

## The Association of Well-Being with Health Risk Behaviors in College-Attending Young Adults

Seth J. Schwartz  
*University of Miami*

Alan S. Waterman  
*The College of New Jersey*

Alexander T. Vazsonyi  
*Auburn University*

Byron L. Zamboanga  
*Smith College*

Susan Krauss Whitbourne  
*University of Massachusetts-Amherst*

Robert S. Weisskirch  
*California State University-Monterey Bay*

Michael Vernon  
*University of Massachusetts-Amherst*

S. Jean Caraway  
*University of South Dakota*

Su Yeong Kim  
*University of Texas at Austin*

Larry F. Forthun  
*University of Florida*

M. Brent Donnellan  
*Michigan State University*

Lindsay S. Ham  
*University of Arkansas*

The present study investigated the associations of well-being with engagement in illicit drug use, sexual risk taking, and impaired driving in a sample of 9,515 students from 30 U.S. colleges and universities. Participants completed measures of subjective well-being, psychological well-being, and eudaimonic well-being, and indicated how many times in the past 30 days that they had engaged in several illicit drug use, sexual risk, and impaired driving behaviors. Findings indicated that well-being was negatively associated with incidence of illicit drug use and some sexual risk behaviors, but not with incidence of drunk/drugged driving or riding with an impaired driver. Well-being was negatively related to frequency of casual sex, sex while drunk/high, drunk/drugged driving, and riding with an impaired driver. Associations of well-being were strongest for more dangerous types of drug use and sexual behavior and for riding with an impaired driver. Results are discussed in terms of implications for research and intervention development.

College-attending young adults have been identified as a group with a high probability of engaging in health risk behaviors such as prescription drug misuse (Whitten, 2008), driving while intoxicated (Chou et al., 2005), and casual sex (Grello, Welsh, & Harper, 2006). Rates and severity of risk behaviors may be greater in college students compared to young adults who do not attend college (Carter, Brandon, & Goldman, 2010). The prevalence of many health risk behaviors on college campuses has increased over the past decade, posing a significant public health problem (Martens, Pedersen, LaBrie, Ferrier, & Cimini, 2007). Not coincidentally, these behaviors are also associated with many of the leading causes of death among adolescents and adults in the United States, including drug overdoses, HIV infection, and motor vehicle accidents (Mokdad, Marks, Stroup, & Gerberding, 2004). The goal of the present study is to provide initial evidence that well-being may serve as a protective factor against some of these behaviors.

Identifying ways to prevent or reduce the prevalence of health risk behaviors and their consequences is an important component of the U.S. government's Healthy People 2010 and 2020 initiatives (U.S. Department of Health and Human Services, 2010). A number of strategies have been advanced to help prevent or reduce the prevalence of health risk behaviors, including motivational interviewing (Whiteside, Cronce, Pedersen, & Larimer, 2010), reminders about risk-related consequences (Hustad, Barnett, Borsari, & Jackson, 2010), and virtual reality simulations to demonstrate the impairments associated with driving while intoxicated (Montgomery, Leu, Montgomery, Nelson, & Sirdeshmukh, 2006). Although such strategies have shown promise (Larimer, Kilmer, & Lee, 2005), a potentially complementary approach might be to focus on promoting or accentuating specific strengths within young people themselves that may further protect against health risks. Given that knowledge about potential negative consequences often does not deter young people from taking risks (e.g., Berten & van Rossem, 2009), it is

possible that developing strengths within young people may represent another avenue for preventing or reducing risk-taking behavior. The present study examined intrapersonal strengths, as reflected by various forms of well-being, as potentially serving such a role in a sample of college-attending young adults.

Cross-sectional and longitudinal research has identified several intrapersonal strengths that can help to protect against substance-use-related, sex-related, and driving-related risks in adolescents and young adults. These intrapersonal strengths include high self-esteem (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005), personal goal setting (Moore & Davidson, 2006), feeling satisfied with one's life (Murphy, McDevitt-Murphy, & Barnett, 2005), and having identified a purpose in life (Minehan, Newcomb, & Galaif, 2000). Links from other aspects of well-being—such as happiness, overall positive functioning, and actualization of one's potentials—to health risk behaviors have not been widely investigated. The literature on personal strengths as potential protective mechanisms against health risk behaviors is largely piecemeal and sparse. Given the potential for positive processes to protect against negative outcomes (Schwartz et al., 2010; Zimmerman, Phelps, & Lerner, 2008), personal strengths, such as well-being, may hold promise for preventing or reducing risk-taking behavior.

The term *well-being* refers to a number of related constructs, including subjective well-being or life satisfaction (Pavot & Diener, 2008; Sheldon et al., 2004), psychological well-being (i.e., general positive functioning; Ryff & Keyes, 1995; Ryff & Singer, 2008), and eudaimonic well-being (i.e., discovering and living in accordance with one's highest potentials; Waterman, 2004). These constructs all represent positive psychosocial functioning and carry the implication that an individual has been able to successfully address the developmental tasks (Havighurst, 1952) that she or he has encountered up to the present stage in life. Support for the notion that well-being stems from doing well in life, for example, can be observed in the negative

relationship between well-being and distress (e.g., anxiety or depression). This negative relationship generalizes across different ways of conceptualizing and assessing well-being, including subjective well-being (Koivumaa-Honkanen, Kaprio, Honkanen, Viinamäki, & Kosenvuo, 2004), psychological well-being (Keyes, 2005), and eudaimonic well-being (Waterman et al., 2010). Given findings that well-being contributes to important life outcomes such as success in work, satisfying relationships, longevity, and health (Lyubomirsky, King, & Diener, 2005), it seems likely that well-being would protect young adults from engaging in reckless and risky behaviors.

### Three Conceptions of Well-Being

Three conceptions of well-being were evaluated in the current research: subjective well-being (SWB), psychological well-being (PWB), and eudaimonic well-being (EWB). Subjective well-being (SWB) refers to the level of balance between positive and negative affective states, and to a cognitive assessment of life satisfaction (Diener, 1984; Diener, Scollon, & Lucas, 2009). Measures of SWB provide an index of how well a person feels life has been going, such that someone reporting high SWB is conveying overall satisfaction with life. SWB does not, however, convey information about the *reason* why life is perceived as going well or poorly.

Psychological well-being (PWB) is often defined in terms of the quality of a person's psychological functioning with respect to an array of characteristics indicative of positive mental health (Ryff, 1989; Ryff & Singer, 2008). Ryff (1989) identified six qualities that are central to PWB: (a) autonomy, (b) environmental mastery, (c) personal growth, (d) positive relations with others, (e) purpose in life, and (f) self-acceptance. Although measures of PWB do not contain items that directly assess life satisfaction, individuals who are functioning positively with respect to mental health are presumed to be in a better position to experience positive SWB compared to those who are low in PWB. However, even individuals high on PWB may report low SWB as a consequence of recent experiences of setbacks in the pursuit of personal goals or a loss in personal relationships (Durkin & Joseph, 2009; Linley, Maltby, Wood, Osborne, & Hurling, 2009).

Eudaimonic well-being (EWB) is defined in terms of the extent to which individuals have successfully identified, developed, and utilized their potentials in ways that give purpose to and enhance the meaning of their lives (Waterman, 2004, 2008). Measures of EWB contain items pertaining to subjective experiences of enjoyment of activities related to self-realization (i.e., feelings of personal expressiveness or meaningfulness) but do not provide information on overall life satisfaction

(Waterman et al., 2010). It is likely that individuals experiencing success with respect to self-realization will be high on SWB, though this may be tempered by the difficulty of the goals they choose to pursue and by any setbacks or personal losses that they have encountered. With respect to the relationship between EWB and PWB, the characteristics of positive mental health (e.g., autonomy, environmental mastery) should facilitate the discovery and development of one's best potentials and the ability to choose personally expressive goals for the implementation of these potentials. However, there can be no assurance that positive mental health, in itself, will lead to self-realization.

In sum, SWB, PWB, and EWB represent three distinct but closely related conceptions of well-being. Although there are good theoretical rationales for expecting moderate to strong positive correlations among these constructs, the differences between them leave open the possibility that they may be differentially related to engagement in health-risk behaviors. As a result, it is important to examine SWB, PWB, and EWB both together (as a higher-level latent construct) and separately in relation to health-risk behaviors.

### The Relationship of Well-Being to Health Risk Behaviors

Although little research has examined the relationship between well-being and health risk behaviors, scholarship on positive development in adolescence (e.g., Vesely et al., 2004; Zimmerman et al., 2008) suggests that positive processes should help to protect against risky behavior. However, the picture may be somewhat more complex, in that individuals who occasionally engage in risky behavior (i.e., "experimenters") may differ qualitatively from individuals who engage in risky behavior more frequently or intensely (Shedler & Block, 1990; Walton & Roberts, 2004). For this reason, it is important to examine predictors of both *incidence* (whether or not the person engages in the behavior) and *frequency* (how often the person engages in the behavior) when evaluating the association between well-being and health risk behaviors.

