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Creando Posibilidades: A Cognitive Model of Risk Behaviors in Mexican American Women

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Abstract

A prevailing theory within eating disorder literature is that the process of acculturation and the strength of ethnic identity are key determinants of disordered eating and related health risk behaviors for Latinas. In this paper, we describe a longitudinal study to test the theoretical proposition that the configuration of personal identities buffers the effects of acculturation on a triad of modifiable risk behaviors (disordered eating, alcohol use and tobacco use) in college-enrolled Mexican American (MA) women. Using the self-schema model to conceptualize personal identities, we review the causal pathways linking self-schema properties to risk behaviors and describe the longitudinal design and measures used to test the hypothesized relationships. We discuss the causal role of the self-concept in the development of the risk behavior patterns among young Latinas, and the association between socio-cultural factors and properties of the self-concept. We describe our longitudinal study design that enables us to examine the pattern of association among the risk behaviors, and the appropriateness of measures that operationalize the theoretical concepts in the study.

Keywords

Self-schema model; longitudinal design; theoretical framework; disordered eating; alcohol; tobacco

Introduction

Eating disorders are often considered disorders of upper class White women, yet research shows that they are equally prevalent in Latinas, particularly women of Mexican origin [77, 78] Even at subclinical levels, disordered eating and weight control behaviors lead to serious short and long-term physical, behavioral and psychological health problems [1, 2].

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Disordered eating and weight control behaviors include binge eating, purging behaviors (e.g. self-induced vomiting, laxative, diuretic, and diet pill use), food restricting/fasting and excessive exercise. The eating disorder diagnoses are based on specified levels of frequency and severity of disordered eating behaviors (DEB). However, erratic patterns of DEB at levels as low as “at least once over the last year” persist for periods as long as ten years [3], and predict compromised physical and emotional health [4] and short and long-term weight gain [5]. In the study described here we test the hypothesis that DEB are correlated with level of tobacco and alcohol use in young adult Mexican American (MA) women, a pattern of risk behaviors demonstrated in both clinical and community based majority samples. In addition, the study addresses the theoretical proposition that the array of identities (referred to as self-schemas) available in memory buffer the challenges and stress associated with the process of acculturation and protect against the internalization of the culturally driven focus on body weight and related DEB. We review the theoretically and empirically supported causal pathways linking self-schema properties to risk behaviors and socio-cultural factors in shaping self-schema properties. We also describe a longitudinal design and methodology to test the hypothesized relationships.

The fundamental underpinning for designing rigorous interventions includes the comprehensive understanding of the presenting problem requiring intervention [6, 7]. The study conceptualized here addresses the association between DEB and tobacco and alcohol use and builds on a theory articulated by Schwarz, that during the process of acculturation, the individual’s cultural identity is in flux as she reconciles values, beliefs, and identifications from the heritage and receiving societies. A well-developed collection of positive personal identities may serve to stabilize the sense of self by giving meaning and direction to behavior. Without a well developed collection of meaningful identities, the individual may feel a sense of identity confusion and turn to culturally salient ways to define the self to give meaning, purpose and sense of direction to daily life. In this paper, we describe the theoretical and operational linkages in our study, *Creando Posibilidades*, in which we test the hypothesis that college-enrolled MA women with fewer distinct positive personal identities available in memory will be more likely to engage in disordered eating behaviors, and the related behaviors of alcohol and tobacco use over a 12-month period and this effect will be mediated by the availability of a personal identity as ‘fat.’

Theoretical rationale

A prevailing theory within eating disorder literature is that acculturation to mainstream Western values and the strength of ethnic identity explain disordered eating and related health risk behaviors for Latinas [8, 9]. According to this view, Hispanic cultures including Mexico, value heavier female body shapes. Consequently, women from these cultures who hold a strong and clear ethnic identity experience lower levels of body dissatisfaction and are less likely to engage in DEB to control weight and shape. In contrast, Hispanic women who have accepted Western values are more likely to internalization of the Western thin body weight ideal leading to high body dissatisfaction and DEB. This perspective, although widely cited, has recently been viewed as overly simplistic since not all women acculturated to Western values develop dysfunctional behaviors related to body weight. In addition,

recent studies have shown that a thin body ideal is not a uniquely Western cultural value but is true in Mexico and other Latin regions as well [10, 11].

