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The Relationship Between Social Support and Psychological Distress Among Hispanic Elders in Miami, Florida

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Abstract

This study compared 5 psychological models of the relationship between social support (SS) and behavioral health. These theoretical models, which have garnered some level of prior empirical support, were as follows: (a) main effects, (b) buffering effects, (c) social exchange, (d) equity, and (e) protective health outcomes of providing SS. A population-based sample of 273 community-dwelling Hispanic elders drawn from East Little Havana, Florida (ages 70–100 years old; 86% Cuban) completed self-report measures of SS, financial strain, and psychological distress (PD). Hierarchical multiple regression analyses were used to test the competing SS models. Results indicated that satisfaction with received SS was, as specified in the main-effects model, associated with lower PD, whereas received SS was unexpectedly associated with heightened PD. Reciprocal exchanges of SS (equity model) or exchanges where Hispanic elders provided more SS than they received (protective health outcomes of providing SS model) were also associated with lower PD. The feasibility of a 6th model in which the effects of SS are contingent upon the elder's preexisting PD level is proposed. Limitations, implications, and directions for future research are discussed.

Keywords

social support; negative interactions; Hispanic elders; psychological distress; depression

In the midst of unprecedented demographic changes, safeguarding the quality of life of the elderly Hispanic in the United States poses multiple challenges. By 2028, Hispanics are projected to be the largest ethnic minority group in the age 65 years and older bracket (Federal Interagency Forum on Aging Related Statistics, 2000) and the one with the highest rates of poverty and substandard healthcare (Smedley, Stith, & Nelson, 2002). Although there is controversy about the actual levels of formal support services utilized by older Hispanics (Angel, Angel, Lee, & Markides, 1999), they are less likely than their White counterparts are to rely on hospices (Colon & Lyke, 2003) and nursing homes for long-term care and more likely to reside with and be economically dependent upon their adult children (Burr & Mutchler, 1999). Moreover, according to the Federal Interagency Forum on Aging Related Statistics (2000), rates of coresidence for older Hispanics are considerably higher than those for White men and women. As a result, an increasing number of researchers have stressed the importance of developing preventive health interventions and therapeutic strategies that incorporate the Hispanic elder's natural web of family, friends, and neighbors

(Gallagher-Thompson et al., 1997; Pinquart & Sörensen, 2005). These social support (SS) therapies (Milne, 1999) or ecosystemic interventions may be particularly efficacious with collectivistic populations such as Hispanics (Robbins, Schwartz, & Szapocznik, 2004), including Hispanic elders (Gallagher-Thompson et al., 1997; Pinquart & Sörensen, 2005; Valdez, Giachello, Rodriguez-Trias, Gomez, & de la Rocha, 1993).

Little is known, however, about the ways in which informal SS relates to psychological distress (PD) among elderly Hispanics. Most published reports provide descriptive information about the structure and function of Hispanic informal networks (Paz, 1993; Valle, 1986). With the exception of a few large scale investigations (e.g., Baxter et al., 1998; Krause & Goldenhar, 1992; Markides & Krause, 1985), empirically based studies are scarce. As a result, existing information regarding SS and elders' well-being is beset with inconsistencies. Two basic problems pervade SS research. First, the relationship between SS and health outcomes is generally viewed as linear and beneficial even though recent research has indicated that SS transactions are surprisingly complex and, sometimes, detrimental (e.g., Krause & Rook, 2003; Liang, Krause, & Bennett, 2001; Newsom & Schulz, 1998). As a consequence of this first assumption, most SS studies have relied upon additive and thus unidimensional measures of SS, which have hindered the ability to capture complex interactions (Mallinckrodt, 1989). Second, how exchanges of SS with family and friends are associated with one's mental health status (i.e., the mechanisms by which SS operates) remains unclear despite a large and diverse empirical literature. More contemporary approaches (Liang et al., 2001) have aimed to understand the complex processes underlying SS by proposing theoretical models that capture the relationships between different types of SS and behavioral and physical health outcomes.

Thus, the purpose of the present investigation was to test five theoretical models or explanations regarding the efficacy of naturally exchanged SS: (a) the main-effects model, (b) the buffering effects model, (c) the social-exchange model, (d) the equity model, and (e) the protective health outcomes of providing SS model. Each of these five models is supported by well-specified theories of aging and SS, as well as by empirical findings from the literature. Two of the models (i.e., main effects and buffering effects) examine the mechanisms by which SS operates (i.e., as a constant effect or only when the SS recipient is under stress), whereas the other three focus on the laws of SS reciprocity (i.e., whether receiving more SS or providing more SS, or a balance between the two, is associated with mental health wellness). Further, this study tested the moderational role of negative social interactions in the relationship between SS and PD. These competing models were examined using a population-based sample drawn from the older Hispanic population of East Little Havana, Florida, which is an understudied but growing group in the United States (cf., Stewart & Nápoles-Springer, 2000). Some cultural aspects of these models of SS are discussed in more depth in the Discussion section.

Theoretical Models Regarding the Effectiveness of SS

The first model (i.e., main-effects model) emerged from a series of experimental and quasi-experimental studies of humans and animals, in which a causal relationship was suggested between social isolation and mortality (House, Landis, & Umberson, 1988). Based on this empirical evidence, documented in a landmark article by House et al. (1988), it has been theorized that SS, across a number of its dimensions (i.e., quantity and quality of social relationships), may be health protective because it promotes normative health behaviors and triggers positive psychological responses (Cohen & Wills, 1985; House et al., 1988). These positive psychological responses (i.e., feeling loved, sense of belonging, security), in turn, increase motivation to care for oneself, contentment, and favorable physiological reactions (Cohen, Gottlieb, & Underwood, 2001). Positive outcomes support a state of emotional

equilibrium that protects against the emergence of mental disturbances, thus underscoring the main-effects model (Cohen et al., 2001).

In contrast, supporters of the second model (i.e., stress buffering-effects model) argue that the benefits of SS are evident only when the recipient of such support is experiencing unusual amounts of stress (i.e., financial difficulties; Cassel, 1976; Cobb, 1976). This second model was largely derived from the work of two physician epidemiologists—John Cassel and Sidney Cobb—interested in the relationship between stress, psychosocial factors, and health (Cohen et al., 2001). According to this model, the availability of SS moderates the negative effects elicited by stress at both cognitive-behavioral and neuroendocrine levels by attenuating the perceived inability to efficiently cope with a problem (Cohen & Wills, 1985), thus facilitating an adaptive response (Cohen et al., 2001; Cohen & Wills, 1985).

Neither the main-effects nor the stress buffering-effects models of SS has received unequivocal empirical support. Although, in the context of the main-effects model, several studies have reported a significant relationship between psychological well-being and SS in samples of non-Hispanic (Krause, Liang, & Keith, 1990; Lin, Dean, & Ensel, 1981) and Hispanic elders (J. L. Angel & Angel, 1992; Baxter et al., 1998), other investigations with older Caucasians have contradicted the premises of this model (Antonucci, 1985). Antonucci (1985), for instance, in a review of the literature on SS, failed to find consistent significant main effects of SS on mental health across studies. Similar discrepancies have been found in the literature regarding the buffering potential of received SS (RSS; George, 1989). Furthermore, there is some evidence suggesting that, under certain circumstances, receiving excess SS could be detrimental (Krause, 1997; Markides & Krause, 1985; Newsom & Schulz, 1998).