It is likely that the motives underlying risk behavior participation differ markedly between experimenters and individuals whose risk behavior participation is more chronic. The direction and strength of the relationship between measures of well-being and engagement in health-risk behaviors may be a function of these various motives. Previous research has suggested that these motives include: (a) curiosity/exploration (Christopherson, Jones, & Sales, 1988), (b) enjoyment of the high or thrill of risk (Ravert et al., 2009; Zuckerman, 1994), (c) conformity to peer group pressure (Santor, Messervey, & Kusumakar, 2000), (d) alleviation of boredom

(Wegner & Flisher, 2009), (e) self-medication (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008), and (f) self-destructive activity (Kelly, Rollings, & Harmon, 2005). In particular, self-medication (Colder, 2001; Robinson, Sareen, Cox, & Bolton, 2009) and self-destructive activities (Scourfield, Roen, & McDermott, 2008) can be undertaken as a way of coping with anxiety, depression, or other forms of distress. Given its strong negative association with distress, then, well-being should strongly contraindicate self-medication and self-destructive motives. Both of these motives involve the presence of pathologies suggesting that risk-taking is likely to be frequent and compulsive (Bolton, Robinson, & Sareen, 2009) and may involve more dangerous outcomes including drug overdoses, automobile accidents, and exposure to HIV/AIDS through high risk sexual activities.

The motives of conformity to peer group pressure and alleviation of boredom also provide a fairly strong basis on which to expect a negative relationship between well-being and engagement in health-risk behaviors. Individuals who score high on measures of well-being are reporting that their lives are going relatively well, possess characteristics associated with mental health, and/or are pursuing self-realization. In turn, individuals high in well-being may be in a relatively good position to resist peer pressure when it is directed toward engaging in activities that have potentially negative consequences. Scoring high on dimensions of well-being also indicates that the individual believes that her or his life is relatively interesting and rewarding and, hence, that she or he is less likely to be in need of alleviating boredom, particularly through risky and self-destructive means (Csikszentmihalyi, 2000). In other words, those who are more satisfied with their lives should be less motivated to seek self-stimulation through high-risk activities.

Some of these motives for engaging in risk behaviors are more or less characteristic of the adolescent and young adult age periods and may, therefore, be more independent of the person's level of well-being. It is well-established, for example, that adolescence and young adulthood are characterized by a high level of curiosity about, and exploration of, available behaviors; and this curiosity is often accompanied by a willingness to experiment with alternative possibilities (Arnett, 1996, 2000). Thus, young adults might be more curious about the effects of illicit substances and the sensations that accompany casual sexual relationships. For example, Shedler and Block (1990) reported that curiosity is associated with experimental, but not heavy, drug use. It is possible that high levels of well-being may serve to limit the extent to which individuals act on this curiosity, given that engagement in high-risk activities has the potential to jeopardize other life possibilities that adolescents or young adults may value. For instance,

Walton and Roberts (2004) found greater emotional stability among abstainers or experimental drug users compared to heavy users, suggesting that abstainers and casual users may report greater well-being. Similarly, the motive to enjoy a high or thrill may be present independent of one's level of well-being (Ravert et al., 2009). Again, however, high levels of well-being may serve to limit the individual's involvement in highly risky behaviors, and may encourage individuals to perceive a trade-off between the benefits of engaging in health risk behaviors and their potential costs. In short, individuals with high levels of well-being may see themselves as having more to lose from the negative effects of extremely risky behaviors. Although these motives were not directly assessed in the present study, they may be inferred from the type and extent of risks in which a person engages, and from the associations of well-being to the incidence and frequency of risk behavior engagement.

### Types of Health-Risk Behaviors

Thus far, we have treated health-risk behaviors as a single category of activity. It may be useful, however, to distinguish among various types of risky activities, with each type characterized by a range of specific behaviors. In the present study, three categories of activities were investigated, each with two or more specific behaviors considered: (a) illicit drug use, (b) sexual risk taking, and (c) impaired driving. Further, within the first two categories, differing levels of risk severity were proposed. Thus, the question as to whether the strength of the well-being-health-risk behavior relationship would vary by category of behavior, as well as by severity of risk, can be addressed in the present research.

#### *Illicit Drug Use*

Five types of illicit drug use were investigated: (a) marijuana, (b) hard drugs, (c) inhalants, (d) injection drugs, and (e) prescription drug misuse. Among these, the risks associated with marijuana use are likely relatively low, whereas the risks for the other four types of drugs have a greater potential to be severe. Hard drugs, inhalants, injection drugs, and abuse or misuse of prescription drugs all have the potential to be deadly (Mokdad et al., 2004); whereas marijuana is generally associated with somewhat less severe consequences (Schaub, Gmel, Annaheim, Mueller, & Schwappach, 2010).

#### *Sexual Risk-Taking*

Five types of sexual activity were investigated: (a) oral sex, (b) anal sex, (c) casual sex (sex with someone whom one does not know well), (d) unprotected sex, and (e) sex while drunk or high. Among these, engaging

in oral sex would be considered less risky than engaging in the other sexual risk behaviors (Lindberg, Jones, & Santelli, 2008).

### *Driving Related Risks*

Two types of driving related risks were investigated: (a) driving while drunk or high and (b) riding with a driver who was drunk or high. Given the increased probability of being in an automobile accident as a result of either of these behaviors (Calafat et al., 2009), and the possible injuries that could result, the riskiness of both activities was considered severe. National statistics support this contention: the National Highway Traffic Safety Administration (2003) reported that, in 2002, 41 percent of traffic fatalities involved at least one driver who had been drinking alcohol, and that 35 percent of traffic fatalities involved a driver who was legally drunk (blood alcohol level of 0.08 or higher). Moreover, the age group with the highest percent of alcohol-related traffic fatalities includes individuals 21–24 years of age.

### **Gender as a Moderator of the Relationship Between Well-Being and Health-Risk Behavior**

Men and women differ in the extent to which they engage in various health-risk behaviors, with men more likely to engage in a wide range of risky behaviors (Arnett, 1996). At the same time, men and women have generally been found to be relatively comparable on various measures of well-being (Haring & Stock, 1984; Ryff, 1989; Waterman, et al., 2010; Zullig, Huebner, & Pun, 2009). Research has been inconclusive regarding gender differences in the association between well-being and health risks (e.g., Green, Freeborn, & Polen, 2001), and, as such, it may not be possible to propose a definitive a priori hypothesis in this regard. We therefore treated gender differences as an exploratory research question in the present study.

### **The Present Study: Research Questions and Hypotheses**

Taken together, the previously discussed considerations provide the basis for two hypotheses. First, collapsing across indicators of well-being, high levels of well-being are hypothesized to be associated with a reduced likelihood of engaging in health-risk behaviors, whereas low levels of well-being should increase the likelihood of such behaviors. This hypothesis was tested in two ways:

#### *Incidence*

When respondents are asked whether or not they have engaged in a particular health-risk behavior during

a specified period of time (in the present study, in the past 30 days), individuals higher on measures of well-being should have a higher probability of responding “no,” whereas those lower on well-being should be more likely to respond “yes.”

### *Frequency of Engagement*

Among respondents who have responded “yes” to having engaged in a particular health-risk behavior during the period of time specified, individuals higher on well-being should report having engaged in the behavior less frequently compared to those lower on well-being. Analyzing incidence and frequency separately may be especially useful for distinguishing between those who engage in risky health behaviors on an experimental or occasional basis from those who regularly or chronically engage in these behaviors (Getz & Bray, 2005). We would expect that regular or chronic engagement in health risk behaviors reflects self-medication or self-destructive motives and should be negatively associated with indices of well-being.

Some behaviors are clearly more risky than other behaviors; therefore, our second hypothesis was that the strength of the association between well-being measures and the likelihood of engaging in health-risk behaviors should vary depending on the severity of risk associated with the behaviors in question. Severity of risk is defined in terms of the probability of a negative outcome occurring and the extent to which such a negative outcome may be highly hazardous to one’s health. A stronger negative association between well-being and health-risk behavior is expected for those behaviors with the greatest severity of risk. Like Hypothesis 1, this hypothesis can be tested using both incidence and frequency.

We also examined three additional research questions: (a) whether well-being would serve as a comparable protector against health risk behavior for men and for women; (b) whether different patterns would emerge for different types of risk behaviors (illicit drug use, sexual risk taking, and impaired driving); and (c) whether the three forms of well-being assessed would be differentially related to health-risk behaviors. Given insufficient prior literature, we did not advance a priori hypotheses for these research questions; thus, we treated them as exploratory research queries.

## METHOD

### **Participants and Procedures**

The present study uses data from the Multi-Site University Study of Identity and Culture (MUSIC), a collaborative effort that began in 2006 and now has

collected data on three cohorts of college-attending young adults (e.g., Ravert et al., 2009; Schwartz, Zamboanga, Weisskirch, & Rodriguez, 2009; Zamboanga et al., 2010). The MUSIC collaboration involves 75 investigators at 30 different sites in the United States. Various constructs of interest to the participating investigators were aggregated to create an assessment battery. This battery was completed by participants at each collaborator's home institutions using an internet-based data collection method. This approach allowed us to gather a larger and more diverse sample than could be collected by a single investigator at any one site. The 2008–2009 data collection, which was used in the present study, included measures of personal and cultural identity, well-being, depression and anxiety, personality, and health risk behavior.

The sample for the present study consisted of 9,515 undergraduate students (73% women, mean age 19.75 years,  $SD$  1.61) from the larger MUSIC data collection ( $N = 10,573$ ). We selected for inclusion in the present analyses only students within the young adult age range (18–25 years of age; Arnett, 2000). The present sample was 62% White, 15% Hispanic, 11% East Asian, 9% Black, and 3% South Asian. Thirty-eight percent of participants were in their first year of college, 22% were in their second year, 20% were in their third year, 12% were in their fourth year, and 8% had been in college for more than four years. Twenty percent of participants reported annual family incomes less than \$30,000, 19% between \$30,000 and \$50,000, 32% between \$50,000 and \$100,000, and 28% above \$100,000. Participants were recruited from courses in psychology, family studies, education, business, and human nutrition. At each site, participants were directed to the study website using printed and emailed announcements. Data were collected between September 2008 and October 2009.