Our study is based on a theoretical perspective that acculturation is a complex and active process in which tensions between native and host cultural values lead to individualized resolutions and changes in ethnic identity [12]. The period surrounding the conflict resolution destabilizes one's ethnic identity and holds potential for feelings of identity confusion. Ethnic identity is conceptualized as a social identity, a conception of the self that reflects social group membership. In contrast, personal identities refer to the self-defining characteristics that distinguish oneself from others [13]. According to Schwartz, a diverse collection of personal identities is a cognitive resource that serves to anchor and stabilize one's sense of self during the process of acculturation when one's ethnic identity is in flux. MA women who lack a diverse collection of personal identities may be more susceptible internalizing Western standards about body weight and shape to stabilize the self, and in doing so, disordered eating and related health risk behaviors may result.

Schema model of personal identities

Personal identities are highly elaborated cognitive structures sometimes referred to as self-schemas that reflect areas of skill, competence and characteristics that distinguish the individual and contribute to feelings of uniqueness [13]. Self-schemas are functional cognitive structures that play a powerful role in regulating affect and behavior [8, 9, 14]. Positive self-schemas predict efficient processing of self-relevant information, reliable and consistent behavior, and are associated with positive affect, high levels of behavioral commitment, and tricks and strategies to facilitate behavior in the domain [15–18]. In contrast, negative self-schemas are associated with anxiety, behavioral inhibition, low levels of involvement in the domain, and contextually dependent evaluations of the self [19, 20].

In addition to the number of positive and negative self-schemas, the organization of self-schemas in memory also influences emotional and behavioral regulation [21, 22]. Self-schemas may be stored in memory as separate units or linked together to form a tightly interrelated network. Highly interrelated schemas function as a single unit such that activation of one self-schema leads to activation of the related schemas in the network [23]. Therefore, even if the person has many self-schemas, if they are in a highly interrelated network, they have fewer functionally distinct schemas to regulate emotions and behaviors. Studies have shown that people with high interrelatedness respond to challenging social feedback with ineffective coping strategies, they react to stressors with decreases in mood and self-esteem, and they experience more physical illness in response to stress than persons who have many independent self-schemas available in memory [24]. In our cross-sectional pilot study with MA women, we found that after controlling for level of acculturation and ethnic identity, many positive self-schemas and few negative self-schemas predicted the presence of an elaborated conception of the self as fat, and the fat self-schema predicted body dissatisfaction, drive for thinness, bulimia and binge eating. High interrelatedness among the self-schemas also directly predicted body dissatisfaction, bulimia and binge eating [25]. Moreover, binge eating was positively associated with alcohol and tobacco use.

Though these results offer preliminary support for the model, the cross-sectional design precludes us from making causal inferences.

In the *Creando Posibilidades* study, we explore the relationship between properties of self-schemas and disordered eating, alcohol and tobacco use over a 12-month period in college enrolled MA women. We build on the theoretical perspective that acculturation is a lifelong process that is not separate from, but rather, an integrated dimension of normal development [26, 27]. We have focused on the period of college enrollment as an important and potentially stressful developmental transition when one's ethnic identity, connection to family, and ethnic community are challenged as the woman integrates into a larger and potentially more diverse mainstream environment. Normative cultural values related to independence versus interdependence, and separation from family to seek autonomous goals versus family based identity and obligations are particularly salient in the college context and at the age of late adolescence and early adulthood. We seek to explicate properties of self-schemas (i.e., personal identities) that predict patterns of disordered eating and related risk behaviors during this developmental period. Figure 1 is a graphic depiction of our model. During a period of heightened acculturation stress, a highly interrelated set of few positive and many negative self-schemas is a cognitive vulnerability for internalizing a fat self-schema, which in turn predicts disordered eating and the related risk behaviors of alcohol and tobacco use. In addition to testing our model, we also explore cultural and contextual experiences in early development that contribute to variability in self-schema properties.

Determinants of self-schema properties

According to the schema model, an individual's array of self-schemas (identities) are a product of unique intersection of the cultural, social, psychological and biological dimensions of the person [28, 29]. Therefore, individuals differ according to the number, valence and content of self-schemas that comprise the self. Likewise, disturbances or limitations in identity development are also seen as the product of these factors. In this study, we examine eight factors that have been linked to identity development and the array of self-schemas available in memory. While some factors have conflicting evidence, and others have been less studied, we have made an effort to understand some of the influences of MA culture on this developmental process.

