Predicting Recklessness in Emerging Adults: A Test of a Psychosocial Model

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ABSTRACT. Emerging adults—people aged 18–25 years—frequently behave recklessly. This study sheds light on the role of 4 psychosocial predictors of recklessness: (a) impulsivity, (b) peer pressure, (c) perceived risk, and (d) perceived benefits. The authors obtained self-report data from 208 emerging adults. All predictors were significantly correlated, in the expected directions, with 3 forms of reckless behavior: (a) reckless substance use, (b) reckless driving, and (c) reckless sexual behavior. Regression analyses revealed that, controlling for gender, relationship status, and social desirability, impulsivity predicted reckless substance use and sexual practices, peer pressure predicted reckless substance use, perceived risk predicted reckless driving, and perceived benefits predicted all three recklessness types. The authors' psychosocial model of emerging adult recklessness gained additional support from the finding that all 4 predictors explained unique variance in overall recklessness.

Keywords: emerging adults, health behavior, impulsivity, peer relations, recklessness

THE FREQUENCY WITH WHICH ADOLESCENTS engage in risk-taking and reckless behaviors has been documented by numerous researchers (for reviews, see Chassin et al., 2004; Igra & Irwin, 1996). In comparison, few researchers have investigated these problem behaviors in samples of young adults. Yet the evidence suggests that problem behaviors, although different in kind, are no less common and no less harmful for individuals in the 18–25 years age group—whom Arnett (2000) termed *emerging adults*—than for adolescents (Arnett, 1991, 1996, 1998, 2000; Greene, Krcmar, Walters, Rubin, & Hale, 2000). For the current study, we proposed and tested a model of the psychosocial predictors of reckless behaviors in emerging adults.

Researchers frequently make a distinction between *risk behaviors* and *reckless behaviors*. According to Arnett (1992), *risk behaviors* are socially approved, thrill-seeking behaviors such as motorcycle riding and bungee jumping. In contrast, *reckless*

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behaviors are those that lack social approval and carry “stronger connotations of the potential for negative consequences . . . [where] precautions that could easily be taken are not” (Arnett, 1992, p. 340). We investigated three such reckless behaviors: (a) reckless substance use, (b) reckless driving, and (c) reckless sexual behavior. As distinct from other problem behaviors such as criminal activities, the incidence of many forms of these three behaviors remains high during the postadolescent years. Research indicates that these behaviors are three of the major lifestyle contributors to morbidity and mortality during emerging adulthood (for reviews and statistical data, see Arnett, 1998, 2000; Australian Bureau of Statistics, 2006; Chassin et al., 2004; Jonah, 1986; Sells & Blum, 1996; Weschler, Dowdall, Davenport, & Castillo, 1995).

Young people who engage in one type of reckless behavior are likely to participate in others (Arnett, 1991, 1998; Benthin, Slovic, & Severson, 1993; Weschler et al., 1995). This comorbidity of problem behaviors has been variously attributed to the existence of a common underlying cause, such as a genetic predisposition or personality trait, or to the mutual influence of reckless behaviors on each other. Jessor and Jessor’s (1977) *problem behavior theory*, for example, views such behaviors as part of a coherent syndrome involving reciprocal influences of the person, the environment, and the behaviors themselves. For Jessor (1991), many such behaviors are normative and developmentally adaptive for young people. In line with this theory and findings from past studies, we expected to find positive correlations between the three reckless behaviors we investigated in the present study.

Explanations of reckless behavior differ in the emphasis placed on biological, psychological, social, and structural factors (Igra & Irwin, 1996). When the aim is to develop interventions for reckless behavior, psychosocial theories are most useful because they are most likely to incorporate variables that are amenable to change (Clapper, Martin, & Clifford, 1994). Psychosocial variables may be of several kinds: affective, cognitive, attitudinal, and personality, as well as those reflecting the influence of family, peers, and community. In the current study, we sought to develop and test a parsimonious psychosocial model of emerging adults’ reckless behavior. We intended this model to help in predicting reckless behaviors and in developing appropriate interventions. The model includes predictors from each of three psychosocial domains: personality, social, and cognitive. In the discussion that follows, we outline the rationale for our selection of the specific predictor(s) from each domain.

The Personality Domain: Impulsivity

Many personality variables, including temperamental, affective, and motivational factors, may contribute to reckless behavior. Relevant personality traits identified by previous researchers include (a) impulsivity, (b) sensation seeking, (c) self-esteem, (d) locus of control, (e) egocentrism, (f) identity status, (g) aggression, (h) unconventionality, and (i) negative affectivity (Arnett, 1996, 1998; Eklund &

Klinterberg, 2005; Greene et al., 2000; Hernandez & DiClemente, 1992; Jones & Heaven, 1998; Rolison & Scherman, 2002). Although all of these attributes have been associated with recklessness, we attempted, in the current model, to minimize conceptual and empirical overlap by including only one of these variables, impulsivity. We chose to study impulsivity because it predicts many forms of recklessness (see, e.g., Chassin et al., 2004; Colder & Chassin, 1997; Colder & Stice, 1998; Eklund & Klinterberg, 2005; Igra & Irwin, 1996; Moore & Gullone, 1996; Rolison & Scherman, 2002). Also, there is evidence (Clapper et al., 1994; Greene et al., 2000; Rolison & Scherman, 2002) that the links frequently demonstrated between sensation-seeking tendencies and reckless behavior are mainly due to *disinhibition*, one of four different components in Zuckerman's (1979) model of sensation seeking (the other three being experience seeking, boredom susceptibility, and thrill and adventure seeking). Researchers who have used this four-factor model of sensation seeking (e.g., Rolison & Scherman, 2002) have described *disinhibition* in a way that closely mirrors the impulsivity construct: Both imply a lack of premeditation, restraint, and reflection (see Colder & Chassin, 1997; Colder & Stice, 1998). Additionally, measures of impulsivity and disinhibition are highly correlated (Colder & Stice, 1998). Thus, an added advantage of including a measure of impulsivity in the current model was that it would, we expected, capture much of the predictive power of the construct of sensation seeking.

