predicting Variation in Perceived Physical Strength.

Variable	R	Standard Error	F	p
Step One*				
Subject's Sex	-0.5907	0.1147	26.49	0.0001
Subject's Age	0.0071	0.0044	2.55	0.1119
Vision	-0.0243	0.0197	1.52	0.2193
Hearing	0.0157	0.0316	0.25	0.6188
Mobility	0.1398	0.0304	21.07	0.0001

Note: R² = 0.22 for Step One;

*p < .0001.

Table 13.

Summary of Backward Regression Analysis for Variables Predicting Variation in Established Interpersonal Distance.

Variable	R	Standard Error	F	p
Step One*				
Subject's Sex	16.9773	4.4375	14.64	0.0002
Subject's Age	1.3018	0.1792	52.78	0.0001
Vision	0.7405	0.7246	1.04	0.3077
Hearing	-1.6909	1.2005	1.98	0.1601
Mobility	-2.3243	1.0161	5.23	0.0229

Note: R2 = 0.19 for Step One;

*p < .0001.

Figure 12.

Theoretical Model of Personal Space.

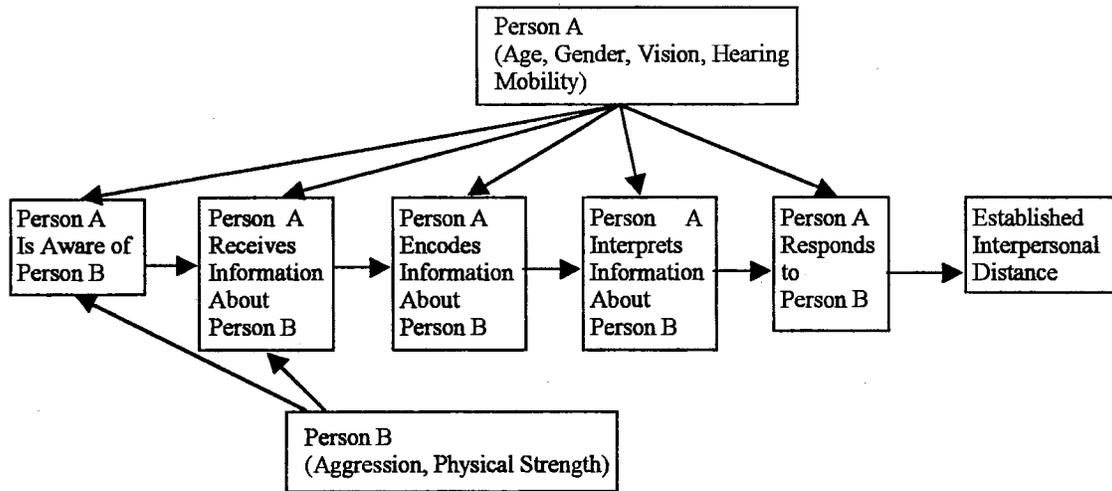


Figure 13.

Photo of Representative Scale Figures

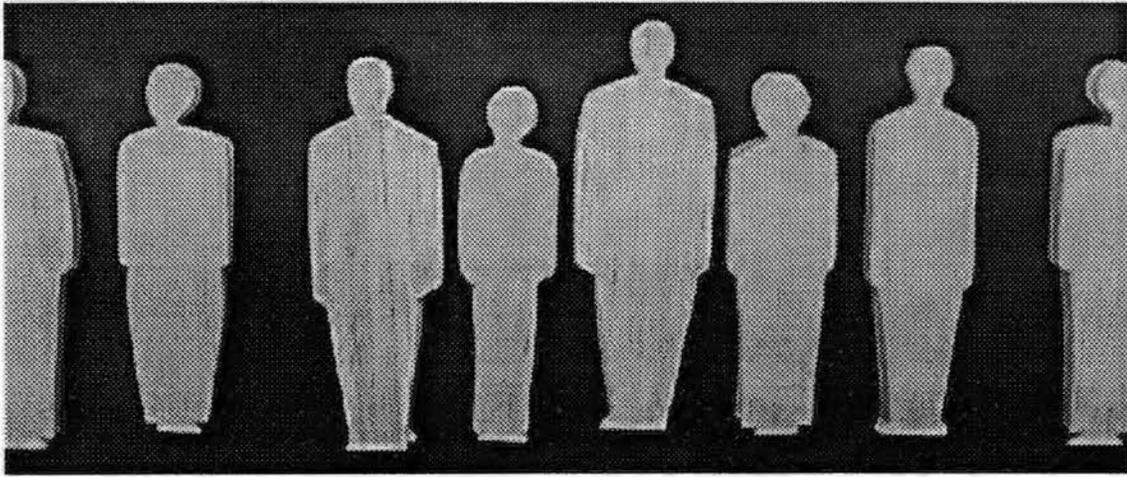
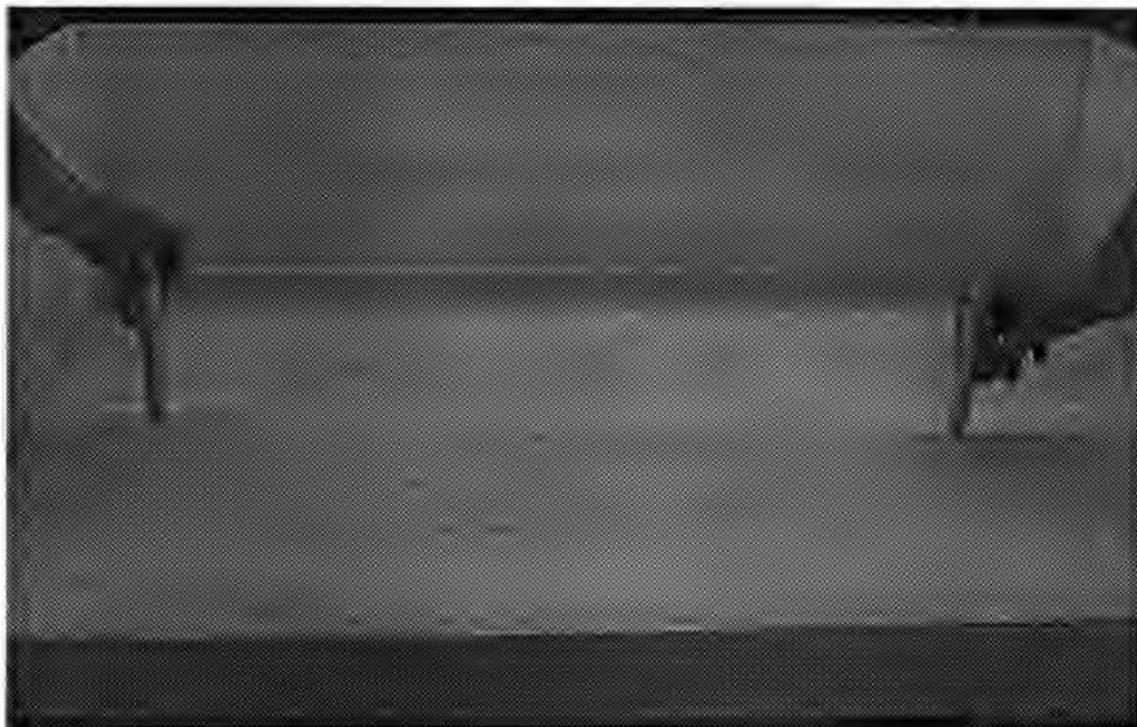


Figure 14.

Photo of Figure Stop Activity.



CHAPTER 6

CONCLUSIONS

This study represents a complex investigation into the interpersonal distances established by an older adult sample. The findings partially support the proposed model and provide a starting point for future studies for application to the design of the built environment. The model was tested in three stages. The preliminary and sequential tests are summarized below and final conclusions are discussed with recommendations for future study.

Preliminary Investigation

Existing theory and empirical research indicate the importance of the relationship between two individuals. Most studies examining the impact of the second person address qualities such as gender (see Evans & Howard, 1973), age (see Hayduk 1984), or culture (see Baldassare & Feller, 1975 and the ensuing spatial patterns. Other studies have delved more deeply into the perceptions of the other person and have examined the role of qualities such as height (Hartnett, Bailey & Hartley, 1974), body size (Bailey, Caffrey & Hartnett, 1976), and attire (Barash, 1973; Boushka & Beatty, 1978).

This study found that evaluations of the approaching person varied as a function of their described age, gender and job (Appendix H). In general, the evaluations of sex-, job-, and age-related status, general health, physical strength, aggression, and intelligence varied consistently. As age increased, evaluations increased for all qualities except health and physical strength which decreased. Grocery clerks, school teachers and doctors received increasingly greater scores for all eight qualities and males typically received higher scores than females. These findings may indicate the strength of our perception of work and gender roles and that these roles influence all facets of an individual and not simply the work or gender role individually. Some significant interactions did occur but they were not consistent across all eight characteristics examined.

This suggests that the concepts and evaluations of other persons goes beyond an easily discernable feature such as gender and warrants closer investigation. Future studies should more carefully examine the

precise stimulus to the response before conclusions can be reached. A method which elicits the relationship between tacit or subconscious knowledge (Reber, 1993) and spatial behavior should be developed. This would allow a more accurate understanding of spatial behaviors which in turn could positively influence the design of the built environment and allow those interacting with persons in a counseling or healthcare setting to be more sensitive to the needs of the individual.

Testing the Model

The model proposed for this study was tested in three steps (Figure 15). The first step was to determine the relationship between the participant’s own characteristics and their perceptions or evaluations of the approaching person. The second step was to examine the relationship between those perceptions and the interpersonal distance that was established. The final step was to investigate the relationship between the participant’s own characteristics and the interpersonal distance that was established.

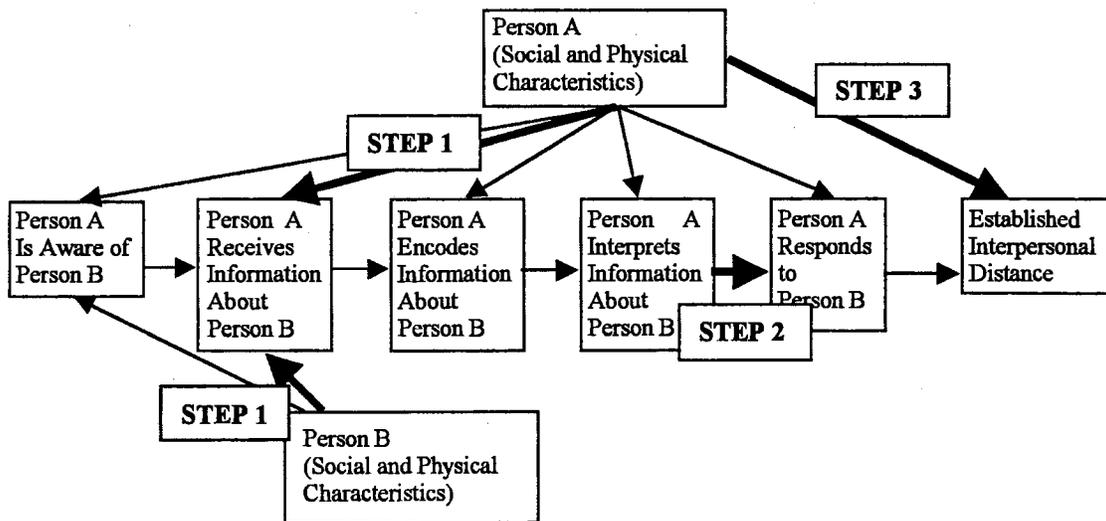


Figure 15. Process of Testing the Theoretical Model.

The first step, determining the relationship between the participants own characteristics and the perception of the approaching person, revealed that a pattern did exist (Appendix I). For all eight evaluated characteristics (age-, sex-, and job-related status, general health, physical strength, aggression, income and

intelligence), the individual's own age and sex were significant predictors for most of the characteristics. Hearing acuity and mobility were significant predictors for half of the characteristics.

The second step was to determine the relationship between the perceptions of the approaching person and the established interpersonal distance. The analysis indicated that no significant relationships existed and this indicated that a mediating relationship (Baron & Kenny, 1986) did not exist.

The final step was to examine the relationship between the participant's own characteristics and established interpersonal distance (Appendix I). This analysis revealed that the individual's age, gender, socioeconomic level and mobility significantly influenced the spacing distances: 1) as age and socioeconomic level increased, there was a corresponding increase in interpersonal distance; 2) as the number of mobility problems increased, there was a corresponding increase in interpersonal distance; and , 3) women tended to establish slightly smaller distances than men.

Conclusions

After testing the model, conclusions addressing several different areas can be addressed. One must consider: 1) the individual's own qualities as they influence personal space; 2) the data collection method and the role of tacit knowledge; and 3) the role of personal space as a protective mechanism.

The findings indicate the individual may use his or her own qualities when establishing interpersonal distances. Referent information is used for comparison and may be generated from past experience and knowledge of one's own strengths and weaknesses or abilities. This study specifically removed context from the interaction yet it is this context that may, in and of itself, determine to a great extent personal space patterns. The individual's own abilities may especially dominate the process when information about the other person and the context is limited. For this reason, a different data collection method may be beneficial or increasing the strength of the stimulus (i.e. more detail in the scale figures/model and in the scenario) and increasing the amount of time for information processing. Understanding the balance between internal reference and external stimulus would also be beneficial in the interpretation of future findings.

While the use of scale models provided a good representation of the scale of the space, the results indicate some weaknesses may exist. The scale model was used to control of exogenous variables in the physical environment and this remains important as the physical environment has been shown to influence

personal space (Bell & Bernard, 1984; Cochran & Urbanczyk, 1982; Leventhal, Schanerman & Maturro, 1978; Smith, 1980b). However, both the scenario and the model were devoid of detail concerning the interaction and for this reason the participants may have had difficulty understanding the context of interaction. A scenario which was richer in detail would help to balance the detail missing from the scale environment. Additionally, the scale figures have a lack of detail and a number of the study's participants commented that they could not see their face, clothes or expression. Future studies must balance the control of the physical environment, the context of the interaction and the variation in human interpretation/experiential influence in order to better understand human spatial behaviors in experimental settings.

There are several examples of the lack of detail in the participants' comments. When the participants were asked to evaluate the approaching persons simulated by the figure, they often expressed concern about their "lack of knowledge" or used people with whom they were acquainted on which to base their evaluations. For example, one woman, when told the man approaching her was a 45 year old doctor, said, "Oh, I really like my doctor. He is such a nice young man." She allowed the figure to approach very closely. Another woman stated that the store where she shopped employed mentally disabled persons and that it "was hard to imagine someone else" as the grocery clerk. These experiences and comparisons can not be accounted for in the study and probably account for a significant portion of the variation. A scenario that provided a richer context and more life-like figures may elicit more valid responses.

The role of one's sex, age, income, and mobility provides another perspective on the role of personal space as a protective function. Women established smaller distances than men and this is consistent with the majority of the literature on personal space. Additionally, as age and income increased, so did established interpersonal distance. And as mobility decreased (reported difficulties getting around home or community), interpersonal distance increased. These findings could be interpreted as response to implied threat or feelings of vulnerability. The role of mobility is significant as a protective mechanism (Hediger, 1961; Lorenz, 1952) and additional research is necessary in this area. Although none of the participants moved his/her figure backwards several of them commented that the approaching figure could come as close as they liked because they were not afraid of anyone. All studies examining distancing

patterns for wheelchair users have examined the perspective of the fully mobile person and not that of the user.