These inconsistencies in findings regarding the main-effects and buffering-effects models of SS have been attributed to methodological problems. Nonetheless, three alternative explanations for these contradictions, which are derived from a review of recent empirical investigations, merit attention. First, the main-effects and buffering-effects models may not be mutually exclusive but rather distinct processes by which SS relates to well-being (Cohen & Wills, 1985). Second, some indicators of SS may have a greater relationship to well-being than to other SS components. For instance, there is evidence that satisfaction with RSS (SSS; i.e., one's subjective evaluation of the quality and/or quantity of SS exchanged) explains more variance in elders' mental health status than any other SS dimension does (Krause, Liang, & Yatomi, 1989). Moreover, the association between SS and PD may vary across cultures. For Hispanic elders, for example, RSS (i.e., actual level of SS received) may be the strongest predictor of positive health outcomes given the importance that this group places on caring for aging parents (i.e., filial piety; Burr & Mutchler, 1999; Kao & Travis, 2005). Third, the provision of social resources beyond (i.e., during periods of chronic stress and need of SS) or below (i.e., cases in which the elder does not receive enough SS) a certain threshold may invalidate the protective functions of SS (Krause, 1995a). This counterproductive effect might occur due to an increased frequency of negative interactions (NI; i.e., conflictive transactions) between SS provider and recipient (Krause, 1995b; Okun & Keith, 1998; Pagel, Erdly, & Becker, 1987).

Taken as a whole, these three alternative explanations led to the following hypotheses regarding the main effects and buffering effects of SS models: Higher levels of SSS will be associated with lower levels of PD, and this relationship will hold true for both the main- and buffering-effects models. RSS will also be related to PD, as specified in the main-effects model. However, this relationship will be nonlinear (or quadratic) in the context of the buffering-effects model; at very low and very high levels of RSS, PD will be high but will be low at moderate levels of RSS (cf., Krause, 1995a). Moreover, NI will play a moderating

role, wherein the negative correlations between RSS and PD and between SSS and PD will decrease significantly among older adults who are more in conflict with members of their social network (cf., Krause, 1995b).

In addition to the main and buffering effects of SS, the third and fourth models examined in this study represent two closely related theoretical paradigms: social-exchange and equity models. Embedded in utilitarian economics and behaviorist concepts, the social-exchange theory was originally developed by sociologist George Homans (1961) and posits that individuals engage in social transactions with the expectancy that the benefits will outweigh the costs. The value of these benefits is particularly important for older people's well-being in light of the aging-related losses of individual sources of reward or power, such as income and social or professional roles (Down, 1980). From this social exchange point of view, then, elders who receive more SS than they give should experience higher levels of life satisfaction (McCulloch, 1990). The equity theory, on the other hand, views social interactions as governed by the *norm of reciprocity*, a term coined by another sociologist, Alvin W. Gouldner, in 1960. According to this norm, the stability of human relationships is contingent upon a balance between the demands and benefits that are shared by the participants (Walster, Berscheid, & Walster, 1973). Therefore, symmetric exchanges of SS do not generate power differences and are associated with psychological wellness. In contrast, individuals who receive more than they give may experience guilt and/or a sense of dependency, and those who give more than they receive might feel angry and resentful (McCulloch, 1990).

A more contemporary approach, grounded in evolutionary theories (i.e., Hamilton's kin-selection theory and Trivers's reciprocal-altruism theory; S. L. Brown, Nesse, Vinokur, & Smith, 2003) and on Erikson's stages of psychosocial development (Erikson, Erikson, & Kivnick, 1986), emphasizes the inverse of the social-exchange theory, or the protective health outcomes of providing SS (provided-support model), which is the fifth model in this study. From an evolutionary standpoint, providing SS to others not only contributed to the reproductive success of relationship partners but activated a motivation for self-preservation on the part of the provider (S. L. Brown et al., 2003). From Erikson's perspective on the other hand, the acquisition of a sense of meaning in one's life becomes an important task in old age (Erikson et al., 1986)—one that can be attained by sharing resources and wisdom with others. In the context of these two theoretical positions, underbenefiting (i.e., receiving less SS than one provides) could trigger an optimistic stance about oneself and one's group survival (S. L. Brown et al., 2003), as well as enhance feelings of self-esteem, which in turn promote psychological well-being (Batson, 1998).

Both the social-exchange and equity models have received mixed empirical support in non-Hispanic samples (Liang et al., 2001; McCulloch, 1990). As a consequence of these mixed outcomes, the provided-support model has become the focus of attention among social gerontologists. A mounting number of recent studies has linked older people's prosocial behaviors with contentment (Krause & Shaw, 2000; Liang et al., 2001) and even with increased longevity (S. L. Brown et al., 2003). However, reflexive assumptions that linear increases in provided SS (PSS) are beneficial may repeat assumptive errors made in the early main-effects literature.

To our knowledge, none of the last three models—those dealing with the symmetry of SS interactions—has been tested simultaneously using Hispanic samples. Hispanic adults, at least those who preserve the values from their country of origin, traditionally invest a great deal of energy and resources in their offspring and relatives with the expectation that they will be cared for as they reach advanced ages (Burr & Mutchler, 1999; Kao & Travis, 2005). Therefore, receiving SS, or being satisfied with the SS received, may be interpreted by

Hispanic elders as a sign of gratitude and success in their child-rearing efforts, which may lead to feelings of self-worth and decreased PD. In this context, we hypothesized that, on one hand, the equity model will better explain transgenerational exchanges of SS among Hispanics over time, whereas in cross-sectional studies, such as this one, the social-exchange model will be more applicable.

In sum, the study proposed here tested five models of SS to better assess the association between different facets of SS and PD in a population-based sample of Hispanic elders drawn from East Little Havana, Florida. Because the main and buffering functions of SS are not mutually exclusive (Cohen & Wills, 1985), both models were tested independently. In contrast, the other three theoretical positions (i.e., social-exchange, equity, and health protective outcomes of providing SS models) were compared with one another.

Method

Sampling Method and Participants

Participants were 273 Hispanic elders living in a Miami, Florida neighborhood (i.e., East Little Havana) whose baseline data were collected as part of a multiyear longitudinal effort to understand Hispanic elders' well-being from an ecodevelopmental perspective (S. C. Brown et al., 2008; Szapocznik & Coatsworth, 1999). According to the 2000 U.S. Census (U.S. Census Bureau, 2000), East Little Havana is over 93% Hispanic, with a relatively high proportion of older adults (i.e., 19% of residents are 65 years old) and with over 35% of residents living below the poverty level.

To obtain a population-based sample of Hispanic elders from East Little Havana, all Hispanic residents 70 years of age or older in each of the 403 residential blocks of this neighborhood were identified and enumerated. For these purposes, a team of 10 bilingual enumerators contacted, either by telephone or in person, almost 16,000 households located in these 403 blocks. The 403 blocks were identified with geo-coding maps (i.e., maps in which house addresses are plotted in terms of latitude and longitude) and subsequently numbered using Bresser's Criss Cross Plus system (Bresser Cross-Index Directory Co., 2000), which provides a listing of households with its associated telephone numbers.

Of the 403 neighborhood residential blocks, 302 blocks had at least one elder living in it who met the following inclusion criteria: (a) 70 years of age or older, (b) Hispanic immigrant origin, (c) ambulatory capacity as permitted by both the individual's physical condition and residence in a type of housing that does not restrict outside access to the community, and (d) intact cognitive ability (score of 17 or above on the Mini-Mental Status Examination [MMSE]; Folstein, Folstein, & McHugh, 1975). From each of these 302 blocks, we attempted (as part of the parent study) to randomly select one Hispanic elder per block. However, we were unable to sample elders from 29 of the 302 blocks, despite random resamplings from the same block, given that most of these 29 blocks had few elders residing on them.