The Social Domain: Peer Pressure

The "social" domain encompasses variables related to family, peers, community, and other social contexts. Although all of these factors may play a role in reckless behavior, two considerations suggest that recklessness during emerging adulthood may be more strongly related to peer factors than to other social variables. The first is that, as Arnett (2000) argued, emerging adulthood is one of the most *volitional* phases of life, a time during which individuals explore and choose between various possibilities in love, work, and worldviews. There is great demographic diversity among emerging adults, such that no single social milieu is likely to universally influence behavior during this stage of life. The exception, however, may be the peer group. Peers become increasingly important during adolescence (Brown, 2004; Farrell & White, 1998). Involvement with peers and dependence on them to assist with developmental tasks such as family separation, identity development, and lifestyle choice may wane only slightly in the early adult years (Arnett, 2000). Conversely, during the years 18–25, young people tend to move away (physically and/or emotionally) from their family of origin, without yet settling into marriage or parenthood. Researchers (e.g., Clapper et al., 1994) comparing the influence of parents and peers on emerging adult problem behavior have found peer influences to be stronger.

The second reason for believing that peer influences may be more critical than other social factors in shaping the recklessness of emerging adults is that

reckless behaviors typically occur in peer contexts (Weschler et al., 1995). Reckless substance use, for example, is a group activity, with only around 25% of adolescents who drink reporting they were alone the last time they used alcohol (Steinberg, 2003). Reckless driving also tends to be a group phenomenon, with young people being more likely than are older adults to travel in multiple-occupant vehicles (Vegega & Klitzner, 1989). And, of course, most acts of sexual risk taking require the participation of a willing other.

Numerous researchers have found that peer-related factors predict reckless behavior during adolescence (Benthin et al., 1993; Deković, 1999; Farrell & White, 1998; Jones & Heaven, 1998; Severson, Slovic, & Hampson, 1993). A smaller number of studies (e.g., Bradley & Wildman, 2002; Rolison & Scherman, 2003) show similar effects in emerging adulthood. Most of this research has linked youth recklessness to perceived peer approval or peer similarity. However, research on these peer-related variables has been criticized for failing to (a) differentiate peer selection from genuine peer influence and (b) discount the role of attribution biases in adolescents' assessments of their peers' attitudes and behaviors (see, e.g., Brown, 2004). To avoid these problems, some researchers (e.g., Clasen & Brown, 1985; Farrell & White, 1998) have argued that peer influence should be studied directly by assessing the extent to which young people feel pushed or pressured by their peers to behave in ways in which they would not otherwise behave. We adopted this approach in the present study by including a measure of peer pressure in our psychosocial model.

The Cognitive Domain: Perceived Risks Versus Perceived Benefits

Youth recklessness can also be understood from a social-cognitive, or decision-making, perspective (Benthin et al., 1993; Furby & Beyth-Marom, 1992; Smith & Rosenthal, 1995). As Igra and Irwin (1996, p. 35) noted, "Inherent in risk-taking is the notion that the behavior is volitional, that there is some conscious weighing of alternative courses of action." It follows that an adequate model of reckless behavior requires the inclusion of one or more cognitive variables. Such variables could reflect people's perceptions of (a) the alternative actions open to them, (b) the possible consequences of these actions, (c) the probability and controllability of such consequences, and (d) the (un)desirability of such consequences (Furby & Beyth-Marom, 1992). Although researchers have empirically tested the extent to which each of these cognitions can predict recklessness, the most common approach to studying recklessness has been to assess the role of perceptions of risk or perceptions of benefits, or both, as antecedents to acts of recklessness (e.g., Benthin et al.; Moore & Gullone, 1996; Parsons, Siegel, & Cousins, 1997).

Researchers have shown that both perceived risks and perceived benefits predict reckless behavior. When these two cognitive variables have been included in a single study (e.g., Parsons et al., 1997; Rolison & Scherman, 2003), researchers have

reached mixed findings as to whether each variable explains significant amounts of unique variance in youth recklessness. Similarly, controversy exists as to their relative importance as predictors of reckless outcomes. Although most relevant research (e.g., Moore & Gullone, 1996; Parsons, Halkitis, Bimbi, & Borkowski, 2000; Parsons et al., 1997; Shapiro, Siegel, Scovill, & Hays, 1998; Rolison & Scherman, 2003) has shown perceived benefits to be more highly predictive of reckless behavior, some studies (e.g., Rolison & Scherman, 2002; Small, Silverberg, & Kerns, 1993) indicate perceived risks (or “costs”) to be the more important predictor, and others (e.g., Hampson, Severson, Burns, Slovic, & Fisher, 2001) indicate little difference between the predictive utility of the two. Our study aimed to shed light on this issue.

Overview of the Present Study

We tested a model of emerging adult recklessness that included predictors from each of three psychosocial domains: personality, social, and cognitive. By sampling sparingly from these domains, we sought to identify a set of predictors that contained little redundancy yet was highly predictive of recklessness. Our model stands midway between those (e.g., Zuckerman, 1979) that rely mainly on a single predictor of risk and reckless behaviors—and thus achieve parsimony without explaining much criterion variance—and those (e.g., Deković, 1999; Hampson et al., 2001; Jones & Heaven, 1998) that include 10 or more predictors of recklessness—and thus achieve explanatory power at the expense of economy. Ours can be labeled an additive or *cumulative risk model*, in that we expected each predictor to contribute incrementally to the prediction of recklessness. We did not hypothesize about interactions between the predictors because past research (e.g., Bradley & Wildman, 2002; Colder & Chassin, 1997; Colder & Stice, 1998; Deković, 1999; cf. Greene et al., 2000) has indicated that variables similar to ours do not interactively impact youth recklessness.