Future studies must address several different areas. These include: (1) an increased understanding of the role of tacit knowledge in personal space behaviors, (2) the role of context in the data collection process, (3) the role of mobility and mobility devices in the establishment of personal space, and (4) feelings of threat or vulnerability in the establishment of interpersonal distance, especially for elderly persons.

The model suggested for the project has been partially supported. Most of the links between the stages of information processing have been shown to be valid although not all of the links have been proven to be strong. Certainly, an additional path directly from the individual (self-reference) to the established interpersonal distance must be added in light of the findings (Figure 16). Additionally, the context of interaction has been added and must be tested in future studies.

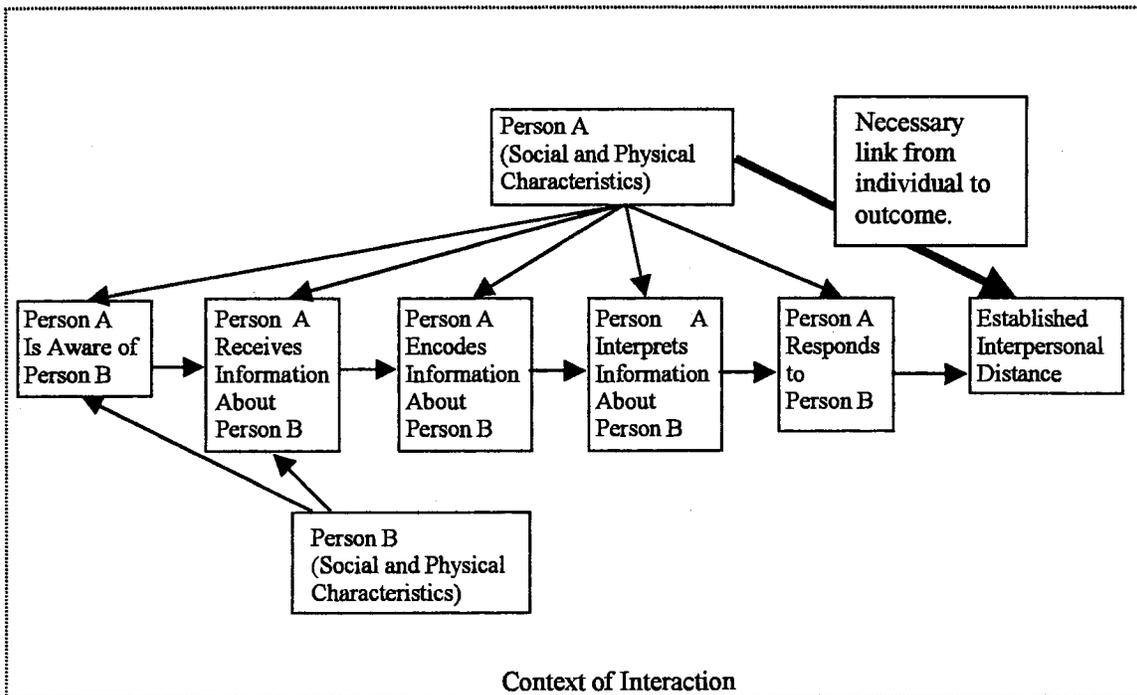


Figure 16. Revised Theoretical Model of Personal Space

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APPENDIX A
KEIRSEY TEMPERMENT SORTER

Please check the box next to the answer which seems to be the most like yourself. There are no right or wrong answers.

1. Do you prize in yourself
strong hold of reality
a vivid imagination
2. In making up in your mind are you more likely to go by
data
desires
3. When finishing a job, do you like to
tie up all the loose ends
move on to something else
4. Facts
speak for themselves
illustrate principles
5. In a heated discussion, do you
stick to your guns
look for common grounds
6. Which appeals to you more
consistency of thought
harmonious relationships
7. Is it preferable mostly to
make sure things are arranged
just let things happen naturally
8. Do you think of yourself as
an outgoing person
a private person
9. Do you more often see
what's right in front of you
what can only be imagined
10. Does interacting with strangers
energize you
tax your reserves
11. In trying circumstances are you sometimes
too unsympathetic
too sympathetic
12. Are you more
observant than introspective
introspective than observant

13. Are you more satisfied having
a finished product
work in progress
14. Would you say you are more
serious and determined
easy going
15. Common sense is
usually reliable
frequently questionable
16. At work do you tend to
be sociable with your colleagues
keep more to yourself
17. Are you more
sensible than ideational
ideational than sensible
18. Do you value in yourself more that you are
reasonable
devoted
19. Are you the kind of person who
is rather talkative
doesn't miss much
20. At work, is it more natural for you to
point out mistakes
try to please others
21. When the phone rings do you
hurry to get it first
hope someone else will answer
22. With people are you usually more
firm than gentle
gentle than firm
23. Are you more likely to trust
your experiences
your conceptions
24. Are you drawn more to
fundamentals
overtones
25. Do you think of yourself as a
tough-minded person
tender-hearted person
26. If you must disappoint someone are you usually
frank and straightforward
warm and considerate

27. Are you more frequently
a practical sort of person
a fanciful sort of person
28. Which is more of a compliment:
"There's a logical person"
"There's a sentimental person"
29. Do you consider yourself
a good conversationalist
a good listener
30. Are you more comfortable in making
critical judgements
value judgements
31. Are you more interested in
what is actual
what is possible
32. Do you see yourself as basically
thick-skinned
thin-skinned
33. Are you swayed more by
convincing evidence
a touching appeal
34. Do you usually want things
settled and decided
just penciled in
35. Do you tend to be more
factual than speculative
speculative than factual
36. Are you more comfortable
after a decision
before a decision
37. Is it easier for you to
put others to good use
identify with others
38. Which seems the greater fault:
to be too compassionate
to be too dispassionate
39. Is clutter in the workplace something you
take time to straighten up
tolerate pretty well
40. Waiting in line, do you often
chat with others
stick to business

41. Are you more often
a cool-headed person
a warm-hearted person
42. Do you feel better about
coming to closure
keeping your options open
43. At a party, do you
interact with many, even strangers
interact with a few friends
44. Do you tend to notice
disorderliness
opportunities for change
45. Is it your way to
make up your mind quickly
pick and choose at some length
46. Which rules you more
your thoughts
your feelings
47. Are you inclined to be
easy to approach
somewhat reserved
48. In sizing up others do you tend to be
objective and impersonal
friendly and personal
49. Do you prefer to work
to deadlines
just whenever
50. Do you tend to
say right out what's on your mind
keep your ears open
51. Are you inclined to take what is said
more literally
more figuratively
52. In most situations are you more
deliberate than spontaneous
spontaneous than deliberate
53. Is it worse to be
a softy
hard-nosed
54. Are you more inclined to feel
down to earth
somewhat removed

55. Children often do not
make themselves useful enough
exercise their fantasy enough
56. Is it worse to
have your head in the clouds
be in a rut
57. Do you like writers who
say what they mean
use metaphors and symbolism
58. Do you prefer contracts to be
signed, sealed, and delivered
settled on a handshake
59. Is it better to be
just
merciful
60. Do you more often prefer
final, unalterable statements
tentative, preliminary statements
61. Do you speak more in
particulars than generalities
generalities than particulars
62. On the job do you want your activities
scheduled
unscheduled
63. In stories do you prefer
action and adventure
fantasy and heroism
64. Do you find visionaries and theorists
somewhat annoying
rather fascinating
65. Which do you wish more for yourself:
strength of will
strength of emotion
66. Are you inclined to be more
hurried than leisurely
leisurely than hurried
67. When in charge of others do you tend to be
firm and unbending
forgiving and lenient
68. Do you tend to choose
rather carefully
somewhat impulsively

69. Are you prone to
nailing things down
exploring the possibilities

70. Are you more
routinized than whimsical
whimsical than routinize

APPENDIX B
DEMOGRAPHIC INTERVIEW

ID# _____

Personal Information

The following questions are about you, your current health status and some of the activities in which you are currently participating. Please, check the blank next to the information that most closely resembles you at this time.

1. My age on my last birthday was _____.

2. My household annual income is (check one):
 - _____ less than \$10,000
 - _____ \$10,000 - \$19,999
 - _____ \$20,000 - \$34,999
 - _____ \$35,000 - \$49,999
 - _____ \$50,000 - \$64,999
 - _____ \$65,000 - \$74,999
 - _____ Over \$75,000

3. I am currently (check one):
 - _____ Married
 - _____ Widowed
 - _____ Single, never been married
 - _____ Widowed or single but co-residing with partner
 - _____ Widowed or single but actively dating
 - _____ Divorced

4. My gender is (check one) :
 - _____ Female
 - _____ Male

5. My cultural or ethnic background is (check all that apply):
 - _____ American Indian or Alaska Native
 - _____ Asian
 - _____ Black or African American
 - _____ Hispanic or Latino
 - _____ Native Hawaiian or Pacific Islander
 - _____ White

6. Currently, I live
 - _____ Alone
 - _____ With my spouse
 - _____ With one or more of my children
 - _____ With relatives
 - _____ With friends
 - _____ Other _____

7. Currently, I live in a(n):
 - _____ House
 - _____ Apartment
 - _____ Congregate living environment
 - _____ Nursing home or other healthcare environment
 - _____ Other _____

19. Do you wear glasses for distance seeing (check one):
 A. No (if no, please go to question 21)
 B. Yes (if yes, please go to question 20)
20. Do you wear the glasses (check all that apply):
 A. All the time
 B. About 75% of the time
 C. About half the time
 D. About 25% of the time or less
Please go to question 21.
21. Do you wear glasses for reading or other close work?
 A. No (if no, please go to question 23).
 B. Yes (if yes, please go to question 22).
22. Do you wear the glasses (check all that apply):
 A. All the time
 B. About 75% of the time
 C. About half the time
 D. About 25% of the time
Please go to question 21.
23. Do you use a cane to assist you in walking?
 A. No (if no, please go to question 25)
 B. Yes (if yes, please go to question 24)
24. Do you use then cane?
 A. All the time
 B. About 75% of the time
 C. About half the time
 D. About 25% of the time
Please go to question 25.
25. Do you use a walker to assist you in walking?
 A. No (if no, please go to question 27)
 B. Yes (if yes, please go to question 26)
26. Do you use the walker?
 A. All the time
 B. About 75% of the time
 C. About half the time
 D. About 25% of the time
Please go to question 27.

27. Do you use any other mobility device?

A. No (please go to question 29)

B. Yes (please go to question 28)

28. If yes, what mobility device do you use and how often do you use it?

Please go to question 29.

29. Do you use a hearing aid?

A. No (please go to question 31)

B. Yes (please go to question 30)

30. Do you use a hearing aid (check all that apply)?

A. All the time

B. All of the time when you are alone

C. Some of the time when you are alone

D. All of the time when with other people

E. Some of the time with other people

Please go to question 31.

31. In general, how would you rate your overall health:

A. I feel pretty good and am able to do anything I want.

B. Most days I feel good and only rarely do I find that I need to cut back on some activities.

C. There are more days than not when I don't feel like doing much and prefer to stay home where I am most comfortable.

D. Most days I don't feel well and would prefer to be alone and not have to do anything.

32. Following is a list of problems that we often face as we age. Check all that you feel apply to you:

- Difficulty keeping my balance when standing still
- Difficulty seeing in bright lights or bright sunlight
- Difficulty hearing others when in an intimate group
- Weakness in my legs when rising from a chair
- Difficulty hearing others in noisy settings
- Difficulty preparing meals
- Difficulty walking short distances (i.e. to your mailbox)
- Difficulty seeing individuals who are standing 2 or 3 feet away
- Difficulty reading the newspaper without extra light
- Dizziness or unsteadiness when walking
- Difficulty seeing when driving at night
- Difficulty seeing individuals standing 4 to 7 feet away
- Difficulty walking moderate distances (i.e. visiting a store in a shopping mall)
- Difficulty seeing individuals who are more than 8 feet away
- Difficulty shopping or completing personal tasks in my neighborhood
- Difficulty hearing the telephone or doorbell
- Difficulty bathing/showering
- Difficulty navigating darkened rooms
- Difficulty hearing someone speak if I can not see their mouth
- Difficulty dressing or other personal toiletries

APPENDIX C
CHARACTERISTICS RATING FORM

ID#: _____

Circle the number which seems most accurate. On the scale, 5 is the highest rating you can give the individual and this means you feel the individual has a lot of this quality or that his / her abilities in that area are very good. If you circle 1, you feel the individual does not have much of this quality or that his or her abilities are not very good. There are no right or wrong answers, only the way you feel.

28-year-old male store clerk:

Income:

Low 1 2 3 4 5 High

Intelligence

Low 1 2 3 4 5 High

Status Associated with Gender

Low 1 2 3 4 5 High

Aggressiveness

Low 1 2 3 4 5 High

Physical Strength

Low 1 2 3 4 5 High

Status Associated with Age

Low 1 2 3 4 5 High

General Health

Low 1 2 3 4 5 High

Status Associated with Job

Low 1 2 3 4 5 High

45-year-old male store clerk

Income:

Low 1 2 3 4 5 High

Intelligence

Low 1 2 3 4 5 High

Status Associated with Gender

Low 1 2 3 4 5 High

Aggressiveness

Low 1 2 3 4 5 High

Physical Strength

Low 1 2 3 4 5 High

Status Associated with Age

Low 1 2 3 4 5 High

General Health

Low 1 2 3 4 5 High

Status Associated with Job

Low 1 2 3 4 5 High

65-year-old female teacher

Income:

Low 1 2 3 4 5 High

Intelligence

Low 1 2 3 4 5 High

Status Associated with Gender

Low 1 2 3 4 5 High

Aggressiveness

Low 1 2 3 4 5 High

Physical Strength

Low 1 2 3 4 5 High

Status Associated with Age

Low 1 2 3 4 5 High

General Health

Low 1 2 3 4 5 High

Status Associated with Job

Low 1 2 3 4 5 High

28-year-old female doctor

Income:

Low 1 2 3 4 5 High

Intelligence

Low 1 2 3 4 5 High

Status Associated with Gender

Low 1 2 3 4 5 High

Aggressiveness

Low 1 2 3 4 5 High

Physical Strength

Low 1 2 3 4 5 High

Status Associated with Age

Low 1 2 3 4 5 High

General Health

Low 1 2 3 4 5 High

Status Associated with Job

Low 1 2 3 4 5 High

APPENDIX D
TEMPLATES

Table 14.

Templates for Profiles of Approaching People in Figure-Stop Activity.

Age	28	45	65
Occupation/ Gender			
Grocery Clerk			
Female	A	G	M
Male	B	H	N
School Teacher			
Female	C	I	O
Male	D	J	P
Doctor			
Female	E	K	Q
Male	F	L	R

- Template 1: AGLR
- Template 2: RGMJ
- Template 3: DIAL
- Template 4: AFPI
- Template 5: DJFN
- Template 6: OHJE
- Template 7: BDMK
- Template 8: CQGH
- Template 9: CHOK
- Template 10: BGPR
- Template 11: QONP
- Template 12: EIQM
- Template 13: CLFH
- Template 14: BNKE
- Template 15: GJMR
- Template 16: PAIF

APPENDIX E
PILOT STUDY

Scale model and figures. Prior to beginning the study, the scale figures were piloted tested for size, gender, ethnicity and general appropriateness. A total of 15 people (8 women and 7 men) between the ages of 52 and 72 were asked to select a figure that he/she was comfortable with and that would represent him/herself later in an experiment. The figures were laid flat on a surface and each person was encouraged to pick up the figures, touch them and move them about prior to selection.

