

**THE ATTAINMENT OF IMPORTANT HEALTH GOALS THROUGHOUT ADULTHOOD: AN INTEGRATION OF THE THEORY OF PLANNED BEHAVIOR AND ASPECTS OF SOCIAL SUPPORT**

**DEAN D. VONDRAS, PH.D.**

*University of Wisconsin–Green Bay*

**SCOTT F. MADEY, PH.D**

*Shippensburg University*

**ABSTRACT**

This research integrates the Theory of Planned Behavior (TPB) with aspects of social support and explores the utility of variables within each model in predicting the attainment of important health goals. Incorporating an idiographic methodology, 290 respondents ranging in age from 27 to 87 years were administered a postal survey and completed a brief follow-up telephone survey months later. The postal survey included measures of respondent's most important health goals, attitudes, motivation to comply with subjective norms, control beliefs, behavioral intention, and plan-of-action for attaining the health goal, as well as aspects of social support. The follow-up telephone survey inquired into respondents' successful goal attainment and health. Results indicate association, between TPB components and aspects of social support. Further, the emotional and instrumental support provided by a family member or friend and size of social support network were found to be unique predictors of health goal attainment after controlling for TPB components. The importance of personalized goals and social support in designing health interventions for older adults is discussed.

**INTRODUCTION**

Several theoretical models provide interpretive lenses by which to describe and explain health-related behaviors of older adults (see Glantz, Lewis, & Rimer,

1997; Penny, Bennett, & Herbert, 1994; Redding, Rossi, Rossi, Velicer, & Prochaska, 2000). Many of these models have focused on social-cognition processes (e.g., attitudes, motivation, perceptions of control, intentionality, and planning of action; Ajzen, 1985, 1987, 1991; Gollwitzer, 1990; Prochaska, DiClemente, & Norcross, 1992) and the influence of social relationships on behavior (e.g., social support; Berkman, 1985; Blazer, 1982; Lewis, Rook, & Schwartz, 1994). While each approach has discerned important factors effecting health and well-being, there has been little research that has integrated these different theoretical perspectives. The purpose of this investigation is to explore social-cognitive constructs and aspects of social support that impact the attainment of important health goals throughout adulthood and to elucidate explanatory psychological mechanisms by which specific aspects of social support have their effects.

### **Social-Cognitive and Social Support Orientations**

One explanation of how people engage in health behaviors that have applicability to older adults is found in the Theory of Planned Behavior. As developed by Ajzen (1985, 1987, 1991), the Theory of Planned Behavior (TPB) posits that an individual's attitudes, motivation to comply with social norms, and perceptions of control are antecedents of one's intention to act or perform a behavior. In the TPB model, attitudes refer to the degree to which the person holds positive evaluations, expectations, and beliefs about a particular behavior. For example, if the person holds a general expectation and belief that exercising will result in a beneficial health outcome, then one's attitudes toward exercising would be positive. Thus, as put forth by the TPB model, as the person's attitudes toward a behavior become more positive, one's intention to perform the behavior increases. The motivation to comply with the subjective norms component of the TPB model reflects the person's perception of social pressure from important others to perform or not to perform a particular behavior. For example, the person's perception that important others hold similar attitudes about exercise and its benefit on health and well-being involves a referencing of social expectations concerning exercise behavior. Thus, the TPB model posits that the greater the person's desire to comply with this type of social pressure, the greater one's intention to perform the behavior and fulfill social expectation. The perceived control component refers to the person's discernment of ease or difficulty in performing a particular behavior and reflects past as well as future impediments in enacting the behavior. Importantly, one's intention to act is suggested to capture the motivational forces of attitudes, subjective norms, and perceptions of control and function as an immediate antecedent of behavior. Therefore, the stronger the intention to perform the behavior, the greater the probability that the person will engage in the behavior or attain a specific behavioral outcome.

Support for the TPB model and the utility of its components in predicting health behavior has been widespread. The predictive reliability of TPB components have been reported in investigations of exercise behaviors (e.g., Blue, Wilbur, & Marston-Scott, 2001; Estabrooks & Caroon, 1999), weight loss (e.g., Netemeyer, Burton, & Johnston, 1991; Schifter & Ajzen, 1985), smoking cessation (e.g., Godin, Valois, Lepage, & Desharnais, 1992; Norman, Conner, & Bell, 1999), alcohol use (e.g., Conner, Warren, Close, & Sparks, 1999; Marcoux & Shope, 1997), sexual behavior (e.g., Reinecke, Schmidt, & Ajzen, 1997), and health prevention behaviors (e.g., DeVellis, Blalock, & Sandler, 1990; Frost, Myers, & Newman, 2001). Despite these research findings, however, reliable inter-correlation of TPB components and their causal impact on intentions and behavior have not always been reported (e.g., Godin, Valois, & Lepage, 1993), and other factors have been suggested as both mediators and moderators of TPB components and behavior (Ajzen, 1991). For example, self-schematicity for exercise has been shown to moderate the intention and behavioral outcome causal relationship, such that when behavioral intention is high the likelihood of exercise is greatly increased if the individual is self-schematic for exercise (Sheeran & Orbell, 2000). Further, while the influences of the personality traits of neuroticism, extraversion, and conscientiousness on exercise were found to be mediated by TPB components, extraversion was shown to produce a unique positive influence on exercise behavior beyond the effects of other personality factors and TPB components (Courneya, Bobick, & Schinke, 1999). Other research has suggested that social and cultural factors may also be moderators and mediators of TPB components and behavior. For example, gender differences have been reported in the self-regulation of hypertension, suggesting women's desire and attempt to regulate hypertension to be significantly influenced by their motivation to comply with subjective norms, while similar relationships were absent in men (Taylor, Bagozzi, & Gaither, 2001). Greater identification with cultural characteristics and social involvement has also been found to be moderators of TPB component links. For example, greater identification with gay culture was suggested to positively influence the causal relationship between compliance with subjective norms and safe sex intentions (Boldero, Santioso, & Brain, 1999), and greater perceived social cohesion and receipt of social support have been reported to positively influence intention to exercise via the attitude and perceived control components (Courneya & McAuley, 1995). Thus, considering Stoll's (1968) observation, that "individuals interact with others partly on the basis of expectations as to how people behave" (p. 128), it is reasonable to suggest that one's attitudes, motivation, control beliefs, as well as intention to act may be broadly influenced by the assumptions, understandings, and expectations of supporting others.

Indeed, as noted by Hafner and Welz (1989), "the network of personal relationships plays a decisive part in the growth of identity, transmission of social norms and attitudes, decision making, and coping with crises and stressful

events” (p. 150). Thus, similar to the subjective norm component of the TPB, social support theory underscores the influence of interpersonal relationships on health behavior. As described by Rook (1994), there are three aspects of social support that may influence behavior and health. The first is the characteristics of the social network one belongs to that provides a connection to a network of integrated relationships. This structural dimension includes one’s relationship statuses, size of network, availability of intimate confidants, and frequency of contacts. A second aspect of social support is the content of social relationships. This aspect refers to a functional aspect of social support and includes dimensions of emotional support (e.g., empathy, reassurance, love), appraisal support (e.g., feedback on performance, thought, or emotion), informational support (e.g., problem solving and information gathering), instrumental support (e.g., provision of services and assistance), and social control. A third aspect of social support is social network evaluations. This aspect includes measures of the quantity and quality of support, as well as overall satisfaction with social relations.

Similar to research using the TPB model, investigations assessing the structural and social network aspects of social support have indicated relationship status, size of network, adequacy of the support network, availability of intimate confidants, and frequency of contacts to be predictors of health status and mortality (e.g., Berkman, 1985; Blazer, 1982; Broadhead et al., 1983; Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997). Correspondingly, investigations focusing on functional aspects have reported association between the person’s perception of positive characteristics of social support and resistance to infection and illness (e.g., Cohen, 1991), as well as enhanced psychological well-being (e.g., Antonucci, 1991). With regard to health behaviors, one’s perceptions of high perceived support as well as positive characteristics of the social network have been suggested to assist the individual in successful smoking cessation (e.g., Coppotelli & Orleans, 1985; Mermelstein, Cohen, Lichtenstein, Baer, & Kamarck, 1986; Morgan, Ashenberg, & Fisher, 1988), medical regime compliance (e.g., DiMatteo & Hays, 1981; Felton, 1990; Wortman & Conway, 1985), and recovery from illness (e.g., Oxman & Hull, 1997). Moreover, functional support is noted to have “a controlling or regulating quality that may either promote or damage health” (House, Umberson, & Landis, 1988, p. 302). Thus, interpersonal communications have been suggested to prompt positive health behaviors (e.g., Tucker & Mueller, 2000) and aid the individual attempting self-initiated changes (e.g., Baranowski & Nader, 1985; Zimmerman & Conner, 1989).