Our model appears to be unique in applying temperamental, contextual, and cognitive variables to the prediction of these three types of emerging adult recklessness. It does, however, bear some similarity to other prominent psychosocial models. For example, parallels can be drawn between our set of predictors and those included in Ajzen’s (1991) theory of planned behavior. Specifically, Ajzen’s variable of *attitude to the behavior* has similarities to our *perceived risks and benefits of reckless behaviors*, and his *subjective norms* parallels our *social dimension of peer influence*. In addition, Ajzen’s *perceived behavioral control* (inversely) resembles our variable of *impulsivity*: Highly impulsive individuals have trouble exercising volitional control over their behaviors, whereas individuals who are low in impulsivity are likely to display greater behavioral control.

Previous researchers (e.g., Arnett, 1991, 1996; Byrnes, Miller, & Schafer, 1999; Greene et al., 2000) have found gender differences in reckless-behavior participation rates, with men reporting more frequent recklessness. We expected to

replicate this finding, and we also sought to explore the possibility that the predictive validity of our psychosocial variables would vary by gender. A further aim was to test the limits of *turning points theory* (Laub, Nagen, & Sampson, 1998), which maintains that desistance from delinquent and other problem behaviors occurs during emerging adulthood as a consequence of the transition to adult work, romantic, and family roles. Findings from several studies (e.g., Arnett, 1998; Jessor, Turbin, & Costa, 1997) provide support for this theory. Although the current sample was made up entirely of unmarried university students, some of these people were involved in stable and committed romantic relationships. Extending the logic of turning points theory, we predicted that this group would display fewer reckless behaviors than would those not currently in a steady relationship.

Our study sought to avoid several of the methodological flaws evident in past research. For example, we took steps to minimize content overlap between predictor and criterion variables. Similarly, whereas most previous researchers have failed to account for response biases, we measured and controlled for social desirability response tendencies. Additionally, previous researchers have tended not to control for the unequal impact that individual reckless-behavior items may have on total recklessness scores. Because there is no sound theoretical reason to disproportionately weight items, we countered this potential bias by standardizing item responses prior to forming composite recklessness scales.

Hypotheses

We hypothesized that the following would hold true in a sample of emerging adults:

Hypothesis 1 (H_1): Reckless behaviors would be positively correlated with each other.

H_2 : Compared with women, men would report more frequent participation in reckless behaviors.

H_3 : Compared with people currently in a stable relationship, those not in a relationship would report more frequent participation in reckless behavior.

H_4 : Impulsivity, peer pressure, and the cognitive variables (perceived risk and perceived benefits) would each (a) correlate with frequency of reckless behavior and (b) explain unique proportions of the variance in reckless behavior, after accounting for demographic variables and social desirability considerations.

Method

Participants

A total of 240 first-year psychology students enrolled at a large public university in Queensland, Australia responded to an advertisement on a university

Web site to participate in a study of “risky behaviors” in exchange for course credit. Participants were required to be aged 18–25 (inclusive) and not married. After removal of blank, incomplete, and inconsistently completed questionnaires, we obtained usable responses from 208 students (123 women, 85 men). The mean age of the participants was 20.4 years ($SD = 1.99$ years). Almost half of the participants ($n = 97$, or 47.1%) were in a stable romantic relationship at the time of the study. Responses from the 27 participants who did not hold a driver’s license or did not currently own or have ready access to a motor vehicle were excluded from the analyses relating to reckless driving ($n = 181$ for that part of the study).

Variables and Measures

Reckless behaviors. We assessed the three dependent variables in this study—reckless substance use, reckless driving, and reckless sexual behavior—using the Reckless Behavior Questionnaire (RBQ), a modified version of Bradley and Wildman’s (2002) Risk and Reckless Behavior Questionnaire. In the current version of the RBQ, the subscale for (socially approved) risk behavior was removed, leaving just the three recklessness subscales. In addition, oral sex and intercourse were assessed separately, rather than as a single item. An item in the original scale addressing number of sexual partners was removed because pilot testing suggested that it was frequently left blank. A final modification to the scale was the addition of the reckless-driving item *driving while using a cell phone* because of recent evidence as to the dangers associated with this practice. The resulting RBQ contained 15 items, 5 per subscale, with each item referring to a specific type of reckless behavior. Bradley and Wildman (2002) reported satisfactory levels of internal consistency ($\alpha s = .75-.78$) and of 2-week test–retest reliability ($r s > .80$) for each of the subscales.

The RBQ requires respondents to record the frequency with which they have engaged in each behavior during the past year by selecting from 10 alternatives ranging from *zero times* to *100+ times* (i.e., *more than twice a week*). We converted responses to each item to z scores and then summed them to obtain a total score for each subscale, with higher scores indicating more frequent participation in the various reckless activities.

Impulsivity. We used the Disinhibition scale from the General Temperament Survey (GTS; Watson & Clark, 1993), as adapted by Colder and Stice (1998), to measure impulsivity. For their seven-item version of the scale, Colder and Stice reported an alpha coefficient of .71, a test–retest reliability of .77 over a 1-month period, and a correlation (r) of .77 with the original GTS Disinhibition scale. Because of overlap with the dependent variables, we removed one item from the original scale: “I rarely, if ever, do anything reckless.” Participants rated each item on a 4-point scale ranging from 1 (*describes me very well*) to 4 (*does not describe*

me at all), and responses were summed to obtain a total score with a possible range of 6–24, with higher scores indicating greater impulsivity.