Of the 30 sites, 15 were major state universities, eight were smaller state universities, three were major private universities, and four were private colleges. Six sites were located in the Northeast, seven in the Southeast, seven in the Midwest, three in the Southwest, and seven in the West. In total, students from colleges and universities in 20 U.S. states participated in the study. The study was approved by the Institutional Review Board at each of the participating sites. The number of participants surveyed at each site ranged from 29 to 1450, largely depending on the size of the institution and the number of classes that were available to be surveyed. The median number of participants per site was 207 (25th percentile: 73, 75th percentile: 466).

Participants logged in to the study website using their university name and student number. Both of these pieces of information were replaced with code numbers to ensure confidentiality both for individual participants and for universities, as well as to decrease the risk of

“deductive disclosure” (i.e., where data on multiple variables can be used to identify participants). The survey was divided into six separate pages, and students were permitted to save their work and resume at a later time. Of participants who initiated the survey, 85% submitted all six pages.

## Measures

### *Well-Being*

Well-being was measured in terms of subjective well-being, psychological well-being, and eudaimonic well-being. A 5-point response scale, ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), was used for each measure.

Subjective well-being was assessed using the 5-item Satisfaction with Life Scale (Pavot & Diener, 1993). This measure has been extensively validated around the world (Kuppens, Realo, & Diener, 2008). A sample item reads: “In most ways, my life is close to my ideal.” In the present dataset, Cronbach's alpha was .87.

Psychological well-being was measured using the shortened (18-item) version of the Scales for Psychological Well-Being (Ryff & Keyes, 1995). This instrument assesses the dimensions of psychological well-being identified by Ryff (1989): autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Ten items are worded in a positive direction, and eight are worded in a negative direction. A composite score for psychological well-being is created by reverse-scoring the negatively worded items and summing across the 18 items. A sample item from this instrument reads “I am quite good at managing the many responsibilities of my daily life.” In the present dataset, Cronbach's alpha for the composite score was .81.

Eudaimonic well-being was assessed using the Questionnaire on Eudaimonic Well-Being (Waterman et al., 2010). This 21-item measure taps into the extent to which respondents enjoy challenging activities, expend a great deal of effort in activities that they find personally expressive, and spend time pursuing and actualizing their personal potentials. Fourteen of the items are written in an affirmative direction, and 7 items are written in a negative direction and are reverse scored. A sample item reads “I feel I have discovered who I really am.” In the present sample, Cronbach's alpha was .87.

### *Health Risk Behaviors*

Participants were asked how many times, in the 30 days prior to assessment, they had engaged in a variety of health risk behaviors, using a 5-point scale: 0 (*Never*), 1 (*Once or Twice*), 2 (*3–5 Times*), 3 (*6–10*

*Times*), or 4 (*11 or More Times*). We asked about frequency of a number of types of illicit drug use, unsafe sexual behavior, and impaired driving. Under the heading of illicit drug use, we included items referencing five activities: marijuana use, hard drug use (e.g., methamphetamines, cocaine, crack), inhalant use, injecting drug use, and misuse of prescription drugs (i.e., any use not specifically prescribed by a doctor). Under the heading of sexual risk behaviors, we included items referencing five types of risks: oral sex, anal sex, casual sex (sex with someone whom the participant had known for less than a week), unprotected sex, and sex under the influence of alcohol or drugs. Under the heading of driving related risks were items regarding two types of risks: driving under the influence of alcohol or drugs and riding with a driver who was drunk or high.

## RESULTS

### Data Analytic Plan

Results are presented in six steps. First, we describe the sample in terms of health risk behavior incidence and frequency. Second, we computed a correlation matrix among the well-being variables to ensure that they could be collapsed into a single higher-order latent construct. Third, we conducted a confirmatory factor analysis to extract a latent well-being construct from among the three well-being variables. Fourth, we estimated a multivariate Poisson regression model in which the latent well-being variable was used to predict each of the health risk behavior variables. Fifth, we examined the

consistency across gender in the associations between well-being and health-risk behavior. Finally, we decomposed the latent well-being variable into its component indicators to identify the extent to which each of the components of well-being was related to risk behavior participation.

### Health Risk Behavior Participation

Rates of engagement in health risk behaviors in the 30 days prior to assessment are displayed for the overall sample in Table 1 and by gender in Table 2. As indicated in Table 1, the most common risk behaviors, as reported by participants, were marijuana use, oral sex, and unprotected sex (all of which were reported by at least 30% of the sample). The more serious drug use behaviors were each reported by less than 10% of the sample, as were anal and casual sex. Drunk/drugged driving and riding with an impaired driver were both reported by more than 20% of participants. Table 2 indicates that gender differences emerged for all but two of the health risk behaviors (oral sex and sex while drunk or high), and that in all but one of these cases—unprotected sex—incidence rates were higher for men.

### Correlations Among Well-Being Variables

Consistent with our expectation, correlations among the measures of the three forms of well-being were all positive and in the moderate to strong range: SWB with PWB,  $r = .60$ ; SWB with EWB,  $r = .48$ ; PWB with EWB,  $r = .65$  (all  $ps < .001$ ). These correlations were sufficiently high to justify extracting a common factor (Loehlin, 2004).

TABLE 1  
Rates of Health Risk Behavior Engagement

Behavior	Percent of Sample Reporting Engagement (Last 30 Days)				
	Never	Once/Twice	3–5 Times	6–10 Times	11+ Times
<i>Illicit Drug Use</i>					
Marijuana Use	78.8%	10.2%	4.2%	2.3%	4.6%
Hard Drug Use	95.5%	2.0%	1.0%	0.4%	0.2%
Inhalant Use	96.1%	2.0%	1.2%	0.4%	0.3%
Injecting Drug Use	97.4%	1.2%	0.9%	0.4%	0.2%
Prescription Drug Misuse	93.9%	3.3%	1.8%	0.7%	0.4%
<i>Sexual Risk Taking</i>					
Oral Sex	52.9%	21.4%	13.1%	7.0%	5.6%
Anal Sex	91.8%	5.3%	1.8%	0.7%	0.4%
Casual Sex	90.8%	5.9%	2.2%	0.7%	0.3%
Unprotected Sex	67.9%	11.7%	7.3%	4.6%	8.4%
Sex while Drunk/High	72.6%	17.6%	6.6%	2.3%	1.0%
<i>Driving Related Risks</i>					
Driving while Drunk/High	78.4%	15.2%	4.7%	1.2%	0.5%
Riding with Drunk Driver	72.9%	18.6%	5.4%	1.9%	1.2%

TABLE 2  
30-Day Health Risk Behavior Incidence Rates by Gender

<i>Behavior</i>	<i>Men (%)</i>	<i>Women (%)</i>	$\chi^2 (1)$	$\phi$
<i>Illicit Drug Use</i>				
Marijuana Use	27.4	17.9	88.38***	.10
Hard Drug Use	7.7	3.1	79.57***	.10
Inhalant Use	7.2	2.5	96.24***	.11
Injecting Drug Use	5.2	1.5	93.69***	.11
Prescription Drug Misuse	9.9	4.5	81.35***	.10
<i>Sexual Risk Taking</i>				
Oral Sex	46.9	47.1	0.02	.00
Anal Sex	11.9	6.9	53.97***	.08
Casual Sex	16.4	6.3	196.48***	.16
Unprotected Sex	29.1	34.3	19.54***	.05
Sex while Drunk/High	27.9	26.6	1.37	.01
<i>Driving Related Risks</i>				
Driving while Drunk/High	26.4	19.4	46.48***	.08
Riding with Drunk Driver	30.1	25.1	20.84***	.05

\*\*\* $p < .001$ .

### Confirmatory Factor Analysis for the Well-Being Variables

We then estimated a confirmatory factor analysis (CFA) for the well-being variables using Mplus release 4.1 (Muthén & Muthén, 2007). Because models with second-order latent variables and count outcomes are mathematically difficult to estimate (cf. Schwartz, Zamboanga, Ravert, et al., 2009), our intent was to use exploratory factor analysis (EFA) to create a composite well-being variable for use in analysis. However, we nonetheless estimated a CFA for the well-being variables for two reasons. First, EFA sometimes generates factor solutions that do not fit the data well (van Prooijen & van der Kloot, 2001) and that capitalize on chance variability (Conway & Huffcutt, 2003). Ensuring that the EFA and CFA produce the same (or similar) solutions would help to allay this concern. Second, the factor loadings from a CFA can be used to estimate the reliability of the latent construct (Fornell & Larcker, 1981), which again can bolster confidence in the factor extracted through EFA.

Because a CFA with only three indicators is saturated and does not provide fit indices, we used a parceling approach (Little, Cunningham, Shahar, & Widaman, 2002) where the item set for each measure was divided into “first” and “second” halves, and each half-set of items was summed to create a parcel. This provided six indicators for use in the CFA. Error terms for each pair of parcels created from a single measure were allowed to correlate.