### **Methodological Approach and Hypotheses**

The present research sought to explore TPB and social support influences on health goal attainment using an idiographic methodology (cf. Bargh & Gollwitzer, 1994; Diener & Fujita, 1995; Pelham, 1993; Shadel, Niaura, & Abrams, 2000). An idiographic approach permits participants to choose self-relevant health goals

and create personalized plans to attain these goals. Indeed, other research has suggested that allowing for self-designated goals is key in involving research participants in a meaningful way (e.g., Diener & Fujita, 1995; Shadel et al., 2000), and more likely to result in successful health goal attainment (e.g., Dean & Kickbusch, 1995; Strecher et al., 1995). Thus, following from age and health trends reported by Jackson (1999), in comparison to young adults, older adults were expected to be more likely to report health goals and activities that reflect chronic health problems (e.g., controlling diabetes, recovery from surgery). Further, it was expected that in comparison to research showing a very weak or no association between subjective norms and behavioral intention (e.g., Blue et al., 2001; Courneya & McAuley, 1995) and no association of behavioral intention with behavior outcomes (Brenes, Strube, & Storandt, 1998), respondents' self-designation of health goal would permit a more reliable reflection of associations between attitudes, subjective norms, perception of control, and behavioral intention. Moreover, following Ajzen's (1991) supposition that other factors may be predictors of intention or behavior beyond the TPB components and in accord with research that suggests that the greater the individual specifies how intended activities will be accomplished the more likely one is to actually perform them (e.g., Bargh & Gollwitzer, 1994), it was expected that participants' specification of plan-of-action would be associated with behavioral intention and potentially a unique predictor of health goal attainment. Additionally, the motivation to comply with a salient referent was also assessed. Conceptually, the salient referent reflects an interpersonal context of behavior and resonates important emotional and instrumental feedback provided by a social control agent that may motivate and direct behavior (Fisher, Fisher & Rye, 1995; Morrison, Gillmore, & Baker, 1995). Thus, motivation to comply with the salient referent was expected to predict behavioral intention and make unique contribution to the TPB model.

Guided by the suggestion that "structural and functional aspects of social relations be explicitly conceptualized and measured in a single study" (House & Kahn, 1985, p. 85), this investigation also assessed dimensions of the structural network, functional social support, and social network evaluations made by the individual (cf. Rook, 1994). Following from research suggesting perceived social support to be important in smoking cessation and compliance with medical regime (e.g., Coppotelli & Orleans, 1985; DiMatteo & Hayes, 1981), it was expected that aspects of functional social support (i.e., perceived support, emotional and instrumental support provided by someone close) would be predictive of successful health goal attainment. Further, following from previous investigations suggesting correlation of perceived social support with extraversion, self-esteem, hostility, and depression (e.g., VonDras & Siegler, 1997; VonDras, Siegler, Barefoot, Williams, & Mark, 2000; VonDras, Williams, Kaplan, & Siegler, 1996), as well as research indicating personality traits to be mediated by TPB components (Courneya et al., 1999), it was expected that the aspects of functional support (i.e., perceived support, emotional and instrumental support provided by someone

close to the individual) would be correlated with attitudes, subjective norms, perceived control, and intention components of the TPB model. Moreover, following from research by Courneya, Plotnikoff, Hotz, and Birkett (2000) that suggests the social support provided by family members and friends supplants subjective norms in predicting intention, and in accord with Ajzen's (1991) postulation that other factors may be predictors of intention and behavior and thus factors that extend the TPB model, it was expected that emotional and instrumental support provided by someone close to the individual would be a stronger correlate of behavioral intention than the subjective norm component and a predictor of behavioral outcome after controlling for the influence of TPB components.

## METHOD

### Respondents and Procedure

Respondents were randomly selected from the Washington University Aging and Adult Development subject pool and recruited in a brief telephone solicitation, asking them to take part in a postal survey and follow-up telephone interview. This postal survey and telephone follow-up methodology is modeled after other health research (e.g., Morrison et al., 1995; Siemiatycki, 1979; Wilson & Roe, 1998; Worth & Tierney, 1993). At the time of recruitment, each individual was informed that the purpose of the research was to investigate the important health goals people have and desire to achieve said goals within the next three months, what activities they would employ, and how other people may assist them in attaining their health goal. Potential respondents were then instructed that they would be asked to complete a postal survey and take part in a telephone interview three months after they completed the survey. Potential respondents were further informed that they would not receive financial remuneration or other benefits for their participation in this study. As a screening measure, during the telephone solicitation each person was asked to designate an important health goal they would like to work toward in the next three months. Individuals who reported not having an important health goal were excluded from the study; the number of people excluded due to this screening question was 12. An introductory letter, consent form, and postal survey were then sent to 400 individuals contacted by telephone who indicated a health goal. Of the 400 individuals who initially received the postal survey, a total of 332 individuals (83% of those mailed the survey) had returned it at investigation's end. A small proportion of these 332 respondents were subsequently excluded because they did not complete the questionnaire or were not available for the telephone interview; two people were excluded because of missing data, and 30 people were unreachable or asked to end their participation during the telephone interview. Subsequently, this investigation included 290 (72.5% of those participants

mailed the postal survey) adults who initially completed the postal survey and who also participated in the telephone interview. Of the 400 individuals sent the postal survey, 17% failed to return the survey and 10.5% discontinued participation or returned surveys with missing data. The overall attrition rate (27.5%) is comparable to rates (20% to 27%) reported in other postal-telephone surveys (Wilson & Roe, 1998).

### *Demographic Characteristics*

Respondents were all community dwelling adults and ranged in age from 27 to 87 years ( $M = 59.3$  years,  $SD = 15.5$ ). As is characteristic of Washington University's Aging and Adult Development subject pool, respondents were predominantly white (96%) and female; the ratio of men to women was 65:224 with one individual declining to provide a gender identification. With regard to respondents' relationship status, 64% ( $n = 185$ ) were married or living with a domestic partner, 8.3% ( $n = 24$ ) were single, 14.2% ( $n = 41$ ) were widowed, 12.1% ( $n = 35$ ) were separated or divorced, 1.4% ( $n = 4$ ) reported some other relationship, and one respondent declined to provide a relationship status classification. Further, respondents' mean number of years of formal education was 15.4 years ( $Range = 3$  to 24 years,  $SD = 2.83$ ).

Respondents' health was assessed using the general health perceptions subscale of *The MOS 36-Item Short-Form Health Survey* (SF-36; Ware, 1993; Ware & Sherbourne, 1992). This instrument is a five-item measure utilizing a Likert type format; the alpha coefficient for this instrument in the present sample was .80. In general, respondents reported very good general health ( $M = 74.77$ ,  $SD = 19.32$ ,  $Range = 0$  to 100).

### **Postal Survey**

The first wave of measurement consisted of the postal survey that included measures assessing demographics, aspects of social support, the important health goal the individual wished to attain in the next three months, and their plan for attaining this health goal. The postal survey also assessed the individual's attitudes, compliance with subjective norms, intentions, and perceived control. Note that the measures discussed below are comparable to those used in other health goal attainment research investigating attitudes, compliance with subjective norms, intentions, and perceptions of control (e.g., Ajzen & Madden, 1986; Blue et al., 2001), as well as the effects of social support (e.g., Mermelstein et al., 1986). Further, the idiographic assessment methodology used here emphasizes the uniqueness of each respondent's personal goal and plan-of-action and has been shown to be useful in illuminating social cognition and health goal relationships (e.g., Shadel et al., 2000).

*Inquiring into the Health Goal, Plan-of-Action,  
and Assessing Components of the TPB*

To obtain a self-designation of respondent's important health goal and plan-of-action for attaining the health goal, respondents were asked two open-ended questions modeled after methodologies developed to assess specificity of behavioral intention (e.g., Bargh & Gollwitzer, 1994; Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987). The first asked the individual to "Tell us what is the one *most* important health goal you would like to work toward in the next three months." The next item instructed the participant to "Describe what plan-of-action you will undertake to work toward your health goal in the next three months. Please note that you do not necessarily have to *attain* your goal in the next three months; what we are interested in knowing is what plan you will use to *work toward* your health goal during the next three months. Please describe your plan-of-action in the space below. Be specific."

Construction of scales to assess attitudes, subjective norms, perceived control, and intention to work toward the health goal followed the direct measurement approach suggested by Ajzen and Fishbein (1980) and similarly used in health research by Blue et al. (2001). To measure attitude toward attaining the health goal, respondents were asked two questions with associated semantic differential rating scales. The first asked the respondent to state their level of agreement to the statement "Working toward my health goal in the next three months would be," using three response scales that ranged from *very bad* (1) to *very good* (7), *very useless* (1) to *very useful* (7), and *very harmful* (1) to *very beneficial* (7). The second question asked, "How important is it that you work toward attaining your health goal in the next three months?" This question required a response on a 7-point scale that ranged from *not at all important* (1) to *very important* (7). The average response on these four scales served as a measure of attitude toward working to attain the health goal. The alpha coefficient of this attitude measure was .82.

Behavioral intention was assessed by a single item that asked, "What are the chances in 10 that you will begin or continue your plan-of-action to attain your health goal during the next three months?" Responses were recorded on an 11-point scale that ranged from *no chance* (0) to *sure bet* (10).