The final sample consisted of 273 participants (aged 70 to 100 years old; $M = 78.5$, $SD = 6.3$), of which 59% were women, 86% were of Cuban origin, 6% were Nicaraguan, and the remaining 8% were from other Latin American countries and Spain. Thirty-four percent of the sample was married or living with a partner; 55% were widowed, divorced, or separated; and 10.6% had never been married. Average years of schooling was 7.27 ($SD = 4.26$, range = 0 to 20).

Measures

All the measures used in this study were drawn, with permission, from the Resources for Enhancing Alzheimer's Caregiver Health (REACH) project's battery (Wisniewski et al., 2003)¹ and were translated from English to Spanish using a standard back-translation method (Brislin, 1980).

RSS—RSS, which captures the frequency of supportive exchanges where the elder participant is the recipient of SS, was evaluated with 10 items developed by Krause and Markides (1990). These 10 items tap three types of RSS: tangible (2 items), which involves concrete or material assistance; emotional (4 items) or supportive behaviors involving empathy, caring, love, and trust; and informational (4 items), which refers to advice and explanations. They are scored on a 4-point Likert scale ranging from 0 (*never*) to 3 (*very often*). A sample RSS item is "In the last month, how often has someone listened to you talk about your private feelings?" Although Krause and Markides assessed the enactment of SS within the last year, the questions used in this study pertained only to the past month. A composite score was created by summing the 10 items, resulting in a range of possible scores from 0 to 30. A high score indicated more RSS. In this sample, Cronbach's alpha was .83 for the original items and was .82 after normalizing transformations.

SSS—The subjective evaluation of the quality and/or quantity of SS received was operationalized with items from two scales developed by Krause and Markides (1990) and Krause (1995b). In contrast to the RSS measure, these two scales tap into the respondent's feelings or reactions to the support that was received. The first scale is a three-item, 3-point Likert-type scale that includes three questions asking the participant to indicate whether he or she was satisfied with the amount of emotional, tangible, and informational SS received or whether he or she would have liked to receive SS more or less often during the last year (Krause & Markides, 1990). In this subscale, a majority of participants reported that they were satisfied with the tangible (85.7%), emotional (86.1%), and informational (84.2%) SS that they received. In contrast, 12.8%, 12.5%, and 13.9% of the sample said that they wished to receive more tangible, emotional, and informational SS, respectively; only a few participants indicated that they wished to receive less of each type of SS. Because wishing to receive more or less SS can be interpreted as not being satisfied with the aid received, scores in this scale were transformed into a binary variable (2 = *satisfied*, 1 = *wished to receive SS more often* or *wished to receive SS less often*). A similar procedure was previously used by Krause et al. (1989).

The second scale (Krause, 1995b) is a three-item, 4-point Likert scale that includes three questions asking the participant to indicate the level of satisfaction experienced (0 = *none*, 1 = *a little*, 2 = *moderately*, 3 = *very much*) during the last month with respect to each type of RSS (i.e., tangible, emotional, and informational). A sample item is, "In the last month, how satisfied have you been with the support you have received during difficult situations, with the comfort others have given you, how others have listened to you, and the interest and concern others have expressed toward you?" According to Krause (1995b), the factor loadings associated with these three satisfaction with SS items ranged from .77 to .90, and the reliability of the construct was estimated to be .87. In the present sample, Cronbach's alpha for SSS in the last month was .71 for the original items and was .65 after normalizing transformations. For SSS in the last year, alpha was .73 for the original items and .82 after

¹REACH is a study funded by the National Institutes of Health, National Institute of Aging, and National Institute of Nursing Research that evaluates the effectiveness of a variety of interventions aimed to improve caregivers' quality of life. The Department of Psychiatry at the University of Miami is one of the six sites in the country where REACH is currently being conducted.

normalizing transformations. The correlation between the two scales of SSS was .48 ($p < .01$).

An index of SSS was calculated by standardizing the total scores of the two scales (Krause and Markides's, 1990, scale and Krause's, 1995a, scale) and summing them together. Scores in this index ranged from a low of $-.47$ to a high of 1.90 . Higher scores indicated higher degrees of SSS.

Financial strain (FS)—The buffering-effects model of SS posits that SS is beneficial when the recipient of such support is experiencing stress. In this study, stress was operationalized with one indicator of FS, which asked the participant to rate on a scale from 1 (*easy*) to 7 (*very difficult*) his or her level of difficulty in paying for basic needs. The use of FS indicators as a proxy of an elder's stress has been the preferred mode of testing the buffering functions of SS in multiple studies (Krause, 1995a, 2005; Lincoln, Chatters, & Taylor, 2005). Several investigations have documented that financial difficulties are a common stressor among older Hispanics (Hooyman & Kiyak, 1999) and a correlate of decreased psychological well-being at old age (R. J. Angel, Frisco, Angel, & Chiriboga, 2003; Black, Markides, & Miller, 1998). Moreover, in lieu of the elders' reduced participation in the work force and their difficulty in improving their economic status, FS is likely to mobilize SS transactions (Krause, 1995a), thus providing an opportunity to test the buffering effects of SS.

NI—This dimension was measured with a four-item, 4-point Likert scale developed by Krause (1995b). In this case, participants were prompted to report how often, during the past month, others made excessive demands, were critical, pried into their affairs, and took advantage of them. Responses to these items ranged from 0 (*never*) to 3 (*very often*). The four items were summed together to form a single index of NI. Total scores ranged from 0 to 12, with higher scores indicating occurrence of more NI. A confirmatory factor analysis reported by Krause (1995b) yielded high loading items ranging from .75 to .96 and a reliability estimate of .87 for the NI's composite. In this study, Cronbach's alpha was .73 for the original items and .73 after normalizing transformations.

PSS—Exchanges of SS wherein the participant was the source of SS were evaluated with a new four-item, 4-point Likert scale developed by the project team Spokane and Zarate (2001). Items in this scale were modeled after Krause and Markides's (1990) subscale. In completing this scale, respondents were asked to indicate the frequency, from 0 (*never*) to 3 (*very often*), with which they provided tangible and emotional support to others during the last month. A composite score was computed by summing responses across the four items. Scores in this scale ranged from 0, indicating no aid provided, to 12, indicating higher levels of PSS. Cronbach's alpha was .71 for the original items and .70 after normalizing transformations. The PSS scale was used to calculate the index of social support reciprocity (IR).

IR—Following procedures used in a previous study (McCulloch, 1990), the IR (i.e., an indicator of whether the elder received or provided more SS) was defined as the difference between the standardized values of the PSS (Spokane & Zarate, 2001) and the RSS (Krause & Markides, 1990) scales (i.e., $IR = PSS - RSS$). Participants who obtained positive difference values (i.e., positive IR values) represented elders who *underbenefited* from SS, that is, elders who provided more SS than they received. Participants with negative scores (i.e., negative IR values) represented individuals who *overbenefited* from SS exchanges. Finally, and given that exchanges of SS among human beings are not exact, even under the most favorable conditions, balanced exchanges of SS were defined as IR values close to 0.

Psychological distress—The dependent variable was operationalized as a composite score of anxiety and depressive symptoms. Depression was measured with the Center for Epidemiological Studies–Depression Scale (CES-D; Carmin, Pollard, & Gillock, 1999). The CES-D is a 20-item, 4-point Likert scale that assesses the frequency (from 0 = *rarely* to 3 = *most or all of the time*) with which the respondent has experienced symptoms of depression during the past week. The psychometric properties of the CES-D have been demonstrated across age, socioeconomic, and ethnic groups (Arena & Miranda, 1997; Carmin et al., 1999). Anxiety was assessed with a 10-item short version of the Spielberger State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), as modified by REACH (Wisniewski et al., 2003). This measure has well-documented reliability and validity with older (Carmin et al., 1999) and Spanish-speaking populations (Novy, Nelson, Smith, Rogers, & Rowzee, 1995). In the present sample, Cronbach alphas for the CES-D and STAI scales were .87 and .89, respectively. A PD index was obtained by transforming the total raw scores of both the CES-D and the STAI into standard scores and then summing them.