Socioeconomic status

Hunt [30], a strong critic of the acculturation perspective of US Hispanics, argues that social structural factors may have more power than acculturation in explaining ethnic group differences, particularly related to health (also see [31]). Socioeconomic status (SES) stemming from language and education barriers may be an important contextual source of differences in access to resources, and hence, in self-concept [32]. Studies have shown that adolescents and young adults from lower SES have less complex self-knowledge and fewer positive future-oriented self-conceptions [33, 34] and are less likely to define themselves in terms of their ethnicity [35].

English language

English fluency is widely recognized as an indicator of socio-economic status and an important resource that protects against social isolation and enhances access to social opportunities and resources. Studies have shown that parents in families that speak only Spanish at home tend to be less educated, have fewer economic resources, and are less likely to participate in school and literary activities [36]. The social and literary consequences of parental absence of English fluency contribute not only to early academic disadvantage but also limit opportunities for defining and elaborating the self.

Social network

Characteristics of the social network have also been recognized as important influences on health and well-being [37]. Studies suggest that interactions among multicultural groups lead to new beliefs, behaviors and strategies for adaptation that contribute to positive growth and elaboration of the self in Hispanic populations. Hispanic youth with diverse social networks report lower social isolation, more positive social networks, more involvement in activities outside of the family, and greater social acceptance by peers [38], and as such, have multiple opportunities for developing a diverse array of identities.

Bicultural identity

Persons create adaptive modes of behavior that reflect acceptance of local values and practices while simultaneously protecting and affirming aspects core to the native identity [39]. Rather than replacing one's ethnic identity, studies suggest that the most adaptive outcome is the development of a bicultural definition of the self [40]. The availability of clear, stable and positive conceptions of the self relevant to one's ethnic background and national identity are likely to expand opportunities and contribute to the development of a rich collection of self-conceptions. Phinney defines ethnic identity as a cognitive and affective product of the acculturation process and suggests that it is formed as one consciously works through issues related to one's ethnic background [41].

Acculturative stress

In the lifelong process of acculturation, problems stemming from intercultural contact may occur, i.e. acculturative stress [42]. For example, a persistent aspect of the MA experience is negative experiences with the dominant culture that inhibit exploration and interfere with development of the self. Racism and discrimination may lead to exclusion from groups and institutions that are essential contexts for the development of diverse identities of the self. Furthermore, attempts to cope with negative outcomes by attributing them to discrimination may disrupt interpersonal relationships and further limit opportunities for development of the self [43]. Another source stems from conflict within the family due to inconsistencies in level of acculturation between parents and children [44]. Family conflict associated with acculturative stress has been shown to have negative consequences on development and the mental health of adolescents [45].

Familism

The nuclear family is a highly influential social context, and as such it may be an important determinant of identity development [46]. A core value within the MA culture is familismo, the strong sense of commitment, obligation and responsibility to the family. Related values include a clear demarcation between family and non-family, a focus on group rather than individual achievements, a sense of shared resources, and a strong commitment to perpetuation of the family unit [47]. Studies examining the relationship between level of acculturation and changes in family values are mixed [47]. In this study, we investigate three dimensions of familismo, perceived family support, family obligation, and family referents as determinants of the organizational properties of the self-concept.

Spirituality

Within the MA family, mestizo spirituality is an important aspect of the value system that shapes daily life [48]. Mestizo refers to spiritual values that emphasize wholeness, harmony, interdependence and balance in one's relationships with self, family, community and the environment. It includes beliefs of a higher good related to "good and evil" that impact one's life. Mestizo is an important dimension of family life that binds interpersonal and community relationships, and may be an important positive factor in shaping one's identity.

Level of activity involvement

This factor is highly influential in identity development and falls at the intersection between cultural context, family environment and individual functioning. While level of acculturation, SES and family values provide access to opportunities and resources necessary for activity involvements, individual differences in temperament, motivation, and interest also contribute [13]. Many studies have shown that involvement in diverse activities related to academics, arts, religion and extracurricular activities is highly predictive of the organization and content of the self-concept. Corte, Fitzgerald, & Zucker [49] showed that the number of involvements was associated with the number of positive and negative self-schemas available in memory of adolescents. Similarly, research that has examined the effects of extracurricular activities on adult adaptive functioning has shown that higher levels of involvement in adolescence are predictive of emotional and behavioral outcomes in adulthood, and this effect is mediated through the development of activity-based identities [13, 50, 51]. In this study, we investigate the role of high school involvements on the organizational properties of the self-concept in college enrolled MA women.