The figures were cut from unfinished basswood and consisted of two silhouettes with layers of basswood between to vary the thickness and were constructed at 1" = 1'-0" scale (see photo 1). The figures ranged in height from 5'-0" to 6'-3" and from 19" to 26" in width (elbow to elbow). Profiles were created that suggested a person with clothing and varied in the roundness of the shoulder, shape of the head and the width of the pant leg. Overall dimensions were taken from *Human Dimensions* (Panero & Zelnick, 1979) and the 95 percentile was used in the creation of the figures.

After each individual had selected a figure, the researcher quizzed them on his/her selection criteria. Answers included "shape of the head," "shape of the shoulders," "the legs," "it's fat like me," and "it looks like me." Size played a small role in the selection and shape appeared to be the overriding factor. The thickness of the figure was not of concern.

Each were asked if gender was apparent as three persons preceded their selection by commenting that first they would "get rid" of all the men or women as was appropriate to the individual. Gender was perceived in head shape (smaller heads were perceived as male), the shape of the shoulder (straight shoulders were perceived as male), and the wideness of the pant leg (wider pant legs were perceived as feminine). Four of the eight women selected figures that they later said were male but felt the shape was the most important quality.

Individuals were all Caucasian Americans and no one perceived an ethnicity other than his/her own. Approximately one third of those reviewing the figures asked exactly what the difference was between them. Those reviewing the figures varied considerably in height and weight.

Experiment instructions and scripts. Instructions and scripts were also pilot tested prior to the study's initiation. The Keirse Personality Sorter (Keirsey, 1998) was not tested as it was a well documented instrument.

Instructions for the scale model activity revealed several areas which required correction. Participants were told that they were being approached by a stranger and that the person was 28/45/65 years old, was male/female, and was employed as a grocery clerk/school teacher/doctor. The most frequent question was "how do I know he/she is a clerk, teacher, doctor if they are a stranger?" The second question was "what is he/she going to do to me?" Instructions were altered to read as follows:

This woman, who is 28 years old, is a school teacher. She is here to help with the experiment and she is going to walk toward you slowly. The only reason she is approaching you is for the experiment and she is not going to speak or do anything to you. She is just here to help with the experiment. When she is too close for comfort, please tell her to stop.

The evaluation of the approaching person on the eight criteria was also pilot tested. The instructions were altered and examples were generated as a way to consistently assist the respondents. The instructions originally asked the participant to rate the approaching person based on the short description that was provided to him/her (This woman, who is 28 years old, is a school teacher.). After a several questions about status, the following example was used for gender, age or job status:

Gender/age/job status refers to the respect or importance that person has in his/her community as a result of his/her gender/age/job.

After 20% of the data had been collected, a number of people had commented that he/she did not know this individual who was a stranger to him/her and that he/she was unable to rate anyone they did not know on such a scale. The instructions that preceded this portion of the experiment were altered to read as follows:

Earlier I described the different people that were approaching you across the room. Very often, when we hear a description like that, we think of someone we know or are familiar with. I am interested in knowing what kind of person you were thinking about as they walked toward you. Using the different characteristics listed below, please rate the person on a scale of 1 to 5 for each of these characteristics. If you do not feel that was something you did not think about or felt was important, then feel free to skip over that question and go on to the next one.

APPENDIX F
DATA COLLECTION SITES

Site One

This site was located in an exercise facility especially for persons over the age of 55. The space was approximately 35 feet by 50 feet and had a surface exercise pool at one end. The walls were painted white and the carpet was a medium gray with small flecks of muted color. There were a few potted plants near the front door and a wall mounted bar for hanging coats. The lighting was suspended fluorescent fixtures and the space was always brightly illuminated. The area was always cool due to the scheduled activities. The area where data collection occurred was opposite the pool area and consisted of a folding table (30" x 72") and three stackable chairs. Exercise classes were conducted in an adjacent area and music could sometimes be heard.

Site Two

This space usually served as the office for a student organization and was 18 feet by 45 feet with a small lounge area at one end, a 36" by 72" conference table in the middle area and 2 desks and computer work area at the far end. The finishes consisted of a muted green-gray patterned carpet and green and cream vinyl wallcovering. The lighting consisted of recessed fluorescent fixtures with standard lenses; the space was brightly illuminated. The table was of a stained oak and the chairs were wood framed with a black, purple and teal upholstery. The space was very quiet and only the researcher and the participants were present.

Site Three

This site was a conference area located off of a major corridor in a campus facility and was about 25 feet by 30 feet. The carpet was a muted pattern in greens and grays and the walls were covered with wooden display cases containing posters and a green and cream vinyl wallcovering. Lighting was provided by recessed fluorescent fixtures with parabolic louvers and the space was well lit without being harsh. Two sides of the area were open and the space served as a thoroughway for traffic (data collection occurred during the late afternoon and there were no intruders). The space was furnished with a 60" diameter conference table in a gray plastic laminate and upholstered office chairs in a dark green/purple upholstery, a low table and sectional lounge seating. The data collection occurred at the conference table. There were a few passersby but no one entered the space during data collection.

Site Four

This lounge area is 18 feet by 30 feet, has off-white walls and blue/gray carpet. Near the door is a 42" diameter table with wood framed chairs and at the other end has upholstered lounge furniture. Illumination is provided by fluorescent fixtures and the windows are covered with off-white blinds. There are computer stations and a copy machine along one wall. The data collection occurred around the table. Data collection occurred during the early evening (5 to 7 p.m.) and there were few students around; one did use the telephone during the collection period.

Site Five

This collection site was the public library. The area where the data were collected was approximately 24 feet by 45 feet and was screened visually from the rest of the facility by the book shelves. The space had dark gray carpet and off-white walls with deep red trim. Illumination is provided by a variety of sources: a large expanse of windows on the east side, clear story windows, suspended fluorescent fixtures and wall sconces. The table where data collection occurred was in a study area with eight 42" x 48" tables were arranged in an open circulation area. The book stacks were approximately 8 feet away. Data collection occurred during the early afternoon and the area was not heavily populated. The tables were covered with a white and black speckled laminate and trimmed in dark wood. The chairs were upholstered in a dark fabric and had a metal frame. Library patrons and staff walked by occasionally but only glanced over very briefly.

Site Six

This collection site was the activity room of a church. The space was 28 feet by 45 feet and had a kitchen along one short wall. Along one of the longer walls four large windows provided ample daylight in addition to overhead, recessed fluorescent fixtures. Sheet vinyl covered about one-third of the area nearest the kitchen and the remainder of the floor was covered in a brown, level-loop carpet. The walls were either painted off-white or were covered with bulletin boards containing posters and photos of church activities. Eight tables (84" by 36") were arranged in two rows and had folding chairs placed for dining. One of the tables was used for data collection.

Site Seven

The family dining room of a senior living environment was used for data collection. The space was about 12 feet by 20 feet and was furnished with a dining table (42" x 86") and fourteen dining chairs. French doors opened off the main corridor and opposite this were sliding doors leading into the courtyard. Illumination was provided by an overhead chandelier and recessed downlights at the room's perimeter. The space had deep blue carpet, walnut finished furnishings and a muted floral wallcovering. The area was very warm and residents stopped by frequently to ask what was going on. Circulation around the table was very tight because of the chairs.

Site Eight

This data collection site was in the activity room of a senior living facility. The space was approximately 50 feet by 50 feet and had a tray ceiling. The carpet was a deep burgundy and the walls were covered in a mauve vinyl wallcovering. Lighting was provided via an indirect cove and with recessed downlights at the perimeter and was very soft. The room was very warm one day and considerably cooler the next. A piano, podium, folding tables and stack chairs were at one side of the space. Data were collected at a folding table 30" by 72" surrounded by stack chairs. The space was at the end of the corridor and was not frequented by other residents although several did come by near lunch time to see what was going on.

Site Nine

This center was previously a funeral home. The large activity area was 40 feet by 85 feet and had a medium brown floor in vinyl composition tile and off white walls. One end of the space was a lounge area with card tables and folding tables occupied about 2/3 of the area and were arranged for dining. A kitchen and serving line were located at the far end of the space. The fluorescent fixtures were surface mounted. Posters covered the walls and advertised good nutrition and the local high school basketball team. Data collection occurred near the lounge area at one of the long dining tables; other participants were playing cards during the collection times.

Site Ten

This area served as the office/meeting area for an organization and was approximately 22 feet by 40 feet. The walls were cream colored and the carpet was a muted level loop. At the end of the room

opposite the entrance was a small counter with office supplies and a small desk-top copier. The lighting consisted of recessed fluorescent fixtures with standard lens and the room was well lit. The room was filled with fourteen 36" square tables surfaced with walnut plastic laminate. There were three to four chairs per table and these consisted of a wooden frame and a green upholstered seat. The tables were arranged in three rows with chairs placed around each one. There were a number of paintings on the walls in desert tones and were primarily landscapes. The space was comfortably warm. Data were collected using two of the tables pulled together. The office area is very secluded and only the researcher and the participants were present during data collection.

Site Eleven

This site was the clubhouse of a small group of condominiums for older persons. The space was approximately 80 feet by 80 feet and had a high ceiling with open beams. There was a large fireplace and stone hearth at one end and a small kitchen area at the other. The carpet consisted of several shades of brown and had a mottled pattern. Walls were covered with a darker vinyl wallcovering and the windows were covered with an off-white casement. There were sofas and lounge chairs arranged in small groups and lighting was provided by track lighting and recessed downlights at the perimeter of the space. The lighting level was muted compared to other data collection sites. Data were collected at two tables near the kitchen area; they were 42" in diameter and were covered with a walnut plastic laminate and the chairs were wood framed with orange upholstered seats. During data collection, some participants gathered near the fireplace and visited after completing the personality test.

Site Twelve

Several participants invited the researcher to visit his/her home. In each instance, data collection occurred in the primary living area of the home and participants/researcher were seated on a sofa and used a low occasional table to support the scale model. Each of the homes was illuminated by natural light and by incandescent table fixtures. All spaces were comfortably warm and no other persons were present.

APPENDIX G
UNOBTRUSIVE MEASUREMENT

The researcher was interested in determining if an unobtrusive measurement could be established between herself and the participating sample. Previous studies had requested the participant to place a chair in a naïve setting and this technique was implemented. The researcher provided a rolling office task chair and requested that the participant bring the chair over to the table for the interview. The researcher placed her chair at a predetermined location and measured the distance between the two chairs after the participant departed.

The results from the portion of the experiment were not successful. Some of the reasons for the lack of success included (1) the participants' mobility, (2) existing furniture or architectural barriers, and (3) available space at the data collection site.

The researcher's intentions were to ask the participant to relocate his/her chair prior to the demographic interview. A number of the participants used a variety of mobility devices such as canes, mini-walkers, walkers, and arm-crutches (only one arrived in a wheelchair although stood for the experiment). Another portion of the participants had difficulty rising from a chair and used the table or other chairs for support. For these reasons, the researcher did not ask them to move chairs due to concern for their safety.

Another difficulty was that of existing furniture or architectural barriers at the data collection sites. All of the sites were furnished and the researcher made adjustments as much as possible prior to data collection. However, at some sites the table was round or hexagonal which prevented an accurate measurement. Additionally, the participants frequently used the corner or edge of the table with which to align his/her chair. Hall (1959) has discussed the role of fixed, semi-fixed and movable barriers and these parameters would be of interest in future studies.

Additionally, the spaces sometimes had limited circulation space. If the space around the conference or activity table being used was so small that it did not allow for an adequate preliminary distance to be established, the researcher forfeited that portion of the experiment.

This type of measurement had been accomplished by previous researchers yet a post-hoc review of the studies indicated that the room was bare except for the chairs themselves. An experiment using a bench or fixed laboratory site would provide more useful data in future studies.

APPENDIX H
PRELIMINARY HYPOTHESES

This section contains analysis undertaken to better understand the results of the research hypotheses. Each hypotheses is noted separately with the type of analysis and the statistical results.

Preliminary Hypotheses

Preliminary Hypothesis 1. Interpersonal distance will not vary as a function of personality type.

Analysis. A t-Test for Independent Groups was used to examine the differences between means in SAS.

Results. Although extroverts had a smaller mean distance compared to introverts, significant differences were not found (Table 12). The null hypothesis was retained.

Table 15.

Interpersonal Distance Means Compared by Personality Type

Personality Type	n	M	SD	Independent T ratio	p
Introverts	44	70.17	37.73	-0.7830	.4356
Extroverts	54	76.00	35.83		

Preliminary Hypothesis 2. Interpersonal distance will not vary as a function of data collection site.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis. Data were collected at a total of twelve different sites (Appendix G). For analysis, all participants who completed the experiment in his/her home were grouped into a single category.

Results. Significant differences in the mean interpersonal distances of each location were found, $F(1,11) = 16.57, p < .0001$. Additional post hoc analysis revealed a pattern in these differences (Table 13).

The mean interpersonal distance for Site Seven is significantly higher than Sites One, Two, Three, Four, Five, Six, Nine, Eleven and Twelve. The mean interpersonal distance for Site Eight is significantly higher than the means for Sites One, Two, Three, Four, Five, Six, Nine, Eleven and Twelve. Sites which differed from Locations Seven and Eight were public areas with participants who lived independently and enjoyed better health and a variety of professional and social activities. Sites Seven and Eight were located in assisted living facilities and these are individuals who, for some reason, were unable to live independently and no longer worked. The difference in mean interpersonal distances for Sites Seven and Eight are not significantly different. No other clear patterns were discernible in the comparisons of the remaining sites.

Table 16

Means for Interpersonal Distance by Location

Location	n	M	SD
1. Exercise Facility	68	46.56	19.52
2. Student Club Office	24	73.75	33.21
3. Conference Area ¹	13	65.38	10.24
4. Student Lounge ^{2,3}	20	45.45	10.11
5. Pubic Library ^{1,4}	14	75.36	22.33
6. Church Activity Room ^{2,5}	16	53.50	26.49
7. Assisted Living Dining ^{1,2,3,4,5,6}	72	96.54	39.60
8. Assisted Living Activity ^{1,2,3,4,5,6}	52	97.03	51.05
9. Senior Citizens Center ^{1,4,7,8}	72	73.72	47.08
10. Condominium Clubhouse	8	70.75	59.42
11. Emeriti Office ^{7,8}	14	60.08	26.91
12. Private Homes ^{7,8}	12	56.67	37.89

¹ Mean significantly differs from Exercise Facility

² Mean significantly differs from Student Club Office

³ Mean significantly differs from Conference Area

⁴ Mean significantly differs from Student Lounge

⁵ Mean significantly differs from Public Library

⁶ Mean significantly differs from Church Activity Room

⁷ Mean significantly differs from Assisted Living Dining

⁸ Mean significantly differs from Assisted Living Activity Room

Preliminary Hypothesis 3. Participant ratings of the approaching persons' characteristics will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. In general, ratings of the approaching person's perceived characteristics did vary as a function of his/her described age, gender and job description. This is significant to consider in the context of the dynamic interaction in which two people engage. Each of the eight characteristics (age-related status, gender-related status, job-related status, intelligence, income, physical strength and aggression) evaluated by the study's participants are detailed in the following sections.