Peer pressure. We used the Emerging Adult Peer Pressure Inventory (EAPPI; Bradley & Wildman, 2002) to assess direct peer influence. The EAPPI is an eight-item scale, based on an earlier measure developed by Clasen and Brown (1985), that is designed to assess young adults' perceptions of the degree and direction of pressure from friends to engage in a range of behaviors. A 7-point response format is used, with prosocial and antisocial behaviors listed as polar opposites. A sample item offers the alternatives "always be conscious of and follow the rules" versus "bend the rules (of parents, society) to suit you and your friends." Respondents rate each item on a 7-point scale: A score of 1 indicates a lot of pressure toward the prosocial behavior, a score of 4 indicates no pressure toward either behavior, and a score of 7 indicates a lot of pressure toward the antisocial behavior. Three items in the scale are reverse scored to moderate affirmation bias. Responses are summed to obtain a total score ranging from 8 to 56, with higher scores indicating higher levels of perceived antisocial peer pressure. Bradley and Wildman (2002) reported an alpha reliability coefficient of .76 and a 2-week test–retest reliability of .89.

Perceived risk and benefits. The Risk and Benefits scale (Smith & Rosenthal, 1995) contains two questions for each item on the RBQ. The first question assesses perceived risk to self by asking participants to rate the likelihood that they would personally be at risk of injury or illness if they engaged in the RBQ behavior. The second question assesses perceived benefits by asking participants to rate the extent to which they would personally derive pleasure or other benefits from engaging in the behavior. Responses to both parts are on a 7-point bipolar scale ranging from 1 (*not at all at risk or no benefit*) to 7 (*very much at risk or great pleasure and benefits*). Responses are summed to give two total scores (ranges = 15–105), one for perceived risk and another for perceived benefits.

Social desirability. We used Form C of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982) to detect and control for socially desirable responding. This is a 13-item shortened version of the original scale. Loo and Loewen (2004) reported that short versions of this scale are effective alternatives to the full version. In the current study, we altered the original true–false format to a 4-point scale to allow items to be interspersed with those measuring impulsivity, with scoring the same as for the Impulsivity scale.

Procedure

We collected data in small noninteracting groups. Confidentiality, anonymity, and honesty of responses were emphasized orally by the researcher, via an

attached information sheet, and by asking participants to seal their completed questionnaires in an envelope provided.

Results

Table 1 displays descriptive statistics and alpha coefficients for all study variables. The distribution of all predictors approximated normality (standardized skew < 3.29), with all but impulsivity showing modest negative skew. In contrast, all recklessness variables were significantly ($p < .001$) and positively skewed. Given these large deviations from normality (and a skew in the criteria data that was in the opposite direction to that in most predictor data), we applied a logarithmic transformation to all recklessness variables. Researchers have used this procedure in some past studies (e.g., Hampson et al., 2001) to increase the symmetry of risk and recklessness behavior scores.

The reliabilities of three of the scales (measuring social desirability, impulsivity, and peer pressure) were not entirely satisfactory. However, it should be noted that (a) the reliability obtained for the scale measuring social desirability ($\alpha = .64$) is similar to that reported by Loo and Loewen (2004; $\alpha = .66$) and (b) the reliability of .67 for the scale measuring impulsivity is consistent with that obtained by Colder and Stice (1998; $\alpha = .71$), given that the current version of the scale contained one item fewer than did the original. However, the low levels of internal consistency associated with these variables indicate that caution is required in interpreting findings based on them.

Table 1 lists the correlations between the study variables. Not surprisingly, given the narrow age range sampled, age was not related to any of the predictor or dependent variables. The tendency to respond in socially desirable ways was correlated with several variables, especially with perceptions of fewer benefits associated with reckless behavior and with reports of less-frequent reckless sexual behavior. The three reckless behaviors were positively correlated, a finding that lends support to H_1 . Given these positive correlations, we decided to compute a total recklessness score by standardizing scores on all reckless behavior items and log-transforming their sum. Consistent with $H_4(a)$, impulsivity, peer pressure, perceived risk to self, and perceived benefits were all significantly correlated, in the expected directions, with the three forms of reckless behavior and with total recklessness scores.

We conducted a series of 2 (gender) $\times$ 2 (relationship status) analyses of covariance (ANCOVAs), with social desirability as the covariate, to assess the extent to which frequency of reckless behaviors varied with gender and relationship status. These analyses revealed that, compared with the female respondents, male respondents reported significantly greater participation in reckless substance use ($p < .001$), reckless sexual practices ($p < .001$), reckless driving ($p < .01$), and total recklessness ($p < .001$), which supports H_2 . Contrary to H_3 , however, there was no evidence of lower levels of recklessness among those respondents who

TABLE 1. Descriptive Statistics and Correlations Between Study Variables (*N* = 208)

Variable	<i>M</i>	<i>SD</i>	Potential range	1	2	3	4	5	6	7	8	9	10
1. Participant age ^a	20.43	1.99	—	—									
2. Social desirability ^b	33.76	4.39	13–52	–0.2	(.64)								
3. Impulsivity ^c	12.69	2.59	6–24	–0.3	–0.7	(.67)							
4. Peer pressure ^d	33.65	5.81	8–56	.03	–.10	.23***	(.68)						
5. Perceived risk ^e	79.43	15.03	15–105	–.08	.15*	–.36***	–.30***	(.90)					
6. Perceived benefits ^e	56.96	17.60	15–105	.05	–.22***	.20*	.25***	–.36***	(.87)				
7. Reckless substance use ^f	12.96	9.33	0–50	–.03	–.09	.30***	.50***	–.37***	.43***	(.73)			
8. Reckless sexual behavior ^f	3.71	7.82	0–50	.06	–.22**	.30***	.25***	–.25***	.33***	.32***	(.77)		
9. Reckless driving ^{f, g}	16.27	9.12	0–50	.06	–.14	.23**	.18*	–.44***	.36***	.30***	.36***	(.72)	
10. Total recklessness ^{f, g}	33.09	17.79	0–150	–.01	–.19**	.40***	.42***	–.52***	.49***	.77***	.70***	.75***	(.81)

Note. Internal consistency reliabilities (Cronbach's alphas) appear in parentheses along the diagonal.