Theoretical and Operational Linkages

We captured the process of acculturation by our study design, as an important *context* in which to test our model. We chose our sample and a developmental period (college-enrolled MA women not in the final year of study) as a context in which acculturative stress and the potential for ethnic identity values clashing would be high. This is also a developmental period during which DEB become prevalent for all young women (79, 80). As such, our design (12 month longitudinal study with measures at baseline, 3, 6, 9, and 12 months) and sample (college-enrolled MA women not in final year of study) provides an appropriate context to test the hypothesis that it is the array of self-schemas that is the critical factor that

determines whether or not a woman takes on a fat self-schema during the process of acculturation, not the acculturation process itself.

The investigative team further strengthened the design of *Creando Posibilidades* by clearly articulating the operationalization of self-schema properties and related contextual variables. Measures were selected to capture the concepts of our theoretical model and the proposed social and cultural determinants of self-schema properties. Table 1 includes measures and reliability, validity information.

Self-Schemas properties of the total array of self-schemas

Self-schema number, valence and interrelatedness are assessed with Zajonc's [52] card-sorting task measures. This measure includes 2 tasks: first participants are given a stack of 52 blank index cards and asked to write down all descriptors that are important to how they think about themselves, and rate each descriptor according to: 1) degree of self-descriptiveness, 2) degree of importance to one's self-description, and 3) valence; positive, negative or neutral. Markus [53] and others [14, 18, 54] have shown that descriptors that are rated highly self-descriptive (8–11 on an 11-point scale) and highly important (8–11) show schema-consistent information processing and behavioral differences. The number of positive (negative, neutral) self-schemas is computed by totaling the number of self-descriptors that meet the criteria for a self-schema and are rated positive (negative, neutral). Second, participants are asked to focus on each self-descriptor separately and to identify all other descriptors that would change if the targeted descriptor was "changed, absent or untrue of you." Responses are used to form a dependency matrix such that when descriptor A_j causes a change in descriptor A_i , a value of 1 is assigned. The total dependence of an element is calculated by summing the row entries, and the total dependency of the schema is calculated by summing the dependencies across all characteristics.

Fat self-schema

A closed-ended self-schema scale, which consists of 14 bipolar sets of trait adjectives that are rated on an 11-point scale for self-descriptiveness and importance are used. Two scales relevant to body-weight – thin-fat and overweight-underweight– are embedded.

Determinants of self-schemas

Acculturation

Hazuda Acculturation & Assimilation Scale is a self-report measure that assesses acculturation (5 scales including childhood experience with English vs. Spanish language, value on preserving Mexican culture, attitudes toward tradition sex role, family structure, and total acculturation), and structural assimilation (2 scales including childhood and adult interaction with mainstream society and total assimilation).

Acculturative stress

Societal, Attitudinal, Familial, & Environmental Acculturative Stress Scale (SAFE) [55] is a 24-item scale developed to quantify acculturation stress and includes four subscales that assess: 1) social stress related to interpersonal relationships and making friends, 2)

attitudinal stressors related to separation from family and friends from the culture of origin, 3) family stressors pertaining to conflicts regarding values and aspirations, and 4) environmental stressors that stem from subtle and obvious racism and discrimination.

Ethnic identity

Multigroup Ethnic Identity Measure (MEIM) [40] is a 23-item questionnaire that assesses similarities and differences in ethnic identity among ethnic groups.

Bicultural acculturation

The Acculturation Rating Scale for Mexican-Americans II (ARSMA-II) [56, 57] is a measure of bicultural acculturation that consists of 30 items that are scored on a 5-point scale anchored by Mexican/Spanish (1) and Anglo/English (5). ARSMA-II consists of two orthogonally developed subscales that measure modes of Mexican and American acculturation that include integration, assimilation, separation, and marginalization [58].

Socioeconomic status

The education attainment question from the US Census 2000 is used as an indicator of SES.

Spirituality

The Daily Spiritual Experience Scale (DSES) [59] is a 16-item scale designed as a multicultural measure of spirituality. The measure addresses five concepts consistent with values of mestizo spirituality, including connection with all of life, support from the divine, a sense of wholeness and harmony, basic elements of spirituality including awe and joy that lifts one out of the mundane, and a sense of inner peace.