Reliability for the latent variable was estimated, using the formula introduced by Fornell and Larcker (1981), as the ratio of the variance explained by the latent variable to the total variability among the indicators. Fit of

the CFA model to the data was estimated using the comparative fit index (CFI) and the non-normed fit index (NNFI), both of which compare the fit of the specified model to that of a null model with no paths or latent variables, as well as the root mean square error of approximation (RMSEA) and the square root mean residual (SRMR), which indicate the extent to which the covariance matrix implied by the model deviates from the covariance matrix observed in the data. The chi-square statistic, which tests the null hypothesis of perfect fit to the data, is reported but not used in interpretation because of the very large sample size. The sandwich estimator (Kauermann & Carroll, 2001) was used to adjust the standard errors of model parameters to control for the nesting of students within data collection sites. This higher-order well-being model fit the data well,  $\chi^2 (5) = 5.94$ ,  $p = .31$ ; CFI = 1.00; NNFI = 1.00; RMSEA = .026 (90% CI = .000 to .090; close-fit  $p$ -value = .65); SRMR = .029. Factor loadings ranged from .67 to .90 (mean .76), and the reliability for the latent construct was .90.

### The Latent Well-Being Construct as a Predictor of Health Risk Behaviors

The next step of analysis was to regress each of the health risk behaviors on the latent well-being variable. This analysis was conducted in a structural equation modeling framework so that all of the risk behaviors could be incorporated into a single model—thereby avoiding inflated Type 1 error associated with multiple-testing issues. As stated previously, because of computational difficulties in using second-order latent variables as predictors in Poisson regression models (cf. Schwartz, Zamboanga, Weisskirch, et al., 2009), we used exploratory factor analysis to create a latent well-being composite from among SWB, PWB, and EWB, to use in predicting the risk behavior variables. A single factor was extracted (eigenvalue 1.77, 58.9% of variability explained). Paths were then estimated from the latent well-being factor to each of the health risk behaviors (cf. Ravert et al., 2009; Schwartz, Zamboanga, Ravert et al., 2009). Again, the sandwich estimator was used to control for the effects of multi-level nesting.

Many of the health risk behaviors were comparatively infrequent; that is, they were reported by less than 25% of the sample. Given that we assessed engagement in these behaviors within a relatively short time frame (30 days), these low levels of risk behavior engagement are not entirely surprising. Because there was very little variability in these behaviors (i.e., the vast majority of responses are zero), it is quite difficult to obtain statistically or practically significant findings with them (Coxe, West, & Aiken, 2009). As a result, we utilized

zero-inflated Poisson (ZIP) modeling (Atkins & Gallop, 2007) for all of the risk behavior outcomes. In a ZIP model, the zero responses are modeled separately from the nonzero count data – which allows for detection of significant patterns that would otherwise be obscured by the preponderance of zero responses. The count variable is split into two parts: (a) an incidence variable, a binary indicator reflecting whether or not the person engaged in the behavior in question; and (b) a frequency of engagement variable reflecting the number of times the person engaged in the behavior. For those participants reporting no engagement in the behavior in question, the count variable is specified as missing.<sup>1</sup> The use of ZIP models also allowed us to examine predictors of both incidence and frequency of engagement in each behavior.

In ZIP models, path coefficients for count variables are interpreted as incidence rate ratios (IRR), which represent the multiplicative increase in the expected count with each 1 *SD* increase in the latent well-being variable. Path coefficients for the binary indicators for ZIP models are interpreted as odds ratios (OR), which represent the multiplicative increase/decrease in the odds of event occurrence with each 1 *SD* increase in the latent well-being variable. For both OR and IRR, values below 1 indicate a negative relationship, a value of 1 indicates no relationship, and values above 1 indicate a positive relationship. In accordance with current practices in reporting of results, 95% confidence

intervals are provided for each OR and IRR value. Statistically significant values are those for which the confidence interval does not include 1.

Results of the ZIP model are presented in two parts—results for incidence in Table 3 and results for frequency of engagement in Table 4. As noted earlier, participants reporting no engagement are not included in the frequency analyses. The frequency analyses examine the *extent* of engagement among those individuals who have participated in the behavior, and these analyses help to distinguish between people who may be experimenting and those who engage in the behavior more regularly.

In terms of *incidence*, the latent well-being variable was significantly and negatively associated with the incidence of all of the illicit drug use behaviors; with oral sex, anal sex, and unprotected sex in the sexual risk taking category; but not to either of the driving-related risk behaviors. In terms of *frequency*, the latent well-being variable was not related to the frequency of engagement in any of the illicit drug use behaviors. In the sexual risk taking category, well-being was significantly and negatively related to the frequency of engagement in casual sex, but it was also significantly and positively related to frequency of unprotected sex. For driving related risks, the latent variable was significantly and negatively related to frequency of both driving while drunk/high and riding with a driver who was drunk or high.

### Testing for Invariance across Gender

As the next step of analysis, we examined the extent to which the model would fit equally across gender. We did so by comparing the fit of two models to the data: (a) an unconstrained model in which each path coefficient from well-being to the health risk behavior outcomes was allowed to vary freely across gender against; and (b) a constrained model in which path coefficients were constrained equal across gender. A non-significant difference in fit between these two models would suggest that the model fits equivalently across gender. In ZIP models (and other models with count variables), invariance tests are conducted by comparing the  $-2 \log$  likelihood values from the constrained versus unconstrained models. This test is conducted as a chi-square analysis, with degrees of freedom equal to the difference in the number of parameters between the two models.

For the present study, the analysis indicated a significant degree of non-equivalence across gender,  $\Delta\chi^2(20) = 113.92, p < .001$ . We therefore examined each path for consistency across gender. The results of these analyses for incidence and frequency are reported in Table 5. Although there is no established standard for comparing odds ratios or incidence rate ratios, in interpreting the gender differences we consider a difference of .10 or

<sup>1</sup>ZIP models are set up by recoding the original variable into two new variables: a dichotomous (incidence) indicator reflecting whether or not the person engaged in the risk behavior; and a count (frequency) variable reflecting the number of times the person engaged in the behavior. For individuals who indicate no engagement in the behavior, the count (frequency) variable is set to the system-missing value. Frequency is therefore analyzed only for individuals who have reported at least some engagement in the behavior in question.

The Mplus software, which we used to conduct the ZIP models, contains a macro for doing this so that the ZIP model does not need to be set up manually. In the statement where variables are labeled as counts (indicating that Poisson regression should be used for these variables), zero-inflated variables are labeled with the notation (i). For example, in the statement

```
COUNT ARE SEXRISK (i) DRUGRISK;
```

The variable SEXRISK is labeled as a zero-inflated count variable, whereas the variable DRUGRISK is labeled as a standard count variable (with no zero-inflation).

Then, in the model statement, two lines of code are used for ZIP variables. The notation “#1” is used to label the incidence variable – for example:

```
SEXRISK#1 ON WELLBNG;
SEXRISK ON WELLBNG;
```

Here, the incidence and frequency variables, respectively, for sexual risks are regressed on the well-being composite.

Both the odds ratio (for incidence) and the incidence rate ratio (for frequency) are computed by taking the exponential (inverse natural logarithm) of the unstandardized regression coefficients in the Mplus output.

TABLE 3  
Health Risk Behavior Incidence by Well-Being Latent Construct and Indicator Variables

Behavior	Latent Variable OR (95% CI)	Subjective Well-Being OR (95% CI)	Psychological Well-Being OR (95% CI)	Eudaimonic Well-Being OR (95% CI)
<i>Illicit Drug Use</i>				
Marijuana Use	0.64*** (0.55–0.75)	0.92 (0.96–1.02)	0.80*** (0.72–0.89)	0.82*** (0.74–0.91)
Hard Drug Use	0.25*** (0.18–0.35)	1.00 (0.87–1.14)	0.44*** (0.38–0.51)	0.76** (0.62–0.94)
Inhalant Use	0.21*** (0.15–0.30)	0.96 (0.79–1.17)	0.36*** (0.30–0.43)	0.98 (0.91–1.06)
Injecting Drug Use	0.09*** (0.04–0.19)	1.09 (0.83–1.42)	0.21*** (0.15–0.29)	0.65* (0.47–0.90)
Prescription Drug Misuse	0.38*** (0.31–0.47)	0.85 (0.70–1.03)	0.58*** (0.48–0.70)	0.96 (0.80–1.16)
<i>Unsafe Sexual Behavior</i>				
Oral Sex	0.87* (0.77–0.99)	1.14* (1.01–1.30)	0.85* (0.75–0.98)	0.96 (0.85–1.08)
Anal Sex	0.60*** (0.46–0.78)	0.93 (0.78–1.11)	0.61*** (0.48–0.77)	1.02 (0.82–1.26)
Casual Sex	0.67 (0.41–1.09)	1.12 (0.92–1.37)	0.50*** (0.40–0.61)	0.93 (0.78–1.10)
Unprotected Sex	0.82*** (0.74–0.91)	1.04 (0.95–1.13)	0.79*** (0.71–0.87)	1.04 (0.96–1.12)
Sex While Drunk/High	0.86 (0.68–1.11)	1.21* (1.01–1.44)	0.90* (0.70–0.99)	0.92 (0.71–1.18)
<i>Impaired Driving</i>				
Driving While Drunk/High	0.90 (0.67–1.20)	1.03 (0.64–1.64)	0.85 (0.65–1.12)	1.15 (0.69–1.90)
Riding with Impaired Driver	0.83 (0.62–1.10)	1.07 (0.83–1.39)	0.73*** (0.61–0.88)	0.97 (0.78–1.21)

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

greater in the corresponding odds ratios or incidence rate ratios as important. This specification seemed appropriate, given that with such a large sample size, much smaller differences would likely have emerged as statistically significant. Results indicated that the latent well-being variable was more strongly and inversely related to incidence of engagement in seven of the 12 health risk behaviors for men compared to women (hard drug use, inhalant use, injecting drug use, prescription drug misuse, and casual sex, sex while drunk/high, and riding with an impaired driver). For hard drug use, inhalant use, and anal sex, frequency of engagement was more strongly related to well-being for women (see Table 5).