Demographic control measures—The relationships among PD and each indicator of SS were assessed after the effects of age, gender, marital status, and years of schooling were controlled statistically. All the control measures were assessed through self-report. Both age and years of formal schooling were scored in a continuous format, and gender (men = 1, women = 0) and marital status (married or common law = 1, otherwise = 0) were represented with binary indicators.

Procedures

Four bilingual assessors with previous experience in administering measures of psychological functioning were trained in the utilization of the baseline protocol using beta and pilot testing techniques. Beta testing consisted of multiple administrations of the study protocol to Spanish-speaking members of the research staff. Pilot testing was conducted with randomly drawn eligible participants in this study who were then excluded from the data set. Additionally, interrater reliability and assessor reliability drift checks were performed monthly (i.e., the study coordinator accompanied each assessor in the field to ensure that the protocol was properly and completely administered) to enhance the validity of the data collection process. A criterion of no more than one protocol error per assessment was utilized to determine whether or not an assessor had “drifted” and required additional training.

Assessors contacted each selected individual in person and requested his or her participation in the study. Signed consents previously translated into Spanish were obtained from all individuals in the sample. An incentive of \$10 for the initial screening and an additional \$25 for the completion of the full baseline protocol was offered. Assessments were conducted in Spanish in each participant’s home. In addition to measures of SS, the baseline protocol included a measure of neighborhood social behavior and multiple cognitive and affective indicators. An average of 3 to 4 hr was required to complete the full baseline assessment protocol.

Data Analytic Strategy

The main- and buffering-effects models of SS were tested using hierarchical multiple regression. Table 1 includes a description of each of the models, associated hypotheses, and the equation testing each model. Equation 1 (see Table 1) includes the predictors needed to examine the main-effects model, whereas Equation 2 (see Equation 2) adds the predictors required to test the buffering-effects model. In a first step, the demographic control variables

were entered; in subsequent steps, sets of independent variables, each corresponding to the two models tested, were entered.

The buffering-effects model of SS stipulates that the impact of stress (as measured by FS) on PD depends upon the amount of RSS or the level of satisfaction experienced in response to such support. To test these statistical interactions, and following Aiken and West's (1991) guidelines, four steps were added into Equation 1. FS, our indicator of stress, was entered first. The cross-product of RSS and FS ($RSS \times FS$) and of SSS and FS ($SSS \times FS$) were subsequently and simultaneously entered (see Table 1, Equation 2) in the regression equation. These multiplicative terms tested whether or not SS buffered the relationship between FS and PD when high levels of RSS and SSS were reported by the elder. Quadratic effects of RSS (RSS^2) and satisfaction with RSS (SSS^2) were also added to control for the possible nonlinear effects of these variables. Lastly, the cross-products of the squared value of RSS ($RSS^2 \times FS$) and of SSS and FS ($SSS^2 \times FS$) were included simultaneously to examine the nonlinear relationships between FS and both types of SS at various levels of RSS and SSS (Aiken & West, 1991; Krause, 1995a, 2005). If the regression coefficients associated with the last two interaction terms ($RSS^2 \times FS$ or $SSS^2 \times FS$) are significant and in the expected direction, then there will be evidence for nonlinear relationships.

The moderation effect of NI on RSS and SSS also implies a statistical interaction; hence, a multiple regression equation (see Table 1, Equation 3) containing the standardized NI predictor and the cross-products of NI and each SS index ($NI \times RSS$ and $NI \times SSS$) was employed. These multiplicative terms were entered simultaneously in a fourth step after controlling for the effects of the demographic measures and the main effects of RSS, SSS, and NI.

Finally, the hypothesis about the laws of reciprocity with respect to SS (i.e., comparison of the social-exchange, equity, and provided-support models) was tested with a hierarchical polynomial regression (see Table 1, Equation 4). After controlling for the effects of the demographic variables, IR (i.e., score obtained by subtracting RSS from PSS) was entered first, followed in a subsequent step by its squared value (IR^2). The first order term for IR tested whether or not there is a significant linear relationship between IR and PD. A significant and positive regression weight, where PD decreases as IR decreases, would indicate that the amount of RSS becomes greater relative to the amount of PSS. This trend would suggest the applicability of the social-exchange model, in contrast to a negative regression weight that would support the protective health outcomes of providing SS model. The quadratic term for IR (IR^2), on the other hand, tested whether or not there is a curvilinear relationship between IR and PD. A U-shaped curve would suggest the applicability of the equity model, as values close to 0 (i.e., reciprocal exchanges of SS) in IR are associated with lower levels of PD (at the base of the curve) and positive (i.e., when $PSS > RSS$ or elders underbenefited) and negative values (i.e., when $PSS < RSS$ or elders overbenefited) in IR are associated with higher levels of PD (at both sides at the uphill of the curve).

In the context of interactive and polynomial regression models, multicollinearity often arises as a problem, not necessarily due to high correlations between the predictor variables but rather as a result of scale discrepancies among variables (Aiken & West, 1991). To avoid this type of multicollinearity, the first order independent variables were centered by transforming them into z scores (Aiken & West, 1991). Z scores were then used to calculate the cross-products and squared values entered in each of the regression equations (Equations 1–4 in Table 1).

Results

Missing Values and Normative and Descriptive Data

Because the overall percentage of missing values was small (1.1% of the total number of values or 99 values distributed among 33 variables), a median replacement method was adopted. An exception to this replacement occurred when one of the items within the NI subscale (i.e., question assessing how often the participant felt criticized) contained 42 missing values; thus, in this case, a regression imputation procedure was employed.

Preliminary analyses included checking the data for normality, linearity, outliers, and homoscedasticity at the item level (Stevens, 2002). Given that the skewness and kurtosis of 12 individual items were not within acceptable limits (± 2 *SDs*), natural logarithms, squares, and square root transformations were computed (Fox, 1997). The skewness of the variables was resolved through these procedures. Two variables, SSS in the last year and NI, continued to present with kurtotic characteristics (estimates of 2.63 and 2.76, respectively). Regression analysis, however, tends to be robust against violations of normality (Bohrnstedt & Carter, as cited in Berry & Feldman, 1985). Means, standard deviations, and zero-order correlations among independent and dependent variables are depicted in Table 2.

Main-Effects Model of SS (Model 1)

Standardized regression coefficients for the hierarchical multiple regression predicting the main effects of SS on PD are shown in Table 3. After entering the control variables in the first step, RSS (Step 2) was significantly associated with PD; however, contrary to our hypothesis, this relationship was positive ($\beta = .35, p < .001$), indicating that receiving more SS was associated with higher levels of PD in this sample of Hispanic elders. SSS (Step 2) was also significantly related to PD, and, in this case, in the expected direction ($\beta = -.39, p < .001$). Individuals who reported greater satisfaction with the SS that they received from others experienced lower levels of PD. A total of 27% of the variance in PD (see Table 3) was accounted for by the main-effects model of SS ($R^2 = .27$), $F(2, 266) = 16.56, p < .001$.

