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A test of the predictive validity of hypothetical intentions to offend

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ABSTRACT
Researchers commonly use hypothetical intentions to offend as proxies for real-world offending behavior. The current study examined the predictive validity of these hypothetical intentions, as well as the consequences of using offending intentions in statistical models of decision-making. Undergraduate students were asked to self-report their intentions to cheat on a hypothetical online exam for which they were unprepared. Minutes later, they completed a difficult online trivia test for course credit. Students who performed well on the trivia test were presumed to have cheated. Hypothetical intentions to cheat were found to predict actual cheating at a rate no better than chance. Furthermore, while several factors were found to be predictive of hypothetical cheating, none were predictive of actual cheating. This incongruence between intentions and behavior may be attributed to the different emotional reactions evoked by hypothetical and real-world offending opportunities. Implications for research on offender decision-making are discussed.

The hypothetical scenario method is commonly used to study offender decision-making (e.g., Bachman, Paternoster, and Ward 1992; Bouffard 2002; Exum 2002; Pogarsky 2004). In these studies, research participants – ranging from juveniles to adults, college students to incarcerated offenders, and from the United States to countries abroad (see Baker and Piquero 2010) – are presented with a short vignette describing a hypothetical criminal opportunity, and are then asked to self-report their intentions to engage in the offense. Participants’ intentions to offend are treated as proxies for real-world behavior, and are used as the dependent variable in statistical models of decision-making.

The utility of the hypothetical scenario method as a technique for studying criminal/deviant behavior rests largely on how well participants’ intentions to offend mirror their actual behavior under the conditions described in the scenario. However, criminologists have acknowledged that intentions to offend and real-world offending are not necessarily equivalent (Bachman, Paternoster, and Ward 1992; Paternoster and Simpson 1996; Tibbetts and Herz 1996), and have referred to this potential discrepancy as the ‘principal weakness’ of the hypothetical scenario method (Nagin and Paternoster 1993, 473). At the same time, criminologists continue to justify the use of hypothetical intentions by invoking the theory of reasoned action (Ajzen and Fishbein 1980) and/or the theory of planned behavior (Ajzen 1991). Both theories contend that personal attitudes and subjective norms regarding a behavior inform individuals’ intentions to engage in the act. These intentions, in turn, are thought to be the proximate cause of volitional behavior. Furthermore, the influence of intentions (I) on behavior (B) is said to be...
so strong that ‘… barring unforeseen events, a person will usually act in accordance with his or her intention’ (Ajzen and Fishbein 1980, 5).

Consistent with this idea, meta-analytic reviews find mean IB correlations ranging from .53 to .81 (Kim and Hunter 1993; Sheppard, Hartwick, and Warshaw 1988), which constitute a large effect size (Cohen 1992). Yet, most of the research on which these IB correlations are based focuses on participants’ intentions to engage in conventional behaviors. Few studies have examined the predictive validity of participants’ intentions to engage in imprudent or deviant acts, and those that do typically suffer from methodological limitations and/or find weaker IB relationships (see Exum, Turner, and Hartman 2012 for a review).

In one of the first tests of the validity of hypothetical offending intentions, Pogarsky (2004) asked participants to self-report their likelihood of driving drunk using a 0–100% scale. He validated these scores by comparing them to participants’ involvement in cheating on a trivia test. The results showed that those who cheated reported significantly higher drunk driving intentions than those who did not (Ms = 31 vs. 22%, respectively). Pogarsky (2004, 126) concluded that such findings ‘… provide additional, confirmatory evidence for the validity of prospective measures of offending.’ While these results are encouraging, the use of participants’ involvement in one act (cheating) to validate their intentions to engage in a different act (drunk driving) is not ideal.

More recently, Exum, Turner, and Hartman (2012) and Exum, Bailey, and Wright (2014) examined the predictive validity of college students’ intentions to engage in music piracy. All students were given a fictitious newspaper article describing a graduate student (i.e., a research confederate) who was emailing digital music files for free. Students then reported their intentions to contact the graduate student, whose email address was included in the article. Most students expressed little-to-no intentions of contacting the confederate – and all but one followed suit. However, among those who expressed strong-to-certain intentions, only two actually contacted the confederate. Exum, Turner, and Hartman (2012) and Exum, Bailey, and Wright (2014) concluded that while participants’ hypothetical intentions to abstain from crime were largely accurate, their intentions to engage in offending were not. Unfortunately, the extreme homogeneity in the offending measure precluded further exploration of the (dis)similarities between intentions and behavior.

The current study

The current study extends the research on the predictive validity of hypothetical intentions to offend. Undergraduate students were given a scenario describing an online academic exam that they were not prepared to take, and then asked to self-report their intentions to cheat on the exam. Later, these same students were presented with an online trivia test and told they could earn course credit with a strong performance on the test. The trivia test was designed to be so difficult that those who received a good score were presumed to have cheated. The congruence between these two cheating measures (hypothetical and behavioral) serves as an indicator of the predictive validity of hypothetical intentions.

The current study was designed to be a rigorous examination of hypothetical intentions to offend, mindful of several ethical and methodological considerations. First, for ethical reasons, the behavioral criterion upon which hypothetical intentions are validated cannot subject participants to legal harm; therefore, the current study focused on a deviant act that was more ethically permissible – namely, test cheating. Given that approximately 50–80% of students engage in some form of academic dishonesty during their collegiate careers (Coston and Jenks 1998; Lambert and Hogan 2004; McCabe, Butterfield, and Trevino 2012; Whitley 1998), the focus on cheating also increases the likelihood of obtaining heterogeneity in the measures of I and B. This heterogeneity is important, as it is difficult for a predictor variable (such as hypothetical intentions) to forecast an outcome variable (such as actual offending) when there is constrained variance on one or both measures (see Smith, Winkler, and Fryback 2000).