Preliminary Hypothesis 3A. Participant ratings of the approaching persons' gender-related status will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis did not indicate significant higher order interaction between age, sex and job existed, $F(4, 74.5) = 0.83, p < 0.5118$, although significant main effects were found for both sex and job for Sex-related status scores (Table 13). Scores for approaching males were significantly higher than scores for approaching females (Figure 8, Table 14). Sex-related status scores also varied significantly by the approaching person's described job. Approaching persons who were described as a clerks received significantly lower scores than those described as teachers and those described as doctors. Approaching persons described as teachers also received significantly lower scores compared to those described as doctors.

Table 17

Differences of Least Square Means for Gender-Related Status Ratings

Var1*Var2*	Diff	Standard Error	DF	t	p
28 45	0.0366	0.1155	72.3	0.32	0.7522
28 65	-1.1050	0.1156	137.0	-0.91	0.3651
45 65	-0.1417	0.1221	78.3	-1.61	0.2494
F M	-0.2716	0.0962	131.0	-2.82	0.0055
C T	-0.3027	0.1137	100.0	-2.66	0.0090
C D	-0.5954	0.1222	79.2	-4.87	0.0001
T D	-0.2927	0.1172	89.4	-2.50	0.0144

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk; T = School Teacher, D = Doctor

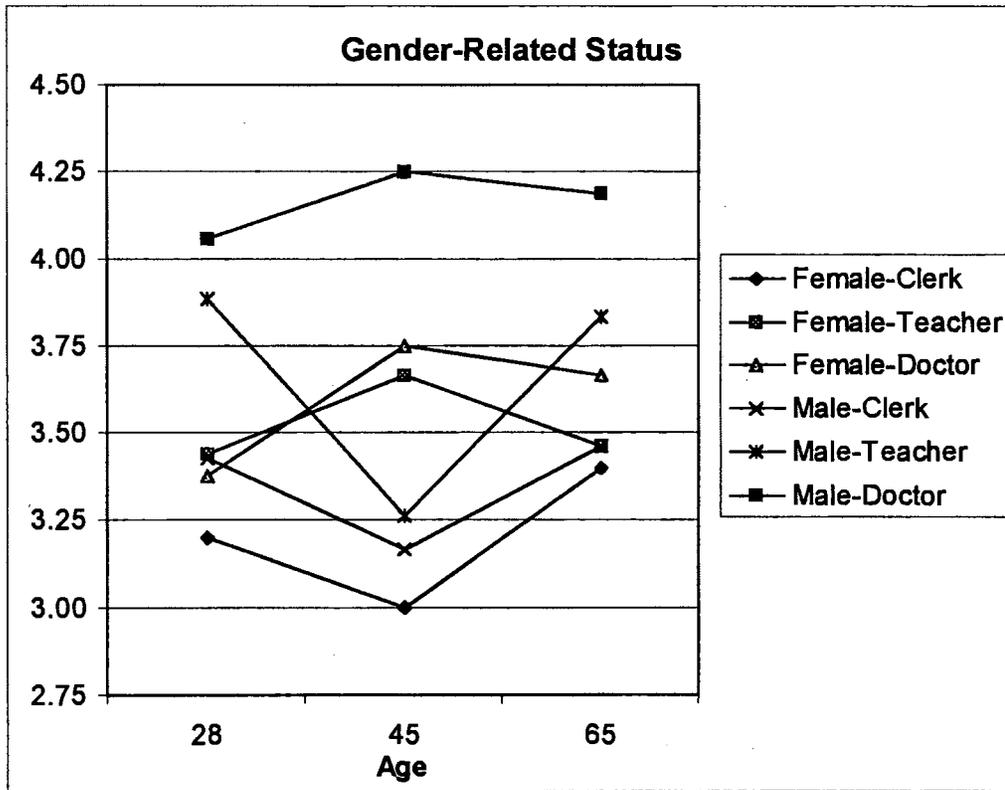
Table 18

Chart of Mean Gender-Related Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	3.20	3.00	3.40
Female-Teacher	3.44	3.67	3.46
Female-Doctor	3.38	3.75	3.67
Male-Clerk	3.43	3.17	3.46
Male-Teacher	3.89	3.26	3.83
Male-Doctor	4.06	4.25	4.19

Figure 17

Plot of Mean Gender-Related Ratings by Age, Gender, Job.



Preliminary Hypothesis 3B. Participant ratings of the approaching persons' intelligence will not vary as function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. A significant higher order interaction of Age X Gender X Job, $F(4, 74.3) = 2.89, p < .0277$ was revealed in the analysis (Table 15). This interaction revealed a pattern of intelligence ratings remaining the same or decreasing slightly for Female-Clerk, Female-Doctor, Male-Clerk, Male-Teachers between the ages of 28 and 45 and an increase from 45 to 65. For Female-Teacher and Male-Doctor, intelligence ratings increased from 28 to 45 years of age and decreased for those described as 65-year-olds (Figure 9, Table 16).

Additionally, a significant main effect was found for job; mean scores for teachers were significantly higher than for grocery clerks. Mean scores for doctors were significantly higher than mean scores for teachers and for grocery clerks. A significant main effect was found for sex and indicated Intelligence scores were significantly higher for women compared to men.

Table 19
Differences of Least Square Means for Intelligence Ratings

Var1*Var2*	Diff	Std	DF	t	p
28 45	0.1124	0.1006	64.2	1.12	0.2679
28 65	-0.0410	0.1005	140.0	- 0.41	0.6833
45 65	-0.1535	0.1010	66.8	- 1.52	0.1334
F M	0.1589	0.0822	119.0	1.93	0.0557
C T	-1.0228	0.1020	134.0	-10.02	0.0001
C D	-1.4237	0.1043	71.8	-13.65	0.0001
T D	-0.4009	0.0955	58.3	- 4.20	0.0001

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

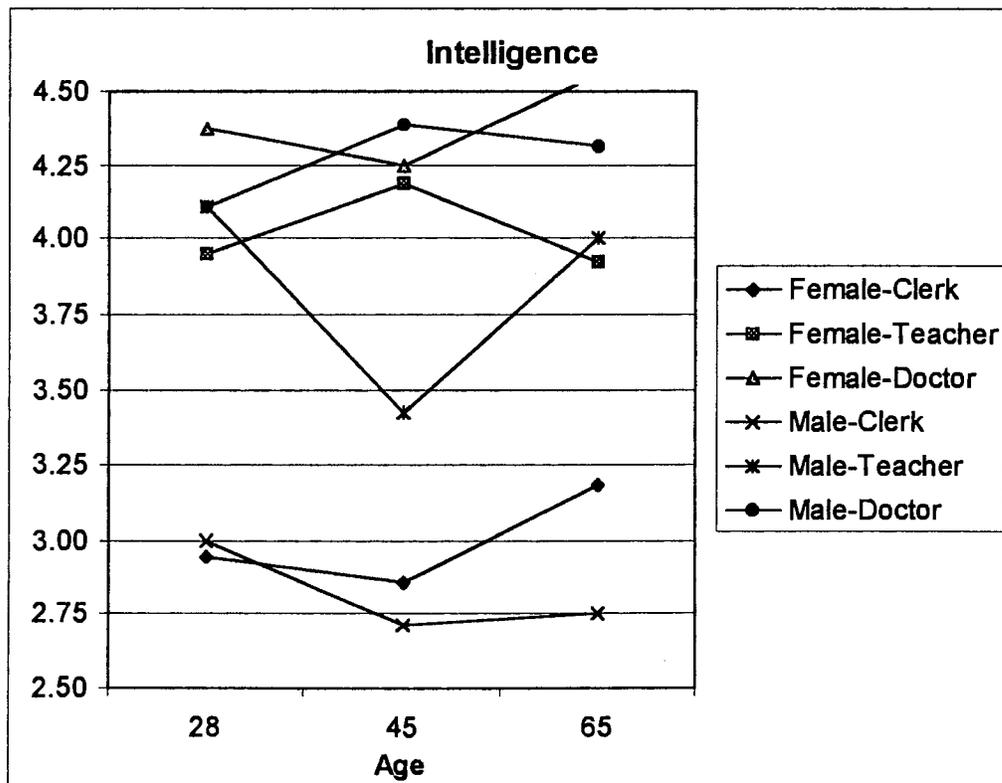
Table 20

Chart of Mean Intelligence Ratings by Age, Gender, Job.

Gender / Job	Age		
	28	45	65
Female-Clerk	2.94	2.86	3.19
Female-Teacher	3.95	4.19	3.92
Female-Doctor	4.38	4.25	4.56
Male-Clerk	3.00	2.71	2.75
Male-Teacher	4.11	3.42	4.00
Male-Doctor	4.11	4.38	4.31

Figure 18

Plot of Mean Intelligence Ratings by Age, Gender, Job.



Preliminary Hypothesis 3C. Participant ratings of the approaching persons' age-related status will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *n*'s was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. Analysis revealed no significant higher order interactions for the age-related status scores, $F(4,72.9) = 0.29, p < .8812$. Two significant main effects, sex and job, were found (Table 17).

In examining the main effect for sex, analysis indicates that approaching males were perceived as having a higher level of status as a function of age compared to that of females (Figure 10, Table 18). The significant main effect for job indicated that approaching persons described as doctors had significantly higher scores for age related status compared to grocery clerks. Scores for approaching persons described as school teachers differed significantly from those described as grocery clerks.

Table 21

Differences of Least Square Means for Age-Related Status Ratings

Var1*Var2*	Diff	Std	DF	t	p
28 45	-0.1028	0.1156	65.7	-0.89	0.3771
28 65	-0.2077	0.1196	97.8	-1.74	0.0857
45 65	-0.1049	0.1184	89.3	-0.89	0.3776
F M	-0.2645	0.0962	124.0	-2.75	0.0069
C T	-0.3810	0.1166	92.4	-3.27	0.0015
C D	-0.5175	0.1166	86.8	-4.44	0.0001
T D	-0.1365	0.1203	73.0	-1.13	0.2603

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

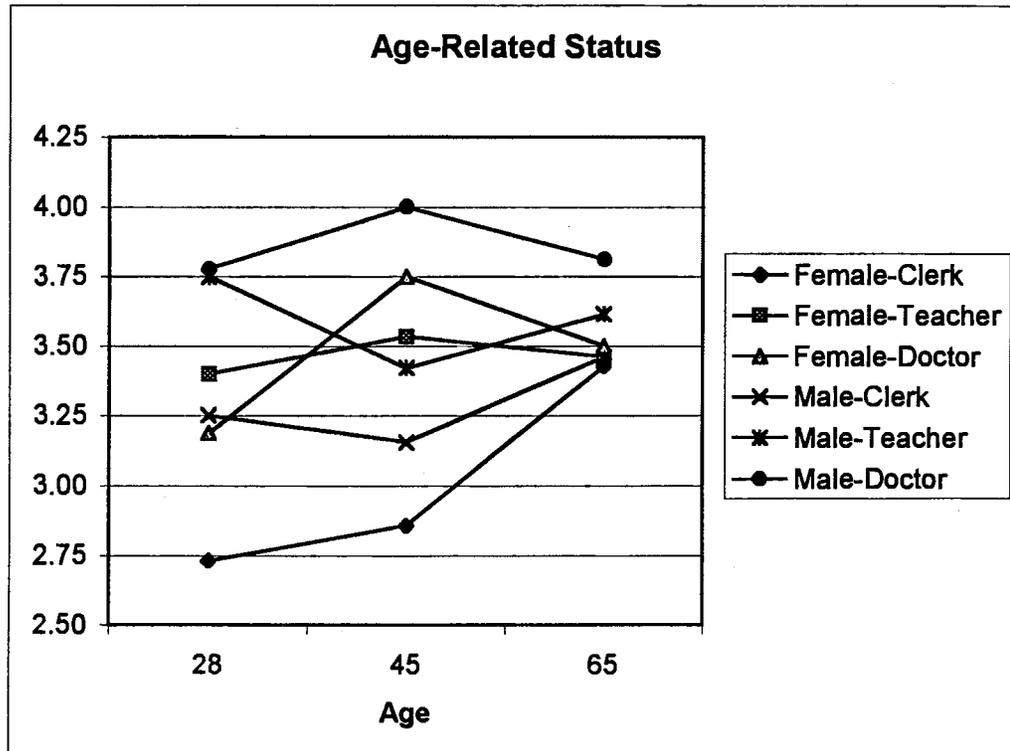
Table 22

Chart of Mean Age-Related Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	2.73	2.86	3.43
Female-Teacher	3.40	3.53	3.46
Female-Doctor	3.19	3.75	3.50
Male-Clerk	3.25	3.15	3.46
Male-Teacher	3.75	3.42	3.62
Male-Doctor	3.78	4.00	3.81

Figure 19

Job of Mean Age-Related Status Ratings by Age, Gender, Job.



Preliminary Hypothesis 3D. Participant ratings of the approaching persons' general health will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis indicated that a higher order interaction effect was not present in the general health scores, $F(4,65.9) = 1.26, p < .2932$, (Table 19). Significant main effects for job and for age were found. Approaching persons described as doctors received significantly higher scores compared to those described as school teachers as well as higher scores compared to grocery clerks (Figure 11, Table 20). Approaching persons described as school teachers also received significantly higher scores compared to those described as grocery clerks. The significant main effect for age indicated that as age increased, General Health scores decreased. Approaching persons described as 28-year olds received significantly higher scores compared to 45- and 65-year olds. Additionally, 45-year olds received higher scores compared to 65-year olds.