Buffering-Effects Model of SS (Model 2)

After entering the main effect for FS in Step 3 (see Table 3), we next examined the two-way interactions between FS and RSS ($RSS \times FS$; Step 4) and between FS and SSS ($SSS \times FS$; Step 4). These interactions were not statistically significant, indicating that in this sample, neither high levels of RSS nor high levels of SSS buffered the noxious effects of FS (i.e., difficulty in paying for basic needs) on PD. The regression coefficients for the higher order multiplicative terms of RSS and FS ($RSS^2 \times FS$; Step 6) and of SSS and FS ($SSS^2 \times FS$; Step 6) were also nonsignificant. These findings suggest that neither medium levels of RSS nor medium levels of SSS moderated the relationship between FS and psychological stress. The addition of the interaction effects terms (see Table 3, Steps 4–6) to the regression model did not significantly increase the amount of variance from that already explained by the main effects of SS.

Moderating Effects of NI

Variable reports the hierarchical regression analyses used to examine whether or not RSS and SSS differentially predict PD depending on the level of NI between the Hispanic elder and members of his or her social network. In this regression model, NI (Step 3) had a significant and positive regression coefficient ($\beta = .21, p < .001$), suggesting that high degrees of conflict-laden exchanges with members of one's social network did predict increased PD.

The estimate of the interaction effect between NI and SSS ($SSS \times NI$; see Table 4, Step 4) was nonsignificant. However, the interaction effect between NI and RSS ($RSS \times NI$; Step 4) was statistically significant ($\beta = -.13, p < .05$). To further explore the meaning of this result, the techniques suggested by Aiken and West (1991) for probing significant interactions were used. First, the equation for testing the moderating effects of NI was restructured to obtain a regression of the dependent variable on only one independent variable. This new arrangement (see Equation 3.1) shows that the slope of PD on RSS depends upon the values of NI.

$$\begin{aligned} PD &= a + b_1 RSS + b_2 NI + b_3 (RSS \times NI) + e \rightarrow \\ PD &= (a + b_2 NI) + (b_1 + b_3 NI) RSS + e \end{aligned} \quad (3.1)$$

Second, and again following Aiken and West's (1991) guidelines, the NI variable was assigned three specific values (mean of NI, 1 *SD* below the mean of NI, and 1 *SD* above the mean of NI) with which the regression equations of three lines were obtained, tested for significance, and plotted (see Figure 1) to display the interaction. These three lines, all of which had statistically significant slopes, represented low ($B = 0.76, p < .01$), moderate ($B = 0.54, p < .001$), and high ($B = 0.32, p < .001$) levels of NI, respectively.

As Figure 1 shows, heightened levels of RSS were associated with increased PD for elder Hispanics who reported any of the three levels of NI (i.e., 1 *SD* below the mean of NI, at the mean of NI, and 1 *SD* above the mean of NI). PD was highest among Hispanic elders who reported increasing levels of RSS in the presence of high levels of NI (see Figure 1, regression line of PD on RSS as a function of high levels of NI). The strength of the relationship between RSS and PD differed, however, based upon the level of NI; the strongest relationship was observed for individuals experiencing low levels of NI (i.e., NI that were less frequent). At high levels of RSS, the moderational effect of NI became minimal, showing very similar high levels of PD. In contrast, greater differences in PD were observed at low levels of RSS.

Social-Exchange Versus Equity Versus Protective Health Outcomes of Providing SS Models (Laws of SS Reciprocity; Models 3, 4, & 5)

Standardized regression coefficients for the hierarchical polynomial multiple regression examining the laws of reciprocity with respect to SS (i.e., social-exchange vs. equity vs. protective health outcomes of providing SS models) are shown in Table 5. The first lower order term for IR (Step 2) was a significant predictor of PD ($\beta = -.22, p < .001$). The slope of this linear regression was negative, suggesting, in contrast to our hypothesis, support for the protective health outcomes of providing SS model (instead of the SS exchange model) in this sample of Hispanic elders. In other words, as IR scores decreased (i.e., in the direction of more RSS rather than PSS), PD increased.

These results, however, could be misinterpreted in the absence of the quadratic term for IR (IR^2 , Step 3), which was also found to be a significant predictor of PD ($\beta = .15, p < .05$). To better understand the nature of this relationship, which suggests the presence of a curvilinear relationship, we plotted the regression of IR on PD using both the first order (IR) and quadratic (IR^2) terms of this index (see Figure 2). The minimum and maximum values of the SS reciprocity index were used to define the limits of this relationship. As Figure 2 shows, there was a predominantly negative, concave upward curve (instead of a U-shaped curve), where the following occurred: (a) PD increased as the value of the SS reciprocity index decreased, suggesting that the Hispanic elders who received more SS than they provided (i.e., those with increasingly negative IR values) reported higher levels of PD; (b) PD decreased as the values of the SS reciprocity index became close to 0, suggesting that the Hispanic elders who received and provided somewhat equitable amounts of SS (i.e., those

who obtained IR values close to 0) reported decreased PD; and (c) PD decreased slightly at first and then partially started to increase as IR increased, suggesting that the Hispanic elders who provided more SS than they received (i.e., those who obtained positive IR values) reported lower levels of PD—at least below a certain threshold in the SS reciprocity index (i.e., those for whom a positive difference between PSS and RSS was not at the highest level). Note however, that at the highest positive value of IR, PD was still at a low level. Taken as a whole, these results challenge the applicability of the social-exchange model to this sample of Hispanic elders. Moreover, they provide preliminary support for the applicability of either the equity or protective health outcomes of providing SS model.

Post Hoc Analyses

This study's result with respect to the main effects of RSS (i.e., higher levels of RSS associated with increased PD) were unexpected. Although the cross-sectional nature of the study does not allow us to make any causal inferences with respect to the positive relationship that we found between RSS and PD, two hypotheses were explored to clarify the meaning of this result: (a) RSS may increase PD by eliciting negative reactions, such as feelings of low self-esteem, loss of control, et cetera (S. L. Brown et al., 2003; Liang et al., 2001; Newsom & Schulz, 1998); or (b) distressed elders may elicit and receive more SS than less distraught individuals do; thus, the effects of RSS may be contingent upon the participant's preexisting level of pathology.

To test the first hypothesis, PD was regressed on the three types of RSS (i.e., tangible, emotional and informational) measured in this investigation after controlling for the effects of our demographic variables. Cronbach's alphas for these three subscales were as follows: .75 for tangible, .73 for emotional, and .78 for informational RSS. As Table 6 shows, out of the three types of RSS entered in the regression equation, only informational (Step 2, Informational RSS) was a significant predictor of PD ($\beta = .26, p < .01$). These results suggest that Hispanic elders who receive SS in the form of advice and explanations (i.e., informational SS) exhibited higher levels of PD. To further investigate this hypothesis, the correlation coefficients between each of the three types of RSS with SSS and with NI were calculated. Whereas SSS was significantly correlated with tangible ($r = .16, p < .01$) and emotional ($r = .22, p < .01$) RSS, the correlation between SSS and informational RSS was not significant ($r = .04, ns$). Moreover, NI was moderately correlated with informational RSS ($r = .36, p < .01$), modestly correlated with emotional RSS ($r = .13$ at $p < .05$), and uncorrelated with tangible RSS ($r = -.01, ns$). This pattern of correlations indicates that degree of SSS was associated with the frequency with which participants received emotional and tangible SS but unrelated to informational RSS. Additionally, participants who received higher levels of informational SS more frequently engaged in NI than did those who received tangible and emotional SS. Taken as a whole, these results suggest that the noxious effects of RSS are dependent upon the type of RSS, in this case, informational RSS.

