

A Decision Theoretic and Prototype Conceptualization of Possible Selves: Implications for the Prediction of Risk Behavior

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ABSTRACT The present study explores a new framework for conceptualizing possible selves for the prediction of behavior. The framework uses decision theory, attitude theory, and classic expectancy-value models. The focus is on using possible-self constructs that (a) correspond to behavioral alternatives, (b) focus on self dimensions directly tied to the behavioral criterion, and (c) use expectancy-value constructs to assess the core features of a given possible self-dimension. A study of 305 college students was undertaken to predict alcohol use from possible self constructs using the framework. Results affirmed the utility of the ap-

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proach, showing that possible-self constructs predicted behavior over and above current self-image and constructs in the Theory of Planned Behavior. Possible-self constructs associated with negative attributes of both binge drinkers and nonbinge drinkers were predictive of behavior.

It has long been recognized that the self-concept is comprised of self-representations that change from situation to situation (James, 1910). The self-conceptions that are accessible in a person's thoughts and memory at a given point in time have been referred to as the *working self-concept* (Markus & Wurf, 1987). This self-concept includes a mixture of self-conceptions that are brought to mind by cues in the immediate social environment as well as chronically accessible self-conceptions that are enduring. Markus and Nurius (1986) argue that the working self-concept not only includes a person's view of oneself as he or she is now but also conceptions of how he or she could be in the future. These future selves include whom a person hopes to become, whom the person expects to become, and whom the person is afraid of becoming. Markus and Nurius suggest possible selves act as incentives that guide future behavior. The way in which possible selves influence behavior is thought to depend on the way in which they are evaluated. Negatively evaluated selves engage avoidance motivational systems to prevent the realization of "feared possible selves," whereas positively evaluated selves engage an approach motivational system to promote the realization of "hoped for possible selves" (Higgins, 1996).

Research has examined the predictive utility of the possible-self construct based on the framework of Markus and Nurius (1986). In support of their approach, researchers have found that possible-self constructs predict adolescent delinquency, school dropout, and academic achievement (Oyserman, Gant, & Ager, 1995; Oyserman & Markus, 1990; Oyserman & Saltz, 1993), as well as health-promoting and health-risk behavior in adolescent and adult samples (Hooker & Kaus, 1992, 1994; Ouellete, Hessing, Gibbons, Reis-Bergan, & Gerrard, 2005; Stein, Roeser, & Markus, 1998). In laboratory contexts, possible selves have predicted task competence (Cross & Markus, 1994; Ruvolo & Markus, 1992). Finally, studies indicate that possible selves predict a variety of important individual difference variables, such as self-esteem (Knox, Funk, Elliot, & Bush, 1998; Markus & Nurius, 1986), optimism (Carver, Reynolds, & Scheier, 1994), and life satisfaction (Ogilvie, 1987). Although the theoretical framework

evolved by Markus and other possible-selves researchers has been useful, the approach can be refined both conceptually and methodologically. The purpose of the present research was to provide a new conceptualization of possible selves that integrates possible-self theory with perspectives from attitude theory and decision theory.

A DECISION-THEORETIC PERSPECTIVE ON POSSIBLE SELVES

There are four central features of the proposed decision-theoretic framework for possible selves: (a) it emphasizes correspondence between the possible-self construct and the behavioral criterion, (b) it introduces a two-dimensional representation of possible selves that incorporates traditional expectancy-value considerations, (c) it elaborates the importance of examining multiple possible selves tied to the behavioral alternatives that a person chooses among, and (d) it examines whether possible selves add unique prediction to behavioral outcomes over and above plausible third-variable accounts. We consider each of these in turn.

Correspondence With Behavioral Criteria

Virtually all studies of possible selves have used open-ended questions to identify the selves that are viewed as possible (e.g., Carver et al., 1994; Cross & Markus, 1991; Hooker, Fiese, Jenkins, Morfei, & Schwagler, 1996; Hooker & Kaus, 1992, 1994; Knox et al., 1998; Stein et al., 1998). As an example, Oyserman and Saltz (1993) used the prompts, "Next year I expect to be . . ." and "Next year I want to avoid being . . ." as ways of eliciting possible-self data from adolescents. Responses to open-ended questions about the expected, feared, and ideal self typically yield self-based constructs that are general and somewhat removed from the behavioral criterion of interest. For example, Cross and Markus (1991) observed response categories that included family life, occupation, personality, education, material wealth, leisure, physical characteristics, and personal relationships. There is a large body of research in attitude theory that suggests that behavioral prediction can be improved by using constructs that are directly tied to the behavioral criterion rather than constructs that are more abstract in character (Jaccard, 1975; Jaccard, King, & Pomazal, 1977). This principle also has been empirically affirmed in personality research. For example, general locus of

control does not predict behavior as well as measures of locus of control that are tailored to the criterion behavior (Burk & Kimiecik, 1994; Spector, 1988), nor does general self-efficacy predict behavior as well as self-efficacy constructs that are more directly tied to the criterion behavior (Bandura, 1986; LaGuardia & Labbe, 1993; Pajares & Miller, 1995).

Measurement correspondence between possible-self constructs and behavior can be achieved by considering the implications that a behavior has for one's self identity. This is reflected, in part, by the social images or consensual prototypes associated with the behavior in question (Gibbons & Gerrard, 1995, 1997). For example, for binge-drinking behavior, there is a prototype among college students of the characteristics, qualities, and personal attributes of the typical binge drinker. One attribute in the prototype of the binge drinker might be that such a person "is outgoing and fun-loving." This attribute can be incorporated into the analysis of the possible self by determining the degree to which different individuals view "outgoing and fun-loving" as a desirable future self. To the extent that an individual desires this future self, then there should be greater incentive to engage in binge drinking. Similarly, to the extent that the prototype of the binge drinker is associated with negative attributes, such as "foolish and impulsive," and to the extent that this represents an undesired or feared future self, then an individual should be less willing to binge drink. The principle of behavioral correspondence suggests that prediction of binge drinking will be accomplished best by focusing on dimensions of the future self that comprise the prototype of the binge drinker rather than global assessments of the self, such as hoped-for and feared selves in terms of family life, employment, education, material wealth, and so on.