These results suggest that well-being is especially critical in protecting college-attending young adults from dangerous drug use – but more so for men than for women. For incidence, the odds ratios indicate that, for men, each standard-deviation increase in well-being is associated with a 63% decrease in the risk of misusing prescription drugs, 72% and 76% decreases in the risk of using hard drugs and inhalants, respectively, and a 90% decrease in the risk of using injecting drugs. The associations for women are also strong, but somewhat less so – with each standard-deviation increase in well-being, the risk for misusing prescription drugs decreases by 43%, the risk for using hard drugs decreases by 58%,

TABLE 4  
Health Risk Behavior Frequency by Well-Being Latent Construct and Indicator Variables

Behavior	Latent Variable IRR (95% CI)	Subjective Well-Being IRR (95% CI)	Psychological Well-Being IRR (95% CI)	Eudaimonic Well-Being IRR (95% CI)
<i>Illicit Drug Use</i>				
Marijuana Use	0.90 (0.96–1.02)	1.00 (0.93–1.07)	1.09 (0.99–1.19)	0.88* (0.80–0.97)
Hard Drug Use	0.97 (0.75–1.25)	1.03 (0.86–1.23)	0.90 (0.73–1.11)	0.85 (0.69–1.06)
Inhalant Use	0.99 (0.77–1.29)	0.96 (0.82–1.14)	0.96 (0.77–1.20)	0.76** (0.62–0.93)
Injecting Drug Use	1.12 (0.88–1.42)	1.09 (0.86–1.37)	0.87 (0.68–1.12)	0.90 (0.60–1.36)
Prescription Drug Misuse	0.95 (0.77–1.17)	0.97 (0.82–1.15)	0.99 (0.85–1.15)	0.82* (0.69–0.98)
<i>Unsafe Sexual Behavior</i>				
Oral Sex	1.00 (0.97–1.03)	1.01 (0.97–1.05)	0.99 (0.95–1.03)	1.04* (1.01–1.09)
Anal Sex	0.89 (0.75–1.07)	1.02 (0.85–1.23)	0.81*** (0.72–0.91)	1.05 (0.88–1.24)
Casual Sex	0.65*** (0.52–0.81)	1.03 (0.90–1.17)	0.72*** (0.63–0.84)	0.95 (0.78–1.14)
Unprotected Sex	1.05*** (1.03–1.07)	1.03 (0.97–1.09)	1.04 (0.99–1.10)	1.02 (0.98–1.06)
Sex While Drunk/High	0.87 (0.68–1.11)	1.01 (0.94–1.09)	0.90* (0.83–0.98)	0.90 (0.80–1.02)
<i>Impaired Driving</i>				
Driving While Drunk/High	0.68*** (0.63–0.74)	1.03 (0.82–1.28)	0.70*** (0.62–0.79)	0.83 (0.65–1.06)
Riding with Impaired Driver	0.76*** (0.71–0.81)	0.98 (0.87–1.11)	0.92 (0.82–1.03)	0.84** (0.74–0.95)

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

TABLE 5  
Differences in Well-Being-Health Risk Behavior  
Associations by Gender

Behavior	Men OR/IRR (95% CI)	Women OR/IRR (95% CI)
<i>Illicit Drug Use</i>		
<i>Marijuana Use</i>		
Incidence	0.57*** (0.50–0.66)	0.66*** (0.60–0.74)
Frequency	1.01 (0.91–1.12)	1.03 (0.94–1.12)
<i>Hard Drug Use</i>		
Incidence	0.28*** (0.22–0.35)	0.42*** (0.32–0.52)
Frequency	0.98 (0.84–1.14)	0.76** (0.62 to 0.94)
<i>Inhalant Use</i>		
Incidence	0.24*** (0.19–0.31)	0.38*** (0.30–0.48)
Frequency	0.92 (0.74–1.14)	0.72** (0.57–0.90)
<i>Injecting Drug Use</i>		
Incidence	0.10*** (0.06–0.17)	0.22*** (0.14–0.34)
Frequency	1.49* (1.04–2.14)	0.80 (0.50–1.10)
<i>Prescription Drug Misuse</i>		
Incidence	0.37*** (0.26–0.51)	0.57*** (0.46–0.71)
Frequency	0.93 (0.76–1.13)	0.80 (0.64–1.01)
<i>Sexual Risk Taking</i>		
<i>Oral Sex</i>		
Incidence	0.84* (0.73–0.97)	0.92 (0.82–1.04)
Frequency	1.01 (0.95–1.07)	1.04* (1.01–1.08)
<i>Anal Sex</i>		
Incidence	0.52*** (0.40–0.67)	0.60*** (0.45–0.80)
Frequency	0.92 (0.83–1.02)	0.82* (0.69–0.99)
<i>Casual Sex</i>		
Incidence	0.42*** (0.32–0.57)	0.69*** (0.54–0.89)
Frequency	0.81* (0.66–0.99)	0.51*** (0.42–0.63)
<i>Unprotected Sex</i>		
Incidence	0.79** (0.68–0.91)	0.84*** (0.77–0.93)
Frequency	1.05 (0.98–1.13)	1.10*** (1.06–1.13)
<i>Sex while Drunk/High</i>		
Incidence	0.74* (0.55–0.98)	0.98 (0.90–1.11)
Frequency	0.89 (0.76–1.05)	0.82*** (0.76–0.90)
<i>Driving Related Risks</i>		
<i>Driving while Drunk/High</i>		
Incidence	1.16 (0.83–1.63)	0.94 (0.75–1.18)
Frequency	0.66*** (0.56–0.78)	0.62*** (0.52–0.73)
<i>Riding with Impaired Driver</i>		
Incidence	0.64*** (0.51–0.80)	0.75*** (0.63–0.89)
Frequency	0.83** (0.72–0.94)	0.81*** (0.74–0.90)

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

the risk for using inhalants decreases by 62%, and the risk for using injecting drugs decreases by 78%.

For the more risky sexual behaviors—anal, casual, and unprotected sex—reductions in risk for men were also greater than the corresponding reductions for women. For men, with each standard-deviation increase in well-being, the risk for unprotected sex decreases by 21%, the risk for anal sex is halved, and the risk for casual sex decreases by nearly 60%. Corresponding

reductions in risk for women are 16% for unprotected sex, 40% for anal sex, and 31% for casual sex. Again, the benefits of increased well-being appear to be especially critical for men.

For driving-related risks, well-being was related to incidence of riding with an impaired driver for both genders, and with reductions in frequency of both drunken/drugged driving and riding with an impaired driver for both genders. For each standard-deviation increase in well-being, the incidence of riding with an impaired driver decreases by 36% for men and by 25% for women. The frequency of riding with an impaired driver also decreases, albeit modestly (between 17% and 19%), for both genders given a standard-deviation increase in well-being. The frequency of drunken/drugged driving decreases by 34% for men and by 38% for women, given a 1 *SD* increase in well-being.

### SWB, PWB, and EWB as Predictors of Health Risk Behaviors

To explore the unique contributions of the individual well-being variables, we reconducted the zero-inflated Poisson regression model with SWB, PWB, and EWB entered together as predictors. In regression-based formats, the contribution of each predictor to a dependent variable is evaluated controlling for all other predictors in the model (Keith, 2006). As a result, these zero-inflated Poisson regression analyses allowed us to examine the relative contributions of SWB, PWB, and EWB to incidence and frequency of each of the health risk behaviors and, therefore, served as a follow-up to the primary analyses using the latent well-being variable.

Although these three forms of well-being were fairly strongly correlated with one another ( $r$ s ranged from .47 to .65, all  $p$ s < .001), multicollinearity did not appear to be a problem. As shown in Tables 3 and 4, PWB was significantly and negatively related to incidence of all five illicit drug use behaviors, all five sexual risk behaviors, and riding with an impaired driver. EWB was negatively related to incidence of marijuana, hard drug, and injecting drug use, but not to any of the sexual risk or impaired driving behaviors. SWB was not significantly associated with incidence of any of the health risk behaviors.

For frequency of engagement, SWB was negatively related to frequency of casual sex, driving while drunk or high, and riding with an impaired driver. SWB was also positively associated with frequency of unprotected sex. PWB was negatively related to frequency of anal sex, casual sex, sex while drunk or high, and driving while drunk or high. Neither SWB nor PWB was significantly associated with frequency of any of the illicit drug use behaviors. EWB was negatively related to frequency of marijuana use, inhalant use, prescription drug use,

and riding with an impaired driver; but, it was positively associated with frequency of oral sex.