To create a measure of compliance with general subjective norms, two questions inquired into respondent's level of agreement with the following statements: "Most people who are important to me think I should work toward my health goal in the next three months," and "When it comes to working toward my health goal in the next three months, I want to do what most people who are important to me think I should do." Responses were recorded on a 7-point scale ranging from *disagree very much* (1) to *agree very much* (7). A measure of each respondent's compliance with general subjective norms was then created by multiplying participant's responses on these two scales.



In accordance with other health goal attainment research, questions that inquired into salient referent support (e.g., Fisher et al., 1995; Morrison et al., 1995) were also included. In this investigation, the salient referent assesses the respondent's compliance with a primary social network member that the respondent has designated as most likely to assist them as they work toward their health goal. These items asked respondents to report their level of agreement with the statements: "This person thinks it is important that I should work toward my health goal in the next three months"; and "When it comes to working toward my health goal in the next three months, I want to do what this person thinks I should do." Responses were recorded on a 7-point scale from *disagree very much* (1) to *agree very much* (7). As with the direct measurement of subjective norms (cf. Blue et al., 2001), the salient referent support measure was created by multiplying the individual's responses on these two scales.

As a measure of perceived control, three questions were posed. The first asked, "How difficult will it be to work toward your health goal in the next three months?" Response to this item was recorded on a 7-point scale that ranged from *very difficult* (1) to *very easy* (7). A second question asked, "How much control do you have over working toward your health goal in the next three months?" Response to this item was recorded on a 7-point scale that ranged from *absolutely no control* (1) to *complete control* (7). A final item asked participants to respond differentially to the statement, "The number of events outside my control which would prevent me from working toward my health goal in the next three months are" using a 7-point scale that ranged from *few* (1) to *numerous* (7). Responses on these scales were averaged, and higher score indicated greater perceived control. The alpha coefficient for the perceived control measure was .75.

#### *Assessing Aspects of Social Support*

Several scales were used to assess the structural and functional aspects of social support, thereby providing an exploration of the individual's perception of support, satisfaction with social contacts, negativity of interpersonal relationships, desire for more support, emotional and instrumental support, and the number of people one feels close to that make up their social network.

As a measure of functional social support, respondents completed a modified form of the *Interpersonal Support Evaluation List* (ISEL; Cohen & Hoberman, 1983). This measure contained 18 items comprising four dimensions of perceived social support: the appraisal of social support, sense of belonging, tangible social support, and self-esteem. Item response format used a 4-point scale ranging along the dimension of *definitely true* (1), *probably true* (2), *probably false* (3), and *definitely false* (4). Responses on these scales were averaged, and a higher score indicates greater perceived social support. The alpha coefficient for the modified ISEL was .90.

As a measure of quality of support two items from research by Schulz, Williamson, Morycz, and Biegel (1992) were used. These questions asked respondents how satisfied they were with “the amount of social contacts,” and “the quality or closeness of the social contacts.” Response format for these items used a 7-point scale that ranged from *very dissatisfied* (1) to *very satisfied* (7). Responses on these scales were averaged, and a high score indicates greater satisfaction with social contacts. The alpha coefficient of this satisfaction with social contacts measure was .88.

Another measure of quality of support assessed one’s interpersonal relationships using five items from research by Schulz et al. (1992). These questions asked how often the respondent felt that social network members “criticized your handling of things,” “don’t help you as much as you thought they would,” “are trying to be helpful to you, but really are making things worse,” “seem to be out to make problems for you,” and “have withdrawn from you.” Item response format used a 5-point scale ranging along the dimensions *not at all* (1), *some of the time* (2), *quite a bit of the time* (3), *a great deal of the time* (4), and *all the time* (5). Responses on these scales were averaged, and a high score indicates a greater negative quality of interpersonal relationships. The alpha coefficient of the negative quality of interpersonal relationships measure was .47.

An additional measure of quality of support assessed the individual’s desire for more support by using four modified questions from the *Mannheim Interview on Social Support* (Veiel, 1990) that asked, “Do you feel that you would like to have more people to talk to and do things with,” “Would you like to be invited out more often,” “Would you like to have more people who could help you make important decisions,” and “Would you like to have more people to talk to about your feelings when things are going wrong?” Item response format used a 4-point scale Likert scale ranging along the dimensions *no, not at all* (1), *sometimes I feel I would* (2), *quite often I feel I would* (3), and *yes, definitely* (4). Responses on these scales were averaged, and a high score indicates greater desire for more support. The alpha coefficient was .83 for this scale.

A group of questions were used to assess structural aspects of social support and to focus the individual on later questions inquiring into emotional and instrumental support provided by a primary social network member. To delineate social network properties (i.e., size of network, social embeddedness), respondents were asked to write down the first name or initials of and their role-relationship to all the people they feel closest to. A subsequent question asked respondents to designate who would be most likely to assist them as they work toward their health goal.

To assess the functional support provided by salient referents, respondents were asked eight questions based on the emotional and instrumental support functions described in Antonucci and Israel (1986). These questions are reflective of the types of emotional and instrumental support often provided to close members of social networks (e.g., Adams, King, & King, 1996; Venkatraman, 1995). The first three questions inquired into how much “support,” “reassurance,”

and “assistance,” this person(s) would provide as they worked to attain their health goal. Four subsequent questions asked how much the respondent felt this person(s) “respects your needs, wishes, and feelings,” “would provide care if you became sick or injured and could no longer perform day-to-day functions,” “was available to talk to you if you become frustrated or upset as you try to attain your health goal,” and “was available to talk to you if you become nervous or depressed as you try to attain your health goal.” A final question asked how much “in the past year have you discussed your stated health goal with the person(s).” Item response format used a 5-point scale ranging along the dimensions *not at all* (1), *some of the time* (2), *quite a bit of the time* (3), *a great deal of the time* (4), and *all the time* (5). Responses on these scales were averaged, and higher score indicates greater emotional and instrumental support provided by salient referents. The alpha coefficient of this emotional/instrumental support measure was .86.

#### *Telephone Interview*

The second wave of measurement consisted of a brief telephone interview three months following respondent’s completion of the postal survey. The length of time between completion of postal survey and telephone interview follows other research using the TPB model that suggests an optimal time to measure changes in health behavior is after three months (e.g., Morrison et al., 1995). At the start of the telephone interview respondents were reminded of their health goal. Immediately thereafter, respondents were asked three questions, modeled after items used by Godin et al. (1993) and by Morrison et al. (1995), which inquired into their success in attaining their health goal. The first asked, “How successful were you in working toward your health goal; using a scale where 1 is *not at all successful* and 7 is *very successful*?” The next question asked, “How close did you come to attaining your health goal; using a scale where 1 is *not close at all to attaining my health goal* and 7 is *completely attained my health goal*?” A subsequent question asked, “To what degree did you reach your desired health goal; using a scale where 1 is *not at all* and 7 is *beyond my expectation*?” Responses on these questions were averaged, and a high score indicates greater success. The alpha coefficient of this success measure was .96.

Respondents were also asked to make a rating of their present health. This query stated, “The following question asks about your present health. Please give the best answer you can. In general, would you say your health now is: *Excellent* (1), *Very Good* (2), *Good* (3), *Fair* (4), *Poor* (5)?”

#### **Data Analysis**

Preliminary analyses used chi-square and correlational techniques to address age effects and investigate relationships between demographic characteristics and study variables. Correlational and multiple regression correlational procedures were conducted to investigate relationships between aspects of social

support and components of the TPB model. As an interpretive guide, we adhere to the convention suggested by J. Cohen and P. Cohen (1983) that correlations of .10, .30, and .50 usually characterize small, moderate, and large effect sizes, respectively. Further, due to participants' omitting of response on some questions, degrees of freedom varied throughout analyses.

## RESULTS

This section first describes respondents' health goal, plan-of-action for attaining the health goals, and role-relationships of the salient referent (i.e., the individual respondents identified as most likely to provide them with instrumental support as they work toward their health goal). Thereafter, correlational analyses investigating relationships between demographic characteristics and study variables are presented, followed by multiple regression correlational (MRC) analyses predicting respondents' success in attaining their health goal as a function of attitudes, compliance with subjective norms, perceived control, intention, plan-of-action, and aspects of social support aspects.

### Health Goals, Plans-of-Action, and Role-Relationships of Salient Referent

#### *Health Goals*

As expected, the idiographic methodology revealed respondents to have a wide variety of health goals. A two-phase categorical analysis of goals was conducted to illuminate the various health goals respondents wished to pursue. The first phase utilized case-blind independent raters who sorted similar health goals into like groups. This first phase of sorting yielded the following 12 health goal categories: eating a balanced diet, losing weight, maintaining weight, exercising, maintaining health, controlling a chronic physical health problem, controlling stress or a mental health problem, recovering from surgery, athletic achievement, quitting smoking, other goals, and no specific goal. Overall concordance between independent raters in this first phase was 78% ( $k = .73, p < .01$ ), suggesting substantial rater agreement (cf. Landis & Koch, 1977). Resolution of disagreements was based upon in-depth discussion between raters to obtain consensus for placement of the goal within a specific category. The second phase collapsed respondents' health goals into logically related domains suggested by supra-goal categories: I. Preventative health goals (e.g., "eat a low-fat diet," "exercise regularly," "lose 20 pounds," "stay healthy"); II. Control of a chronic physical health condition (e.g., "control diabetes and hypertension," "recover from open heart surgery"); III. Mental health (e.g., "cope with stress," "overcome depression," "develop self-esteem"); and IV. Other (e.g., "go to dentist," "reduce competitive swimming time," no specific goal). The number of participants in each of these supra-goal

category was 166, 66, 35, and 23, respectively. To describe age and health goal associations, the sample was partitioned into young (49 years old and younger) and old (50 years or greater) groups. Result of chi-square analyses suggested age and health goal associations,  $\chi^2(3, 289) = 9.41, p < .03$ . As expected, a follow-up analysis of preventative health goals versus chronic health goals indicated older adults to be more likely to report a goal that addresses a chronic health problem,  $\chi^2(1, 132) = 4.80, p < .03$ .