A Two-Dimensional Expectancy-Value Model

Markus and Nurius (1986) emphasize three types of possible selves: the ideal self, the expected self, and the feared self. In an elicitation study, Quinlan (1999) found that the feared self consisted of negative attributes, the ideal self consisted of positive attributes, and the expected self consisted of a mixture of positive and negative attributes, most of which overlapped with the feared and ideal self. Given this, it seems reasonable to conceptualize possible selves in terms of two dimensions, comprising either positive attributes (corresponding to

the ideal self) or negative attributes (corresponding to the feared self). Because negative selves can differ in their degree of negativity and because positive selves can differ in their degree of positivity, it is theoretically prudent to incorporate degrees of each type of valence into a theory of possible selves, something that possible-selves theorists have not done.

Possible selves also differ in how “possible” they are. For example, one person who places a high value on being characterized as “outgoing” in the future may think it is highly likely that this self will be attained, whereas another who places a similarly high value on this self may think it is only moderately likely to occur. These differences in expectancy also should be taken into account.

A focus on both the extremity of valence and the degree of possibility linked to a possible-self attribute maps directly onto classic expectancy-value formulations of behavior and suggests that such an approach may be useful for conceptualizing the future self. We elaborate such a formulation below.

In sum, rather than focusing on three types of possible selves, the present framework emphasizes two fundamental types. The first type corresponds to what has been called the ideal self and is comprised of positive attributes; the second corresponds to what has been called the feared self and is comprised of negative attributes. These attributes may differ in the degree of positive or negative valence associated with them and their degree of “possibleness.” The expected self is not viewed as a separate entity. Rather, expectancies are seen as a feature of the ideal and the feared selves in accord with classic expectancy-value theories.

Multiple Selves and Behavioral Alternatives

Both decision and attitude theorists have emphasized the importance of incorporating behavioral alternatives into the analysis of behavioral decisions (e.g., Jaccard, 1981; Jaccard & Becker, 1985; Jaccard, Radecki, Wilson, & Dittus, 1995). For example, Jaccard (1981) found that attitudes toward a specific action (e.g., use of birth control pills) were less predictive of behavior (pill use) when such attitudes were analyzed in isolation as compared to when they were analyzed in conjunction with attitudes towards other behavioral alternatives (e.g., using condoms, using the diaphragm). Similarly, self theorists have stressed the importance of examining both the

prototypes that characterize a behavior and those that characterize the alternatives to that behavior (e.g., Blanton & Christie, 2003). The current conceptualization draws on this research and considers the multiple possible selves available to individuals, by virtue of the different courses of action they can pursue. Consider a two-alternative case, where an individual can engage in one behavioral alternative A_1 (e.g., choosing to binge drink) or another mutually exclusive behavioral alternative A_2 (e.g., choosing not to binge drink). The choice of actions should be influenced by possible-self linkages to A_1 as well as possible-self linkages to A_2 . Using the theoretical framework described above, the relevant variables are (a) the expectancies and valences associated with the positive selves associated with A_1 as well as A_2 and (b) the expectancies and valences associated with the negative selves associated with A_1 as well as A_2 . The present conceptualization of possible selves expands prior theory by considering the positive and negative expectancies that link to the multiple alternatives that define a behavioral choice.

Weighing possibilities. One advantage to considering multiple behavioral alternatives is that researchers can systematically study factors that influence the importance of different possible selves in the behavioral-decision process. For example, there is reason to predict that attributes associated with an action will have greater incentive value than attributes associated with inaction. The basis for this prediction can be found in research on feature-positive effects, which is the tendency for both animals and humans to learn more easily from an event occurrence than from an event nonoccurrence (Jenkins & Sainsbury, 1969, 1970). Fazio, Sherman, and Herr (1982) have linked this phenomenon to self-perception processes by demonstrating that people draw inferences about the self more quickly through their own actions than through their own inactions (see also Allison & Messick, 1988; Cioffi, 1994). The feature-positive effect suggests that when a behavioral decision is evaluated in terms of the identity consequences of an action (e.g., binge drinking) versus an inaction (e.g., not binge drinking), the consequences associated with action will be given greater weight than those associated with inaction. This possibility is tested in the present research.

A second general set of predictions can be made for the differential importance of the positive versus negative selves. There is a substantial body of literature indicating that negative information is

given greater weight in attitude evaluation and self-regulation than positive information (e.g., Anderson, 1974, Fiske, 1980; Skowronski & Carlston, 1989; Taylor, 1991; Wyer, 1974; see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001 for review). This suggests that the negative attributes associated with a behavioral alternative should be given greater weight than the positive attributes. In support of this prediction, Blanton and colleagues (Blanton, VandenEijnden et al., 2001) found that the negative prototype associated with health risk was more predictive of behavioral decisions than the positive prototype associated with health promotion. Similarly, the negative possible selves associated with unwanted health outcomes have been shown to be more predictive of general health behaviors than the positive possible selves related to desired health outcomes (Hooker & Kaus, 1994; see also Ogilvie, 1987). In sum, there is reason to believe that possible negative selves will be more predictive of behavior than possible positive selves. This prediction also is tested in the current research.

Plausible Third Variable Accounts

Numerous studies have found that an individual's current self-concept is predictive of risk behavior. Given this, it is plausible that constructs related to the possible self represent nothing more than an extension and expression of one's current self-image. This would occur, for instance, if the people who most expect to be outgoing in the future are the ones who feel the most outgoing in the present. If this is the case, possible selves may not predict behavioral decisions over and above the current self-image, suggesting that the predictive utility of the possible self is limited. Prior research has not thoroughly examined the degree to which possible selves act as a proxy for the current self in behavioral prediction. One study by Stein et al. (1998) tested whether possible selves predicted behavior over and above current selves and found this not to be the case. Oyserman and Markus (1990) found that possible-self constructs were predictive of behavior over and above traditional measures of self-esteem and optimism but found only weak support for independent, explained variance relative to other features of the current self. The theoretical import of possible selves is strengthened if it can be shown to predict behavior independent of the current self. The current study examines this possibility.