Table 23

Differences of Least Square Means for General Health Ratings

Var1*	Var2*	Diff	Std	DF	t	p
28	45	0.3370	0.1191	39.6	2.83	0.0073
28	65	0.8320	0.1073	127	7.75	0.0001
45	65	0.4950	0.1311	54.7	3.77	0.0004
F	M	-0.1556	0.0976	79.8	-1.59	0.1152
C	T	-0.3084	0.1214	49.8	-2.54	0.0143
C	D	-0.5539	0.1227	44.5	-4.51	0.0001
T	D	-0.2454	0.1144	83.1	-2.15	0.0348

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

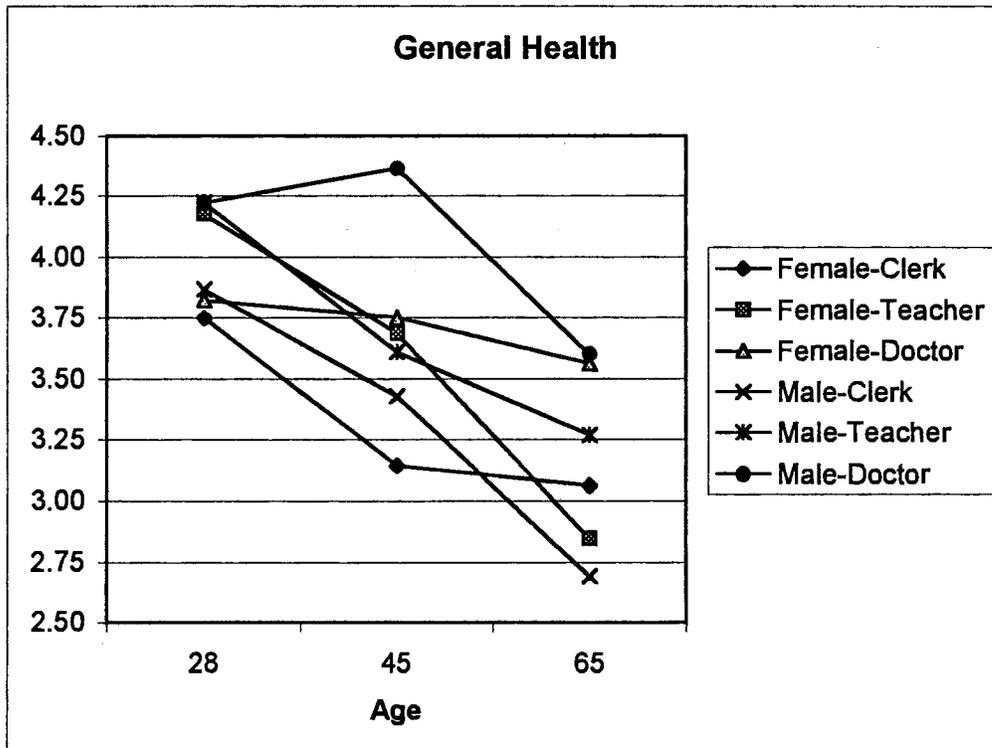
Table 24

Chart of Mean General Health Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	3.75	3.14	3.06
Female-Teacher	4.18	3.69	2.85
Female-Doctor	3.82	3.75	3.56
Male-Clerk	3.87	3.43	2.69
Male-Teacher	4.22	3.61	3.27
Male-Doctor	4.22	4.36	3.60

Figure 20

Plot of Mean General Health Ratings by Age, Gender, Job.



Preliminary Hypothesis 3E. Participant ratings of the approaching persons' physical strength will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis indicated no significant higher order interaction effects, $F(4, 73.5) = 0.74$, $p < .5704$, although significant differences were found for the interaction between age and sex for the physical strength scores (Table 21). The interaction for age and sex, $F(2, 92.7) = 2.98$, $p < .0559$, reveals that for all groups strength ratings decreased as age increased for female teachers and female doctors whose strength ratings increased for those described as 45 years old (Figure 12, Table 22). Approaching persons described as 28 years old and 45 years old received physical strength scores significantly higher than those persons described as 65 years old. No difference existed between those described as 28 and 45 years old. Persons described as female received significantly lower physical strength scores compared to those described as males.

Table 25

Differences of Least Square Means for Physical Strength Ratings

Var1*	Var2*	Diff	Std	DF	t	p
28	45	0.0669	0.1284	61.4	0.52	0.6043
28	65	0.5594	0.1158	115.0	4.84	0.0001
45	65	0.4925	0.1293	66.8	3.81	0.0003
F	M	-0.5736	0.1017	107.0	-5.64	0.0001
C	T	-0.0195	0.1173	96.8	-0.17	0.8682
C	D	-0.2097	0.1253	61.8	-1.67	0.0993
T	D	-0.1902	0.1309	69.5	-1.45	0.1508

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

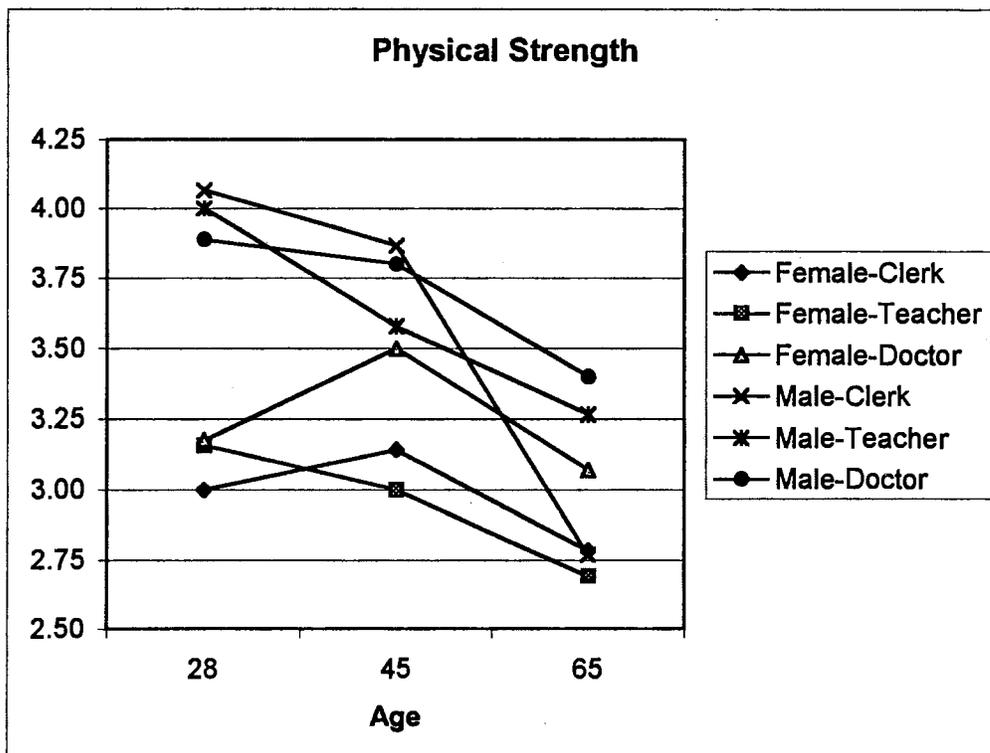
Table 26

Chart of Mean Physical Strength Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	3.00	3.14	2.79
Female-Teacher	3.16	3.00	2.69
Female-Doctor	3.18	3.50	3.07
Male-Clerk	4.07	3.87	2.77
Male-Teacher	4.00	3.58	3.27
Male-Doctor	3.89	3.80	3.40

Figure 21

Plot of Mean Physical Strength Ratings by Age, Gender, Job.



Preliminary Hypothesis 3F. Participant ratings of the approaching persons' aggression will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small n s was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis revealed no significant higher order effect in the aggression scores, $F(4, 85.3) = 0.68, p < .6073$, but did indicate a significant second order effect for sex and job did exist, $F(2, 84.7) = 3.38, p < .0388$. Aggression scores for persons described as Female-Clerks, Female-Teachers, Female-Doctors, and Male-Doctors exhibited a pattern of lower scores for the 28-year age group, higher levels for the 45-year age group and scores falling for the 65-year age group (Figure 13, Table 23). For Male-Clerks, aggression scores fell from the 28- to 45- to the 65-year age group and for Male-Teachers scores fell sharply from the 28- to the 45-year age group and then increased again for the 65-year age group (Table 24).

A significant main effect for job was also present. Approaching persons described as doctors received significantly higher scores compared to those described as school teachers as well as those described as grocery clerks.

Table 27

Differences of Least Square Means for Aggression Ratings

Var1*VaR2*	Diff	Error	DF	t	p
28 45	-0.0232	0.1306	62.7	-0.18	0.8594
28 65	0.1445	0.1115	137.0	1.30	0.1970
45 65	0.1677	0.1320	63.0	1.27	0.2086
F M	-0.1423	0.1021	104.0	-1.39	0.1663
C T	-0.2403	0.1311	74.8	-1.83	0.0707
C D	-0.7027	0.1312	62.3	-5.36	0.0001
T D	-0.4623	0.1119	82.5	-4.13	0.0001

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

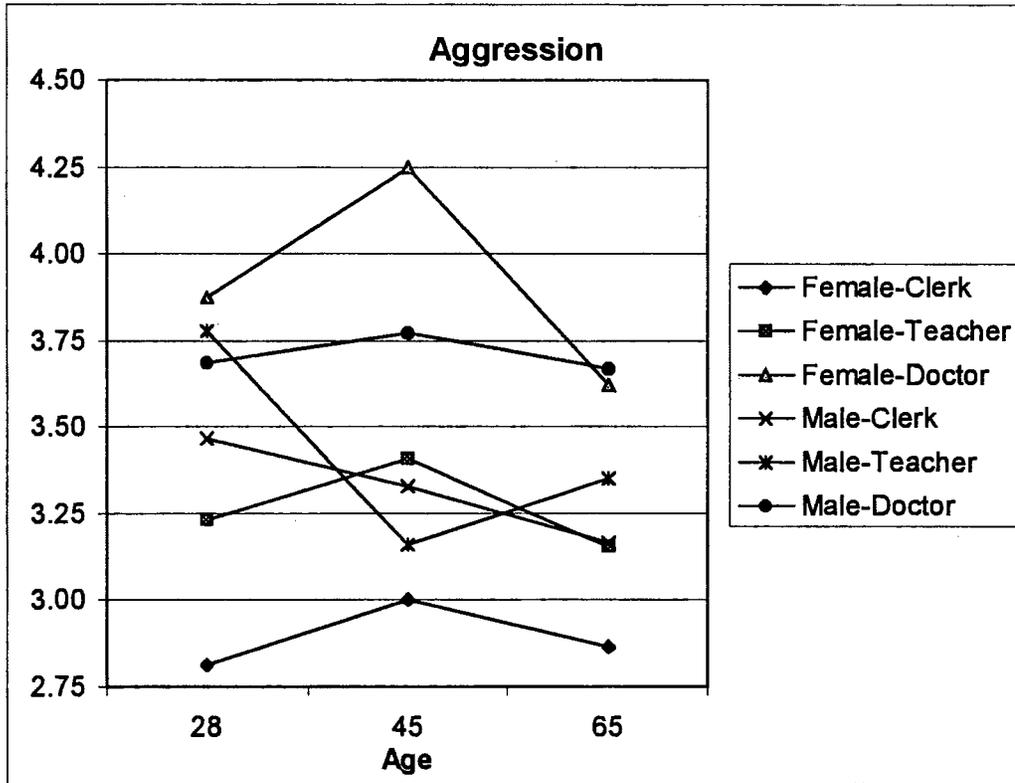
Table 28

Chart of Mean Aggression Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	2.81	3.00	2.87
Female-Teacher	3.24	3.41	3.15
Female-Doctor	3.88	4.25	3.63
Male-Clerk	3.47	3.33	3.17
Male-Teacher	3.78	3.16	3.36
Male-Doctor	3.68	3.77	3.67

Figure 22

Chart of Mean Aggression Ratings by Age, Gender, Job.



Preliminary Hypothesis 3G. Participant ratings of the approaching persons' income will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis indicated that a higher order interaction existed, $F(4, 245) = 3.10, p < .0162$, (Table 25). A plot of the means illustrates that income scores increase for Female-Teacher and Male-Doctor from the 28-year age group to the 45- and 65-year age group. For Female-Clerks, Female-Doctors and Male-Teachers income levels were rated lower for the 45-year age group compared to the 28-year age group but increased for the 65-year old group (Figure 14, Table 26). The Male-Clerk ratings reflected a different trend; income ratings remained constant for the two younger age levels but dropped sharply for the 65-year age group.

Post hoc analysis for the main effects indicated that 28-year olds received lower income scores compared to 65-year olds. It also indicated that women received significantly lower scores than males. Additionally, the analysis revealed that persons described as doctors received higher income scores compared to school teachers and grocery clerks. Those described as school teachers received higher scores than those described as grocery clerks.

Table 29

Differences of Least Square Means for Income Ratings

Var1*	Var2*	Diff	Std	DF	t	p
28	45	-0.1028	0.1351	245	-0.76	0.4476
28	65	-0.3095	0.1182	245	-2.62	0.0094
45	65	-0.2067	0.1352	245	-1.52	0.1288
F	M	-0.3919	0.1060	245	-3.70	0.0003
C	T	-0.7226	0.1241	245	-5.82	0.0001
C	D	-1.7358	0.1346	245	-12.90	0.0001
T	D	-1.0133	0.1309	245	-7.74	0.0001

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; *C = Grocery Clerk, T = School Teacher, D = Doctor

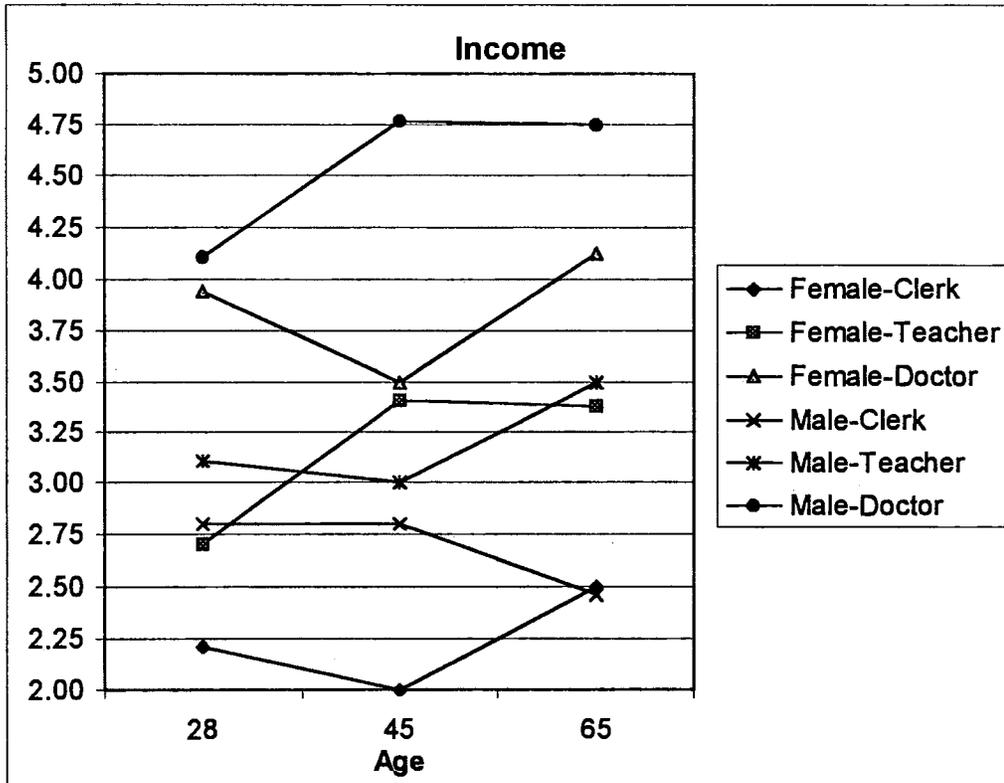
Table 30

Chart of Mean Income Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	2.21	2.00	2.50
Female-Teacher	2.70	3.41	3.38
Female-Doctor	3.94	3.50	4.13
Male-Clerk	2.80	2.80	2.46
Male-Teacher	3.11	3.00	3.50
Male-Doctor	4.10	4.77	4.75

Figure 23

Plot of Mean Income Ratings by Age, Gender, Job



Preliminary Hypothesis 3G. Participant ratings of the approaching persons' job-related status will not vary as a function of the approaching person's described age, gender and job.

Analysis. SAS was used to examine the difference between the means and a PROC MIXED with a Satterthwaite control for unequal variances and uneven or small *ns* was used. This procedure was selected for its sensitivity to differences over procedures such as Analysis of Variance. The LS Means procedure was used for post hoc analysis.