Involvements and activities

A checklist devised by Eccles [50] measures retrospective involvement in extracurricular activities during high school. It consists of a list of 12 sports and 28 school, community clubs and organizations that participants check to reflect their activities in high school. Activities can be clustered into five different categories: pro-social activities, performance activities, team sports, school involvement, and academic clubs.

Outcomes

Ecological Momentary Assessment (EMA) is used to measure DEB, alcohol and tobacco use. EMA is an in vivo measurement approach in which a computerized menu-driven interview is used to measure the target health risk behaviors. For five 14-day intervals (baseline, 3, 6, 9 and 12 mos. after enrollment), participants are asked to carry with them a hand-held computer (PDA) during waking hours. Participants record all targeted behaviors at the time they occur, prompted through related screens for each behavior. For example, the first screen lists behaviors including alcohol use, tobacco use, bingeing, vomiting, laxative, diuretic and diet pill use, and exercise to lose weight. The second screen focuses on the first behavior endorsed and consists of questions about that specific behavior. In addition, participants are signaled at 3 points daily and asked to record behaviors that occurred since the last signal that were not previously recorded.

Questions related to DEB are based on items from the Eating Disorder Examination [60] that have been rewritten to focus on the behavioral episode just enacted. Other questions are based on items used in studies that have measured alcohol use [61–63] and tobacco use [64–66] with EMA methodology and the immediate episode.

The PDA program was developed and is maintained by Symfo, an electronic patient diary company. A participant manual provides a step-by-step description of the recording, downloading procedures and the Symfo help-line phone number. Behavioral data collected using EMA has been shown to have high validity compared to standard retrospective questionnaires by eliminating cognitive biases associated with recall [66–68].

Control Variables

Demographic characteristics, BMI and mood are potential covariates that may contribute to individual differences in the organizational properties of the self-concept, the availability of a fat body weight self-schema, and the triad of risk behaviors. Consequently related measures are included in our protocol. We assess Body Mass Index, using a portable Detecto 439 Mechanical Doctor Scale that measures with high precision (400 lb x 4 oz).

Symptom distress

Profile of Mood States (POMS) (Short Form) [69] is used to measure intensity of symptom distress. A self-administered questionnaire with 30 mood/affect items rated on a 5-point scale and includes 6 scales (tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, confusion-bewilderment).

Risk behavior treatment and pregnancy status

A brief questionnaire is used to measure pregnancy and involvement in treatment for disordered eating, alcohol or tobacco along with follow-up questions regarding gestation, prescribed treatments and kept sessions.

Procedures

The 12-month longitudinal design consists of six individual face-to-face sessions spaced at 3-month intervals. Each participant is assigned to work with a single data collector to maximize retention. The baseline data collection consists of two sessions scheduled about 2 weeks apart. Self-schema measures are administered during the first data collection session. Participants are asked to complete measures of acculturation and social networks at home prior to the follow-up session to limit the duration of these sessions. The second session is an orientation to the ecological momentary assessment procedures and use of the PDA. This session is 45 minutes in duration and includes verbal instructions, review of a written EMA manual and hands-on experience with the PDA and recording program. This session is followed by a 24 hour EMA practice period. The next day the data collector calls the participant to answer questions related to the EMA procedures and the 14-day EMA period begins. Procedures for data collection at 3, 9, 9 and 12 month follow-up consist of a reorientation to the EMA procedures and a 24 hour practice period, follow-up phone call and a 14-day EMA recording period. To compensate for participants' time and sustained efforts,

a total of up to \$375 are paid across the 12-month protocol (Baseline \$30 + \$30 for EMA, 3, 6, 9 and 12 mos. EMA at \$40, \$50, \$60 and \$70 respectively).

Data Analysis Plans

Data analyses focus on four primary DEB variables (binge eating episodes, purging, restricting/fasting, and excessive exercise), as well as alcohol and tobacco use. EMA data will be used to construct the following variables at each time point: 1) average 14-day sum each for each of the target behaviors at each time, and 2) average 14-day sum of DEB (binge eating, purging, excessive exercise and restricting/fasting) at each time point. Use of average 14-day sum scores will allow inclusion of participants who complete less than the full 14 days of diaries at each time point. Consistent with procedures used in our previous research, we will compute 14-day behavior sum scores for participants with at least 7 diaries completed at a data collection point¹⁵. For these participants, the average weekly score will be multiplied by 2 weeks to determine an average 14-day sum. Because each of the DEB reflects a different unit of measurement (e.g., episodes for binge eating; days for fasting and restricting), we will create a composite DEB index score by summing the z-scores of the four DEB.