^aIn years. ^bMeasured with a modified version of Form C of the Marlowe-Crowne Social Desirability Scale (W. M. Reynolds, 1982); higher scores indicate a greater tendency to act in socially desirable ways. ^cMeasured with the Disinhibition scale from the General Temperament Survey (D. Watson & L. A. Clark, 1993), as adapted by C. R. Colder and E. Stice (1998); higher scores indicate greater impulsivity. ^dMeasured with the Emerging Adult Peer Pressure Inventory (G. Bradley & K. Wildman, 2002); higher scores indicate higher levels of perceived antisocial peer pressure. ^eMeasured with A. M. A. Smith and D. A. Rosenthal's (1995) Risk and Benefits scale, which produces two independent scores, one measuring perceptions of the risk and the other perceptions of the benefits associated with certain reckless behaviors. ^fMeasured with a modified version of G. Bradley and K. Wildman's (2002) Risk and Reckless Behavior Questionnaire; higher scores indicate that the participant engaged more frequently in those types of reckless behavior over the past year. Means, standard deviations, and ranges for recklessness scales given here were computed by a simple sum of the responses to all relevant items; they are provided for the purpose of comparison with those obtained in other studies that use the same scales, as currently modified. For the analyses reported in the present article, composite scales were formed by standardizing each recklessness item, summing the standardized scores, adding a constant to insure all values were positive, and log transforming the result to reduce skew. ^gAll statistics relating to the Reckless Driving and Total Recklessness scales were calculated using only scores for those respondents who possessed a driver's licence and had access to a vehicle (*n* = 181).

p* < .05. *p* < .01. ****p* < .001 (two-tailed).

were currently involved in a stable relationship. In fact, participants who were in a relationship reported significantly ($p < .05$) more frequent substance use than did those not in a relationship. None of the Gender $\times$ Relationship Status interactions was significant.

We used a parallel set of 2×2 ANCOVAs to examine the effects of gender and relationship status on each of the psychosocial predictor variables. Compared with female respondents, male respondents reported significantly ($p < .001$) higher levels of peer pressure and perceived benefits and lower levels of perceived risk. Impulsivity did not vary by gender. In all analyses, neither the main effect for relationship status nor the Gender $\times$ Relationship Status interaction effect was significant.

We performed hierarchical multiple regression analyses to test the predictive model of reckless behavior. The criteria in separate analyses were the three types of recklessness and total recklessness. In all analyses, we entered gender (dummy coded: female = 0, male = 1), relationship status (dummy coded: in a relationship = 0, not in a relationship = 1), and social desirability in Step 1. Given its nonsignificant association with all other variables, age was not included as a control variable in any of the regression analyses. In Step 2 of the initial runs, we entered a product term reflecting the interaction of gender and social desirability, but, because none of these interactions was significant (all $ps > .05$), we omitted the interaction term in the main analyses. We entered the remaining predictors in an order that reflected their temporal sequence: Impulsivity (a deeply-rooted temperamental variable) preceding that of peer pressure (a more proximal but nonetheless relatively context-free variable), which, in turn, preceded the entry of the two cognitive variables, perceptions of risk and benefits (the most context-specific and potentially transient of all the predictors). This order of entry is consistent with past research (e.g., Hampson et al., 2001) that shows perceptions of risk and benefits to be the most proximal predictors of youth recklessness. In the final step, we entered product terms reflecting the interaction between each of the predictors and gender and, in separate analyses, between all possible pairs of the predictors. Because none of these terms approached significance, results are reported for main effects only.

Table 2 summarizes the regression analyses predicting the three specific forms of reckless behavior and total recklessness. In the equation with reckless substance use as the criterion, both gender ($\beta = .26, p < .0005$) and relationship status ($\beta = -.15, p = .027$) accounted for significant proportions of variance when entered at Step 1. Relationship status remained significant following entry of the other predictors, whereas gender did not. Both impulsivity ($\beta = .27, p < .0005$, when entered at Step 2) and peer pressure ($\beta = .42, p < .0005$, when entered at Step 3) were also associated with significant increments in explained variance. After all predictors were included, 40% (38% adjusted) of the variance in reckless substance use was explained, with peer pressure ($\beta = .37, p < .0005$) and perceived benefits ($\beta = .29, p < .0005$) accounting for the largest proportions of unique variance.

TABLE 2. Hierarchical Multiple Regression Predicting Three Types of Recklessness and Total Recklessness

Predictor variable	Reckless substance use ^a				Reckless sexual behavior ^a			
	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
Step 1								
Gender ^b	-0.005	0.020	-.02	.00	0.041	0.021	.15*	.02
Relationship status ^c	-0.048	0.017	-.16**	.02	-0.002	0.017	-.01	.00
Social desirability ^d	0.001	0.002	.04	.00	-0.003	0.002	-.11	.01
Step 2								
Impulsivity ^e	0.007	0.003	.13*	.01	0.011	0.004	.21**	.04
Step 3								
Peer pressure ^f	0.009	0.002	.37***	.11	0.002	0.002	.11	.01
Step 4								
Perceived risk ^g	-0.001	0.001	-.13	.01	0.000	0.001	.01	.00
Perceived benefits ^g	0.002	0.001	.29***	.07	0.001	0.001	.19**	.03

Note. $R^2 = .40$, adj. $R^2 = .38$ for reckless substance use; $R^2 = .21$, adj. $R^2 = .19$ for reckless sexual behavior; $R^2 = .25$, adj. $R^2 = .22$ for reckless driving; $R^2 = .44$, adj. $R^2 = .42$ for total recklessness.