Studies also have provided support for decision models in the prediction of risk behavior that give little or no formal consideration to self-constructs. A popular and powerful theory of social behavior is that of the Theory of Planned Behavior (Ajzen, 1985; Ajzen & Madden, 1986). According to this theory, behavior is a function of an individual's intention to engage or not engage in a behavior, and a person's intention to perform that behavior is, in turn, a function of (a) the person's attitude toward performing the behavior, (b) the person's subjective norm of the extent to which important others think he or she should or should not perform the behavior, and (c) the person's perceived behavioral control over the behavior. According to Ajzen (1985), these variables are the immediate determinants of behavioral intent, with all other variables impacting on intent through these mediators. For example, demographic or personality variables might be related to the behavior in question, but the effects of these distal variables are assumed to be mediated by a person's attitudes, norms, and perceived control (Ajzen & Fishbein, 1980). Of theoretical interest is whether the constructs of possible selves contribute to the prediction of behavior independent of the primary mediators specified in these theories or whether they function as distal variables whose effects are mediated by attitudes and norms. The theoretical import of the present conceptualization of possible selves is strengthened if it can be shown to predict behavior independent of the constructs in the Theory of Planned Behavior.

The Current Study

In sum, this study seeks to advance traditional theories of the possible self in several important ways. First, it provides a mechanism for linking constructs associated with the possible self to specific behaviors through the use of consensual social prototypes. This permits the use of a long-honored tradition in social personality research that emphasizes the conceptual utility of predictors that are directly tied to the behavioral criterion of interest. Second, the research reconceptualizes the traditional ideal future self, expected future self, and feared future self into a classic expectancy-value framework in which the degree of valence associated with an attribute is assumed to interact with the expectancy that the attribute will, in fact, occur to impact behavior. The expectancy-value

formulation not only brings a more refined measurement process to the possible-self literature but also suggests interactive influences between the expected self and ideal/feared self that have been untested or tested crudely (via the balance construct) in prior research. Third, the research integrates the possible-self literature with decision-theoretic approaches that emphasize the importance of examining multiple behavioral alternatives rather than a single behavioral alternative when predicting behavior. Predictions about the differential importance of action versus inaction and positive- versus negative-self attributes will be evaluated in the context of this formulation. Finally, the research evaluates the predictive utility of possible-self constructs relative to plausible third variable accounts, including the view that the possible self is theoretically redundant with the images of the current self and the view that the effects of the possible self are completely mediated by the components of the Theory of Planned Behavior.

Area of Application

We focused our research on an important risk behavior for college students, namely, binge drinking. Binge drinking is widespread on college campuses throughout the United States (Knight et al., 2002). Numerous studies have linked binge drinking to negative outcomes, including actions one later regrets, such as engaging in sexual aggression, missing a class, driving after consuming alcohol, and driving while intoxicated (Delk & Meilman, 1996; Hanson & Engs, 1992; Meilman, 1993; Quigley & Marlatt, 1996; Syre, Martino-McAllister, & Vanada, 1997; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Although the construct of possible selves has not been applied to the analysis of binge drinking, several studies have supported the application of the Theory of Planned Behavior to the analysis of alcohol consumption among college students (Johnston & White, 2003; Laflin, Moore-Hirschl, Weis, & Hayes, 1994; Norman, Bennett, & Lewis, 1998; O'Callaghan, Chant, Callan, & Baglioni, 1997; Trafimow, 1996), but results have not been unequivocal (Knibbe, Oostveen, & Van de Goor, 1991). The current research uses the proposed framework for possible selves, in conjunction with the Theory of Planned Behavior, to predict current binge drinking activity in college students.

ELICITATION STUDY

To develop our measure of possible selves, it was necessary first to identify the positive and negative attributes that commonly are associated with students who do and do not binge drink. Past research using social prototypes to predict health behavior has not provided guidance for how to do this. Most commonly, researchers have used a single, fixed list of positive and negative descriptors to describe a wide range of prototypes (Blanton, Vanden Eijnden et al., 2001; Gibbons & Gerrard, 1995, 1997). To address measurement correspondence issues, it was necessary to break from this tradition and identify empirically the attributes that commonly are associated with binge-drinking behaviors. The elicitation study addressed this.

One hundred sixty-nine college students were asked open-ended questions regarding what they thought were positive and negative characteristics of a binge drinker and a nonbinge drinker. All participants were provided with the definition of a binge drinker and a nonbinge drinker and then asked to list any positive and negative characteristics of each that they could think of. The responses were content analyzed and coded into categories by one rater; a subsample also was coded by a second, independent rater. Coder agreement was assessed by first constructing a taxonomy of possible categories of responses and then having each coder examine each attribute listed by a respondent and indicate to which category it belonged. We then calculated the proportion of times that the two raters placed the listed attribute into the same category. This occurred 94% of the time for over 250 listed attributes. Responses from males and females initially were kept separate, but examination of the frequency distributions suggested no gender differences of consequence. Within each of the four categories (positive characteristics of a binge drinker, negative characteristics of a binge drinker, positive characteristics of a nonbinge drinker, and negative characteristics of a nonbinge drinker), items were ordered from the most frequently mentioned to the least frequently mentioned. Items were selected for inclusion in the closed-ended questionnaire based on a scree criterion comparable to that typically used in factor analysis. This resulted in five items for each of the four categories, as shown in Table 1. These attributes were incorporated into the measure of possible selves for this study.

Table 1
Positive and Negative Attributes Associated With Binge Drinkers and Nonbinge Drinkers

<i>Binge Drinker Positive</i>	<i>Binge Drinker Negative</i>	<i>Nonbinge Drinker Positive</i>	<i>Nonbinge Drinker Negative</i>
Outgoing	Out of control	Kind	Shy
Good sense of humor	Loud	Responsible	Boring
Fun to be with	Violent	Friendly	Uptight
Fun-loving	Drinks all the time	Caring	Condescending
Happy	Gets sick from drinking too much	Has self-control	Does not know how to have fun

Note. Results of an elicitation study of $N = 169$ college students. Attributes reveal the positive and negative attributes associated with being either a binge drinker or nonbinge drinker.

MAIN STUDY

Method

Participants

Participants for this study were 305 students currently taking psychology courses at a large Northeastern university. Fifty-eight percent were female, and 42% were male. Age ranged from 18 to 25 years old ($M = 19.8$).