#### *Specificity of Plan-of-Action*

Assessment of the specificity of respondent's plan-of-action was based on multiple dimensions of the planned activity. Thus, following designation of respondent's important health goal, during a "preactional phase" where respondents express an "implementation of intentions," "the individual is expected to work out plans that specify *when*, *where*, and *how* this implementation is to be done" (Bargh & Gollwitzer, 1994, p. 95). Thus, each plan was rated along the dimensions of how specific the respondent indicated what the target activity would be (e.g., playing golf), how the activity would be realized (e.g., walking nine holes instead of riding in a cart), and where and when the activity would occur, that is, the place, time of occurrence, and duration of the scheduled activity (e.g., playing every day in the afternoon at the local course). Specificity of plan-of-action ratings were made by case-blind independent raters using a scale ranging from *extremely vague* (1) to *extremely specific* (9). The Pearson product-moment correlation between raters' specificity assessments was .88; the alpha coefficient was .92. A measure of each respondent's plan-of-action specificity was obtained by averaging raters' specificity assessments.

#### *Role-Relationship of Salient Referent*

For purposes of description only, a frequency analysis was conducted on the role-relationship of the individual respondents designated as their salient referent (i.e., the individual identified as most likely to provide respondent with emotional and mental support as they work toward their health goal). The Spearman correlation between marital status (collapsed into two levels: married or other type of relationship) and role relationship of salient referent (collapsed into two levels: spouse or other relationship status) was .69. As suggested by Rook (1994), both role relationship and marital status are measures of social embeddedness; however, marital status is the simpler measure and has shown significant predictive utility in prospective health outcome studies. Thus, noting that prediction of health goal attainment and the understanding of functional dimensions of support are the primary objective of this present report, role relationship was omitted and marital status and network size were used as assessments of social embeddedness in all subsequent analyses. Results of the frequency tabulation indicated that a family member was the most frequently identified salient referent

(70.8%,  $n = 199$ ): a spouse was designated by 42.3% ( $n = 119$ ) of respondents; a parent, sibling, or other relative was designated by 28.5% ( $n = 80$ ) of respondents; a friend was designated by 23.5% ( $n = 66$ ) of respondents; a health professional was designated by 3.6% ( $n = 10$ ) of respondents; 2.1% ( $n = 6$ ) of respondents indicated no one would assist them; and nine respondents did not provide a designation of primary support network or salient referent's role-relationship. To explore the relationship between age and the role relationships of salient referent, the sample was again partitioned into young (49 years old and younger) and old (50 years or greater) groups, and into categories of spouse, other family member, and other relationship status. Results of chi-square analysis indicated no age effect.

### Zero-Order Correlations

Correlational analyses first investigated relationships between demographic characteristics and study variables. To control for inflation of Type I error when several statistical tests are conducted, a Bonferroni correction was applied setting the alpha criterion at  $p < .0001$ . Of particular note in these analyses were significant correlations of age with the TPB component's attitudes toward the health goal ( $r = -.24, p < .0001$ ), motivation to comply with general subjective norm ( $r = .29, p < .0001$ ), motivation to comply with salient referent ( $r = .28, p < .0001$ ), and specificity of plan-of-action ( $r = -.32, p < .0001$ ), suggesting that while older adults express greater motivation to comply with subjective norms, they express weaker attitudes toward the health goal and describe less specific plans-of-action. Also of note were the significant associations of perceived health at Time 1 with the TPB components of perceived control ( $r = .29, p < .0001$ ) and behavioral intention ( $r = .24, p < .0001$ ), and with the social support dimensions of perceived social support ( $r = .34, p < .0001$ ), satisfaction with social contacts ( $r = .29, p < .0001$ ), negative quality of social relationships ( $r = -.32, p < .0001$ ), and desire for greater social support ( $r = -.30, p < .0001$ ), indicating that respondents in poorer health express lower levels of control and behavioral intention as well as perceive a lower availability and quality of support. Other correlational analyses indicated that married individuals were more likely to report greater receipt of emotional and instrumental support from a salient referent ( $r = .23, p < .0001$ ), and individuals with more years of formal education were less likely to comply with general subjective norms ( $r = -.22, p < .0001$ ).

Correlations between TPB components, aspects of social support, plan-of-action, success in attaining health goal, and perceived health at follow-up are shown in Table 1. Note that the significant correlations of attitudes, general subjective norm, salient referent, and perceived control with respondents' behavioral intention ratings reflect expected associations within the TPB model (Ajzen, 1985). Further, as expected, the specificity of respondent's plan-of-action was found to be significantly correlated with respondent's intention. The

Table 1. Correlations, Means, and Standard Deviations of Study Variables

| Variable                                     | 1    | 2     | 3     | 4     | 5    | 6    | 7     | 8     | 9    | 10    | 11   | 12   | 13   | 14   |
|--|------|-------|-------|-------|------|------|-------|-------|------|-------|------|------|------|------|
| 1. Attitudes toward goal                     | —    |       |       |       |      |      |       |       |      |       |      |      |      |      |
| 2. General subjective norm                   | -.04 | —     |       |       |      |      |       |       |      |       |      |      |      |      |
| 3. Salient referent                          | .02  | .62*  | —     |       |      |      |       |       |      |       |      |      |      |      |
| 4. Perceived control                         | .07  | .11   | .15   | —     |      |      |       |       |      |       |      |      |      |      |
| 5. Behavioral intention                      | .21* | .19*  | .21*  | .41*  | —    |      |       |       |      |       |      |      |      |      |
| 6. Specificity of plan-of-action             | .18  | -.02  | .04   | .12   | .27* | —    |       |       |      |       |      |      |      |      |
| 7. Perceived support (ISEL)                  | .04  | .09   | .13   | .28*  | .20  | .11  | —     |       |      |       |      |      |      |      |
| 8. Satisfaction with social contacts         | -.03 | .11   | .15   | .10   | .12  | .05  | .60*  | —     |      |       |      |      |      |      |
| 9. Negativity of interpersonal relationships | .00  | .01   | .00   | -.28* | -.12 | -.04 | -.43* | -.32* | —    |       |      |      |      |      |
| 10. Desire for greater support               | .03  | -.10  | -.12  | -.18  | -.11 | -.06 | -.54* | -.61* | .44* | —     |      |      |      |      |
| 11. Emotional/instrumental support           | .04  | .37*  | .42*  | .23*  | .28* | .05  | .46*  | .32*  | -.14 | -.32* | —    |      |      |      |
| 12. Size of primary support network          | -.01 | .01   | .05   | .06   | .05  | .08  | .30*  | .24*  | -.12 | -.13  | .12  | —    |      |      |
| 13. Success in attaining health goal         | .12  | .10   | .11   | .29*  | .38* | .13  | .22*  | .12   | -.12 | -.16  | .27* | .18  | —    |      |
| 14. Health at follow-up <sup>a</sup>         | .04  | -.04  | -.04  | .18   | .21* | .20  | .32*  | .17   | -.16 | -.20* | .11  | .22* | .32* | —    |
| Mean   | 5.67 | 26.86 | 29.75 | 4.97  | 8.01 | 4.14 | 3.35  | 3.90  | 1.46 | 1.76  | 3.70 | 8.21 | 4.05 | 3.69 |
| SD   | 2.01 | 16.14 | 14.41 | 1.34  | 1.94 | 2.18 | 0.48  | 1.10  | 0.39 | 0.69  | 0.78 | 5.76 | 1.81 | 0.92 |

<sup>a</sup>The health at follow-up rating has been reversed so that a higher value indicates better perceived health.

\* $p < .0001$ .

intercorrelation among social support measures, while suggesting that various aspects of social support are undifferentiated using traditional measurement techniques (cf. House & Kahn, 1985; Kessler & McLeod, 1985), allude to the dynamic and reciprocal effects one would expect to logically occur in interpersonal relationships (e.g., the individual who is not satisfied with one's social relationships because of poor quality or receipt of negative feedback, would seek greater support from other network members). Also of special note in Table 1 are the significant correlations of the emotional and instrumental support provided by the salient referent with most of the TPB components. As expected, emotional and instrumental support from a close family member or friend were more highly correlated with intention than was the subjective norm component of the TPB model suggesting it to be a replacement for compliance with subjective norm in the TPB model.