Results. The analysis indicated that a higher order interaction effect was not present in the job-related status scores, $F(4, 50) = 2.39, p < .0630$, (Table 27). A significant main effect was present for job, $F(2, 39.3) = 75.95, p < .0001$. Approaching persons described as doctors received significantly higher scores compared to those described as school teachers and grocery clerks (Figure 15, Table 28). Approaching persons described as school teachers also received significantly higher scores than persons described as grocery clerks.

Table 31

Differences of Least Square Means for Job-Related Status Ratings

Var1*	Var2*	Diff	Std	DF	t	p
28	45	0.1498	0.1401	43.0	1.07	0.2911
28	65	-0.0559	0.1195	137.0	-0.47	0.6406
45	65	-0.2057	0.1295	33.8	-1.59	0.1216
F	M	-0.1349	0.1061	68.5	-1.27	0.2079
C	T	-0.8575	0.1262	134.0	-6.79	0.0001
C	D	-1.6516	0.1342	37.9	-12.31	0.0001
T	D	-0.7941	0.1294	33.7	-6.14	0.0001

*28 = 28-year-old; 45 = 45-year-old; 65 = 65-year-old; F = Female; M = Male; C = Grocery Clerk, T = School Teacher, D = Doctor

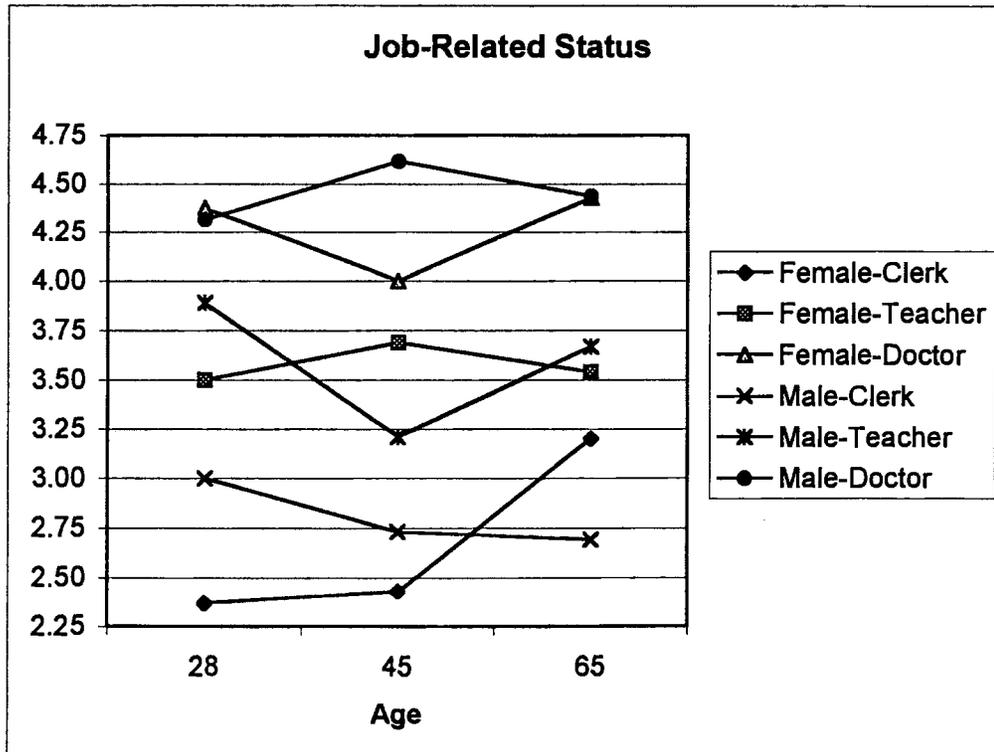
Table 32

Chart of Mean Job-Related Ratings by Age, Gender, Job.

Gender/Job	Age		
	28	45	65
Female-Clerk	2.37	2.43	3.20
Female-Teacher	3.50	3.69	3.54
Female-Doctor	4.38	4.00	4.43
Male-Clerk	3.00	2.73	2.69
Male-Teacher	3.89	3.21	3.67
Male-Doctor	4.32	4.62	4.44

Figure 24

Plot of Mean Job-Related Ratings by Age, Gender, Job.



APPENDIX I
RESEARCH HYPOTHESES

Hypothesis 1: There will be significant differences in the interpretation of the approaching person's gender-associated status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's gender-associated status did differ significantly as a function of the participant's personal characteristics, $F(7, 184) = 2.41, p < .0223$. The backward selection process indicated the most significant predictors in the differences were the subject's age and visual acuity (Table 27). The model explained approximately 8% of the variation in model.

Table 33

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpersonal Distance as a Function of the Individual (N = 191)

Variable	R	Standard Error	F	p
Step One				
Subject's Sex	-0.1007	0.1276	0.62	0.4312
Subject's Age	0.0093	0.0051	3033	0.0697
Income	0.0389	0.0392	0.98	0.3227
SIOPS	0.0015	0.0055	0.07	0.7874
Vision	0.0392	0.0217	3.25	0.0731
Hearing	0.0069	0.0352	0.04	0.8461
Mobility	0.0083	0.0353	0.05	0.8153
Step Three*				
Subject's Sex	-0.0833	0.3949	0.49	0.4870
Subject's Age	0.0105	0.0043	6.09	0.0145
Income	0.0428	0.0317	1.83	0.1781
Vision	0.0401	0.0203	3.89	0.0501

Note. $R^2 = .082$ for Step 1; $R^2 = .083$ for Step 3.

* $p < .01$.

Hypothesis2. There will not be significant differences in the interpretation of the approaching person's intelligence as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of approaching person's age-associated status did differ significantly as a function of the participants personal characteristics, $F(7, 193) = 2.58, p < .0144$, (Table 30). The backward selection process indicated that the subject's gender, income, and hearing acuity were the best predictors of variation in Intelligence ratings and explain approximately 8% of the variation in scores.

Table 34

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Intelligence (N = 200)

Variable	R	Standard Error	F	p
Step 1				
Subject's Sex	-0.3101	0.4489	5.40	0.0212
Subject's Age	0.0023	0.0051	0.21	0.6457
Income	-0.0515	0.0394	1.71	0.1928
SIOPS	0.0000	0.0056	0.00	0.9890
Vision	0.0167	0.0230	0.52	0.4705
Hearing	0.0754	0.0371	4.15	0.0431
Mobility	-0.0265	0.0357	0.55	0.4582
Step Four				
Subject's Sex	-0.3534	0.1236	8.18	0.0047
Income	-0.0473	0.0320	2.18	0.1413
Hearing	0.0864	0.0301	8.22	0.0046

Note. $R^2 = .085$ for Step 1; $R^2 = .081$ for Step 4.

* $p < .0009$.

Hypothesis 3: There will be significant differences in the interpretation of the approaching person's age-related status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the intelligence of the approaching person did differ significantly as a function of the participant's personal characteristics, $F(7, 198) = 2.97, p < .0057$. The analysis indicated approximately 10% of the variation can be explained by the model and that the best predictors are the subject's age and hearing acuity (Table 31).

Table 35

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Age-Related Status (N = 200)

Variable	R	Standard Error	F	p
Step One				
Subject's Sex	-0.1721	0.1252	1.89	0.1709
Subject's Age	0.0102	0.0048	4.49	0.0353
Income	0.0117	0.0367	0.10	0.7496
SIOPS	-0.0082	0.0052	2.49	0.1164
Vision	0.0166	0.0212	0.62	0.4330
Hearing	0.0707	0.0342	4.28	0.0398
Mobility	-0.0374	0.0338	1.22	0.2699
Step Two*				
Subject's Sex	-0.1781	0.1235	2.08	0.1508
Subject's Age	0.0103	0.0048	4.60	0.0333
SIOPS	-0.0073	0.0044	2.81	0.0955
Vision	0.0181	0.0206	0.77	0.3823
Hearin	0.0666	0.0316	4.44	0.0364
Mobil	-0.0381	0.0337	1.28	0.2586

Note. $R^2 = .098$ for Step 1; $R^2 = .098$ for Step 2.

* $p < .0029$.

Hypothesis 4: There will be significant differences in the interpretation of the approaching person's general health as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's general health did not differ significantly as a function of the participant's characteristics, $F(7, 190) = 1.57, p < .1480$. The backward selection process indicated no clear, strong predictors of variance although a total of 5% of the difference could be attributed to the model (Table 32).

Table 36

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's General Health (N = 199)

Variable	Standard			
	R	Error	F	p
Step One				
Subject's Sex	-0.1956	0.1232	2.52	0.1139
Subject's Age	0.0071	0.0047	2.28	0.1328
Income	0.0297	0.0358	0.69	0.4076
SIOPS	-0.0066	0.0052	1.61	0.2063
Vision	0.0037	0.0211	0.03	0.8617
Hearing	0.0252	0.0339	0.55	0.4588
Mobility	0.0354	0.0327	1.17	0.2807
Step Two*				
Subject's Sex	-0.1977	0.1223	2.61	0.1078
Subject's Age	0.0071	0.0047	2.36	0.1264
Income	0.0309	0.0350	0.78	0.3782
SIOPS	-0.0067	0.0051	1.77	0.1844
Hearing	0.0268	0.0325	0.68	0.4103
Mobility	0.0364	0.0321	1.28	0.2598

Note. $R^2 = .054$ for Step 1; $R^2 = .054$ for Step 2. * $p < .0951$.

Hypothesis 5: There will be significant differences in the interpretation of the approaching person's physical strength as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used to examine the *a priori* hypothesis.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's strength did differ significantly as a function of the participant's characteristics, $F(7, 192) = 7.60, p < .0001$. The backward selection process indicated the best predictors in the model include the subject's sex, age and level of mobility (Table 33). The model explained approximately 22% of the variation in scores.

Table 37

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Physical Strength (N = 199)

Variable	Standard			
	R	Error	F	p
Step One				
Subject's Sex	-0.5908	0.1148	26.49	0.0001
Subject's Age	0.0071	0.0044	2.55	0.1119
Income	0.0359	0.0336	1.14	0.2863
SIOPS	-0.0081	0.0048	2.83	0.0944
Vision	-0.0244	0.0198	1.52	0.2193
Hearing	0.0158	0.0317	0.25	0.6188
Mobility	0.1398	0.0304	21.07	0.0001
Step Two*				
Subject's Sex	-0.5815	0.1130	26.46	0.0001
Subject's Age	0.0078	0.0041	3.58	0.0599
Income	0.0295	0.0309	0.91	0.3419
SIOPS	-0.0073	0.0046	2.59	0.1092
Vision	-0.0216	0.0189	1.30	0.2552
Mobility	0.1385	0.0303	20.91	0.0001

Note. $R^2 = .217$ for Step 1; $R^2 = .216$ for Step 2.

* $p < .0001$.

Hypothesis 6: There will be significant differences in the interpretation of the approaching person's aggression as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's aggression did differ significantly as a function of the participant's characteristics, $F(7, 194) = 2.80, p < .0086$. The best predictors indicated by the model include the subject's age, gender, occupational prestige score and mobility level (Table 34). The model explained approximately 9% of the variation in scores.

Table 38

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Aggression (N = 199)

Variable	R	Standard Error	F	p
Step 1				
Subject's Sex	-0.3195	0.1311	5.94	0.0157
Subject's Age	0.0121	0.0049	5.97	0.0154
Income	-0.0107	0.0379	0.08	0.7777
SIOPS	-0.0066	0.0054	1.47	0.2265
Vision	-0.0022	0.0222	0.01	0.9215
Hearing	-0.0165	0.0359	0.21	0.6459
Mobility	0.0611	0.0348	3.08	0.0810
Step 3*				
Subject's Sex	-0.3233	0.1247	6.73	0.0102
Subject's Age	0.0111	0.0045	6.14	0.0140
SIOPS	-0.0075	0.0045	2.84	0.0935
Mobility	0.0611	0.0340	3.22	0.0743

Note. $R^2 = .092$ for Step 1; $R^2 = .090$ for Step 3.

* $p < .0009$

Hypothesis 7: There will be significant differences in the interpretation of the approaching person's income as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's income did differ significantly as a function of the participant's personal characteristics, $F(7,201) = 8.53, p < .0001$. The backward selection process indicates that the subject's age, hearing and mobility were the best predictors in the model and explained approximately 23% of the variation in the scores (Table 33).

Table 39

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Income (N = 208)

Variable	R	Standard Error	F	p
Step One*				
Subject's Sex	-0.2621	0.2823	0.86	0.3541
Subject's Age	-0.0189	0.0109	2.99	0.0851
Income	0.0242	0.0835	0.08	0.7727
SIOPS	0.0008	0.0121	0.00	0.9459
Vision	0.0153	0.0492	0.10	0.7563
Hearing	0.1784	0.0780	5.23	0.0233
Mobility	0.4340	0.0634	46.74	0.0001
Step 3*				
Subject's Sex	-0.2860	0.2758	1.08	0.3010
S Age	-0.0179	0.0106	2.87	0.0917
Hear	0.1779	0.0693	6.59	0.0110
Mobility	0.4369	0.0611	51.13	0.0001

Note. $R^2 = .228$ for Step 1; $R^2 = .227$ for Step 3.

* $p < .0001$.

Hypothesis 8: There will be significant differences in the interpretation of the approaching person's job-associated status as a function of the participant's personal characteristics (gender, age, income level, occupational prestige score, visual acuity, hearing acuity, and mobility).

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. The model generated in multiple regression analysis indicated the participant's ratings of the approaching person's job-associated status did not differ significantly as a function of the participant's characteristics, $F(7, 194) = 1.64, p < .1258$. The backward selection process indicated that the subject's gender and level of hearing acuity were the best predictors for job-associated status scores. Approximately 5% of the variation was accounted for in the reduced model (Table 36).

Table 40

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Job-Associated Status (N = 199)

Variable	R	Standard Error	F	p
Step One*				
Subject's Sex	0.4094	0.1613	6.44	0.0119
Subject's Age	0.0008	0.0061	0.02	0.8914
Income	0.0119	0.0466	0.07	0.7983
SIOPS	-0.0004	0.0067	0.00	0.9559
Vision	0.0129	0.0273	0.23	0.6354
Hearing	0.0706	0.0440	2.57	0.1105
Mobility	0.0157	0.0428	0.14	0.7131
Step Five*				
Subject's Sex	-0.4172	0.1462	8.14	0.0048
Hearing	0.0769	0.0354	4.70	0.0313

Note. $R^2 = .055$ for Step 1; $R^2 = .052$ for Step 5.

* $p < .0047$.

Hypothesis 9.

There will be no significant relationship between the participant's established interpersonal distance and the perceived income level of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of the existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.06$, $p<.95$.

Therefore, the null hypothesis was retained.

Hypothesis 10.

There will be no significant relationship between the participant's established interpersonal distance and the perceived intelligence level of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.11$, $p<.06$.

Therefore, the null hypothesis was retained.

Hypothesis 11.

There will be no significant relationship between the participant's established interpersonal distance and the perceived gender-related status of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.06$, $p<.27$.

Therefore, the null hypothesis was retained.

Hypothesis 12.

There will be no significant relationship between the participant's established interpersonal distance and the perceived age-associated status the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.03$, $p<.56$. Therefore, the null hypothesis was retained.

Hypothesis 13.