Measures

Possible-self and current-self measures. To assess possible selves related to binge-drinking decisions, participants rated the probability that the attributes from the elicitation study (Table 1) would characterize them 2 years after college and how much they would like this to be the case. The expectancy (i.e., probability) was measured on a 0 to 10 scale, with the 0 indicating *not at all likely*, 3 indicating *slightly likely*, 6 indicating *quite likely*, and 9 indicating *extremely likely*. The valence of the attribute was measured in two ways, depending on the valence of the item. For the positive characteristics of a binge drinker and nonbinge drinker (which were positively valenced), valence was measured by asking individuals to indicate how much they would like it if the item were true for them, on a scale ranging from 0 to 10, with *not at all* anchored on the 0, *slightly* anchored on the 3, *quite a bit* anchored on the 6, and *extremely so*

anchored on the 9. For the negative characteristics of a binge drinker and a nonbinge drinker (negatively valenced) items, participants were asked to indicate how positive or negative it would be if the characteristic were true for them on a bipolar scale ranging from -5 to $+5$. Verbal anchors were provided for every other number on the scale and included *extremely negative* (-5), *quite negative* (-3), *slightly negative* (-1), *slightly positive* ($+1$), *quite positive* ($+3$), and *extremely positive* ($+5$).¹

For the expectancy items, the alpha coefficients for the positive attributes of binge drinkers were .88; for the negative attributes of binge drinkers, .73; for the positive attributes of nonbinge drinkers, .83; and for the negative attributes of nonbinge drinkers, .60. For the valence items, the alpha coefficients for the positive attributes of binge drinkers were .85; for the negative attributes of binge drinkers, .61; for the positive attributes of nonbinge drinkers, .86; and for the negative attributes of nonbinge drinkers, .66.²

To measure current self-image, respondents rated the same constructs in Table 1 with reference to the current self. Specifically, respondents were provided a list of statements and asked to indicate "the extent to which the statement describes you or something about you." Each statement

1. In addition to the attributes related to binge drinking, our elicitation study collected data on general possible selves. Based on a study by Cross and Markus (1991), participants listed possible selves related to areas of family life, occupation, personality, abilities and education, material wealth, leisure, physical characteristics, and personal relationships. These data were content analyzed, and the most frequently mentioned attributes/characteristics in each domain were isolated. From this analysis, closed format items were developed for the main study, using our expectancy-value framework. Attempts to predict binge drinking from these general possible selves proved to be unsuccessful. This finding is consistent with the view that general self-evaluations typically will be poor predictors of specific behavioral criteria (Jaccard, 1975; Jaccard, King, & Pomazal, 1977). Because our primary interest was in presenting methods for linking possible selves to behavioral criteria, we focus no additional attention on this measure of general possible selves. (see Quinlan, 1999 for more details)

2. The alpha values for some constructs were marginal in magnitude, suggesting that they might better be represented using a multidimensional rather than a unidimensional structure. For those constructs where the alpha was less than 0.70, we conducted additional analyses that fit a single factor model to the items using LISREL. In all cases, a single factor model was found to adequately represent the data. This suggests that averaging constructs within a category was empirically defensible. Given (a) that the alpha levels were generally satisfactory and only marginal in a few cases and that alphas typically reflect lower bound estimates of reliability, (b) the results of the LISREL analyses, and (c) a theoretical justification for averaging, our primary analyses focused on average ratings for each of the major categories.

was followed by a rating scale from 0 to 10 as described above. The alpha coefficient for the self-image associated with positive attributes of a binge drinker prototype was .86; for the negative attributes associated with the binge drinker, .68; for the positive attributes associated with the nonbinge drinker, 0.80; and for the negative attributes associated with the nonbinge drinker, .60.

Measures of the Theory of Planned Behavior. A person's attitude toward binge drinking was measured using two items on an 11-point (ranging from -5 to $+5$) bipolar scale. The first item was "How favorable or unfavorable do you feel toward your engaging in binge drinking" with endpoints labeled *extremely unfavorable* and *extremely favorable*. The second item was "How positive or negative do you feel toward your engaging in binge drinking" with endpoints labeled *extremely negative* and *extremely positive*. The correlation between these two items was .86. The mean of these two items was used as the measure of the attitude. The subjective norm was also assessed using two items, which were measured on a 5-point Likert scale. The items were "Most people who are important to me would approve of my binge drinking" and "Most people who are important to me would disapprove of my binge drinking." The responses ranged from strongly disagree to strongly agree. The mean of these two items (with one item reverse scored) was used as the measure of the subjective norm ($r = -.77$). Perceived behavioral control also was measured in the present study. This construct was measured with two items, including "If I wanted, I could go binge drinking," and "It would be hard for me to go binge drinking" ($r = -.73$). These items were measured on a 5-point scale ranging from *strongly disagree* to *strongly agree*. The mean of these two items was used as the measure of perceived behavioral control.

Binge drinking. Binge-drinking behavior was assessed with two items asking participants to indicate the number of times they engaged in binge drinking in the last month. This measure was gender specific to accommodate differences in height, weight, and metabolism between males and females (Wechsler et al., 1994). Females were asked to indicate the number of times in the last month they drank four or more drinks on one occasion. Males were asked to indicate the number of times in the last month they drank five or more drinks on one occasion. This measure has been used extensively in the binge-drinking literature in general. Given that binge-drinking practices are relatively stable within a given college year (Wechsler, Molnar, Davenport, & Baer, 1999), this index of past binge-drinking behavior is a good indicator of future binge-drinking behavior and would be redundant with a prospectively gathered indicator

of behavior (see Jaccard & Blanton, in press; Jaccard, Blanton, & Dodge, 2005).

Procedure

The questionnaire was divided into two parts and respondents participated in two sessions, in groups ranging in size from 2 to 30. One packet contained all self-measures, and the other contained the binge-drinking and Theory of Planned Behavior measures. Order of the packets was randomly counterbalanced.

RESULTS

Attrition Analyses and Missing Data

Attrition analyses for those who completed both parts of the study versus those who dropped out of the study focused on bias due to the age of participants, year in school, gender, membership in a fraternity or sorority, and ethnicity. No statistically significant differences were found between those who participated in both sessions and those who did not. The attrition rate was 10%, and only the 305 individuals who participated in both sessions were used in the analyses. Missing data were minimal, representing no more than 2% to 3% of the cases on a given variable. Missing values were imputed using the expectation-maximization (EM) method described by Little and Schenker (1995).