## DISCUSSION

### The Relationship of Well-Being to Health Risk Behaviors

The present study was designed to evaluate whether well-being, both as a higher-order construct and as a set of first-order constructs, would relate to engagement in health risk behaviors among a sample of college-attending young adults. Our first hypothesis predicted that there would be a negative relationship of well-being with the incidence of participation in health risk behaviors and, among those engaging in a given behavior, with the frequency of engagement. In support of this hypothesis, the latent well-being variable was a significant negative predictor of past-30-day incidence for 8 of the 12 risk behaviors studied. Among those engaging in a given health risk behavior, the frequency of occurrence was significantly and negatively related to the latent well-being variable for 3 of the 12 behaviors. In one instance, unprotected sex, the latent variable was positively associated with the frequency of risk taking. This finding may reflect the likelihood of individuals with high well-being to be involved in exclusive romantic relationships. It is interesting to note that the latent variable was significantly and negatively associated with the frequency of engagement for three of the four risk behaviors where the latent variable was not significantly related to incidence. Thus, for all of the health risks except engaging in sex while drunk or high, the latent well-being variable appeared to serve some protective function. This pattern of findings suggests that feeling satisfied with one's life, doing well with regard to one's personal growth and relationships with others, and discovering and actualizing one's life purpose may help to steer young people away from health-compromising activities. Past research has found that self-esteem may be inversely associated with participation in casual sex and other risky sexual behaviors (Dawson, Shih, Moor, & Shrier, 2008). This pattern may generalize to well-being as well.

Our second hypothesis predicted that well-being would be most strongly and negatively related to more dangerous risk behaviors, and less strongly related to behaviors carrying milder potential adverse consequences. This hypothesis received partial support; the strongest negative associations of well-being with health risk behaviors were found for several of the behaviors with the most severe risk, especially those in the illicit drug use category (i.e., hard drug use, inhalant use, injecting drug use, and prescription drug misuse). For

driving-related risks, the latent well-being variable was unrelated to incidence but was strongly negatively related to frequency of engagement. Also, consistent with our hypothesis, the frequency and incidence of marijuana use and oral sex were only weakly related to well being. These findings are consistent with the supposition that less dangerous behaviors are likely to be undertaken as a form of exploration or experimentation that is characteristic of young adulthood (Arnett, 2005; Bell, Forthun, & Sun, 2000), but that chronic engagement in risk behaviors, or engagement in more dangerous behaviors, is more likely to be undertaken by individuals low in well-being and who may wish to self-medicate or to harm themselves.

### Gender, Category of Risk-Taking, and Type of Well-Being as Moderator Variables

Three additional research questions were also addressed in this study. These research questions referred to differences across gender, category of risk behavior, and dimension of well-being in the strengths of associations between well-being and health risk behaviors. Regarding differences across gender, significant differences were found for both incidence and frequency of engagement. The overall patterns of relationships were similar; but, associations between well-being and risk behavior incidence tended to be somewhat stronger for men than for women, whereas the associations between well-being and frequency of hard drug use, anal sex, and casual sex were stronger for women than for men. The incidence rates for many risk behaviors tend to be higher for boys and men than for girls and women (e.g., Centers for Disease Control and Prevention, 2009; Johnston, O'Malley, Bachman, & Schulenberg, 2010). It may be that the increased prevalence of risk behaviors for men provides more opportunities for well-being to protect against engagement in these behaviors. The weaker association of well-being with casual and anal sex for men than for women may reflect the fact that these behaviors are more common (and perhaps somewhat normative) among homosexual men. To the extent that these behaviors are more normative among certain subgroups, they may be less likely to be associated with motives (e.g., self-medication, self-harm) that are incompatible with high well-being.

Regarding type of risk behavior (e.g., illicit drug use, unsafe sexual behavior, impaired driving), the inverse association between well-being and health risk behavior was relatively strong for incidence of illicit drug use, significant but more modest for some (but not all) types of sexual risk taking, and nonsignificant for driving-related risks. In contrast, for frequency of engagement, the relationship between well-being and health risk behaviors showed the opposite pattern (i.e., strongest for

the frequency of engagement in driving-related risks, modest for sexual risk taking, and nonsignificant for illicit drug use). These opposing patterns speak to the complexity of factors relating to health-related risks of varying types. It may be that well-being contraindicates, at least to some extent, use of dangerous drugs, but that young adults may drive while intoxicated (or ride with an impaired driver) regardless of their level of well-being. Engaging in these activities on occasional basis may involve finding transportation home from a party or other social event after having consumed alcohol, for example. However, individuals low in well-being may be more likely to engage in risky driving practices on a more chronic or repeated basis. Such a pattern of behavior may reflect a lack of regard for personal safety, a lack of investment and concern for one's future, or even perhaps an explicit desire to harm oneself.

Finally, with regard to dimension of well-being, parallel findings were observed for all of the well-being measures across the array of health risk behaviors, but the strength of the relationships varied somewhat based on the nature of the behaviors being considered. In general, for incidence of health risk behaviors, psychological well-being evidenced the strongest negative relationships, with eudaimonic well-being significantly related only to some of the illicit drug use behaviors. Subjective well-being showed no significant associations with incidence of any of the risk behaviors, and, in fact, the only significant relationships that emerged involving SWB were positive (with oral sex and with sex while drunk or high).

The findings for frequency were similar to, but weaker than, those for incidence. PWB and EWB each evidenced four negative associations with risk behavior frequency: PWB with anal sex, casual sex, sex while drunk or high, and driving while drunk or high; and EWB with marijuana use, inhalant use, prescription drug misuse, and riding with an impaired driver. Similar to the case with incidence, SWB was not significantly related to frequency of any of the risk behaviors.

This pattern of findings for incidence suggests that, among college-attending young adults, those who perceive themselves as "doing well" in life—feeling in control over their lives and enjoying satisfying relationships with others—are least likely to engage in risky behaviors. Having a clear sense of purpose, meaning, and direction in one's life (i.e., EWB) appears to add some degree of protection, beyond that conferred by PWB, against marijuana use, hard drug use, and injecting drug use, but not against any of the sexual or driving-related risk behaviors. For those individuals who do engage in risky behaviors, the demarcation between experimentation and chronic engagement appears to be, at least to some extent, associated with "doing well" in life and having a clear sense of purpose and direction.

Individuals who believe that they have more to lose through repeated participation in risky behaviors may be more likely to abstain from these behaviors or to limit their engagement to occasional or experimental levels. Feeling content with one's life (i.e., SWB) does not appear to contribute to risk behavior incidence or frequency independent of its overlap with PWB and EWB.

### Implications for the Development of Intervention Programs

An analysis of the motivation for engaging in health risk behaviors suggests that such risk-taking may be functional; that is, it serves a purpose for the individual. In some cases, this purpose or motivation involves exploration or thrill seeking (Arnett, 1996; Ravert et al., 2009), whereas in other cases it may involve self-medication (Colder, 2001; Suh et al., 2008) or self-harm (Kelly et al., 2005; Scourfield et al., 2008). Intervention programs are likely to be substantially more effective if they address the motivational structure and individual factors that contribute to risk-taking. The results of the present study suggest that well-being in its various forms is generally protective against risk-taking in young adults who attend college. Based on the definitions of SWB, PWB, and EWB, individuals high in well-being are likely to perceive their lives as more interesting, meaningful, rewarding, and purposeful. Because all of the forms of well-being examined here involve happiness and contentment (Diener et al., 2009; Ryff & Singer, 2008; Waterman, 2004, 2008), individuals higher in well-being may not need to engage in health risks to alleviate boredom or to self-medicate and would likely lack the impetus to harm themselves. Promoting well-being, in any of its forms, may represent one route for creating conditions under which life is perceived to be more interesting, rewarding, and purposeful, and for decreasing the likelihood or frequency of engaging in behaviors associated with severe risks.

It should be acknowledged that creating stable, long-term changes in well-being is not an easy undertaking. The conditions determining a person's level of PWB and EWB potentially originate earlier in life in contexts of family, peers, and community (e.g., Maynard & Harding, 2010). This complexity makes community-wide prevention efforts or interventions targeted to at-risk populations difficult, but not impossible. For example, programs designed to improve parenting practices, promote successful school performance, and reduce bullying in schools should have beneficial consequences with respect to SWB and PWB and, therefore, may decrease subsequent rates of health risk behaviors. Motivational interviewing techniques, which are designed to promote self-awareness and self-monitoring

(Branscum & Sharma, 2010), might also be expanded to include consideration of activities or pursuits that promote SWB and PWB. Programs in schools designed to help students identify and develop their areas of special interest and talent are likely to promote EWB (cf. Schwartz, Kurtines, & Montgomery, 2005), thereby providing a similar benefit with respect to health risk behaviors.

Based on the linkage of well-being with health risk behaviors, prevention efforts directed at improving levels of well-being among those already identified as engaged in health risk behaviors may hold particular promise. However, a focus on well-being should not be considered an alternative to risk-avoidance education and other approaches for addressing risky behaviors, but rather as a complement to more traditionally-oriented prevention strategies. Programs designed to help participants currently or recently engaging in health risk behaviors to identify and develop their interests and latent talents, to foster a sense of purpose and meaning in life, and, more broadly, to promote personal growth, may have the effect of increasing overall well-being with salutary benefits for future reductions in risk-taking.

### Limitations

The present results should be interpreted in light of several important limitations. First, although we hypothesized that well-being would serve as an antecedent to health risk behavior, the cross-sectional design that we used did not allow us to test this directly. It is possible, for example, that individuals may have felt regret following engagement in risk behavior (e.g., Eshbaugh & Gute, 2008). Such a pattern could potentially explain the negative relationship between well-being and risk behavior, particularly regarding casual sex (Grello et al., 2006). It is unclear, however, whether such regrets would also accompany illicit drug use or intoxicated driving—and no published research has examined this potential explanation. Longitudinal research is clearly needed to explore the directionality of the associations between well-being and risk behaviors. To be sure, it would not be surprising if there were reciprocal links between well-being and health risks.