### **Hierarchical Multiple Regression Correlational (MRC) Analyses**

A series of hierarchical MRC analyses were used to model the effects of attitudes, subjective norms, salient referent, perceived control, intention, specificity rating of the plan-of-action, and aspects of social support on successful health goal attainment. The first group of MRC analyses tested the efficacy of the TPB model with the additions of salient referent and specificity of plan-of-action in accounting for respondents' success in health goal attainment. The second group of MRC analyses assessed the effects of aspects of social support on successful attainment of health goal. Subsequent MRC analyses examined components of the TPB model as mediators between various aspects of social support and successful attainment of health goal. Noting that previous research has suggested that demographic characteristics may influence respondents' perceptions of social support and success in attaining health goals (e.g., Antonucci & Akiyama, 1987; Broadhead et al., 1983; Grzywacz & Fuqua, 2000; Vaux, 1985), age, gender (coded: female = 1; male = 0), marital status (coded: married = 1; other relationship status = 0), education, and general health perceptions were always controlled for by entering these demographic variables first as a hierarchical set in all MRC models.

#### *Theory of Planned Behavior*

Efficacy of the TPB model was examined via two hierarchical MRC analyses. The first hierarchical MRC analysis predicted behavioral intention as a function of other TPB components, as well as the salient referent and specificity of plan-of-action constructs. Order of variable entry was planned to test the contribution of TPB components and idiographic constructs after controlling for demographic characteristics. Thus, the first set of variables to enter the MRC equation contained demographic characteristics. The second step of entry were the



components originally discerned by the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975); this set consisted of attitudes toward the goal and motivation to comply with general subjective norms. The third step entered the perceived control component, a component of the TPB and noted extension of the Theory of Reasoned Action (Ajzen, 1985). The final step entered the idiographic components salient referent and specificity of the plan-of-action as a set. As shown in Table 2, after controlling for demographic characteristics, the set consisting of attitudes toward the health goal and motivation to comply with general subjective norms significantly accounted for 10% of the variance,  $Change\ in\ R^2 = .10, p < .0001$ . Perceived control was also a significant contributor with its entry into the MRC model,  $Change\ in\ R^2 = .08, p < .0001$ . As hypothesized, entry of the salient referent and specificity of plan components set also made a significant contribution,  $Change\ in\ R^2 = .02, p < .01$ . The unique contributions of the salient referent and specificity of plan-of-action constructs to this MRC model were  $\beta = .12 (p < .07)$ , and  $\beta = .13 (p < .03)$ , respectively. The overall MRC model predicting behavioral intention accounted for 28% of the variance,  $R^2 = .28, F(10, 262) = 10.64, p < .0001$ .

Table 2. Hierarchical MRC Analysis Predicting Behavioral Intention as a Function of Demographic Characteristics, Attitudes toward the Goal, Motivation to Comply with General Subjective Norms, Perceived Control, Salient Referent, and Specificity of the Plan-of-Action

| Variable                         | B       | S.E. B | $\beta$ | Change in $R^2$ | F         |
|----------------------------------|---------|--------|---------|-----------------|-----------|
| Step 1                           |         |        |         | .08             | 4.63***   |
| Age                              | -.01    | .01    | -.08    |                 |           |
| Gender                           | .51     | .28    | .11     |                 |           |
| Marital status                   | -.06    | .23    | -.02    |                 |           |
| Education                        | .00     | .04    | .00     |                 |           |
| General health perceptions       | .02***  | .01    | .24     |                 |           |
| Step 2                           |         |        |         | .10             | 16.04**** |
| Attitudes toward health goal     | .18***  | .06    | .20     |                 |           |
| Compliance with subjective norms | .03**** | .01    | .26     |                 |           |
| Step 3                           |         |        |         | .08             | 29.70**** |
| Perceived control                | .44**** | .08    | .30     |                 |           |
| Step 4                           |         |        |         | .02             | 4.83**    |
| Salient referent                 | .02     | .01    | .12     |                 |           |
| Specificity of plan-of-action    | .12*    | .05    | .13     |                 |           |

**Note:** The full model  $R^2 = .28, F(10, 262) = 10.62, p < .0001$ .  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

The next hierarchical MRC analysis examined the predictive influence of TPB components, salient referent, and specificity of plan on successful health goal attainment. The order of variable entry was the demographic set, followed by the entry of behavioral intention, then the set of attitudes and motivation to comply with subjective norms, the entry of perceived control, and the set salient referent and specificity of the plan-of-action. As shown in Table 3, results of this analysis indicate that behavioral intention accounts for an additional 10% of the variance after controlling for demographic characteristics,  $Change\ in\ R^2 = .10, p < .0001$ . However, the perceived control component very nearly approached the statistical decision criterion of  $p < .05$  with its entry ( $Change\ in\ R^2 = .01, p < .06$ ) and remained at this level in the full model ( $\beta = .12, p < .06$ ), suggesting, as has been reported in other health goal research (e.g., Schlegel, d'Avernas, Zanna, DeCourville, & Manske, 1992), that it may have a unique influence beyond its causal association with intention. Further, with their entry, the salient referent and specificity of plan components did not make a significant contribution to the MRC

Table 3. Hierarchical MRC Analysis Predicting Success in Health Goal Attainment at a Three-Month Follow-Up as a Function of Demographic Characteristics, Behavioral Intention, Attitudes toward the Goal, Motivation to Comply with General Subjective Norms, Perceived Control, Salient Referent, and Specificity of the Plan-of-Action

| Variable                         | <i>B</i> | <i>S.E. B</i> | $\beta$ | <i>Change in R<sup>2</sup></i> | <i>F</i>  |
|----------------------------------|----------|---------------|---------|--------------------------------|-----------|
| Step 1                           |          |               |         | .07                            | 4.29***   |
| Age                              | .01*     | .01           | .07     |                                |           |
| Gender                           | .68      | .28           | .16     |                                |           |
| Marital status                   | -.15     | .23           | -.04    |                                |           |
| Education                        | .02      | .04           | .02     |                                |           |
| General health perceptions       | .02***   | .01           | .20     |                                |           |
| Step 2                           |          |               |         | .10                            | 33.06**** |
| Behavioral Intention             | .32****  | .06           | .33     |                                |           |
| Step 3                           |          |               |         | .00                            | 1.20      |
| Attitudes toward health goal     | .08      | .05           | .08     |                                |           |
| Compliance with subjective norms | .00      | .01           | .04     |                                |           |
| Step 4                           |          |               |         | .01                            | 3.78      |
| Perceived control                | .16      | .08           | .12     |                                |           |
| Step 5                           |          |               |         | .00                            | 0.04      |
| Salient referent                 | -.00     | .01           | -.00    |                                |           |
| Specificity of plan-of-action    | -.02     | .05           | -.02    |                                |           |

**Note:** The full model  $R^2 = .20, F(11, 261) = 5.78, p < .0001$ .  
 $*p < .05$ .  $**p < .01$ .  $***p < .001$ .  $****p < .0001$ .

model. Overall, this MRC model exploring effects of demographic characteristics and TPB component on successful health goal attainment accounted for 20% of the variance,  $R^2 = .28$ ,  $F(11, 261) = 5.78$ ,  $p < .0001$ .

It should be noted that in separate preliminary analyses, the regression models presented here were not significantly moderated by raters' classification of health goals, respondent's self-description of their goal as one that would prevent illness or a medical problem, controlling of a chronic condition, or improving physical or mental health. Further, concordant with research showing no differences in the prediction of health behavior from proximal or distal measures of intention (Hausenblas, Carron, & Mack, 1997), there was no moderation of the regression modeling based on respondent's self-described stage of planning or history of involvement in plan-of-action to attain their health goal. Thus, following Ajzen's (1987) note that "it serves no useful purpose to include past behavior in causal models human action" (p. 41), these potential covariates were excluded from further statistical analyses. Indeed, as Ajzen (1991) suggests, "the residue of past behavior is reflected in attitudes, subjective norms, and perceived control" (p. 201). For example, the TPB components of attitude toward the goal, adherence to subjective norm, perceived control, and intention have been found to significantly predict future health enhancing behaviors (e.g., Armitage & Conner, 2001; Shifter & Ajzen, 1985). Nevertheless, it is recognized that stages of planning approach (cf. Prochaska et al., 1992) may be a complement to the TPB model (see Armitage and Conner (2000) for a review of social cognition models and health behavior) and that for abnormal or deviant behaviors, where the action may be considered contrary to broader cultural and subjective norms, the stages of planning approach may be a more reliable predictor of behavior. For example, risk of suicide attempt in individuals who reported suicidal ideation but without a plan was limited to approximately the first year following their initial suicidal ideation, while individuals with prior ideation and a plan had significantly increased risk of suicide attempt several years thereafter (Kessler, Borges, & Walters, 1999).