^aMeasured with a modified version of G. Bradley and K. Wildman's (2002) Risk and Reckless Behavior Questionnaire. ^bDummy coded as female = 0 and male = 1. ^cDummy coded as in a relationship = 0 and not in a relationship = 1. ^dMeasured with a modified version of Form C of the Marlowe-Crowne Social Desirability Scale (W. M. Reynolds, 1982). ^eMeasured with the Disinhibition scale from the General Temperament Survey (D. Watson & L. A. Clark, 1993), as adapted by C. R. Colder and E. Stice (1998). ^fMeasured with the Emerging Adult Peer Pressure Inventory (G. Bradley & K. Wildman, 2002). ^gMeasured with A. M. A. Smith and D. A. Rosenthal's (1995) Risk and Benefits scale.

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

In predicting reckless sexual behavior, gender ($\beta = .26$, $p < .0005$) and social desirability ($\beta = -.16$, $p = .013$) were significant when first entered, but only gender remained so after we included all predictors. Impulsivity ($\beta = .24$, $p < .0005$) was significant when first entered, but peer pressure was not ($\beta = .13$, $p = .069$). In the final equation, 21% (19% adjusted) of the variance in sexual behavior was explained, with impulsivity ($\beta = .21$, $p = .003$) and perceived benefits ($\beta = .19$, $p = .009$) accounting for most variance.

When reckless driving was the criterion, gender, once again, explained significant proportions of variance in the initial step ($\beta = .23$, $p = .003$) but not in the final step of the equation. As was the case in predicting sexual behavior, impulsivity ($\beta = .16$, $p = .035$), but not peer pressure ($\beta = .07$, $p = .399$), was a

Reckless driving ^a				Total recklessness ^a			
<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
0.003	0.022	.01	.00	0.054	0.041	.09	.01
0.026	0.019	.10	.01	-0.033	0.034	-.05	.00
-0.001	0.002	-.04	.00	-0.004	0.004	-.05	.00
0.003	0.004	.05	.00	0.017	0.007	.14*	.02
0.000	0.002	-.01	.00	0.012	0.003	.23***	.04
-0.003	0.001	-.31***	.06	-0.005	0.001	-.24***	.04
0.002	0.001	.21**	.03	0.005	0.001	.27***	.06

significant predictor of reckless driving. After the last step, 25% (22% adjusted) of the variance in driving was explained, with the two cognitive variables, perceived risk ($\beta = -.31, p < .0005$) and perceived benefits ($\beta = .21, p = .006$), being the only significant predictors.

Last, when predicting total recklessness, gender ($\beta = .37, p < .0005$) and social desirability ($\beta = -.15, p = .028$) were significant predictors at Step 1 but not in the final equation. Impulsivity was highly significant when entered at Step 2 ($\beta = .28, p < .0005$), although its unique contribution decreased as other predictors were added. The full set of predictors accounted for 44% (42% adjusted) of the variance in this criterion. All four psychosocial variables explained significant proportions of variance in the final equation.

In sum, perceived benefits was a significant predictor of all three specific reckless behavior criteria. Each of the other psychosocial factors significantly predicted only one specific reckless behavior, although all also predicted total recklessness. Gender contributed little to the final prediction of recklessness.

Discussion

Emerging adults frequently engage in reckless behaviors. We sought to shed light on the psychosocial factors contributing to three such behaviors—reckless substance use, driving, and sexual behavior—because behaviors of these kinds have been shown to threaten the well-being of large numbers of emerging adults. We focused on developing and testing a model involving a mix of personality, social, and cognitive variables. We also tested three preliminary hypotheses pertaining to the covariation between different types of reckless behavior and the links between gender, relationship status, and recklessness.

Hypotheses 1–3 (H_1 – H_3)

Consistent with H_1 and the theory (e.g., Jessor, 1991) and research (e.g., Arnett, 1991; Bradley & Wildman, 2002) underpinning it, we found that the three reckless behaviors were significantly and positively correlated with one another. These correlations were in the range .30–.36, which is somewhat less than the correlations reported by past researchers. Bearing in mind that the data on the three types of recklessness were collected in a single sitting (a procedure that may spuriously increase the size of the observed relations), our modest correlations suggest the possibility that the “coherent syndrome” of problem behaviors identified in adolescent populations by Jessor (1991) and others may be less prominent in emerging adulthood. Such a proposition does, of course, require further testing, and the correlations we obtained may equally be due to a range of other factors including peculiarities of our sample and measures.

Past research (Arnett, 1996; Byrnes et al., 1999; Greene et al., 2000) has shown that male young adults engage in more frequent reckless behaviors than do same-aged women. Consistent with this finding, and supporting H_2 , we found that males reported greater recklessness. Whereas other researchers have reported larger gender differences for reckless driving than for substance use and sexual behavior (Arnett, 1996; Bradley & Wildman, 2002; Byrnes et al., 1999), we obtained effects for gender that were similar in size across the three reckless behaviors, partial η^2 s = .06, .05, and .07 for substance use, driving, and sexual behavior, respectively. These discrepant findings may be due in part to the content of our measures. For example, our inclusion of an item relating to use of cell phones while driving may have contributed to

the smaller than expected gender difference in reckless driving. Cohort differences are another possible explanation: Perhaps the gender difference in reckless driving, like that in other risky and reckless behaviors (Byrnes et al., 1999), is narrowing over time.

An intriguing aspect of our findings relates to the role of gender in predicting recklessness criteria when we progressively included other predictor variables in multiple regression analyses. In all cases, gender was significant when entered along with relationship status and social desirability at Step 1, and it remained significant when impulsivity was added at Step 2. However, in all cases except for sexual recklessness, gender was no longer significant when the other predictors were entered in the equation. This finding is consistent with the existence of mediation pathways from gender, through peer pressure and the cognitive variables, to reckless behavior.