To examine the second hypothesis, that is, that the effects of RSS depend upon the participant's extant level of distress, RSS was correlated with cognitive status, as measured by the MMSE (Folstein et al., 1975), which was used in the recruitment phase of this study. A modest but significant correlation between these two variables was found ($r = -.12, p < .05$). This finding suggests that more cognitively impaired Hispanic elders (i.e., those who received lower MMSE scores) received more SS, thus supporting the possibility that health status may be confounding the relationship between RSS and PD.

Discussion

The present study tested five theoretical models of SS to better understand the relationship between SS and PD in a communitybased sample of Hispanic (predominantly Cuban) elders

residing in East Little Havana, Florida. Two of these models explored the mechanisms by which SS operates: as a constant influence in the main-effects model and as an interaction effect in the buffering effects model. The other three models examined whether symmetric (equity model) or asymmetric exchanges of SS (social exchange model or provided-support model) were associated with enhanced levels of psychological functioning. Recognizing that SS is a multidimensional construct, various dimensions of SS—RSS, PSS, and SSS—were used to examine this study's hypotheses. Moreover, the moderating role of NI was used to provide an integrated framework of the dynamics that exist among the distinct types of SS and the exchanges that occur among SS provider and recipient.

Consistent with our expectations, this study's results supported the main-effects model of SS in the relationship between SSS and PD. Hispanic elders who were satisfied with the SS that they received from others exhibited decreased levels of PD. In contrast, the findings did not substantiate the main-effects model when a measure of RSS (as contrasted with SSS) was examined in relation to PD. In our sample, higher levels of RSS were unexpectedly associated with increased PD. This combination of results (with respect to SSS and RSS), though unforeseen, is reminiscent of findings from previous studies (Krause, 1997; Krause et al., 1989) and adds to a growing body of research documenting that rather than the actual amount of SS received, it is the subjective evaluation that the SS recipient holds about these exchanges that relates to a positive mental health status (Antonucci, 1985; Krause, 1987).

Understanding the unanticipated association between high levels of RSS and PD has important implications for the care of older Hispanics. Given that the data in this study were gathered at a single point in time, which limits any causal ordering of the SS and PD constructs, we considered two alternative hypotheses to explain this finding. A first possible explanation, which has been supported in prior empirical studies, is that receiving more SS may be associated with adverse psychological reactions (i.e., feelings of low self-esteem, resentment, or loss of control; S. L. Brown et al., 2003; Liang et al., 2001; Newsom & Schulz, 1998), which in turn increase the likelihood of experiencing higher levels of PD. To examine this possibility, we conducted post hoc analyses and found that out of the three types of RSS included in this study (i.e., tangible, emotional, and informational), only informational was significantly associated with increased PD. Thus, Hispanic elders may dislike or resent receiving advice or explanations from others, as these types of information may imply a functional or cognitive decline on the part of the elder that may increase their level of distress. In fact, all the informational RSS items used in the current study seem to relate to the receipt of suggestions that may insinuate a lack of understanding (e.g., "In the last month, how often has someone made a difficult situation easier to understand?") or be interpreted as critical (e.g., "In the last month, how often has someone helped you understand why you did not do something well?"). Further, when we correlated RSS by type with SSS (i.e., index of the two SSS scales), informational was the only type of RSS not significantly correlated with SSS. Hence, level of SSS is related to the frequency with which Hispanic elders received tangible and emotional SS but not informational SS. These findings seem to explain a pattern of results that initially seemed contradictory: Even though RSS and SSS were positively correlated, PD increased with more RSS and decreased with more SSS.

A second and perhaps more parsimonious explanation is that the positive relationship between RSS and PD may be confounded by the elder's health status (Maher, Mora, & Howard, 2006). Hispanic elders who are either more ill or more psychologically distressed may be precisely those who require and, therefore, receive more informational SS. In similar fashion, elders who are physically and/or mentally healthier may report greater satisfaction with the SS that they receive. Thus, a sixth model of SS, in which the effects of SS are *contingent upon level of pathology* (contingent model), may be operating in our sample.

This contingent model would predict that an elder whose physical and/or mental status is so compromised that RSS is insufficient to meet his or her SS needs (and also precludes the provision of SS to others) will report increased PD (and possibly more frequent NI). Our data were cross-sectional and limited with respect to physical health measures, which, as previously said, hinders a definite determination of directionality in the relationship between SS and distress. Nonetheless, in post hoc analyses, we found that RSS was modestly but significantly correlated with cognitive status, as measured by the MMSE (Folstein et al., 1975). In other words, Hispanic elders who presented higher levels of cognitive impairment (i.e., lower MMSE scores) received more SS—a finding that seems consistent with the contingent upon level of pathology model. Indeed, previous empirical evidence suggests that the effects of SS on health may be exaggerated by elders' preexisting health status (Cornman, Goldman, Gleib, Weinstein, & Chang, 2003) and that distressed individuals tend to mobilize more SS from their social network (Hobfoll & Lerman, 1988). Further, a very small percentage of this study's participants indicated that they wished to receive less SS in one of the two SSS scales (Krause & Markides, 1990) used in this investigation.² This result is also consistent with the idea that distressed individuals may want to receive more and not less SS.

The question of whether higher levels of RSS tend to be noxious or whether its effects are contingent upon the elders' extant distress level (i.e., the two hypotheses just described) should also be considered in the context of this study's findings with regards to NI. PD increased when the Hispanic elders of our sample reported higher levels of NI (i.e., when they felt that others made excessive demands, were critical, pried into their affairs, and/or took advantage of them), a result that replicates findings from Krause (1995b), Coyne and Downey (1991), and Rook (1984, 1990) among others. Moreover, NI was negatively correlated with SSS and positively correlated with RSS, particularly with receiving informational SS. Thus it seemed conceivable that (a) elders who were satisfied with the emotional and tangible SS that they received reported fewer NI, and (b) elders who received high levels of advice and clarifications (i.e., informational SS received) and, as a result, felt that others pried into their business and were critical of them (i.e., engaged in more NI), also reported an increase in PD. The pattern by which NI exerted a moderational effect between RSS and PD was, nonetheless, not only unexpected but somewhat inconsistent with this hypothesis (i.e., Item b). Although PD was highest among Hispanic elders who reported increasing levels of RSS in the presence of high levels of NI (see Figure 1), the relationship between RSS and PD was stronger among those who reported less frequent conflict-laden transactions (i.e., low levels of NI) than it was among those who reported more frequent negative SS exchanges (i.e., moderate or high levels of NI). An alternative and parsimonious explanation for this moderating effect, which is consistent with the contingent model described earlier, is that elders were more inclined to seek SS commensurate with their level of distress but that in the context of many NI, they were inclined to seek support that was less commensurate with their distress. Any of these interpretations should be tempered by the small number of elders who reported either high or medium levels of NI.

Contrary to the stress buffering-effects model (Fernandez, Mutran, & Reitzes, 1998; Krause, 1986, 1995a), our data did not confirm the hypothesized buffering functions of moderate levels of RSS and SSS. Our inability to detect these attenuating functions in the presence of stress might have been due to the use of a single indicator for FS. Other indicators of financial struggles or other types of stressors (i.e., physical illness) not measured in the current investigation may better account for the mobilization of SS and for the levels of PD found among this group of elder immigrants of Hispanic origin. It is possible that those

²In all analyses previously described, an index of SSS (i.e., sum of the standardized scores of two scales) and not this individual scale was utilized.

Hispanic elders who reported moderate levels of RSS and/or SSS, the levels at which the stress buffering-effects model is hypothesized to work most effectively, did not find themselves in FS (i.e., the measure of stress in the current study). Moreover, the relationship between SS, FS, and PD may be moderated by other variables, such as age. Krause (2005) for instance, found that emotional SS helped the oldest of his sample of elders, but not other age groups, to cope with the negative effects of FS.