There will be no significant relationship between the participant's established interpersonal distance and the perceived job-related status of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.07$, $p<.23$. Therefore, the null hypothesis was retained.

Hypothesis 14.

There will be no significant relationship between the participant's established interpersonal distance and the perceived aggression level of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicated that a significant, positive relationship exists, $r=.12$, $p<.0594$. Therefore, the null hypothesis was rejected.

Hypothesis 15.

There will be no significant relationship between the participant's established interpersonal distance and the perceived strength of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicated that a weak, significant relationship exists, $r=.12$, $p<.0538$. Therefore, the null hypothesis was rejected.

Hypothesis 16.

There will be no significant relationship between the participant's established interpersonal distance and the perceived general health of the approaching person.

Analysis. Pearson's Product Moment Correlation was used to establish the strength and direction of existing relationships.

Results. Correlation analysis indicates that no significant relationship exists, $r=.01$, $p<.8247$. Therefore, the null hypothesis was retained.

Hypothesis 17.

There will be significant differences in the established interpersonal distance as a function of individual differences in the interpretation of perceived income level, intelligence, gender-associated status, aggressiveness, physical strength, age-associated status, general health and job-related status of the approaching person.

Analysis. Multiple regression was used to examine the difference between the means of interpersonal distance and a PROC REG in SAS with a backward selection procedure was used.

Results. Multiple regression analysis indicated no significant differences exist in the interpersonal distance as a function of individual differences in the interpretation of the approaching person's characteristics, $F(8, 209) = 1.00$, $p<.4402$. The backward selection process did not produce a model that reached a significant level of significance.

Additional analysis included a Maximum-R selection process in SAS. This selection process chooses variables at preset entry levels and p-values to determine the optimal model fit in an all possible pairs evaluation. This process indicates a model including perceived aggression and income would explain approximately 2% of the variation, $F(1, 216) = 3.53$, $p<.09$.

After examining the available data, an alternative model was considered. During the model construction, the individual's perception of the approaching person's characteristics were conceptualized as mediating factors (Baron & Kenny, 1986). A mediating variable is a "mechanism through which the focal independent variable is able to influence the dependent variable of interest" (Baron & Kenny, 1986, p. 1173).

Statistical tests were undertaken to better understand the relationship between the independent variables and the mediating variables. This analysis indicated that a significant mediating relationship was not present.

An alternative model was proposed as a result of the preceding analysis. Because a clear mediating role could not be verified, a model was constructed to examine the direct relationship between the established interpersonal distance and the participant's gender, age, socioeconomic level, SIOPS, ISEI and evaluations of the approaching persons age-, gender-, and job-related status. A number of studies have examined the role of gender and age and these variables were assumed to be significant predictors in the variation of established interpersonal distance.

The Maximum-R selection process was implemented with the multiple regression analysis (Table 37). Results indicated that a model including the participants' gender, age, socioeconomic level and mobility scores would account for 22% of the variation in interpersonal distance, $F(9, 179) = 5.55$, $p < .0001$.

Table 41

Summary of Backward Regression Analysis for Variables Predicting Variation in the Interpretation of the Approaching Person's Job-Associated Status (N = 303)

Variable	R	Standard Error	F	p
Step 0				
Sex Status	4.6222	3.8659	1.43	.2334
Age Status	-3.3661	3.6822	0.84	.3619
Job Status	3.9587	2.9339	1.82	.1789
Income Status	-3.1615	1.4186	4.97	.0271
Subject's Sex	16.4432	4.8644	11.43	.0009
Subject's Age	0.9314	0.1848	25.40	.0001
SIOPS	-0.0914	0.3717	0.06	.8060
ISEI	-0.1117	0.3509	0.10	.7505
Income	-2.6787	1.4499	3.41	.0663

Note. $R^2 = .2183$ for Step 1.

APPENDIX J
LITERATURE TABLE

Author/Date	Independent Variable	Dependent Variable	Theory	Method	Findings
Adams & Zuckerman, 1991	Lighting Conditions	Personal Space	Sociobiological	Figure Stop, Full Scale	Discomfort high under low light conditions. Distance increased as angle of approach moved from front to rear.
Adler & Iverson, 1974	Praise, Status, Sex, Task Difficulty	Interpersonal Distance		Experiment	Furthest distance established from those of low status in false praise situations and smallest distance from those with low status with appropriate status. Did not vary across high status persons. Gender interactions were found.
Adler & Iverson, 1975	Praise, Status, Sex, Task Difficulty	Interpersonal Distance		Figure Placement	Distances were closer in a valid praise compared to false praise setting. Males projected larger distance than females in false praise condition
Ahmed, 1979	Gender, Gender of Invader	Departure Time		Field Experiment	Females departed more quickly than males. Subjects left more quickly if male intruder compared to female intruder.
Aiello, DeRisi, Epstein & Karlin, 1977	Short Term Crowding, Discomfort, Distance Preferences	Physiological Stress	Sociobiological	Experiment	SS preferring large interpersonal distances showed higher levels of physical stress and poorer performance on creativity tests during a crowded condition compared to those preferring smaller distances.
Aiello & Jones, 1971	Subculture	Interaction distance and shoulder orientation	Enculturation	Observation	Interaction distances for white children > black or Puerto Rican children. White females stood closer together than white males.
Akande, 1997	Locus of Control, Gender	Personal Space		Experiment, Figure Stop	Males exhibited greater external locus of control than females. Both males and females allowed female experimenter to approach more closely than male experimenter did.
Albas, 1991	Stand Still or Back-Up	Established interaction distance	Enculturation	Experiment in Natural Setting	Distance is significantly smaller if interviewer stands still compared to backing up.
Albas & Albas, 1989	Culture	Established interaction distance	Symbolic Interaction	Experiment in Natural Setting	In same-culture dyads, contact culture established a smaller distance compared to those from a noncontact culture. Both contact and noncontact cultures established a closer distance to the contact interviewer compared to the noncontact interviewer.

Argyle & Dean, 1965	Interpersonal distance, Affiliation	Eye Contact		Experiment	As distance decreased, eye contact decreased. Total length of eye contact was greater for same-sex pairs than for mixed-sex pairs.
Aronow, Reznikoff, Tryon & Rauchway, 1977				Comparison of Methods	Kuethel Felt Figure, MAPS, Chair Placement and Psychological Distance Scales were compared. PDS / Kuethel and the PDS / MAPS measurements were similar.
Ashton & Shaw, 1980	Sex, Instructions, Affiliation, Approach Direction	Interpersonal Distance		Comfortable Interpersonal Distance Scale, Figure Stop in Full Scale	Distance was smaller when told to stop at a comfortable distance compared to a change in relationship. Females were approached more closely than males. Front approach resulted in greater distances than side approach.
Ashton, Shaw, & Worsham, 1980	Affiliation, Interpersonal Distance	Ratings on 5 Scales	Altman & Sommer	Experiment	Males and females preferred significantly smaller distances between those with whom they were acquainted compared to strangers. Females exhibited greater variation compared to males.
Bailey, Caffrey, & Harnett, 1976	Body Size	Personal Space and Person Perception	Ethnological	Experiment, Figure Stop	Implied threat did not affect personal space although threat did influence perceptions of aggression and strength.
Bailey, Hartnett & Glover, 1973	Modeled Behavior	Interpersonal Distance		Experiment, Figure Stop	Having viewed tapes of modeled close and far interpersonal distance, children imitated what they had seen. Control groups fell between the close and the far conditions.
Baldassare & Feller, 1975	Culture	Personal Space	Enculturation	Theoretical Discussion	
Barash, 1973	Attire, Approach Distance	Departure Time	Sociobiological	Experiment in Natural Setting	Faculty attire/close approach departed more quickly than student attire and both more quickly than medium approach in faculty attire. Control groups departed most slowly.
Baron, 1978	Invasion	Helping Behavior		Experiment in Natural Setting	A close approach and low need for help resulted in

Barrios, Corbitt, Estes & Topping, 1976	Social Stigma	Interpersonal Distance	Enculturation	Experiment	Subjects established greater distances from those described as bisexual compared to unstigmatized persons.
Batchelor & Goethals, 1972	Collaboration	Spatial Distance in Small Groups	Sociobiological	Experiment	A group of eight persons established smaller distances when engaged in a collaborative activity compared to an individual activity.
Bates, 1987	Personality	Personal Space			Results indicated that 5% of the variation in distance could be attributed to those with higher extroversion scores on the MBTI.
Bauer, 1973	Culture, Gender	Approach Distance	Enculturation	Experiment	White males, white females, black males and black females established increasingly smaller distances.
Baxter, 1970	Culture, Age, Gender, Setting	Interpersonal Distance	Enculturation	Observation	Mexican-Americans, whites and blacks established increasingly greater distances. As age increased, so did interpersonal distance. Male-Female, female-female and male-male dyads established increasingly greater distances.
Beach & Sokoloff, 1974	Gender	Distance, Orientation, Position, Visual Regard	Enculturation	Observation	Girls maintained a greater distance than boys.
Bell & Barnard, 1984	Heat, Noise	Personal Space Permeability		Scale Model Experiment	Males placed fewer figures and in more direct visual contact at higher levels of noise than did women. No other interactions were found.
Bleda & Bleda, 1978	Gender, Smoking, Invasion	Departure Time	Sociobiological	Field Experiment	Subjects left more quickly and more often when invaded by a male compared to a female. Subjects left more quickly when invader was smoking. Male smokers elicited the most rapid and most frequent departure of subjects.
Bouska & Beatty, 1978	Clothing, Interaction	Intrusion	Enculturation	Field Experiment	At close distances, dyads were not invaded regardless of attire or interaction. At far distances, conversing dyads in which one person was dressed as priest or businessman was invaded less frequently than dyads dressed as students.

Bowers, 1978	Personality	Personal Space		Experiment	The relationship between extroversion and personal space was not significant. Subjects with low locus-of-control scores permitted a closer approach compared to those with high locus-of-control scores.
Brady & Walker, 1978	Anxiety	Interpersonal Distance		Laboratory Experiment	Interpersonal distance was significantly greater in high anxiety conditions compared to low anxiety conditions.
Buchanan, Goldman & Juhnke, 1977	Eye Contact, Gender	Violation of Personal Space	Sociobiological	Field Experiment	Males violated the space of someone with diverted gaze while females violated the space of someone who initiated visual contact. In choice conditions, females invaded the space of directly gazing females while males showed no preference.
Buller, 1987	Individual Apprehension, Distance, Gender	Compliance	Violations of Nonverbal Expectations	Experiment	Those who were apprehensive and those at close distance signed petition more frequently.
Burgoon, 1991	Level and Type of Touch, Proximity, Posture	Message Interpretation	Social Meaning Model	Field Experiment	Close distance communicated composure and dominance.
Burgoon & Jones, 1976					Theoretical discussion addressing expectations during personal space violations.
Caplan & Goldman, 1981	Height, Gender	Intrusion Behavior		Field Experiment	Commuters intruded upon the personal space of a short confederate significantly more frequently than a tall confederate. Females intruded on the short confederate more frequently than males.
Cavallin & Houston, 1980	Aggressiveness, Maladjustment, Body Experience	Protective Role of Personal Space	Sociobiological	Experiment	Those who are maladjusted or who tend to be aggressive preferred more personal space in a face-to-face approach. The more underestimated body size was, the greater personal space preferred.
Cheyne & Efran, 1972	Sex of Group, Activity of Group, Spatial Parameters	Frequency of Intrusion	Sociobiological	Field Experiment	Significantly, more subjects avoided intruding upon interacting pairs than uninteracting pairs. Male-male or male-female dyads diverted more intruders than female-female dyads.

Cochran & Urbanczyk, 1982	Vertical Space	Personal Space		Experiment	As distance between ceiling and top of head decreased, figure stop distances increased.
Cohen, Sherman & Sherman, 1982	Data Collection Method	Personal Space Measurement		Experiment	Correlation's between Kuethe's felt figure placement and Duke and Nowicki's CID scale were examined.
Cozby, 1973	Room Density, Activity, Personal Space	Room Liking	Sociobiological	Experiment	In a high density scenario, the space was more positively evaluated for a party than for study. In a low density scenario, the space was evaluated in an opposite manner. Those subjects with small personal space evaluated high density settings more positively than did those large personal spaces.
Cronje & Moller, 1976	Data Collection Method	Personal Space Measurement		Experiment, Observation	Scale models were more accurate predictors of actual behavior than did photographs.
De Long, 1976	Data Collection Method	Personal Space Measurement		Experiment	Results indicated that distancing patterns for scale model and full scale environments are similar.
De Long, 1980		Personal Space Interaction		Observation	Older persons prefer a smaller interaction distance in hospital. Context of interaction is different for older persons and the healthcare provider.
Dean, Willis & Hewitt, 1975	Military Rank	Interaction Distance		Observation of field setting	Subordinates initiated conversation at greater distances as rank of other increased. No pattern was found for distance when initiator was of higher rank.
Dean, Willis & La Rocco, 1976	Age, Sex, Race	Reaction to invasion of space	Sociobiological Theory	Field Experiment	As the age of the invader (5, 7 and 10 year olds) increased, blocking behavior increased by adults.
Doctor, 1989	Culture, Gender	Proxemic Zones	Enculturation Theory	Observation	Findings detail differences in proxemic zones compared to Hall's established parameters. Same sex dyads require less space than opposite-sex dyads.
Dolphin, 1988	Age, Sex, Relationship, Environment, Ethnicity	Personal Space		Meta-analysis	Summaries of studies are compiled and synthesizes. Author believes findings for relationship and age outweigh other factors.
Dosey & Meisels, 1969	Stress, Body Image Boundary,	Personal Space	Sociobiological Theory	Experiment, Rorschach	No significant relationships were found between the personality measures and personal space.
Eastman & Harper, 1971	Prediction Variables	Proxemic Behavior		Observation	Analysis indicates the only clear predictor of proxemic behavior is that of prior occupancy in the selection of seating.

Eastwood, 1985	Personality, Intelligence, Violent Behavior	Personal Space		Experiment	Significant relationships between extroversion, verbal intelligence and violent/non-violent behaviors among delinquents' personal space preferences were not found.
Edney & Jordon-Edney, 1974	Gender, Control	Personal Space		Experiment, Natural and Lab	Subjects with low sense of control claimed larger areas both in a natural and a lab setting.
Edney, Walker, & Jordan, 1976	Sense of Control	Claimed Space		Lab and Field Experiments	Those with a low sense of control claimed more space when crowded.
Edwards, 1973	Relationship, Culture, Gender	Interaction Distance		Experiment	As relationship became more intimate, distances became smaller. One ethnic group altered orientation between mixed gender dyads. Two ethnic groups perceived acquaintance as unfriendly and increased distance.
Edwards, 1980b	Crowding and Tolerance	Interpersonal proximity	Sociobiological	Scale Model Experiment	Blacks placed more people in a room than whites in a non-social setting. No difference was found for a social setting.
Evans & Howard, 1973					Meta-analysis indicated that findings were inconsistent and the authors suggest a multivariate method of data collection.
Ford & Graves, 1977	Culture	Interpersonal Distance, Touching	Enculturation	Figure Stop Activity	Mexican American children established smaller distances and touched more than white children.
Fry & Willis, 1971	Age	Reaction to Personal Space Invasion	Sociobiological	Field Experiment	5-, 8-, and 10-year olds approached adults standing in line. As age of invader increased, negative blocking behaviors increased by adults.
Gardin, Kaplan, Firestone & Cowan, 1973	Cooperation, Attitude	Approach, Avoidance	Enculturation	Experiment	Side-by-side orientation resulted in cooperation and across-table orientation resulted in decreased cooperation. Other factors were not significant.
Geden & Begeman, 1981	Context, Relationship	Preferred distances		Experiment	Patients established smaller distances in a home context compared to a hospital context. Family, doctor, nurse, and stranger were placed at increasingly greater distances.
Giesen & McClaren, 1976	Mood, Evaluation, Attraction and Attitude	Seating Distance, Sex		Experiment	Females sat closer together than males and all participants sat closer to a female moderator than a male moderator.
Gillespie & Leffler, 1983					Theoretical review of existing frameworks.