It is also possible that third variables, such as successful parenting behaviors (both past and current), may be potentially responsible both for the increased levels of well-being and for reductions in the likelihood of engaging in health risk behaviors. Such third variables may be responsible for the associations found here between well-being and health risks. Given that experimental intervention studies can be used to ascertain the effects of one variable on another (Poulin, Dishion, & Burraston, 2001), work directed toward developing

and evaluating intervention techniques for promoting well-being can help to more definitively determine the strength and direction of the linkage between well-being and health-related risks.

Second, the use of a college student samples may have systematically excluded certain types of participants, such as those from lower income brackets and those with educational, social, or financial difficulties. It is important to ascertain whether the findings from the present study generalize to the “forgotten half” (Halperin, 2001) of young adults who do not attend college or university. Nonetheless, individuals who attend college at some point in their late teens or twenties represent a large segment of that age group. Likewise, risk taking by college students imposes costs to society, and, as a result, efforts to identify and better understand factors that protect against risk in that group could prove beneficial.

A third limitation involves the use of self-reports of risk behaviors. Individuals may underreport or overreport risk behavior engagement for a number of reasons. Studies also differ in terms of how some of the risk behaviors are defined such as casual sex (e.g., what delineates casual or “hook-up” sex from sexual activity within a stable relationship) and drunk driving (e.g., how the driver’s level of impairment is determined). Future research should involve more in-depth efforts to gather biological or collateral information about participants’ risk behaviors in smaller and more intensively studied samples. On the positive side, there is evidence that gathering information about sensitive or illegal behaviors through confidential, computerized surveys leads to more honest reporting compared to paper-pencil or interview-based assessments (Turner et al., 1998) and may be more appropriate for college student samples (Naus, Philipp, & Samsi, 2009). Thus, the approach used in the present study may have helped to overcome some of the methodological shortcomings traditionally associated with self-reports.

### CONCLUSIONS

Despite these and other potential limitations, the present results have opened a line of research on well-being as a potential mechanism for preventing or reducing health-compromising behavior in college-attending young adults. In particular, addressing the growing problem of dangerous drug use, including misuse of prescription drugs, is a key element of the United States government’s strategy for improving the health of the public (Department of Health and Human Services, 2008). Moreover, illicit drug use, sexual risk-taking behaviors, and driving related risks are associated with the leading behaviorally based causes of death in the United States

(e.g., drug overdoses, HIV, automobile accidents; Mokdad et al., 2004). If helping individuals develop a stronger sense of life satisfaction, fulfillment, self-actualization, and a sense of life purpose can contribute even modestly to preventing these outcomes, then promoting well-being may be an important goal for prevention and intervention programs. It remains for further research to examine how such interventions might be designed and the extent to which they might achieve their intended goal.

## REFERENCES

- Arnett, J. J. (1996). Sensation seeking, aggressiveness, and adolescent reckless behavior. *Personality and Individual Differences, 20*, 693–702.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469–480.
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues, 34*, 235–254.
- Atkins, D. C., & Gallop, R. J. (2007). Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology, 21*, 726–735.
- Bell, N. J., Forthun, L. F., & Sun, S. (2000). Attachment, adolescent competencies, and substance use: Developmental considerations in the study of risk behaviors. *Substance Use and Misuse, 35*, 1177–1206.
- Berten, H., & van Rossem, R. (2009). Doing worse but knowing better: An exploration of the relationship between HIV/AIDS knowledge and sexual behavior among adolescents in Flemish secondary schools. *Journal of Adolescence, 32*, 1303–1319.
- Bolton, J. M., Robinson, J., & Sareen, J. (2009). Self-medication of mood disorders with alcohol and drugs in the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Affective Disorders, 115*, 367–375.
- Branscum, P., & Sharma, M. (2010). A review of motivational interviewing-based interventions targeting problematic drinking among college students. *Alcoholism Treatment Quarterly, 28*, 63–77.
- Calafat, A., Androver-Roig, D., Blay, N., Juan, M., Bellis, M., Hughes, K., . . . Kokkevi, A. (2009). Which young people accept a lift from a drunk or drugged driver? *Accident Analysis and Prevention, 41*, 703–709.
- Carter, A. C., Brandon, K. O., & Goldman, M. S. (2010). The college and non-college experience: A review of the factors that influence drinking behavior in young adulthood. *Journal of Studies on Alcohol and Drugs, 71*, 742–750.
- Centers for Disease Control, and Prevention. (2009). *HIV/AIDS surveillance report, vol. 18: Cases of HIV infection and AIDS in the United States and dependent areas, 2007*. Atlanta, GA: U.S. Department of Health and Human Services.
- Chou, S. P., Grant, B. F., Dawson, D. A., Stinson, F. S., Saha, T., & Pickering, R. P. (2005). Twelve-month prevalence and changes in driving after drinking: United States, 1991–1992 and 2001–2002. *Drug and Alcohol Dependence, 80*, 223–230.
- Christopherson, B. B., Jones, R. M., & Sales, A. P. (1988). Diversity in reported motives for substance use as a function of ego identity development. *Journal of Adolescent Research, 3*, 141–152.
- Colder, C. R. (2001). Life stress, physiological and subjective indices of negative emotionality, and coping reasons for drinking: Is there evidence for a self-medication model for alcohol use? *Psychology of Addictive Behaviors, 15*, 237–245.
- Conway, J. M., & Huffcutt, A. I. (2003). A review and evaluation of exploratory factor analysis practices in organizational research. *Organizational Research Methods, 6*, 147–168.
- Coxe, S., West, S. G., & Aiken, L. S. (2009). The analysis of count data: A gentle introduction to Poisson regression and its alternatives. *Journal of Personality Assessment, 91*, 121–136.
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety: Experiencing flow in work and play* (2nd ed). San Francisco, CA: Jossey-Bass.
- Dawson, L. H., Shih, M., Moor, C., & Shrier, L. (2008). Reasons why adolescents and young adults have sex: Associations with psychological characteristics and sexual behavior. *Journal of Sex Research, 45*, 225–232.
- Department of Health, and Human Services. (2008). *Progress review: Substance abuse*. Retrieved from <http://www.healthypeople.gov/data/2010prog/focus26/>
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–595.
- Diener, E., Scollon, C. N., & Lucas, R. E. (2009). The evolving concept of subjective well-being: The multifaceted nature of happiness. In E. Diener (Ed.), *Assessing well-being: The collected works of Ed Diener* (pp. 67–100). New York, NY: Springer.
- Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., Moffitt, T. E., & Caspi, A. (2005). Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychological Science, 16*, 328–335.
- Durkin, J., & Joseph, S. (2009). Growth following adversity and its relation with subjective well-being and psychological well-being. *Journal of Loss and Trauma, 14*, 228–234.
- Eshbaugh, E. M., & Gute, G. (2008). Hookups and sexual regret among college women. *Journal of Social Psychology, 148*, 77–89.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research, 18*, 382–388.
- Getz, J. G., & Bray, J. H. (2005). Predicting heavy alcohol use among adolescents. *American Journal of Orthopsychiatry, 75*, 102–116.
- Green, C. A., Freeborn, D. K., & Polen, M. K. (2001). Gender and alcohol use: The roles of social support, chronic illness, and psychological well-being. *Journal of Behavioral Medicine, 24*, 383–399.
- Grello, C. M., Welsh, D. P., & Harper, M. S. (2006). No strings attached: The nature of casual sex in college students. *Journal of Sex Research, 43*, 255–267.
- Halperin, S. (Ed.) (2001). *The forgotten half revisited: American youth and young families, 1988–2008*. Washington, DC: American Youth Policy Forum.
- Haring, M. J., & Stock, W. A. (1984). A research synthesis of gender and social class correlates of subjective well-being. *Human Relations, 37*, 645–657.
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York: Guilford.
- Havighurst, R. J. (1952). *Developmental tasks and education*. New York, NY: David McKay.
- Hustad, J. T. P., Barnett, N. P., Borsari, B., & Jackson, K. M. (2010). Web-based alcohol prevention for incoming college students: A randomized controlled trial. *Addictive Behaviors, 35*, 183–189.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenburg, J. E. (2010). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2009 (NIH Publication No. 09-7401)*. Bethesda, MD: National Institute on Drug Abuse.
- Kauermann, G., & Carroll, R. J. (2001). A note on the efficiency of sandwich covariance matrix estimation. *Journal of the American Statistical Association, 96*, 1387–1396.
- Keith, T. Z. (2006). *Multiple regression and beyond*. New York, NY: Guilford.
- Kelly, D. B., Rollings, A. L., & Harmon, J. G. (2005). Chronic self-destructiveness, hopelessness, and risk taking in college students. *Psychological Reports, 96*, 920–924.