The literature reflects that chronic stressors (i.e., physical disability), as opposed to those that are acute, entail ongoing exchanges of aid that over time erode the quality of the relationship between SS provider and recipient and thus trigger NI (Krause & Rook, 2003). Given the overall low socioeconomic status of this study's sample, FS was assumed to be of a chronic nature and a potential source of NI; however, in this case, difficulty paying for basic needs, though possibly activating the elder's SS system in terms of providing more SS to him or her, was not significantly correlated with NI. Other types of RSS than those that involve monetary aid may trigger conflict between the elder participants and his or her SS network.

Our test of the laws of SS reciprocity yielded interesting yet unexpected results. Hispanic elders who provided more SS than they received and those who engaged in equitable exchanges of SS reported lower levels of PD. Exactly the opposite occurred among those elders who overbenefited from RSS ($PSS < RSS$). Owing to the cross-sectional nature of this study, these findings need to be interpreted from a bidirectional standpoint. On one hand, and in accordance with the contingent model previously proposed, Hispanic elders who reported higher levels of PD may have been able—given their mental status—to provide equal (or less) but no more SS than they received. Alternatively, these results provide support for both the protective health outcomes of providing SS and equity models, in contrast to the social-exchange model, and thus corroborate a number of recent studies supporting that, for the elderly, reciprocating the assistance that they receive and giving SS to others may be more beneficial than only receiving SS is (S. L. Brown et al., 2003; Krause & Shaw, 2000; Liang et al., 2001; Masae & Ichiro, 2006).

It is important to note that a majority of our sample (86%) was of Cuban origin and thus somewhat unique. Therefore, our findings may not accurately reflect the SS processes of other Hispanic groups. We agree with S. L. Brown et al. (2003) that the processes of exchanging SS may be intimately related to a group's self-preservation. Thus, it is possible to hypothesize that for Cuban seniors, a majority of whom left their country for political reasons, providing rather than receiving SS may play an important role in the transmission of cultural values and thus in the preservation of the Cuban identity. Speculatively, other Hispanic groups, particularly those who do not have the benefits of political refugees (i.e., access to a legal migratory status, health care) and who, for that reason, feel more pressure to assimilate to the U.S. cultural values may engage in SS transactions that allow them to survive economically at the expense of the survival of their cultural identity; in such contexts, receiving more SS (than providing it) may be associated with increased life stability and decreased PD. This underscores the need for integrating measures of cultural identity and acculturation in studies that replicate tests of the laws of SS reciprocity among different groups of Hispanic elders. The present investigation is limited with respect to both acculturation effects and generalizability to Hispanics other than those of Cuban origin.

Alternative interpretations of our findings regarding SS reciprocity are plausible vis-à-vis the other models of SS tested. Given that in the context of the main-effects model, SSS was associated with lowered levels of PD, it is conceivable that the socialexchange ($PSS < RSS$) model could be substantiated when SS reciprocity (i.e., IR) accounts for the difference between satisfaction with PSS and SSS rather than with PSS and RSS. Hence, future

investigations may benefit from integrating measures of satisfaction with PSS into their protocol.

Interpretation of these findings should be considered in light of this study's limitations. First, the analyses presented in this article are cross-sectional, which limits our ability to confirm whether SS relates to PD in varied ways, as specified by the theoretical models of SS tested, or whether this relationship depends upon the elder's preexisting level of pathology, as hypothesized in the sixth model that we proposed (contingent model). Future studies should use longitudinal data and control for the influence of other relevant variables, such as SS needs, health, personality characteristics (i.e., neuroticism; Kahn, Hessling, & Russell, 2003), and attachment style (Mallinckrodt & Wei, 2005), among others.

A second shortcoming of this investigation is embedded in features of the SS measures that were selected. Indicators of social embeddedness (i.e., composition of the elder's social network) were not included in our analyses, a clear limitation in light of the importance that nuclear and extended family relationships (*familismo*; Vega, 1995) are said to have in the lives of Hispanic elders. Moreover, our measure of PSS was developed for the purposes of this study; thus, its effectiveness in measuring such a construct needs to be supported in other investigations. Furthermore, most of the SS items did not specify who the referent for the SS transaction was, that is, whether the source of any RSS or the recipient of any PSS was a friend or a family member of the elder. It is possible that the relationship between SS and PD varies depending on who was involved in the exchange of SS with the elder. There is clearly a need for further refinement of the ways in which SS is assessed. Future researchers need to use more sensitive measures of the source, type, and reaction to SS (O'Shaughnessy, Spokane, & Cruza-Guet, 2007).

A third limitation of this study involves the assessment environment. Participants in this study were interviewed in their homes, and occasionally, family members were present during the assessment process. In the few cases where another person was present in the elder's room, typically a spouse, they were there with the elder's approval. Moreover, the participant was given the option of moving to another room or rescheduling the assessment. This may have, however, influenced their responses about the actual and perceived SS that they received and provided. Finally, our investigation did not collect data regarding the elders' physical health and disability status. These variables may account for more variance than FS did in the mobilization of SS among the Hispanic elders' SS network, and thus would have allowed us to detect the buffering functions of SS.

The findings from this investigation are noteworthy for various reasons. This study used a population-based sample of community-dwelling Hispanic elders drawn from East Little Havana, Florida. Moreover, to our knowledge, this is the first attempt to provide an integrated framework of the relationships between SS and PD among this population at the junction of various SS dimensions and SS theoretical models. As such, our results highlight the complex nature of the SS processes and the need to further address important questions: Are the benefits of SS contingent upon Hispanic elders' preexisting psychological status? Are the effects of SS specific to the type of SS taken into account? Further, results of this study have implications for the development of counseling and preventive interventions with Hispanic elders, particularly for those of Cuban origin.

On one hand, if SS relates to PD, as specified by the three theoretical models for which we found preliminary support (i.e., main-effects of SSS, equity, and protective health outcomes of providing SS model), then therapeutic strategies may prove more effective by focusing upon indices of SSS and reconsidering the assumption that Hispanic elders are care recipients rather than care-givers. Strengthening the elders' prosocial behaviors by creating

opportunities for them to reciprocate and/or to altruistically assist others may serve to enhance their psychological health. Volunteering either through the elder's natural SS network or community services (Fischer, 1993; Folts, 2006), mentoring, and helping peers (Ho, 2007) are activities that may serve these purposes and that have been previously found to be beneficial to the elderly (Dulin, Hill, Anderson, & Rasmussen, 2001; Musick & Wilson, 2003). Moreover, it may be advantageous for counseling professionals to monitor the types of SS given to the elder, as some types of RSS (i.e., information in the form of advice and explanations) may elicit unpleasant responses and possibly NI. Minimizing negative SS exchanges may enhance the benefits of SS (Liang et al., 2001). On the other hand, if the effects of SS are dependent upon level of PD and not vice versa (i.e., contingent model), then therapeutic strategies ought to better assess the SS needs of Hispanic elders so that the amount of SS that they receive is commensurate with those needs. The benefits of receiving SS, particularly in elders who are severely distressed, may only be evident when congruency between needs and amount of SS received is achieved.

In light of the scarcity of published research on SS and PD among Hispanic elders and the limitations of this study, the conclusions presented herein regarding the applicability of either the main effects (of SSS) and both the protective health outcomes of providing SS and equity models to this sample should be weighed carefully. Hopefully, our conclusions, including the feasibility of a contingent upon level of pathology model, will serve as the impetus for future studies.

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Figure 1. Regression lines of psychological distress on received social support (RSS) as a function of low, moderate, and high levels of negative interactions.

Figure 2.