Goldstein & Jeffords, 1981	Status	Touching Behavior	Nonverbal Communication	Observation	Lower status state congressmen touched higher status congressmen more frequently.
Gotta, 1977	Personality	Personal Space		Experiment, Figure Stop	Intelligence, intro/extroversion and neuroticism were not significantly correlated with personal space boundaries.
Gottheil, Corey & Paredes, 1968	Measurement Technique	Personal Space			A high, significant correlation was found between actresses placed on a stage and plastic figurines placed on a board.
Graves & Robinson, 1976	Inconsistent Verbal and NonVerbal Behavior	Proxemic Behavior	Communication Theory	Role Play	Inconsistent messages resulted in greater interpersonal distance.
Greenberg, Aronow & Rauchway, 1977	Anxiety, Hostility, Barrier	Interpersonal Distance		Inkblot, Projective Techniques	Positive correlations between anxiety, hostility and a sense of barrier and interpersonal distance were found.
Gutheil, 1992					Theoretical discussion on the role of personal space and territoriality in social work practice.
Haber, 1982	Dominant / Marginal Cultural Groups	Seating Choice	Enculturation	Observation	Marginal persons (minority, ethnic) selected seats at the perimeter of classrooms while dominant persons (white, Anglo-Saxon Protestants) selected seats in the center of the room.
Hanson, 1976					Review of Hall's (1976) <i>Handbook for Proxemic Research</i> .
Harnett, Bailey & Hartley, 1974	Body Height, Position, Gender	Personal Space	Sociobiological	Experiment, Figure Stop	Subjects approached short persons more closely compared to tall persons when seated and standing. Females approached seated figures more closely while males approached standing figures more closely.
Harris, Luginbuhl, & Fishbein (1978)	Density	Personal Space	Sociobiological	Field Experiment	Males reacted more frequently in high density settings when the personal space was invaded by another male.
Hayduk, 1978					Meta-analysis of theory and measurement techniques. Summaries indicate age, physical/psychological setting, stigmas, and mental disorders hold true across multiple studies.
Hayduk, 1981	Approach Direction, Shape of Personal Space	Personal Space		Experiment, Figure Stop	Shape of personal space was larger to the front of the individual compared to the back. This shape changes if the head is turned.

Hayduk, 1983					Meta-analysis of personal space that suggests projective measures of data collection are inappropriate. Permeability of space is discussed.
Hayduk, 1994					Theory development of personal space addressing the role of feedback in a linear sequence.
Hayduk & Mainprize, 1980	Blindness, School Environment	Personal Space		Figure Stop Activity	Institutionalized blind maintained larger interpersonal distances than non-institutionalized blind.
Henley, 1973	Status, Gender	Touching Behavior	Nonverbal Communication	Observation	Results indicated that high status persons will more frequently touch lower status persons. This was true when status was defined as socioeconomic, age, or gender related status.
Heshka & Nelson, 1972	Relationship, Age, Sex	Interpersonal Speaking Distance		Photos of Naturally Formed Dyads	Female strangers maintained greater distances than male strangers. Younger and older dyads stood closer together than middle aged dyads.
Holmes, Karst & Erhart, 1990					Theoretical discussion of physical disability and personal space. The authors suggest that the physical barrier results in social barriers.
Hughes & Goldman, 1978	Eye Contact, Facial Expression, Gender	Personal Space Intrusion	Sociobiological	Field Experiment	Males preferred to violate the personal space of persons who made no eye contact or turned back to them. Females preferred to violate the space of persons who initiated eye contact and smiled.
Jones, 1971	Subculture	Interpersonal Distance and Orientation	Enculturation	Observation	No significant differences were found between subgroups
Jorgenson, 1975	Status	Interpersonal Distance		Observation	No significant differences were found between pairs of subjects with equal status and those with unequal status. Orientation did differ significantly.
Kenner & Katsimaglis, 1993	Gender	Taxi Seat Choice		Observation	Females always chose seat furthest away from driver while 86% of males selected seat next to driver.
Kilbury, Bordieri, & Wong, 1996	Physical Disability	Interpersonal Distance	Enculturation	Experiment	Subjects established smaller distances from those using wheelchairs than those fully mobile. Authors attributed findings to recent changes in policy.
Kiotas, 1990	Social Status, Gender	Proxemic Variables	Enculturation	Experiment	Subjects prefer greater distances from those with higher status. Subjects stood closer to male than female confederates.

Kmieciak, Mausar, & Banziger, 1979	Attractiveness	Interpersonal Space	Sociobiological	Field Experiment	Persons at a crosswalk left more quickly when approached by an unattractive person than when approached by an attractive person.
Krail & Levanthal, 1976	Gender	Blocking Behaviors, Departure Time		Field Experiment	As level of invasion increased (sitting close, sitting next to, reading the other's book), time to departure decreased. Same-sex dyads resulted in shorter departure time.
Latta, 1978	Status	Personal Space	Situational Resource	Experiment	Subjects maintained a greater distance from high status confederates compared to a low status confederate.
Leffler, Gillespie, & Conaty, 1982	Status	Interpersonal Distance	Nonverbal Communication	Experiment	High status "teachers" claimed more space and intruded upon the other's space more frequently than low status "students."
Leibman, 1970	Gender, Race	Interpersonal Distance, Intrusion	Enculturation	Experiment	Race did not influence interpersonal distance, intrusion choice or intrusion distance. Subjects sat closer to females than males and chose female intrusion over male intrusion.
Lerner, Iwawaki, Chihara, 1976	Age, Gender, Body Type	Interpersonal Distance	Organismic Development Theory	Felt Board	Distance increased as age increased. Subjects established greater distance from opposite-sex stimulus. Differences were found between body types of stimulus.
Lerner, Karabenick & Meisels, 1975	Age, Gender, Body Build	Personal Space	Organismic Theory of Development	Experiment	As age increased, interpersonal distance increased. Body types did significantly affect interpersonal distance and males established greater distances than females.
Leventhal, Schanerman & Maturro, 1978	Room Size, Initial Approach Distance, Gender	Personal Space		Experiment, Figure Stop	Gender and room size interacted to produce significant differences in interpersonal distance.
Lomranz, Shapira, Choresch & Gilat, 1975	Age, Gender	Personal Space	Enculturation	Experiment, Figure Stop	As age increased from 3 to 7 years, personal space increased. Both boys and girls established greater distances from boys than from girls.
Lott & Sommer, 1967	Status	Seating Choice	Sociobiological	Experiment	Head of the table was consistently associated with a high status person. At a square table, the subjects selected seats that were most distant from high status person.
Love & Aiello, 1980	Measurement Technique	Personal Space			Unobtrusive measurements were not significantly related to felt board placement, doll placement or figure stop techniques.

Mahoney, 1974	Invasion and Non-Invasion Conditions	Compensatory Behavior	Sociobiological	Field Experiment	The more closely the subjects space was invaded, the more leaning and blocking behaviors occurred.
Mallenby & Mallenby, 1975	Hearing, Educational Environment	Interpersonal Distance	Enculturation	Observation	Hearing-disabled children attending special schools established larger distances compared to those attending public high schools.
Mehrabian & Diamond, 1971	Gender, Affiliation, Sensitivity, Seating Choice	Conversation		Lab Experiment	Females and those with high levels of affiliation established closer distances. More proximate persons engaged in more conversation.
Meisels & Guardo, 1969	Age, Gender, Liking	Interpersonal Distance	Enculturation	Pencil-Paper Tests	The higher the level of liking, the smaller the distance established. Children placed themselves closer to same-sex persons at young ages and closer to opposite-sex persons at older ages.
Mishara, et al., 1974	Gender, Age	Personal Space	Sociobiological	Experiment	Older women departed more slowly when intruded upon by an older women compared to a young woman.
Pagan & Aiello, 1982	Age, Subculture, Gender	Interpersonal Distance	Enculturation	Observation	A positive relationship was found between age and interpersonal distance. Gender differences were not found.
Patterson & Sechrest, 1970	Interpersonal Distance	Ratings of Friendliness, Aggression, Extroversion and Dominance		Experiment	At close distance, ratings for all four characteristics were moderate. At moderate distance, ratings for all characteristics increased and then decreased as distance increased.
Pederson, 1973a	Age, Gender	Interpersonal Distance	Enculturation	Pedersen Personal Space Measure	Female children established smaller distances than male children. As age increased, established distance increased.
Pederson, 1973c	Measurement Technique	Interpersonal Distance		Experiment	High levels of reliability were found between an unobtrusive measurement, a profile-paper test and a figure stop activity.
Phillips, 1979	Perception of Body Boundary, Body Size	Personal Space	Sociobiological	Questionnaire, Experiment	Perception of small body size was negatively correlated with large body boundaries and large personal spaces in the elderly.
Remland, Jones & Brinkman, 1995	Culture, Gender, Age	Proxemic and Haptic Behavior	Enculturation	Observation	Age and gender-composition of the dyads were not significant predictors. Dutch maintained greater distances compared to French and English.
Rubak & Snow, 1993	Race	Intrusion Behavior		Field Experiment	White subjects left faster and black subjects lingered longer when intruded upon by a white confederate. Cross race intruders waited longer to intrude.

Rustemli, 1990	Distance, Density, Sex, Affiliation	Crowding Effect	Sociobiological	Experiment	Distance between subject and near persons in diagram resulted in higher perception of crowding. Density had no effect.
Sanders, 1976	Body Image	Personal Space		Pencil-Paper Tests	Both genders indicated greater distance for males. Barrier scores were significantly correlated when the approaching stranger was a male.
Sanders, Thomas, Suydam & Petri, 1980	Measurement Technique	Personal Space			An auditory technique (figure stop with audible footsteps) was compared to pencil-paper measurement and full scale figure stop. The auditory technique was a better representation of personal space than the pencil-paper technique.
Scherer, 1974	Socioeconomic Class, Subculture	Proxemic Behavior	Enculturation	Observation	Subcultural distances were not apparent. Lower-class pairs stood closer together than middle-class pairs.
Scott, 1993					Theoretical discussion on the role of personal space boundaries in psychiatric health care.
Severy, Forsyth, & Wagner, 1979	Age, Race, Gender	Personal Space		Experiment	As age increased, personal space requirements decreased and this was truer for whites than blacks. Referent other is discussed in role of variation in measurement techniques.
Sinha & Mukherjee, 1996	Perceived Cooperation, Room Occupancy	Interpersonal Distance	Sociobiological	Paper and Pencil	Friendly relationships and high levels of cooperation resulted in greater tolerance of cooperation.
Sinha & Sinha, 1991	Density and Personal Space	Task Performance and Feelings of Crowding	Sociobiological	Lab Experiment, Stop Figure	Persons with large personal space performed poorly and rated the experimental site as more crowded in a high-density condition compared to those with smaller personal space preferences.
Smith, 1980b	Furniture, Status, Room Size	Spatial Patterns		Experiment	As room size increased, space between furniture components increased.
Stephenson & Rutter, 1970	Eye Contact, Affiliation	Distance	Affiliative-Conflict Theory	Experiment	As distance increased, eye contact increased.
Stratton, Tekippe & Flick, 1973	Self Concept	Personal Space		Questionnaire, Experiment	High self-concept students approached a male confederate more closely than low self-concept students. There were no differences between a dress dummy and a live person in approach distances.
Summit, Westfall, Sommer & Harrison, 1992	Position in weightless environment	Interpersonal Distance		Experiment	As uniqueness of position increased, distance increased due to fear of touching.

Tedesco & Fromme, 1974	Cooperation	Interpersonal Distance		Experiment	Groups of individuals engaged in a joint task sat more closely than groups engaged in individual tasks.
Tennis & Dabbs, 1976	Sex, Setting, Age	Personal Space		Experiment	Males maintained a greater distance than females from fifth grade through college. Corner settings resulted in greater distances than center settings.
Tolor, 1975	Measurement Technique, Personality	Personal Space			Results indicate that placing oneself in relation to another figure and placing the other figure in relation to oneself are highly correlated. Extroversion was not related to the distance measurements.
White, 1975	Room Size, Status, Gender	Interpersonal Distance		Experiment	Gender and status did not significantly affect interpersonal distance. Large rooms tended to result in smaller distances than smaller rooms.
Willis, 1966	Relationship	Initial Speaking Distance	Sociobiological Theory	Observation	Speakers stood more closely to women than men. Gender interacts with relationship to affect distancing patterns. Peers (same age) stand closer than different age groups.
Wittig & Skolnick, 1978	Warmth, Gender	Personal Space		Experiment	Perception of warmth was examined in relationship to allotted distance. "Cool," low status males were allotted more space than "warm," high status males. High status females were given more space than low status females, regardless of warmth.
Worthington, 1974	Physical Disability	Interpersonal Distance	Enculturation	Field Experiment	Subjects established greater distances from those using wheelchairs compared to those standing.

APPENDIX K
INSTITUTIONAL REVIEW BOARD APPROVAL

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 12-22-98

IRB #: HE-99-048

Proposal Title: **PERSONAL SPACE: INTERPERSONAL SPATIAL DISTANCES
OF CAUCASIAN AMERICANS IN LATE ADULTHOOD**

Principal Investigator(s): Margaret J. Weber, Jennifer D. Webb

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature:

 (80)

Date: December 22, 1998

Carol Olson, Director of University Research Compliance

cc: Jennifer D. Webb

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA ✓

Jennifer D. Webb

Candidate for the Degree of

Doctor of Philosophy

**Dissertation: PERSONAL SPACE: INTERPERSONAL DISTANCES IN LATE ADULTHOOD
FOR CAUCASIANS RESIDING IN OKLAHOMA**

Major Field: Human Environmental Sciences

Biographical:

Personal Data: Born in Knoxville, Tennessee, On August 24, 1963, the daughter of David and Jeanne Webb.

Education: Graduated from West High School, Knoxville, Tennessee in June, 1981; received Bachelor of Science and a Master of Science in Interior Design from the University of Tennessee – Knoxville in 1989 and 1995 respectively. Completed requirements for the Doctor of Philosophy degree with a major in Human Environmental Sciences and a Gerontology Certificate at Oklahoma State University in June, 1999.

Experience: Employed as an interior designer in Knoxville, Tennessee; employed as a graduate teaching assistant by the University of Tennessee; employed as a lecturer by Appalachian State University and as a graduate research associate by Oklahoma State University.

Professional and Honorary Memberships: Interior Design Educator's Council, National Council for Interior Design Qualifications, Southwest Society on Aging, American Society on Aging, Kappa Omicron Nu and Sigma Phi Omega.