Baseline EMA data were used to examine the predicted relationships among DEB, alcohol and tobacco use and are reported in a previous paper (see Stein, Ding-Geng, Corte, Keller & Trabold, 2013). Because the risk behavior data are counts and therefore, not normally distributed, relationships among the behaviors were examined using negative binomial modeling. Logistic regression modeling will be used to test the hypothesis that the properties of the total collection of self-schemas (e.g. number of positive self-schemas, number of negative self-schemas, interrelatedness) predict availability of a fat self-schema. Body mass index (BMI) will be entered into the equation as a covariate.

Generalized estimating equation modeling [81] will be used in the second step of the analyses to estimate whether women with a fat self-schema (measured at baseline) differ from women with no fat self-schema in DEB trajectories over time. A series of analyses will be completed to examine: 1) the effects of the fat self-schema on individual behavioral trajectories (binge eating, purging, restricting/fasting, excessive exercise, alcohol, tobacco use) and 2) the effects of the fat self-schema on the DEB composite index. Dependent variables will be the mean sum of the target behaviors across the baseline, 3, 6, 9 and 12 month measures. The main predictor of interest is the binary variable reflecting availability in memory of a fat self-schema. We will control for BMI at baseline.

Mediation analyses [82] with bootstrapping will be used to determine whether the fat self-schema mediates the effects of self-concept variables (number of positive self-schemas, number of negative self-schemas, and interrelatedness) on DEB, alcohol and tobacco use. In these models, number of positive self-schemas, number of negative self-schemas, and interrelatedness at baseline will be treated as independent variables with BMI at baseline as a covariate. The fat self-schema at baseline will be the mediator. The dependent variables to be tested in separate models are the DEB composite score, alcohol use, and tobacco use at 6 months and 12 months.

Finally, to examine the mechanism linking acculturation and other developmental variables to the fat self-schema, mediation analysis [83] with bootstrapping test [84] will be used. In this model, acculturation and sociocultural context variables measured at baseline will be the independent variables, with baseline BMI as a covariate. The dependent variable will be the presence/absence of a fat self-schema at baseline. The number of positive self-schemas, number of negative self-schemas, and interrelatedness at baseline will be treated as mediators.

Discussion

Three important features of *Creando Posibilidades* underpin its importance to the science and highlight the implications of the conceptual framework. First, this study is unique in that it will enable us to execute a longitudinal investigation that is essential to meaningfully investigate causal relationships, and to distinguish between persons who experiment from persons who experience escalating and enduring risk behavior patterns. Although there is broad recognition that the transition to college represents a period in which the escalation of risk behaviors is normative [70] and levels of risk behaviors temporarily spike, studies have shown that distinct and meaningful patterns of behaviors can be identified within the 12-month period between the first and second college year. We will examine trajectories of DEB, alcohol use, and smoking in college aged MA women over a one-year period, and will elucidate the critical components operating over time that will serve as leverage points for intervention design. Previous studies of DEB, alcohol and tobacco use behaviors in community-based samples of Hispanic women have tended to focus on a single behavior and have used cross-sectional designs [71, 72]. Consequently, little is known about factors that contribute to the co-occurring pattern of risk behaviors. This study will explore the process of risk behavior escalation and movement toward consolidation by studying behavioral trajectories over time.

Second, the study addresses the mechanisms salient to young Latinas during a vulnerable developmental life transition. Preliminary evidence suggests that disordered eating behaviors are prevalent in Latinas and that these behaviors along with alcohol and tobacco use may contribute to obesity and related diseases that disproportionately affect this population. Research efforts to understand the mechanisms underlying these behaviors have been based on a simplistic view that acculturation to Western values related to female beauty and body shape lead to the disordered eating and related risk behaviors. Individual differences in acculturation outcome and factors that may protect women from an over identification on Western body weight standards have not been explored. In this study we build on a theoretical perspective that focuses on the configuration of personal identities that serve as an internal resource that influences the individual's ability to cope with the changes that occur during acculturation. Further, we hypothesize that individual differences in developmental experiences and social contextual factors influence the configuration of personal identities available during the stressful period of adaptation to college.