Prediction of Binge Drinking from the Possible Self

Table 2 presents basic descriptive statistics for the major possible-selves variables and binge-drinking variables. The measure of binge-drinking behavior was a count variable reflecting the number of times each individual had engaged in binge drinking during the past 30 days. Given a count variable as an outcome, the class of models associated with Poisson regression is the most viable candidate for analysis (Jaccard & Blanton, in press). Preliminary analyses indicated that the only variables or interactions that had any degree of predictive power were the possible-self items associated with the negative attributes of a binge drinker and the negative attributes of a nonbinge drinker. This finding is consistent with research suggesting

Table 2
Descriptive Statistics

	Mean	Std. Deviation
Frequency of Binge Drinking	3.05	4.17
Positive Expectancies–Binge Drinker	7.61	1.55
Negative Expectancies–Binge Drinker	1.87	1.45
Positive Expectancies–Nonbinge Drinker	8.15	1.23
Negative Expectancies–Nonbinge Drinker	3.32	1.12
Positive Valence–Binge Drinker	8.99	1.07
Negative Valence–Binge Drinker	3.24	1.12
Positive Valence–Nonbinge Drinker	9.00	1.05
Negative Valence–Nonbinge Drinker	2.95	1.13

greater motivational impact of negative possible selves (Hooker & Kaus, 1994; Ogilvie, 1987) and negative social prototypes (Blanton et al., 2001), relative to their positive counterparts. Preliminary analyses also indicated that the only statistically significant interaction effect was between the negative attributes of a nonbinge drinker and the valence of these attributes.

Because of the complexity of the analyses, all of the reported analyses focus only on the negative possible selves and the significant interaction term. Model testing followed closely the procedures described in Long (1997). All measures were mean centered prior to analysis, and the product term for the interaction was generated using the mean-centered component parts (see Jaccard & Turrissi, 2003). The initial analyses used Poisson and negative binomial regression, as well as their zero-inflated counterparts, to predict the frequency of binge drinking from possible-self constructs. The predictor variables were the averaged expectancies for the negative attributes associated with a binge drinker, the averaged valences associated with these attributes, the averaged expectancies for the negative attributes associated with a nonbinge drinker, the averaged valences associated with these attributes, and a product term between the latter two variables. The analyses revealed that criterion prediction was primarily concentrated in the ability to discriminate nonbinge drinkers from binge drinkers as opposed to the prediction of variations in the frequency of binge drinking once a student had engaged in at least one instance of binge drinking. We therefore

Table 3
 Logistic Regression Analysis for Binge Drinking Versus Nonbinge Drinking

Predictor	Coeff	SE	Wald	Exponent of Coeff	95% CI
BD Neg Expectancy	.51	.15	12.09**	1.66	1.25 to 2.21
BD Neg Valence	-.71	.19	14.07**	0.49	0.34 to 0.71
Non-BD Neg Expectancy	-.09	.13	0.44	0.92	0.71 to 1.19
Non-BD Neg Valence	.44	.14	9.49**	1.54	1.17 to 2.04
Non-BD Expect X Valence	.42	.12	11.49**	1.52	1.10 to 1.94
Constant	.82				

Note. BD = self items for binge-drinking prototype; Non-BD = self items for nonbinge-drinking prototype; Neg = negative characteristics of the prototype; Coeff = equation coefficient; SE = estimated standard error of coefficient; CI = confidence interval; Confidence intervals are for the exponent of the coefficient. ** $p < .01$.

modeled this dichotomous outcome using more traditional logistic regression methods.³ Specifically, the analysis predicted whether or not the individual had engaged in binge drinking from the possible-self predictors described above. Table 3 presents the logistic equation that emerged from this analysis. The log likelihood function for the logistic model was -159.9 . The Nagelkerke squared pseudo R was 0.34. Figure 1 presents a variant of the Hosmer-Lemeshow (1989) test-evaluating model fit. Specifically, a predicted log odds was calculated from the logistic equation for each individual, and the distribution of predicted log odds scores was divided into deciles representing the lowest 10% predicted scores, the next lowest 10% predicted scores, and so on. For each group defined by a decile, the mean predicted log odds was computed and converted to a predicted probability for that group. These predicted probabilities were then

3. We modeled the data successfully using a zero-inflated, negative binomial regression model, but report here logistic regression analyses because they are more familiar to readers and because the predictive utility of the constructs was in the equation discriminating individuals with zero versus individuals with non-zeros on the binge-drinking measure. The conclusions from both sets of analyses are the same, and the coefficients were similar in magnitude in the two analyses. More information about the analyses can be obtained from either Jim Jaccard or Hart Blanton.

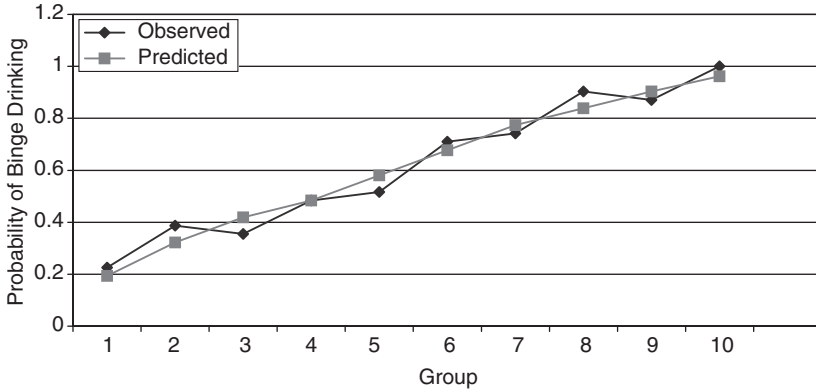


Figure 1
Predicted versus observed probability of binge drinking for logistic regression model.

contrasted with the observed probability of binge drinking, defined as the proportion of individuals in each group who reported having engaged in binge drinking. As seen in Figure 1, the correspondence between predicted and observed probabilities suggest a reasonable model fit.