#### *Aspects of Social Support*

The efficacy of aspects of social support in predicting successful health goal attainment was investigated via a separate hierarchical MRC analysis. The order of variable entry into the MRC model was the demographic set, followed by perceived support, satisfaction with social contacts, negativity of interpersonal relationships, desire for greater support, emotional and instrumental support provided by the salient referent, and size of primary social support network entered as a set. As shown in Table 4, the results of this analysis suggest that after controlling for demographic characteristics, the aspects of social support set accounted for an additional 9% of the variance in predicting success in health goal attainment,  $\text{Change in } R^2 = .09$ ,  $p < .0001$ . Aspects of social support that made significant contribution at this second step of model entry were emotional and

Table 4. Hierarchical MRC Analysis Predicting Success in Health Goal Attainment at Three-Month Follow-Up as a Function of Demographic Characteristics and Aspects of Social Support

| Variable                                  | <i>B</i> | <i>S.E. B</i> | $\beta$ | <i>Change in R<sup>2</sup></i> | <i>F</i> |
|---|----------|---------------|---------|--------------------------------|----------|
| Step 1                                    |          |               |         | .07                            | 4.11**   |
| Age                                       | .01      | .01           | .09     |                                |          |
| Gender                                    | .57*     | .28           | .12     |                                |          |
| Marital status                            | -.19     | .23           | -.05    |                                |          |
| Education                                 | .02      | .04           | .06     |                                |          |
| General health perceptions                | .02***   | .01           | .20     |                                |          |
| Step 2                                    |          |               |         | .09                            | 4.82**** |
| Perceived support                         | .22      | .32           | .06     |                                |          |
| Satisfaction with social contacts         | -.16     | .13           | -.10    |                                |          |
| Negativity of interpersonal relationships | .02      | .32           | .00     |                                |          |
| Desire for greater support                | -.12     | .20           | -.04    |                                |          |
| Emotional/instrumental support            | .58***   | .16           | .24     |                                |          |
| Size of primary support network           | .04*     | .02           | .14     |                                |          |

**Note:** The full model  $R^2 = .16$ ,  $F(11, 266) = 4.66$ ,  $p < .0001$ .  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

instrumental support provided by the salient referent ( $\beta = .24$ ,  $p < .0002$ ), as well as size of primary social support network ( $\beta = .14$ ,  $p < .03$ ). The total MRC model predicting success in health goal attainment accounted for 16% of the variance,  $R^2 = .16$ ,  $F(11, 266) = 4.66$ ,  $p < .0001$ .

### Integrating TPB Components, Idiographic Constructs, and Aspects of Social Support

The next hierarchical MRC analysis was conducted to integrate TPB components, salient referent, specificity of plan, and aspects of social support to determine their independent effects on successful health goal attainment after controlling for demographic characteristics. The first step of variable entry was the demographic set. The second step of variable entry was behavioral intention. The third step of variable entry included the set consisting of TPB, salient referent, and specificity of plan components. The last step of variable entry included aspects of social support entered as a set. As shown in Table 5, the aspects of social support set significantly account for an additional 5% of the variance in predicting successful health goal attainment,  $Change\ in\ R^2 = .05$ ,  $p < .02$ . As expected, the emotional and instrumental support provided by the salient referent made

Table 5. Hierarchical MRC Analysis Predicting Success in Health at Three-Month Follow-Up as a Function of Demographic Characteristics, Components of the Modified Theory of Planned Behavior, and Aspects of Social Support

| Variable                                  | <i>B</i> | <i>S.E. B</i> | $\beta$ | <i>Change in R<sup>2</sup></i> | <i>F</i> |
|---|----------|---------------|---------|--------------------------------|----------|
| Step 1                                    |          |               |         |                                |          |
| Age                                       | .01      | .01           | .06     | .07                            | 4.16**   |
| Gender                                    | .62*     | .28           | .14     |                                |          |
| Marital status                            | -.20     | .24           | -.05    |                                |          |
| Education                                 | .02      | .04           | .03     |                                |          |
| General health perceptions                | .02***   | .01           | .22     |                                |          |
|   |          |               |         | .13                            | 6.98**** |
| Step 2                                    |          |               |         |                                |          |
| Behavioral intention                      | .27****  | .06           | .28     |                                |          |
| Attitudes toward health goal              | .08      | .05           | .09     |                                |          |
| Compliance with subjective norms          | .01      | .01           | .05     |                                |          |
| Perceived control                         | .16      | .08           | .11     |                                |          |
| Salient referent                          | -.00     | .01           | -.00    |                                |          |
| Specificity of plan-of-action             | -.02     | .05           | -.02    |                                |          |
|   |          |               |         | .05                            | 2.58*    |
| Step 3                                    |          |               |         |                                |          |
| Perceived support                         | .12      | .32           | .03     |                                |          |
| Satisfaction with social contacts         | -.10     | .12           | -.06    |                                |          |
| Negativity of interpersonal relationships | .16      | .32           | .03     |                                |          |
| Desire for greater support                | -.16     | .20           | -.06    |                                |          |
| Emotional/instrumental support            | .34*     | .17           | .14     |                                |          |
| Size of primary support network           | .04**    | .02           | .15     |                                |          |

**Note:** The full model  $R^2 = .25$ ,  $F(17, 249) = 4.91$ ,  $p < .0001$ .  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

significant and unique contribution in predicting attainment of health goal ( $\beta = .14$ ,  $p < .05$ ), as did size of primary social support network ( $\beta = .15$ ,  $p < .01$ ).

## DISCUSSION

Using an idiographic approach, this research examined the unique influence of TPB components, plans-of-action, and aspects of social support on the health goal attainment of young, mid-life, and older adults. Correlational and MRC results suggest that the emotional and instrumental support provided by a close family member or friend is more highly associated with behavioral intention than is the subjective norm component of the TPB model and provides a unique predictive influence on health goal attainment in a model integrating TPB components and dimensions of social support. This finding is in accord with other research that

suggests functional dimensions of social support may supplant motivation to comply with subjective norms as a predictor of intention in the TPB model (e.g., Courneya & McAuley, 1995; Courneya et al., 2000). Moreover, it suggests that the emotional and instrumental support provided by family members and friends as “the more theoretically relevant social influence construct” across many behaviors and contexts (Courneya et al., 2000, p. 306) and a factor that extends the TPB model (Ajzen, 1991). Further, as expected, the predictive relationships posited by Ajzen (1991) between attitudes, subjective norms, control, intention, and behavioral outcome were observed. This replication of the relationships between TPB components is contrary to the findings of other health goal research involving midlife and older adults where there has been a failure to show the link between subjective norms and intention (e.g., Blue et al., 2001; Courneya & McAuley, 1995), and intention and behavior (e.g., Brenes et al., 1998). Therefore, it may be argued, as Sears (1987) alluded, that a more idiographic approach is necessary to better understand the health concerns and related behavior of older adults.

Also in accordance with expectations, older respondents were more likely to report important health goals that reflect chronic medical problems encountered by the elderly (cf. Jackson, 1999), and specificity of plan-of-action was found to be correlated with behavioral intention. This later finding is in agreement with other research that has suggested specification of planned activity to influence intention and behavioral action (e.g., Gollwitzer, 1990). This research also identified age and perceived general health as variables associated with TPB components, specificity of action plan, and aspects of social support, suggesting indirect influences of age and health on behavioral intention and health goal attainment. Thus, in concept, one’s age and health status represent important life-contexts that influence activities and moderate health behaviors. For example, as observed in these data, while older adults express greater motivation to comply with subjective norms, they report more modest attitudes toward and less specific plans for addressing important health goals than do young people. Speculatively, this may be due in part to the chronicity of the health problems older adults are concerned with and endure. Indeed, the positive correlation of perceived health with behavioral intention and perceived control bolsters such an interpretation.

### **Behavioral and Psychological Consequences of Social Support**

The zero-order correlational analyses also revealed an intercorrelation of social support variables that reflects a chain of logically occurring interpersonal events. For example, as these associations give hint, when quantity or quality of support is lacking, individuals may report lower functional support and a greater desire for support and assistance from others. Further, in accord with assertions that interpersonal relationships influence and provide motivation for a wide range of

behaviors (e.g., Lewis et al., 1994), correlational analyses of TPB components and aspects of social support indicate significant positive associations between the emotional and instrumental support provided by a close family member or friend (i.e., the salient other) and one's motivation to comply with subjective norms, perception of control, and behavioral intention. Thus, as Nouwen (1994) suggested, our interpersonal communications may have very profound psychological influences, in that,

When someone says to me "I love you" or "I hate you," I am not just receiving some useful information. These words *do* something in me. They make my blood move, my heart beat, my breathing speed up. They make me feel and think differently. They lift me up to a new way of being and give me another knowledge of myself. These words have the power to heal or to destroy (pp. 47-48).

Appropriately then, as suggested in the MRC models, the perception of emotional and instrumental support provided by a close family member or friend was found to be associated with behavioral intention and a unique predictor of successful health goal attainment. Further, the number of persons one feels close to was also observed to have a unique predictive influence on successful health goal attainment. Thus, in general, these results indicate aspects of social support to be associated with attitudes, subjective norms, perceptions of control, behavioral intention, and to be predictive of health goal attainment.