Third, this study will employ an innovative measurement strategy to capture the assessment of Latina's constellation of risk behaviors. In this study, risk behaviors are measured in vivo using Ecological Momentary Assessment (EMA) methodology. Although most risk behavior studies to date have relied on retrospective measures to examine changes in behaviors [60,

73, 74], studies in the area of recall of event frequency raise serious questions about the validity of retrospective measures for risk behaviors. We will use measures to reduce the biasing effects (e.g. overestimates of the number of episodes of binge eating) seen with recall of alcohol intake [75] and cigarette smoking [65], and disordered eating behaviors [76].

Creando Posibilidades will address important gaps in our understanding of lifestyle risk behaviors in young Latinas. There are a number of unique aspects of this longitudinal study. It targets a high-risk, underserved population of women of Mexican origin who are at a vulnerable developmental stage of embarking on college and exposed to life outside the family. Our study uses a unique approach to track risk behaviors and self-schemas during an important transitional period for vulnerable young Latinas.

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Figure 1.
Schematic of Theoretical Relationships in Creando Posibilidades.

Table 1

Scales and Psychometric properties.

Concept	Measure	Psychometrics
Array of Self-Schemas		
Positive and Negative Self-Schemas	Zajonc's card-sorting task; participants are given a stack of 52 blank index cards and asked to write down all descriptors that are important to how they think about themselves, and rate each descriptor according to: 1) degree of self-descriptiveness, 2) degree of importance to one's self-description, 3) valence (positive, negative or neutral). Items rated as highly self-descriptive and highly important to the self (8–11 on 11 point scale) are considered self-schemas.	Retest reliability across a 12-mo. interval for number of positive schemas, $r(94) = .53$, $p < .001$, and number of negative schemas, $r(94) = .58$, $p < .001$ (Stein & Corte, 2008).
Interrelatedness among Self-Schemas	Subjective dependencies are determined among self-descriptors generated in Zajonc's cardsort. See text for full description of task. Interrelatedness score ranges from 0 (no dependencies) to 1 (all self-descriptors dependent on all others).	Retest reliability across a 12-mo. interval, $r(94) = .66$, $p < .001$ (Stein & Corte, 2008)
of Fat Self-Schema		
	Closed-ended self-schema scale consisting of 14 bipolar sets of trait adjectives that are rated on an 11-point scale for self-descriptiveness and importance. Two scales relevant to body-weight (thin-fat and overweight-underweight) are embedded. Extreme endorsements on the "fat" and/or "overweight" end of the scale (8–11 on self-descriptiveness and importance) are considered evidence of a fat self-schema.	Validity and reliability has been demonstrated in college women, $X^2(1, N=94) = 38.27$, $p < .001$, $\phi = .64$ across 1 year (Stein & Corte, 2006).
Determinants of Self-Schemas		
SES	Education attainment question from the US Census 2000 is used as an indicator of SES. The question is asked in terms of the parent/guardian with the highest education in your household when you were growing up.	
Acculturation	<i>Hazuda Acculturation & Assimilation Scale</i> is a self-report measure that assesses acculturation (5 scales including childhood experience with English vs. Spanish language, value on preserving Mexican culture, attitudes toward tradition sex role, family structure, and total acculturation), and structural assimilation (2 scales including childhood and adult interaction with mainstream society and total assimilation).	Alpha coefficients range from .071–.097 with Hispanic and non-Hispanic White samples. Construct validity is evident from correlations with other types of assimilation measures that ranged from .11 to .73 (Hazuda, Stern, & Haffner, 1988).
Acculturation Stress	<i>Societal, Attitudinal, Familial, & Environmental Acculturative Stress Scale</i> (SAFE) [75] is a 24-item scale developed to quantify acculturation stress and includes four subscales that assess: 1) social stress related to interpersonal relationships and making friends, 2) attitudinal stressors related to separation from family and friends from the culture of origin, 3) family stressors pertaining to conflicts regarding values and aspirations, and 4) environmental stressors that stem from subtle and obvious racism and discrimination. Items are rated on a 5-point scale ("not stressful" to "extremely stressful"). Scores range from 0 to 120.	Factor analyses results provide support for the theoretically derived subscales and convergent validity was demonstrated (Fuertes & Westbrook, 1996). Internal consistency has been demonstrated with Hispanic samples ($\alpha = .87-.90$) (Fuertes & Westbrook, 1996; Hovey & Magana, 2000; Perez et al., 2002).
Ethnic Identity	<i>Multigroup Ethnic Identity Measure</i> (MEIM) [44] is a 23-item questionnaire that assesses similarities and differences in ethnic identity among ethnic groups. The first 14 items consist of three subscales that measure attitudes and belonging, ethnic identity achievement, and ethnic behavior (scores range from 14 to 56). The next 6 items measure attitudes and orientation towards other groups (range 6 to 24). The last 3 items assess personal ethnicity and are not scored. Items are scored on a 4-point scale with a higher score indicating higher levels of ethnicity.	Construct validity is satisfactory (Ponterotto et al. 2003). Alpha coefficients were .81 and .90 respectively (Phinney, 1992). The measure has been shown to discriminate among different ethnic groups in a sample of Euroamerican, Asian, African American, and Hispanic Latino adolescents and young adults (Branch, 2001).
Bicultural Identity	Bicultural Acculturation. <i>The Acculturation Rating Scale for Mexican-Americans II (ARSMA-II)</i> [80, 81] is a measure of bicultural acculturation that consists of 30 items that are scored on a 5-point scale anchored by Mexican/Spanish (1)	Construct validity, and concurrent validity (.89 correlation with original ARSMA) have been demonstrated to be strong (Cuellar,