Four of the five predictors in the model were statistically significant. For the negative-self items associated with the prototype of a binge drinker, the more individuals thought they would be characterized by these attributes 2 years after college, the more likely they were to have engaged in binge drinking during the past 30 days. The predicted odds ratio associated with this measure was 1.66 (95% CI = 1.25 to 2.21), indicating that for every one unit change on the scale metric, the predicted odds of engaging in binge drinking increased by a factor of 1.66. The predicted odds of binge drinking for the highest observed score of 7 on this measure was over 30 times higher than the predicted odds of drinking for the lowest observed score of 0 on this scale. In addition, the more negatively that individuals evaluated these attributes as being, the less likely they were to engage in binge drinking. Specifically, the odds ratio associated with the negative valence of these items was 0.49 (95% CI = 0.34 to 0.71), indicating that for every additional unit increase on the scale metric (where higher scores indicate more negative evaluations), the predicted odds of engaging in binge drinking were essentially cut in half.

There also was a statistically significant interaction effect between expectancy and valence for the negative-self items associated with a nonbinge drinker. When the expectancy of these attributes was equal to its sample mean value, the odds ratio for the valence of these attributes was 1.54 (95% CI = 1.17 to 2.04). This pattern indicated that the more negatively the individual evaluated the attributes of nonbinge drinkers, the greater was the likelihood of binge drinking. This pattern of association was exacerbated at higher levels of expectancy and weakened at lower levels of expectancy, as indicated by the exponent of 1.52 (95% CI = 1.10 to 1.94) associated with the product term. For example, when the expectancy was one standard deviation above its mean, the exponent of the coefficient reflecting the effect of valence on binge drinking was .448 ($p < 0.01$), whereas when the expectancy was one standard deviation below its mean, the exponent of the coefficient was only 0.97 (*ns*).⁴

Possible Selves, Current Self, and the Theory of Planned Behavior

To test if the possible-self constructs were predictive of binge drinking behavior over and above current self-image, two logistic regression analyses were performed. The first analysis predicted whether the individual had engaged in binge drinking based only on the current self-image constructs. The log likelihood function for this model was -170.9 and the Nagelkerke pseudo- R squared was 0.26. The second analysis added the possible-selves predictors to this equation and yielded a log likelihood function of -151.3 and a Nagelkerke pseudo- R squared of 0.39. The increased fit for the second model was statistically significantly better than the fit for the first model (change in chi square for model fit = 39.2, $df = 5$, $p < 0.01$). The pattern of statistical significance for the possible-selves item was the same as the analysis that excluded the current self-image covariates. These data suggest that the effects of the possible-self constructs are not merely due to them being an extension of the current self because they were predictive of the outcome variable even when current self-image was held constant.

To test if the possible-self constructs were predictive of binge-drinking behavior over and above the central constructs of the The-

4. We also tested all interactions using a linear probability model, and these analyses would yield comparable conclusions to those of the logistic model.

ory of Planned Behavior, a similar set of two logistic regression analyses was performed. The first analysis predicted whether the individual had engaged in binge drinking from just the constructs of the Theory of Planned Behavior, namely the attitude toward binge drinking, the subjective norm about binge drinking, and the perceived control over the behavior of binge drinking. The log likelihood function for this model was -150.9 and the Nagelkerke pseudo- R squared was 0.39 . The second analysis added the possible-selves predictors to this equation and yielded a log likelihood function of -131.9 and a Nagelkerke pseudo- R squared of 0.51 . The increased fit for the second model was statistically significantly better than the fit for the first model (change in chi square for model fit = 38.1 , $df = 5$, $p < 0.01$). Again, the pattern of statistical significance for the possible-selves item was the same as the analysis that excluded the Theory of Planned Behavior components.⁵

Finally, a logistic regression analysis was performed in which the possible-self constructs, the Theory of Planned Behavior constructs, and the current self-image constructs were included in the prediction equation. The log likelihood function for this model was -125.2 and the Nagelkerke pseudo- R squared was 0.55 . Table 4 presents the logistic coefficients for this analysis. The statistically significant effects for the possible-self negative attributes associated with the binge drinker prototype became statistically nonsignificant in this analysis. However, the interaction effect between expectancy and valence for the negative possible-self attributes associated with the nonbinge drinker prototype remained intact.⁶ The change in statistical significance of the centered component parts of the product term indicate that the simple effects of the valence of these attributes do not attain statistical significance until a higher point on the expectancy component is reached. However, the fundamental trend of the effect is the same: A greater perceived likelihood of possessing the negative attributes of a nonbinge drinker were associated with a higher odds of binge drinking, and this effect was stronger as the valence of these attributes became more negative.

5. The overall fit of the logistic model for the Theory of Planned Behavior variables was comparable or better than fits typically observed in meta-analyses of the theory (Armitage & Conner, 2001).

6. This interaction remained significant when the parallel interaction using the current self instead of possible self was included as an additional covariate.

Table 4
 Logistic Regression Analysis for Possible Self, Theory of Planned Behavior, and Current Self Constructs

Predictor	Coeff	SE	Wald	Exponent of Coeff	95% CI
BD Neg Expectancy	.28	.19	2.25	1.32	0.92 to 1.90
BD Neg Valence	-.28	.24	1.37	0.76	0.48 to 1.20
Non-BD Neg Expectancy	.10	.19	0.28	1.10	0.76 to 1.60
Non-BD Neg Valence	.26	.17	2.82	1.30	0.92 to 1.82
Non-BD Expect X Valence	.43	.15	8.21**	1.53	1.15 to 2.05
Attitude	.37	.09	17.36***	1.45	1.22 to 1.72
Subjective Norm	-.16	.20	0.64	0.85	0.58 to 1.26
Perceived Control	.58	.16	13.17***	1.79	1.31 to 2.45
Current Image BD Pos	-.13	.16	0.67	0.88	0.64 to 1.20
Current Image BD Neg	.49	.15	11.03**	1.63	1.22 to 2.17
Current Image Non-BD Pos	.08	.19	0.17	1.08	0.75 to 1.56
Current Image Non-BD Neg	-.30	.16	3.74	0.74	0.55 to 1.00
Constant	-.80				

Note. BD = self items for binge-drinking prototype; Non-BD = self items for nonbinge-drinking prototype; Neg = negative characteristics of the prototype; Pos = positive characteristics of the prototype; Coeff = equation coefficient; SE = estimated standard error of coefficient; CI = confidence interval; Confidence intervals are for the exponent of the coefficient.