### **Successful Goal Attainment and Changes in Health**

The idiographic approach of this research also affords some insight into respondents' personal health goals and self-prescribed plans for attaining these goals. In theory, respondents' self-designated health goals and action plans may be construed as rather informal constructions, reflecting a mixture of intuitive and knowledge-based understandings of illness prevention or management. Moreover, the vagueness of some respondents' action plans, as indicated by low specificity of the personalized plan, reflect the extent to which self-prescriptive action plans may lack scientifically based evaluation of health and beneficial methods for illness prevention or management. Correspondingly, with regard to formal health interventions, interventions for older adults are noted to be more successful when action plans include realistic goals personalized to the individual, offer opportunities for continuous adjustment of goals and plans, and address individual needs (Piette, 1996). The findings presented here further suggest that interventions designed for older adults may also be more successful when positive health attitudes and control beliefs are encouraged, and appropriate emotional and instrumental social support is provided. Accordingly then, formal health interventions should give forethought to how the social support network provides assistance in coping, how interpersonal relationships influence health attitudes and behavior, and how one's interpersonal relationships provide diagnostic medical

information and care referrals (Hafner & Welz, 1989). Thus, it seems imperative to address interpersonal dimensions, as well as provide opportunities for self-care health education, so as to increase the likelihood that both formal and informal health interventions effectively aid older adults.

### CONCLUSION

The idiographic approach of this research permitted the illumination of important health goals of older adults, their action plans for attaining these goals, as well as the intra- and interpersonal contexts in which they live their lives. Results indicated respondents' age and perceived health to be associated with important social-cognition constructs and aspects of social support that are antecedents of behavioral intention and health goal attainment. Further, the emotional and instrumental support provided by salient referents and size of primary social support network were found to be unique predictors of health goal attainment in a model integrating the TPB components and aspects of social support, suggesting that the emotional and instrumental support provided by close family members or friends may be the most important social influence on a variety of behaviors across many different contexts (Courneya et al., 2000). This integrated model suggests two potential frameworks for health interventions: at the person-level, health interventions may target the individual's attitudes, motivation, control beliefs, and articulation of plan-of-action to meet specific health goals; and at the interpersonal level, interventions may target emotional and instrumental dimensions of functional social support that influence behavioral intention and foster health goal attainment. Future research should continue to pursue methodologies that involve older adults in very personal and meaningful ways. A limitation of the present research is the select sample used (i.e., respondents were all members of a psychology research pool, predominantly female, Caucasian, well educated); different results may be found in a more diversified sample. Thus, further research is also needed that involves older adults of diverse backgrounds and health statuses so as to further enhance understanding of health goal attainment in later life.

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### REFERENCES

- Adams, G. A., King, L. A., & King, D. W. (1996). Relationships of job and family involvement, family social support, and work-family conflict with job and life satisfaction. *Journal of Applied Psychology, 81*, 411-420.



- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.
- Ajzen, I. (1987). Attitudes, traits, and actions: Dispositional prediction of behavior in personality and social psychology. *Advances in Experimental Social Psychology*, 20, 1-63.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- Antonucci, T. C. (1991). Attachment, social support, and coping with negative life events in mature adulthood. In E. M. Cummings, A. L. Greene, K. H. Karraker (Eds.), *Life-span developmental psychology: Perspectives on stress and coping* (pp. 261-276). Hillsdale, NJ: Erlbaum.
- Antonucci, T. C., & Akiyama, H. (1987). An examination of sex differences in social support among older men and women. *Sex Roles*, 17, 737-749.
- Antonucci, T. C., & Israel, B. A. (1986). Veridicality of social support: A comparison of principal and network members' responses. *Journal of Consulting and Clinical Psychology*, 54, 432-437.
- Armitage, C. J., & Conner, M. (2000). Social cognition models and health behavior: A structured review. *Psychology & Health*, 15, 173-190.
- Armitage, C. J., & Conner, M. (2001). Social cognitive determinants of blood donation. *Journal of Applied Social Psychology*, 31, 1431-1457.
- Baranowski, T., & Nader, P. R. (1985). Family involvement in health behavior change programs. In D. C. Turk & R. D. Kerns (Eds.), *Health, illness, and families: A lifespan perspective* (pp. 81-107). New York: Wiley.
- Bargh, J. A., & Gollwitzer, P. M. (1994). Environmental control of goal-directed action: Automatic and strategic contingencies between situations and behavior. In R. Dienstbier & W. D. Spaulding (Eds.), *Integrative views of motivation, cognition, and emotion: Volume 41 of the Nebraska Symposium on Motivation* (pp. 71-124). Lincoln: University of Nebraska Press.
- Berkman, L. F. (1985). The relationship of social networks and social support to morbidity and mortality. In S. Cohen & L. S. Syme (Eds.), *Social support and health* (pp. 241-262). New York: Academic.
- Blazer, D. G. (1982). Social support and mortality in an elderly community population. *American Journal of Epidemiology*, 115, 684-694.
- Blue, C. L., Wilbur, J., & Marston-Scott, M. (2001). Exercise among blue-collar workers: Application of the theory of planned behavior. *Research in Nursing & Health*, 24, 481-493.
- Boldero, J., Santioso, R., & Brain, B. (1999). Gay Asian Australians' safer-sex behavior and behavioral skills: The predictive utility of the theory of planned behavior and cultural factors. *Journal of Applied Social Psychology*, 29, 2143-2163.
- Brenes, G. A., Strube, M. J., & Storaandt, M. (1998). An application of the theory of planned behavior to exercise among older adults. *Journal of Applied Social Psychology*, 28, 2274-2290.

Broadhead, W. E., Kaplan, B. H., James, S. A., Wagner, E. H., Schoenback, V. J., Grimson, R., Heyden, S., Tibblin, B., & Gehlbach, S. H. (1983). The epidemiologic evidence for a relationship between social support and health. *American Journal of Epidemiology*, *117*, 521-537.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, S. (1991). Social support and physical health: Symptoms, health behaviors, and infectious disease. In E. M. Cummings, A. L. Greene, & K. H. Karraker (Eds.), *Life-span developmental psychology perspectives on stress and coping* (pp. 213-234). Hillsdale, NJ: Erlbaum.

Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association*, *277*, 1940-1944.

Cohen, S., & Hoberman, H. (1983). Positive events and social support as buffers of life change stress. *Journal of Applied Social Psychology*, *13*, 99-125.

Conner, M., Warren, R., Close, S., & Sparks, P. (1999). Alcohol consumption and the theory of planned behavior: An examination of the cognitive mediation of past behavior. *Journal of Applied Social Psychology*, *29*, 1676-1704.

Coppotelli, H. C., & Orleans, C. T. (1985). Partner support and other determinants of smoking cessation maintenance among women. *Journal of Consulting and Clinical Psychology*, *53*, 455-460.

Courneya, K. S., Bobick, T. M., & Schinke, R. J. (1999). Does the theory of planned behavior mediate the relation between personality and exercise behavior? *Basic and Applied Social Psychology*, *21*, 317-324.

Courneya, K. S., & McAuley, E. (1995). Cognitive mediators of the social influence-exercise adherence relationship: A test of the theory of planned behavior. *Journal of Behavioral Medicine*, *18*, 499-515.

Courneya, K. S., Plotnikoff, R. C., Hotz, S. B., & Birkett, N. J. (2000). Social support and the theory of planned behavior in the exercise domain. *American Journal of Health Behavior*, *24*, 300-308.

Dean, K., & Kickbusch, I. (1995). Health related behavior in health promotion: Utilizing the concept of self care. *Health Promotion International*, *10*(1), 35-40.

DeVellis, B. M., Blalock, S. J., & Sandler, R. S. (1990). Predicting participation in cancer screening: The role of perceived behavioral control. *Journal of Applied Social Psychology*, *20*, 639-660.

Diener, E., & Fujita, F. (1995). Resources, personal strivings, and subjective well-being: A nomothetic and idiographic approach. *Journal of Personality and Social Psychology*, *68*, 926-935.

DiMatteo, M. R., & Hays, R. (1981). Social support and serious illness. In B. H. Gottlieb (Ed.), *Social networks and social support* (pp. 117-147). Beverly Hills: Sage.

Estabrooks, P., & Caroon, A. V. (1999). The influence of the group with elderly exercisers. *Small Group Research*, *30*, 438-452.

Felton, B. J. (1990). Coping and social support in older people's experiences of chronic illness. In M. A. P. Stephens, J. H. Crowther, S. E. Hobfoll, & D. L. Tennenbaum (Eds.), *Stresses and coping in later-life families* (pp. 153-171). New York: Hemisphere.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fisher, W. A., Fisher, J. D., & Rye, B. J. (1995). Understanding and promoting AIDS-preventive behavior: Insights from the Theory of Reasoned Action. *Health Psychology, 14*, 255-264.

Frost, S., Myers, L. B., & Newman, S. P. (2001). Genetic screening for Alzheimer's disease: What factors predict intentions to take a test? *Behavioral Medicine, 27*(3), 101-109.

Glantz, K., Lewis, F. M., & Rimer, B. K. (Eds.). (1997). *Health behavior and health education: Theory, research, and practice* (2nd ed.). San Francisco, CA: Jossey-Bass, Inc.

Godin, G., Valois, P., & Lepage, L. (1993). The pattern of influence of perceived behavioral control upon exercising behavior: An application of Ajzen's theory of planned behavior. *Journal of Behavioral Medicine, 16*(1), 81-102.