The potential implications of such mediation pathways are profound. Whereas previous researchers have demonstrated that men engage in more reckless behaviors than do women, few have identified the mechanism by which this gender difference arises. A biologically-based difference between the genders in impulsivity is one possible mechanism, yet the current findings (admittedly, using a measure whose reliability is less than optimal) provide no support for this hypothesis. Rather, our findings suggest that somewhat different mediation pathways exist for each type of recklessness: Whereas perceived benefits may mediate gender effects on all three types of recklessness, peer pressure also may mediate effects on reckless substance use, and perceived risks also may mediate effects on reckless driving. If confirmed in future research, these mediation pathways would have implications for the design and implementation of gender-differentiated interventions.

Turning points theory (Laub et al., 1998) proposes that age-related reductions in the incidence of reckless behaviors are due to emerging adults' increasing participation in conventional adult roles. Extending this logic, in H_3 we proposed that emerging adults who were involved in romantic relationships would report fewer reckless acts than would those not currently in a relationship. Our results did not support this hypothesis: Only one of the three reckless behaviors (substance use) differed by relationship status, and this difference was in the opposite direction than expected. Nonetheless, this hypothesis may be worthy of further investigation, and future researchers should test the hypothesis that reckless behaviors vary as a function of the duration and level of commitment, rather than the mere presence, of a romantic relationship. Indeed, future researchers, especially those using longitudinal methods, may address a number of issues related to our first three hypotheses. Worthwhile issues include whether, across the emerging adult years, (a) levels of comorbidity of reckless behaviors decline, (b) gender differences narrow, and (c) relationship status become an increasingly important predictor of desistance from recklessness.

The Psychosocial Model

In our fourth—and central—hypothesis (H_4), we proposed that frequency of reckless behavior could be predicted on the basis of four psychosocial factors. Consistent with $H_4(a)$, all predictors were significantly ($p < .001$) correlated, in the expected directions, with all three reckless behaviors. Whereas some zero-order correlations were only modest in size, the fact that all predictors were related to all outcomes provides preliminary confirmation of our theoretical model.

Findings from a series of hierarchical regression analyses offered mixed evidence in relation to $H_4(b)$. Support was strongest when the total recklessness composite was the criterion: As hypothesized, when we controlled for demographic and social desirability variables, all four psychosocial variables made significant unique contributions to the prediction of total recklessness. A different pattern of results emerged when each of the specific types of reckless behavior was used as the criterion: Three of the psychosocial variables (peer pressure, perceived benefits, and impulsivity) predicted reckless substance use, two (impulsivity and perceived benefits) predicted reckless sexual behavior, and two (perceived risks and perceived benefits) predicted reckless driving. Thus, all four psychosocial variables contributed uniquely to the prediction of at least one of the specific reckless behaviors as well as to total recklessness.

The findings relating to the issue of redundancy between the four predictors provide mixed support for the model. The highest correlation between any two of the predictors was only .36, with a mean correlation of .28. However, as previously noted, although all predictors were significantly correlated with the recklessness criteria, not all of them were significant in the final regression models. This coexistence of significant bivariate correlations and nonsignificant regression coefficients suggests that the predictors were partially redundant. That said, results from the regression analyses contain only one instance of a previously significant psychosocial variable becoming nonsignificant following the subsequent entry of other predictors (impulsivity significantly predicted reckless driving in the absence of the other factors, but not in their presence). With that exception, the psychosocial factors complemented each other in predicting all types of recklessness.

In the context of our regression model, impulsivity was (a) the strongest predictor of sexual recklessness, (b) a modest predictor of substance use, and (c) a nonsignificant predictor of reckless driving behavior. Our finding that impulsivity predicted recklessness is consistent with the results of Colder and Chassin (1997), Colder and Stice (1998), and Hampson et al. (2001). These and other related past studies were conducted using adolescent samples, so the current findings provide evidence that the relations hold into emerging adulthood. The results do, however, need to be interpreted with some caution because of the limited reliability ($\alpha = .67$) of the Impulsivity scale. On balance, our findings support the utility of impulsivity as a predictor of several forms of reckless behavior and a valuable aspect

of a psychosocial model accounting for reckless behaviors. Future research may benefit from the use of a more reliable measure of this construct.

Peer pressure was the strongest of all the current predictors of substance use. It also predicted total recklessness. These findings are consistent with the extensive literature linking peer pressure to reckless behaviors in adolescence (e.g., Benthin et al., 1993; Brown, 2004; Farrell & White, 1998) and with research showing similar links for emerging adults (e.g., Bradley & Wildman, 2002). In our study, however, peer pressure did not explain significant amounts of unique variance in reckless sexual or driving behaviors. This outcome runs counter to the findings of Bradley and Wildman (2002), who used an identical measure of peer pressure and found this variable to be a significant predictor of all three forms of reckless behavior (although, as in the present study, effects were strongest in relation to substance use). In the absence of a clear means of resolving these discrepant findings, doubt must remain as to whether peer pressure is a pathway common to all forms of emerging adult recklessness. Future researchers may obtain stronger effects for this predictor by targeting more "public" acts of recklessness and by using the size and intimacy of peer groups as additional predictors of reckless behavior.

The cognitive variables of perceived risk and perceived benefits were significant unique predictors of reckless driving behavior and of total recklessness. In addition, perceptions of benefits (but not perceptions of risks) predicted reckless sexual and driving behaviors. After we took into account the variance associated with (a) demographic variables, (b) social desirability, (c) impulsivity, and (d) peer pressure, the pair of cognitive variables explained between 2% (for reckless sexual behavior) and 13% (for reckless driving behavior) of additional variance in recklessness. Together, these findings show that the cognitive variables are important contributors to an understanding of reckless behavior in emerging adults.