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

The most prominent predictors of binge drinking in Table 4 are the attitude toward binge drinking (such that individuals with more positive attitudes toward binge drinking were more likely to engage in binge drinking), perceived control or efficacy with respect to binge drinking (such that individuals who believed that they could gain access to alcohol were more likely to engage in binge drinking), one's current self-image on the negative attributes associated with the binge drinker prototype (such that the more the individual saw himself or herself as having the negative attributes of a prototypical binge drinker, the more likely s/he was to binge drink), and the negativity of one's future self having the characteristics of a prototypical nonbinge drinker (with this effect being dependent on the expectancy for the characteristics).

DISCUSSION

The results of this study have numerous theoretical and methodological implications. We discuss these in the context of the functions that possible selves may serve, the importance of predictor-criterion correspondence, the usefulness of examining behavioral alternatives, the differential weighting of positive and negative possible selves, and the predictive utility of possible-self constructs over and above other psychological constructs.

Functions of the Future Self

The current research affirms the utility of an expectancy-valence conceptualization of possible selves. Respondents who expected in the future to possess the negative attributes associated with the prototype of binge drinking were more likely to engage in this risk behavior. In addition, those who more negatively evaluated the negative attributes associated with the prototype of the nonbinge drinker were less likely to engage in risk behavior, and this effect was exacerbated for those with higher expectations that these attributes would occur. It thus appears that there are two independent ways in which the possible self might influence binge drinking. On the one hand, it appears that participants who thought they would come to possess the future negative attributes of the risk taker behaved in a way that fulfilled these expectations. On the other hand, those who thought they might possess the future negative attributes of the non-risk-taker appeared to reduce this possibility by choosing to engage in risk activity instead. Of course, each of these patterns reflects the patterning of data in a cross-sectional data set, and so the true direction and nature of causality is not known. Nevertheless, since both of these findings are suggestive, we consider the implications of each.

For expectancies associated with the prototype of a risk taker, the theoretical framework of Markus and Nurius (1986) predicts that higher expectations of a negative (feared) self induces avoidance motivation, thereby reducing the motivation to engage in current risk activity. In contrast to these predictions, we found that individuals who thought they would develop the characteristics of the binge drinker were *more* likely to be engaged in current binge drinking. It is possible that past research has not observed this phenomenon

because it has not measured varying degrees of expectancy associated with the future self. Rather, it has relied on global content analyses of the type of person someone expects to become relative to the type of person one fears becoming. Interestingly, the one study that diverted from this tradition and used close-ended measures of possible selves found a similar pattern to our own. Oyserman and Markus (1990) found that increased endorsement of negative possible selves was a positive predictor of delinquency. Oddly, this pattern was not interpreted as a challenge to the negative-incentive function in the traditional possible-self framework (Markus and Nurius, 1986)—even though it was the opposite of what would be predicted by this theory.

One explanation for our results is that, rather than serving the hypothesized “avoidance function,” negative possible selves serve a “confirmation function” that validates a desire for risk activity. As a result, risk behavior is more likely to occur for those who expect to have the negative attributes of a risk taker in the future.⁷ Stated another way, one’s vision of the future is validated through one’s current choices, thereby reinforcing behaviors that are consistent with that envisioned future (see Swann, 1997).

For the prototype of the non-risk-taker, individuals who negatively evaluated the attributes associated with the non-binge-drinking prototype were more likely to engage in binge drinking, and this effect was heightened the more the individual expected these attributes to occur in the future. This result is consistent with the view that current risk takers do not desire the attributes of the non-risk-taker. Accordingly, the more individuals suspect that they may develop these unwanted attributes in the future, the more they resist risky actions that could cultivate these possibilities in themselves. Thus, unlike the possible self with respect to binge drinking, the possible self with respect to nonbinge drinking appeared to activate an avoidance motivation.

The above suggests that negative attributes associated with a future self can serve either of two functions, an avoidance function or a confirmation function. The function that the future self assumes probably varies depending upon contextual and individual

7. About 33% of our sample provided ratings that suggested they would be more likely to have the negative attributes of a binge drinker relative to how they currently are.

differences. Of interest in the present research is a patterning of data that is consistent with a confirmation function for the (negative) self attributes associated with a risk taker but an avoidance function for the (negative) self attributes associated with a non-risk-taker. One possible account for these data focuses on how each individual construes the course of action that is opposite to his or her current behavioral orientation. It is possible that current nonbinge drinkers simply do not envision the negative attributes of the prototypical binge drinker as being as plausible for their future as current binge drinkers because these attributes may be uniquely tied to excessive alcohol use. By contrast, current binge drinkers may feel that if they ceased binge drinking, they might indeed develop the negative future-self characteristic of the nonbinge drinker, thereby inducing an avoidance motivation. The joint operation of these processes would produce the observed pattern of results. Future research is needed to explore the exact mechanisms underlying the activation of the avoidance versus the confirmation functions of the future self.

Dimension Linking Possible-Self Predictors and Behavior

The present research not only affirmed the usefulness of the expectancy-value framework for conceptualizing possible-self constructs, it also affirmed the applicability of a fundamental principle of behavioral prediction, the principle of correspondent measurement for predictor and criterion variables. Whereas past studies have used general, open-ended measures to assess an individual's possible selves, the current approach established correspondent links between possible selves and binge drinking by incorporating the concept of behavioral prototypes (Gibbons & Gerrard, 1995, 1997). We first assessed the consensual prototypes related to binge drinking with a thought-listing task. Participants in the main study then rated their expectancies and values relevant to these prototypes.

The logic behind this procedure was that individuals move toward or away from the consensual prototype through their actions, and so ratings of these prototypes can provide insights into the identity consequences of binge-drinking decisions. The results of the main study supported this view. In further support, ancillary analyses reported in greater detail in Quinlan (1999) found that more general possible selves were not predictive of binge-drinking behavior (see also Footnote 1). In future research, our method of gaining

correspondence can be improved upon by also measuring individual differences in the degree to which participants endorse the consensual prototypes. It seems likely that values and expectations regarding the prototype will only influence the behavioral decisions of individuals who view the prototype as true.