Godin, G., Valois, P., Lepage, L., & Desharnais, R. (1992). Predictors of smoking behavior: An application of Ajzen's theory of planned behavior. *British Journal of Addictions, 87*, 1335-1343.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 53-92). New York: Guilford.

Grzywacz, J. G., & Fuqua, J. (2000). The social ecology of health: Leverage points and linkages. *Behavioral Medicine, 26*(3), 101-116.

Hafner, H., & Welz, R. (1989). Social networks and mental disorder (with special reference to the elderly). In D. Hamburg & N. Sartorius (Eds.), *Health and behavior: Selected perspectives* (pp. 150-161). New York: Cambridge University Press.

Hausenblas, H. A., Carron, A. V., & Mack, D. E. (1997). Application of the theories of reasoned action and planned behavior to exercise behavior: A meta-analysis. *Journal of Sport & Exercise Psychology, 19*(1), 36-51.

Heckhausen, H., & Gollwitzer, P. M. (1987). Thought contents and cognitive functioning in motivational versus volitional states of mind. *Motivation and Emotion, 11*, 101-120.

House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 83-108). New York: Academic Press.

House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology, 14*, 293-318.

Jackson, S. A. (1999). The epidemiology of aging. In W. R. Hazzard, J. P. Blass, W. H. Ettinger, J. B. Halter, & J. G. Ouslander (Eds.), *Principles of geriatric medicine and gerontology* (pp. 203-225). New York: McGraw-Hill.

Kessler, R. C., Borges, G., & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry, 56*, 617-626.

Kessler, R. C., & McLeod, J. D. (1985). Social support and mental health in community samples. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 219-240). New York: Academic Press.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.

Lewis, M. A., Rook, K. S., & Schwarzer, R. (1994). Social support, social control, and health among the elderly. In G. N. Penny, P. Bennett, & M. Herbert (Eds.), *Health psychology: A lifespan perspective* (pp. 191-211). Chur, Switzerland: Harwood.

Marcoux, B. C., & Shope, J. T. (1997). Application of the theory of planned behavior to adolescent use and misuse of alcohol. *Health Education Research, 12*, 323-331.

Mermelstein, R., Cohen, S., Lichtenstein, E., Baer, J. S., & Kamarck, T. (1986). Social support and smoking cessation and maintenance. *Journal of Consulting and Clinical Psychology, 54*, 447-453.

Morgan, G. E., Ashenberg, Z. S., & Fisher, E. B. (1988). Abstinence from smoking and the social environment. *Journal of Consulting and Clinical Psychology, 56*, 298-301.

Morrison, D. M., Gillmore, M. R., & Baker, S. A. (1995). Determinants of condom use among high-risk heterosexual adults: A test of the Theory of Reasoned Action. *Journal of Applied Social Psychology, 25*, 651-676.

Netemeyer, R. G., Burton, S., & Johnston, M. (1991). A comparison of two models for the prediction of volitional and goal-directed behaviors: A confirmatory analysis approach. *Social Psychology Quarterly, 54*(2), 87-100.

Norman, P., Conner, M., & Bell, R. (1999). The theory of planned behavior and smoking cessation. *Health Psychology, 18*, 89-94.

Nouwen, H. J. M. (1994). *With burning hearts: A meditation on the Eucharistic life*. Maryknoll, NY: Orbis.

Oxman, T. E., & Hull, J. G. (1997). Social support, depression, and activities of daily living in older heart surgery patients. *Journal of Gerontology: Psychological Sciences, 52B*, P1-P14.

Pelham, B. W. (1993). The idiographic nature of human personality. *Journal of Personality and Social Psychology, 64*, 665-577.

Penny, G. N., Bennett, P., & Herbert, M. (Eds.). (1994). *Health psychology: A lifespan perspective*. Chur, Switzerland: Harwood.

Piette, J. D. (1996). Preventive care for patients with coronary heart disease: A review of changing technology. In J. D. Piette, R. M. Kaplan, & K. R. Ferrari (Eds.), *Preventing illness among people with coronary heart disease* (pp. 91-110). New York: Haworth Press.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change. *American Psychologist, 47*, 1102-1114.

Redding, C. A., Rossi, J. S., Rossi, S. R., Velicer, W. F., & Prochaska, J. O. (2000). Health behavior models. *The International Electronic Journal of Health Education, 3* (Special Issue), 180-193. Retrieved May 5, 2002, from: <http://www.iejhe.siu.edu>

Reinecke, J., Schmidt, P., & Ajzen, I. (1997). Birth control versus AIDS prevention: A hierarchical model of condom use among young people. *Journal of Applied Social Psychology, 27*, 743-759.

Rook, K. S. (1994). Assessing the health-related dimensions of older adults' social relationships. *Annual Review of Gerontology, 14*, 142-181.

Schifter, D. E., & Ajzen, I. (1985). Intention, perceived control, and weight loss: An application of the Theory of Planned Behavior. *Journal of Personality and Social Psychology, 49*, 843-851.

Schlegel, R. P., d'Avernas, J. R., Zanna, M. P., DeCourville, N. H., & Manske, S. R. (1992). Problem drinking: A problem for the Theory of Reasoned Action? *Journal of Applied Social Psychology, 22*, 358-385.

Schulz, R., Williamson, G. M., Morycz, R. K., & Biegel, D. E. (1992). Costs and benefits of providing care to Alzheimer's patients. In S. Spacapan & S. Oskamp (Eds.), *Helping and being helped: Naturalistic studies* (pp. 153-181). Newbury Park, CA: Sage.

Sears, D. O. (1987). College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *Journal of Personality and Social Psychology, 57*, 515-530.

Shadel, W., Niaura, R., & Abrams, D. (2000). An idiographic approach to understanding personality structure and individual differences among smokers. *Cognitive Therapy and Research, 24*, 345-359.

Sheeran, P., & Orbell, S. (2000). Self-schemas and the theory of planned behavior. *European Journal of Social Psychology, 30*, 533-550.

Siemiatycki, J. (1979). A comparison of postal, telephone, and home interview strategies for household health surveys. *American Journal of Public Health, 69*, 238-244.

Strecher, V. J., Seijts, G. H., Kok, G. J., Latham, G. P., Glasgow, R., DeVellis, B., Meertens, R. M., & Bulger, D. W. (1995). Goal setting as a strategy for health behavior change. *Health Education Quarterly, 27*, 190-200.

Stoll, C. S. (1968). Images of man and social control. *Social Forces, 47*, 119-127.

Taylor, S. D., Bagozzi, R. P., & Gaither, C. A. (2001). Gender differences in the self-regulation of hypertension. *Journal of Behavioral Medicine, 24*, 469-487.

Tucker, J. S., & Mueller, J. S. (2000). Spouses' social control of health behaviors: Use and effectiveness of specific strategies. *Personality and Social Psychology Bulletin, 26*, 1120-1130.

Vaux, A. (1985). Variations in social support associated with gender, ethnicity, and age. *Journal of Social Issues, 41*, 89-110.

Veiel, H. O. F. (1990). The Mannheim interview on social support. *Social Psychiatry and Psychiatric Epidemiology, 25*, 250-259.

Venkatraman, M. M. (1995). A cross-cultural study of the subjective well-being of married elderly persons. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 50B*, S35-45.

VonDras, D. D., & Siegler, I. C. (1997). Stability in extraversion and aspects of social support at mid-life. *Journal of Personality and Social Psychology, 71*, 233-241.

VonDras, D. D., Siegler, I. C., Barefoot, J. C., Williams, R. B., & Mark, D. B. (2000). Coronary cauterization patient and wife's perceptions of social support: Effects due to characteristics of recipient, provider, and their interaction. *International Journal of Aging and Human Development, 50*(2), 97-125.

VonDras, D. D., Williams, R. B. Jr., Kaplan, B. H., & Siegler, I. C. (1996). Correlates of perceived social support and equality of interpersonal relationships at mid-life. *International Journal of Aging and Human Development, 43*, 199-217.

Ware, J. E. (1993). *SF-36 Health Survey: Manual and interpretation guide*. Boston, MA: The Health Institute, New England Medical Center.

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). *Medical Care, 30*, 473-483.

Wilson, K., & Roe, B. (1998). Interviewing older people by telephone following initial contact by postal survey. *Journal of Advanced Nursing, 27*, 575-581.

Worth, A., & Tierney, A. (1993). Conducting research interviews with elderly people by telephone. *Journal of Advanced Nursing, 18*, 1077-1084.

Wortman, C. B., & Conway, T. L. (1985). The role of social support in adaptation and recovery from physical illness. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 281-302). New York: Academic.

Zimmerman, R. S., & Connor, C. (1989). Health promotion in context: The effects of significant others on health behavior change. *Health Education Quarterly*, *16*, 57-75.

Direct reprint requests to:

Dean D. VonDras, Ph.D.  
College of Human Development & Psychology  
University of Wisconsin–Green Bay  
MAC-319  
2420 Nicolet Dr.  
Green Bay, WI 54311-7001  
e-mail: vondrasd@uwgb.edu