As previously noted, past researchers (e.g., Moore & Gullone, 1996; Parsons et al., 2000; Parsons et al., 1997; Rolison & Scherman, 2002, 2003) have been divided as to the relative importance of perceived risks and perceived benefits in the prediction of recklessness. In our study, there was little difference in the extent to which the two were correlated with recklessness: Mean correlations across the three specific recklessness types were .37 for benefits and .35 for risks. However, in the context of the regression model, perceived benefits emerged as the stronger predictor of all reckless behaviors except reckless driving. Clearly, the relative importance of the two cognitive variables is in part dependent on whether bivariate or multivariate associations are examined, and, if the latter, on the composition of the predictor set.

Our psychosocial predictive model accounted for more of the variance in total recklessness ($R^2 = .44$) and reckless substance use ($R^2 = .40$) than it did in reckless driving ($R^2 = .25$) and reckless sexual behavior ($R^2 = .21$). These proportions of explained variance compare favorably with those reported in past studies. For example, the set of predictors used by Bradley and Wildman (2002)—(a) age, (b) gender, (c) education, (d) social desirability, (e) sensation seeking, and

(f) peer pressure—explained 36%, 27%, 31%, and 17% of the variance in total recklessness, reckless substance use, reckless driving, and reckless sexual behavior, respectively. In both our study and that of Bradley and Wildman (2002), reckless sexual behavior was the least adequately predicted of the three reckless behaviors, raising questions as to the types of variables that could be added to the model to boost its validity in relation to this outcome. Two variables worth examining in future research are identity achievement and romantic relationship quality. Researchers (e.g., Hernandez & DiClemente, 1992; Lagana, 1999) have shown that these variables play a protective role in late adolescent sexual recklessness, and there seems to be no reason for expecting their influence to wane in early adulthood. There may be value in assessing the incremental contribution of these two protective factors to the prediction of the full range of emerging adults' reckless behaviors.

We neither hypothesized about nor found interactions between the predictors, but future researchers may want to extend our study by examining more complex effects. For example, future researchers could test the hypothesis that the quality of young people's romantic relationships buffers the relation between peer pressure and recklessness. In addition, in line with the analogy we drew between the current model and Ajzen's (1991) theory of planned behavior, future longitudinal researchers could examine whether behavioral intentions mediate the relations between the psychosocial predictors and the three types of reckless behavior.

Strengths, Weaknesses, and Applications

Our study had a number of strengths. We identified several psychosocial variables for which we found evidence of predictive utility in the field of youth recklessness, and we sought to integrate these disparate factors in a coherent framework. We measured these variables using scales that have been previously validated and, where appropriate, modified these instruments by updating their content and reducing the extent to which they overlapped with the criterion variables. We controlled for opportunity to engage in reckless driving behavior by excluding respondents without both a license and access to a motor vehicle. We used standardized measures of the dependent variables, thereby insuring that no specific act of recklessness had a disproportionate influence on total recklessness scores. We measured the tendency to respond in socially desirable ways and found evidence that participants trying to present themselves in a socially desirable light tended to underreport their sexual recklessness and minimize the potential benefits of reckless behavior. We controlled for this response bias in our regression analyses. We also examined both main and interactive effects of each of our predictor variables. Future researchers are encouraged to do likewise.

Our study also had a number of limitations. First, we used a cross-sectional design even though a longitudinal study conducted over the duration of the emerging adult years would have enabled a much clearer evaluation of the

temporal relations between our predictor and recklessness variables. Second, like most previous researchers in this field, we obtained our data exclusively through self-reports. Although there is evidence to suggest that self-reports provide reliable and valid information regarding reckless behavior (e.g., Johnston, 1985), and although we controlled for social desirability considerations, the possibility that the findings were distorted by response biases and common method variance cannot be discounted. Third, because all respondents were university students, our findings may not generalize to other populations. However, although the level of recklessness displayed by students may be different from that of other emerging adult groups, there are no compelling grounds for maintaining that the relations between the predictor and recklessness variables are different in student and nonstudent populations. Fourth, our decision to exclude married students from the sample meant that the distribution of participants along the relationship status variable was unnecessarily restricted, which consequently weakened the test of turning points theory. Last, our measures of impulsivity and peer pressure were less reliable than is ideal, and our criterion measures (especially our measure of sexual recklessness) could have been more sensitive to low-level forms of recklessness.

Findings from this study clearly require replication using other samples, methods, and measures. If confirmed using research approaches that give clues as to causal relations, the findings may have applications in deterring future acts of recklessness. All four of the predictor variables in this study are potentially amenable to change. For example, impulsivity may be curbed through impulse-control interventions; psychoeducational programs could increase young adults' awareness of the impact of peer pressure and teach them skills in resisting this pressure; and interventions delivered through youth organizations, colleges, and the mass media could alter young adults' perceptions of risks and benefits (Byrnes, 2003; Parsons et al., 1997; Wassef, Collins, Ingham, & Mason, 1995). Because perceived benefits was the most consistent predictor of recklessness across the range of behaviors currently under investigation, the most effective means of reducing recklessness in general may be to adopt interventions that challenge these perceptions. In contrast, in situations in which specific types of recklessness are particularly problematic, the intervention effort may more appropriately target other variables. For example, we found that peer pressure is an important predictor of substance use but not of reckless sexual or driving behaviors. This suggests that substance use, but not the latter forms of recklessness, may be best tackled by peer-related interventions. Similarly, we found that perceptions of risk were more relevant to reckless driving than to reckless sexual behavior, which suggests that public health interventions aimed at increasing perceptions of risk may prove more effective in preventing the former type of recklessness than the latter. With this kind of knowledge, interventions can be tailored to specific forms of reckless behavior so that overall effectiveness is increased.

AUTHOR NOTES

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