Multiple Behavioral Alternatives

With respect to multiple behavioral alternatives, current binge-drinking tendencies were predicted not only by how the individual construed the future self in terms of the prototype of the binge drinker but also how the future self was construed in terms of the prototype of the nonbinge drinker. This result has not been shown in past research on possible selves, but it derives from traditional models of decision making (Jaccard, Turrisi, & Wan, 1989; Jaccard & Wood, 1986) and research on the attitude-behavior relationship (Jaccard, 1981; Jaccard & Dittus, 1990).⁸

8. The one exception where researchers have given consideration to multiple possible selves relates to the concept of *balance*. Possible selves are said to be “balanced” when a person holds a positive self that is desired and a negative possible self in the same domain that is to be avoided. For example, one might have a positive possible self of “popular” and a negative possible self of “disliked.” Unfortunately, the analytic strategy for investigating balance is problematic. It involves simply counting the number of positive and negative selves that relate to the same behavioral outcome (Oyserman et al., 1995; Oyserman & Markus, 1990; Oyserman & Saltz, 1993). This coding method does not control the main effects exerted by the positive and negative selves, nor does it control for the number of selves listed. (A person with balance, by definition, has listed at least two possible selves related to a behavior in response to an open-ended prompt, whereas someone not in balance might have listed no selves or just one). It is possible that all published effects of “balance” reflect these statistical confounds. In our framework, balance can be tested free of these confounds by inspecting the interactive influence of different expectancy-value product terms, after controlling for lower-order main effects and lower-order interactions. We tested a wide range conceptualizations of balance in our main study and found little support for their predictive utility of this construct, once main effects were taken into account. For space considerations, we chose not to elaborate on these findings in this article. But future research should focus attention directly on the balance hypothesis, applying methods that are free of the above-mentioned statistical confounds. This will help determine if there is any validity to past research interpretations surrounding the balance construct.

Although promising, our method can be improved by considering a larger set of behavioral alternatives. The focus of our research was on two behavioral alternatives: (a) engaging in binge drinking and (b) not engaging in binge drinking. In contrast, we could have structured questions around the frequency of binge drinking to investigate a larger number of alternatives. We might, for instance, study the possible selves associated with (a) abstaining from alcohol, (b) drinking in moderation, and (c) drinking excessively. No doubt, however, there will be upper limits to the number of alternatives that can be associated with meaningful possible selves. Future research is needed to help researchers determine the number and type of behavioral alternatives they should incorporate into a possible-self assessment to maximize behavioral prediction.

Differential Weighting and the Negativity Bias

As predicted, we found that negative attributes of the different possible-self alternatives were the primary determinants of binge drinking. This pattern suggests that people give greater consideration to the possible negative implications that their binge drinking decisions can have on their identity than they give to the possible positive implications. This pattern of results supports a great deal of research and theory suggesting that people are more concerned about the negative consequences of their actions than the positive consequences (e.g., Anderson, 1974; Fiske, 1980; Skowronski & Carlston, 1989; Taylor, 1991; Wyer, 1974), particularly as they relate to possible selves (Ogilvie, 1987) and associations with social prototypes (Blanton, VandenEijnden et al., 2001; Gibbons & Gerrard, 1997). It is worth noting that the reliability for the negative possible-self inventories generally was lower than those for the positive possible selves. This would suggest that, if anything, our results underestimate the greater predictive power of negative possible selves relative to positive possible selves (see Zuckerman, Hodgins, Zuckerman, Rosenthal, 1993).⁹

9. The greater predictive power of the negative attributes could reflect range restriction due to ceiling effects in the evaluation of positive traits. In evaluating restriction of range arguments, one first must determine if the range restriction that is evident is externally valid or if it is an artifact of experimental procedures. If it is externally valid, the failure to predict because of range restriction is meaningful, reflective of real life and not artifactual. We would argue that this is so in

We also predicted that possible selves related to action would provide better prediction of behavior than possible selves related to inaction (Allison & Messick, 1988; Cioffi, 1994; Fazio et al., 1982). This was not the case. Both the possible selves linked to the binge-drinker prototype and the possible selves linked to the non-binge-drinker prototype provided independent prediction of binge drinking, albeit in a different manner. Future research should investigate this issue further (see Blanton & Christie, 2003, for a detailed discussion of this issue).

Future Selves, the Current Self, and the Theory of Planned Behavior

Finally, the current research affirmed the importance of possible-self constructs relative to other theoretical approaches, such as the Theory of Planned Behavior and theories that focus on the current self-concept. When the Theory of Planned Behavior constructs were statistically held constant, the effects of the possible-self constructs maintained statistical significance, as they did when just the current self-image constructs were statistically controlled. It was only when both the Theory of Planned Behavior and the current self-image measures were both held constant that some of the predictive power of the possible-self constructs was curtailed. Even in this case, the expectations and valences associated with the future self vis-à-vis the prototypical nonbinge drinker were predictive of binge drinking. These findings are important because past research has failed to provide adequate controls that address potential conceptual redundancies with other psychological constructs.

Limitations

As with any research, the results of the present investigation must be interpreted in light of methodological constraints associated with data collection. First, our primary results derived from a single study. Future research must replicate our methods in different be-

the present case. Despite this, our data do not support a range-restriction interpretation because the standard deviation for the averaged negative attributes tended to be similar to those for the negative attributes. The negative attributes also included a few characteristics that explicitly focused on drinking. Again, this is appropriate because the attributes were selected for their external validity vis-à-vis the elicitation study.

havioral domains. Evidence that our assessment techniques predict a wide range of behaviors across different social contexts will offer reassurance that our conceptualization of possible selves has merit. In these replications, it is important to use a wider range of experimental designs. We tested our model with cross-sectional data. This limitation prevented us from assessing the role of possible selves in influencing behavior change over time, and so future studies should incorporate longitudinal data collection and time series analysis to address the causal sequence of change. Finally, the current framework for possible selves, though promising, requires extensions. First, research can consider incorporating individual variability in the degree to which the consensual prototype is endorsed. Second, research can consider a wider range of behavioral alternatives than simply action and inaction. Third, research can control for other psychological constructs that might be creating spurious associations between possible selves and behavioral criteria.

CONCLUSION

Despite limitations, the current results support the utility of conceptualizing possible selves in terms of an expectancy-value formulation. With careful attention to the theoretical and methodological issues outlined above, we believe that the current model can improve our ability to predict behavioral criteria from the psychological construct, possible selves.

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