Concept	Measure	Psychometrics
	and Anglo/English (5). ARSMA-II consists of two orthogonally developed subscales that measure modes of Mexican and American acculturation that include integration, assimilation, separation, and marginalization [82].	Arnold, & Maldonado, 1995). Internal consistency has been shown for the Mexican Orientation Scale (alpha = .88) and the Anglo Orientation Scale (alpha = .83) (Cuellar et al., 1997). Retest reliability with a one-week interval yielded correlations that ranged from .72 to .96.
Hispanic Familism	The Hispanic Familism measure [83] is a 14-item questionnaire that measures three dimensions of culture-specific values related to family including: 1) family obligation – perceived obligation to provide material and emotional support to members of the extended family, 2) perceived support from family – perceptions of the family as reliable providers of help and support to solve problems, and 3) perceptions of relatives as behavioral and attitudinal referents.	1) family obligation – (alpha=.76), 2) perceived support from family – (alpha=.70), and 3) (alpha=.64). Factor analyses provide evidence to support construct validity (Sobogal et al., 1987).
Spirituality	<i>The Daily Spiritual Experience Scale (DSES)</i> [85] is a 16-item scale addresses five concepts consistent with values of mestizo spirituality, including connection with all of life, support from the divine, a sense of wholeness and harmony, basic elements of spirituality including awe and joy that lifts one out of the mundane, and a sense of inner peace. Items focus on current experience and are rated on a 6-point scale anchored by “almost never” and “many times a day.” Two items refer to closeness to God and are rated on a 4-point scale.	Evidence to support construct validity with Hispanic samples has been shown. Factor analyses confirmed a one factor solution and reported internal consistency coefficients ranged from 0.94 to 0.95. Two-day retest reliability was 0.85 (Underwood & Teresi, 2002).
Involvements and Activities	A checklist devised by Eccles [54] measures involvement in extracurricular activities during high school. It consists of a list of 12 sports and 28 school, community clubs and organizations that participants check to reflect their activities in high school. Activities can be clustered into five different categories: prosocial activities, performance activities, team sports, school involvement, and academic clubs.	Predicted correlations between 10 th grade activity involvement and college attendance, academic performance, and risky behaviors in adulthood support construct validity (Eccles & Barber, 1999). Retest reliability has not been reported.
Outcomes		
Disordered Eating, Alcohol and Tobacco Use Behaviors.	A computerized menu-driven interview is used to prospectively measure DE, alcohol and tobacco use behaviors, using a combined event-contingent, interval contingent and signal-contingent EMA methodology. Participants record all targeted behaviors at the time they occur, prompted through related screens for each behavior.	
Control Variables		
Profile of Mood States (POMS) (Short Form) [86] is used to measure intensity of symptom distress.	A self-administered questionnaire with 30 mood/affect items rated on a 5-point scale and includes 6 scales (tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, confusion-bewilderment)	In an ethnically diverse sample of 172 (6% Hispanic), Cronbach's alpha values ranging from .76 to .95.