Regression line of psychological distress on the index of social support (SS) reciprocity (IR). Negative IR = provided SS < received SS (overbenefited from SS); positive IR = provided SS > received SS (underbenefited from SS); IR close to 0 = reciprocal exchanges of SS.

Table 1
Processes, and Equations of Each of the Five Theoretical Models of Social Support (SS)

Model description	Hypothesis	Equation
Received SS (RSS) is health protective; however, some types of SS are more beneficial than others.	a. Satisfaction with received SS (SSS) will account for more variance in psychological distress (PD) than RSS will.	$PD = a + b_1RSS + b_2SSS + e \quad \text{Equation 1}$
	b. Higher degrees of SSS and RSS will be associated with decreased levels of PD.	
	a. High levels of SSS will offset the deleterious effects of financial strain (FS) on PD.	
SS offsets the deleterious effects of stress on PD.	b. Neither high nor low levels of RSS will buffer the negative impact of FS on PD. The protecting functions of RSS will be evident among elders who report moderate levels of RSS.	$PD = a + b_1RSS + b_2SSS + b_3FS + b_4(RSS \times FS) + b_5(SSS \times FS) + b_6RSS^2 + b_7SSS^2 + b_8(RSS^2 \times FS) + b_9(SSS^2 \times FS) + e \quad \text{Equation 2}$

Model description	Hypothesis	Equation
Conflicting transactions between source and recipient of SS invalidate the protective functions of SS.	<p>a. NI will moderate the relationship between RSS and PD.</p> <p>b. NI will moderate the relationship between SSS and PD.</p>	$PD = a + b_1RSS + b_2SSS + b_3NI + b_4(RSS \times NI) + b_5(SSS \times NI) + e \quad \text{Equation 3}$
Individuals who receive more SS than they provide experience decreased PD.	the social-exchange model, in contrast to the equity and provided SS models, will better explain the relationship between SS and PD.	$PD = a + b_1IR + b_2IR^2 + e \quad \text{Equation 4}$
Reciprocal exchanges of SS lead to decreased PD.		
Individuals who provide more SS than they receive experience decreased PD.		

status, and years of schooling were controlled in each analysis but not depicted in any of these equations. a = intercept; b_1 = partial regression coefficients; IR = index of social or.

model but an extension of the main- and buffering-effects models.

Table 2

Means, Standard Deviations, and Intercorrelations Among Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Dependent												
1. PD	0	1	—									
Independent												
2. SSS	0	1	-.32**	—								
3. RSS	10.13	6.69	.30**	.19**	—							
4. PSS	6.31	3.22	.02	.24*	.26**	—						
5. NI	0.90	1.41	.39**	-.34**	.21**	.02	—					
6. FS	4.18	2.14	.28**	-.07	.25**	-.01	.11	—				
Control												
7. Age	78.47	6.30	.07	.06	.07	-.11	.02	-.03	—			
8. Gender	0.41	0.49	-.22**	-.02	-.20**	-.13*	-.09	-.13*	-.19**	—		
9. Marital status	0.34	0.48	-.13*	.03	.06	.03	-.06	-.05	-.17**	.22**	—	
10. Education	7.27	4.26	-.04	-.08	-.13*	.00	-.02	-.03	-.12*	.09	.06	—

Note. PD and SSS are reported in standardized form ($M = 0$, $SD = 1$) as they represent indices obtained through the addition of the standardized scores of individual variables. PD = psychological distress; RSS = received social support (SS); SSS = satisfaction with RSS; PSS = provided SS; NI = negative interactions; FS = financial strain.

* $p < .05$.

** $p < .01$, both two-tailed.

Table 3
Hierarchical Regression Analysis Predicting the Main Effects and Buffering Effects of Social Support (SS)

Variable	Step 1: Control variables	Step 2: Main-effects model	Step 3: Financial strain	Step 4: Buffering-effects model	Step 5: Quadratic terms	Step 6: Buffering-effects model
Control						
Age	.02	.03	.04	.04	.04	.04
Gender	-.20**	-.13*	-.12*	-.12*	-.13*	-.13*
Marital status	-.08	-.10	-.09	-.09	-.09	-.09
Education	-.01	.00	.00	.01	.01	.01
Independent						
RSS		.35***	.31***	.30***	.27***	.28***
SSS		-.39***	-.37***	-.38***	-.38***	-.38***
FS			.16**	.16**	.16**	.18*
RSS × FS				.01	-.00	.01
SSS × FS				.07	.07	.10
RSS ²					.06	.07
SSS ²					-.01	-.02
RSS ² × FS						-.06
SSS ² × FS						.06
R ²	.06	.27	.30	.30	.30	.31
R ²	.06	.22	.02	.01	.00	.00
F	3.96**	16.56***	15.84***	12.53***	10.31***	8.75***
F	3.96**	39.49***	8.68**	0.94	0.54	0.42
df	268.00	266.00	265.00	263.00	261.00	259.00

Note. All analyses were conducted using Equations 1 and 2 (from Table 1). All reported coefficients are standardized (). RSS = received SS; SSS = satisfaction with RSS; FS = financial strain.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Hierarchical Regression Analysis of the Moderating Effects of Negative Interactions (NI)

Variable	Step 1: Control variables	Step 2: Main-effects model	Step 3: NI	Step 4: Moderational effects of NI
Control				
Age	.02	.03	.03	.02
Gender	-.20 **	-.13 *	-.13 *	-.12 *
Marital status	-.08	-.10	-.10	-.09
Education	-.01	.00	.01	-.00
Independent				
RSS		.35 ***	.29 ***	.29 ***
SSS		-.39 ***	-.30 ***	-.28 ***
NI			.21 ***	.29 ***
NI × RSS				-.13 *
NI × SSS				.03
R^2	.06	.27	.31	.32
R^2	.06	.22	.04	.01
F	3.96 **	16.56 ***	16.89 ***	13.84 ***
F	3.96 **	39.49 ***	14.00 ***	2.52
df	268.00	266.00	265.00	263.00

Note. All analyses were conducted using Equation 3 (from Table 1). All reported coefficients are standardized (). RSS = received social support; SSS = satisfaction with RSS.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 5

Hierarchical Polynomial Regression Analysis Examining the Social-Exchange, Equity, and Provided SS Models

Variable	Step 1: Control variables	Step 2: Social-exchange and provided SS models	Step 3: Equity model
Control			
Age	.02	-.01	-.03
Gender	-.20 **	-.19 **	-.17 **
Marital status	-.08	-.09	-.10
Education	-.01	.01	.01
Independent			
IR		-.22 ***	-.22 ***
IR ²			.15 *
R ²	.06	.10	.12
R ²	.06	.05	.02
F	3.96 **	6.14 ***	6.30 ***
F	3.96 **	14.09 ***	6.47 *
df	268.00	267.00	266.00

Note. All analyses were conducted using Equation 4 (from Table 1). All reported coefficients are standardized (). IR = index of social support reciprocity.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 6

Post Hoc Analysis: Hierarchical Regression Analysis of Effects of Received Social Support (RSS) by Type (i.e., Tangible, Informational, Emotional) on Psychological Distress

Variable	Step 1: Control variables	Step 2: RSS by type
Control		
Age	.02	.03
Gender	-.20 **	-.15 *
Marital status	-.08	-.11
Education	-.01	.03
Independent		
Tangible RSS		-.03
Emotional RSS		.10
Informational RSS		.26 **
R^2	.06	.16
R^2	.06	.10
F	3.96 **	6.97 ***
F	3.96 **	10.42 ***
df	268.00	265.00

Note. All reported coefficients are standardized ().

* $p < .05$.

** $p < .01$.

*** $p < .001$.