- Keyes, C. L. M. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73*, 539–548.
- Koivumaa-Honkanen, H., Kaprio, J., Honkanen, R., Viinamäki, H., & Koskenvuo, M. (2004). Life satisfaction and depression in a 15-year follow-up of healthy adults. *Social Psychiatry and Psychiatric Epidemiology, 39*, 994–999.
- Kuppens, P., Realo, A., & Diener, E. (2008). The role of positive and negative emotions in life satisfaction judgment across nations. *Journal of Personality and Social Psychology, 95*, 66–75.
- Larimer, M. E., Kilmer, J. R., & Lee, C. M. (2005). College student drug prevention: A review of individually oriented prevention strategies. *Journal of Drug Issues, 35*, 431–456.
- Lindberg, L. D., Jones, R., & Santelli, J. S. (2008). Noncoital sexual activities among adolescents. *Journal of Adolescent Health, 43*, 231–238.
- Linley, P. A., Maltby, J., Wood, A. M., Osborne, G., & Hurling, R. (2009). Measuring happiness: The higher-order factor structure of subjective and psychological well-being measures. *Personality and Individual Differences, 47*, 878–884.
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151–173.
- Loehlin, J. C. (2004). *Latent variable models* (4th ed.). Mahwah, NJ: Erlbaum.
- Luyckx, K., Schwartz, S. J., Goossens, L., Beyers, W., & Missotten, L. (in press). Personal identity in the making: A process-oriented model of identity formation and evaluation. In S. J. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of identity theory and research*. New York, NY: Springer.
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*, 803–855.
- Martens, M. P., Pedersen, E. R., LaBrie, J. W., Ferrier, A. G., & Cimini, M. D. (2007). Measuring alcohol-related protective behavioral strategies among college students: Further examination of the Protective Behavioral Strategies Scale. *Psychology of Addictive Behaviors, 21*, 307–315.
- Maynard, M. J., & Harding, S. (2010). Perceived parenting and psychological well-being in U.K. ethnic minority adolescents. *Child Care, Health, and Development, 36*, 630–638.
- Minehan, J. A., Newcomb, M. D., & Galaif, E. R. (2000). Predictors of adolescent drug use: Cognitive abilities, coping strategies, and purpose in life. *Journal of Child and Adolescent Substance Abuse, 10*(2), 33–52.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association, 291*, 1238–1245.
- Montgomery, F. H., Leu, M. C., Montgomery, R. L., Nelson, M. D., & Sirdeshmukh, M. (2006). Use of a virtual reality driving simulator as an alcohol abuse prevention approach with college students. *Journal of Alcohol and Drug Education, 50*(3), 31–40.
- Moore, N. B., & Davidson, J. K. Sr., (2006). College women and personal goals: Cognitive dimensions that differentiate risk-reduction sexual decisions. *Journal of Youth and Adolescence, 35*, 577–589.
- Murphy, J. G., McDevitt-Murphy, M. E., & Barnett, N. P. (2005). Drink and be merry? Gender, life satisfaction, and alcohol consumption among college students. *Psychology of Addictive Behaviors, 19*, 184–191.
- Muthén, L. K., & Muthén, B. O. (2007). *Mplus users guide (Version 4.1)*. Los Angeles, CA: Author.
- National Highway Traffic Safety Administration. (2003). *Traffic Safety Facts 2002: Alcohol (Pub. No. DOT HS-809-606)*. Washington, DC: U.S. Department of Transportation.
- Naus, M. J., Philipp, L. M., & Samsi, M. (2009). From paper to pixels: A comparison of paper and computer formats in psychological assessment. *Computers in Human Behavior, 25*, 1–7.
- Pavot, W., & Diener, E. (1993). Review of the satisfactions with life scales. *Psychological Assessment, 5*, 164–177.
- Pavot, W., & Diener, E. (2008). The Satisfaction with Life Scale and the emerging construct of life satisfaction. *Journal of Positive Psychology, 3*, 137–152.
- Poulin, F., Dishion, T. J., & Burraston, B. (2001). 3-year iatrogenic effects associated with aggregating high-risk adolescents in cognitive-behavioral preventive interventions. *Applied Developmental Science, 5*(4), 214–224.
- Ravert, R. D., Schwartz, S. J., Zamboanga, B. L., Kim, S. Y., Weisskirch, R. S., & Bersamin, M. (2009). Sensation seeking and danger invulnerability: Paths to college student risk taking. *Personality and Individual Differences, 47*, 763–768.
- Robinson, J. A., Sareen, J., Cox, B. J., & Bolton, J. M. (2009). Correlates of self-medication for anxiety disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Nervous and Mental Disease, 197*, 873–878.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069–1081.
- Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*, 719–727.
- Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies, 9*, 13–39.
- Santor, D. A., Messervey, D., & Kusumakar, V. (2000). Measuring peer pressure, popularity, and conformity in adolescent boys and girls: Predicting school performance, sexual attitudes, and substance abuse. *Journal of Youth and Adolescence, 29*, 163–182.
- Schaub, M., Gmel, G., Annaheim, B., Mueller, M., & Schwappach, D. (2010). Leisure time activities that predict initiation, progression, and reduction of cannabis use: A prospective, population-based panel survey. *Drug and Alcohol Review, 29*, 378–384.
- Schwartz, S. J., Kurtines, W. M., & Montgomery, M. J. (2005). A comparison of two strategies for facilitating identity formation processes in emerging adults: An exploratory study. *Journal of Adolescent Research, 20*, 309–345.
- Schwartz, S. J., Phelps, E., Lerner, J. V., Huang, S., Brown, C. H., Lewin-Bizan, S., Li, Y., & Lerner, R. M. (2010). Promotion as prevention: Trajectories of positive youth development as protective against tobacco, alcohol, illicit drug, and sex initiation. *Applied Developmental Science, 14*, 197–211.
- Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Kim, S. Y., Weisskirch, R. S., Williams, M. K., . . . Finley, G. E. (2009). Perceived parental relationships and health risk behaviors in college-attending emerging adults. *Journal of Marriage and Family, 71*, 727–740.
- Schwartz, S. J., Zamboanga, B. L., Weisskirch, R. S., & Rodriguez, L. (2009). The relationships of personal and ethnic identity exploration to indices of adaptive and maladaptive psychosocial functioning. *International Journal of Behavioral Development, 33*, 131–144.
- Scourfield, J., Roen, K., & McDermott, L. (2008). Lesbian, gay, bisexual and transgender young people's experiences of distress: Resilience, ambivalence and self-destructive behavior. *Health and Social Care in the Community, 16*(3), 329–336.
- Shedler, J., & Block, J. (1990). Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist, 45*, 612–630.
- Sheldon, K. M., Elliot, A. J., Ryan, R. M., Chirkov, V., Kim, Y., Wu, C. . . . , & Sun, Z. (2004). Self-concordance and subjective well-being in four cultures. *Journal of Cross-Cultural Psychology, 35*, 209–223.
- Suh, J. J., Ruffins, S., Robins, C. E., Albanese, M. J., & Khantzian, E. J. (2008). Self-medication hypothesis: Connecting affective experience and drug choice. *Psychoanalytic Psychology, 25*, 518–532.
- Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. B., Pleck, J. H., & Sonenstein, L. H. (1998). Adolescent sexual behavior, drug use,

- and violence: Increased reporting with computer survey technology. *Science*, 280, 867–873.
- U.S. Department of Health, and Human Services. (2010). *Healthy People 2010*. Retrieved from <http://www.healthypeople.gov/>
- van Prooijen, J. W., & Van Der Kloot, W. A. (2001). Confirmatory analysis of exploratively obtained factor structures. *Educational and Psychological Measurement*, 61, 777–792.
- Vesely, S. K., Wyatt, V. H., Oman, R. F., Aspy, C. B., Kegler, M. C., Rodine, S., . . . McLeroy, K. R. (2004). The potential protective effects of youth assets from adolescent sexual risk behaviors. *Journal of Adolescent Health*, 34, 356–365.
- Walton, K. E., & Roberts, B. W. (2004). On the relationship between substance use and personality traits: Abstainers are not maladjusted. *Journal of Research in Personality*, 38, 515–535.
- Waterman, A. S. (2004). Finding someone to be: Studies on the role of intrinsic motivation in identity formation. *Identity: An International Journal of Theory and Research*, 4, 209–228.
- Waterman, A. S. (2008). Reconsidering happiness: A eudaimonist's perspective. *Journal of Positive Psychology*, 3, 234–252.
- Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Williams, M. K., Agocha, B., . . . Donnellan, M. B. (2010). The Questionnaire for Eudaimonic Well-Being: Psychometric properties, demographic comparisons, and evidence of validity. *Journal of Positive Psychology*, 6, 41–61.
- Wegner, L., & Flisher, A. J. (2009). Leisure boredom and adolescent risk behavior: A systematic literature review. *Journal of Child and Adolescent Mental Health*, 21, 1–28.
- Whiteside, U., Crouce, J. M., Pedersen, E. R., & Larimer, M. E. (2010). Brief motivational feedback for college students and adolescents: A harm reduction approach. *Journal of Clinical Psychology*, 66, 150–163.
- Whitten, L. (2008). Studies identify factors surrounding rise in abuse of prescription drugs by college students. Retrieved from [http://www.nida.nih.gov/NIDA\\_notes/NNvol20N4/Studies.html](http://www.nida.nih.gov/NIDA_notes/NNvol20N4/Studies.html)
- Zamboanga, B. L., Schwartz, S. J., Van Tyne, K., Ham, L. S., & Olthuis, J. V., Huang, S., . . . Weisskirch, R. S. (2010). Drinking game behaviors among college students: How often and how much? *American Journal of Drug and Alcohol Abuse*, 36, 175–179.
- Zimmerman, S. M., Phelps, E., & Lerner, R. M. (2008). Positive and negative developmental trajectories in U.S. adolescents: Where the PYD perspective meets the deficit model. *Research in Human Development*, 5, 153–165.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge, UK: Cambridge University Press.
- Zullig, K. J., Huebner, E. S., & Pun, S. M. (2009). Demographic correlates of domain-based life satisfaction of college students. *Journal of Happiness Studies*, 10, 229–238.