Second, the behavioral criterion upon which hypothetical intentions are validated should be as similar as possible to the behavior described in the scenario (see Fishbein and Ajzen’s (1975, 369) discussion of levels of specificity). Therefore, the current study included a behavioral measure of cheating.
that closely resembled the hypothetical opportunity described in the scenario. It is also important that the risk/reward structure for the hypothetical and actual cheating opportunities be as similar as possible. Recall that the hypothetical scenario describes an opportunity to cheat on an academic exam for which participants are unprepared. In such a situation, cheating comes with a reward (i.e., a better grade) while remaining honest comes with a cost (i.e., lower academic standing in the class). The real-world cheating opportunity in the current study was designed to have a similar incentive structure. Students were told that those who performed well on the trivia test would receive extra credit points (thereby improving their course grade), but that those who performed poorly would forfeit a $5.00 incentive they earned earlier in the study. (We used a financial penalty because we could not devise a way to reasonably and ethically threaten students with an academic penalty.)

Third, given that the IB relationship is moderated by the temporal stability of one’s intentions (Conner et al. 2000), the behavioral criterion should be measured in close proximity to participants’ hypothetical intentions (unless there is strong evidence of temporal stability). Therefore, the current study presented its real-world opportunity to cheat soon after participants self-reported their intentions to cheat. Finally, the ability to uncover a given relationship is dependent upon the size of the effect and the sample size (Cohen 1992). Given that the IB relationship is presumed to be large, the current study utilized a sample size that is more than sufficient to detect an effect of that magnitude.

In addition to examining the predictive validity of participants’ hypothetical intentions to offend, the current study also explores the statistical implications of using hypothetical intentions as the dependent variable in models of criminal decision-making. In order to do so, the study examined the relationships between each measure of cheating (hypothetical and behavioral) and various correlates of cheating taken from the extant literature, summarized below.

**Correlates of cheating**

Much of the research on cheating is retrospective in nature, or is based on hypothetical intentions to cheat. Consistent with a rational choice perspective, many studies find that cheating is related to the perceived costs and benefits of the act including the perceived fun/thrill of cheating and the risk of academic/social sanctions (Cochran, Aleksa, and Sanders 2008; Cochran et al. 1999; Michaels and Miethe 1989; Nagin and Pogarsky 2003; Pogarsky 2004; Tibbetts 1998, 1999; Tibbetts and Herz 1996; Tibbetts and Myers 1999). Similarly, research finds that those who have a more favorable attitude toward academic dishonesty are more likely to cheat (Bolin 2004). This underlying attitude toward dishonesty may help explain the positive relationship sometimes found between past and future acts of cheating (Tibbetts 1999; Tibbetts and Myers 1999).

Low self-control has been shown to be related to higher likelihoods of cheating among students (Bichler-Robertson, Potchak, and Tibbetts 2003; Bolin 2004; Cochran, Aleksa, and Sanders 2008; Cochran et al. 1998; Tibbetts 1998, 1999; Tibbetts and Myers 1999). In a similar vein, Nagin and Pogarsky (2003) found that participants who had a strong preference to delay an impending criminal sanction were more likely to cheat. Nagin and Pogarsky further argued that one’s preference for delay is in part a function of one’s executive cognitive functioning, which they measured with a single logic problem: The total cost of a bat and a ball is $1.10. The bat costs $1 more than the ball. How much does the ball cost? Participants who answered this question correctly ($0.05) were seen as having greater executive functioning, and were less likely to cheat.

At the institutional level, schools with an honor code are commonly found to have a lower prevalence of cheating (McCabe, Butterfield, and Trevino 2006, 2012; McCabe and Trevino 1993; McCabe, Trevino, and Butterfield 2002). At the individual level, certain demographic factors have been shown to be predictive of academic dishonesty. For example, younger students tend to cheat more frequently than older students (Bichler-Robertson, Potchak, and Tibbetts 2003; Cochran et al. 1998; Haines et al. 1986; Lambert and Hogan 2004; McCabe and Trevino 1997; Mustaine and Tewksbury 2005; Tibbetts 1998). Many studies have found that male students are more prone to cheating than females (Cochran et al. 1998; McCabe and Trevino 1997; Michaels and Miethe 1989; Nagin and Pogarsky 2003; Storch and
Storch 2002; Tibbetts and Myers 1999); however, other studies have found that females are just as prone to cheating – if not more so – than males (Cochran et al. 1999; Crown and Spiller 1998; Whitley, Nelson, and Jones 1999). There is little evidence to suggest that academic cheating varies across racial groups.

Grade point average has been shown to be negatively related to cheating (Crown and Spiller 1998; Kerkvliet 1994; Lanier 2006; McCabe and Trevino 1997; Tibbetts 1998, 1999). Additionally, students who are members of Greek organizations or who are student athletes are more likely to cheat than those who are not (Crown and Spiller 1998; Diekhoff et al. 1996; Haines et al. 1986; Lambert and Hogan 2004; McCabe and Bowers 1996; McCabe and Trevino 1997; Mustaine and Tewksbury 2005; Storch and Storch 2002). In the current study, each of these factors was examined as possible correlates of hypothetical and actual cheating.

**Method**

**Participants**

Undergraduate students enrolled in one of several criminal justice (CJUS) courses at a southeastern university were recruited to take part in this study, which was described as two separate investigations. Students were informed they could earn up to $10.00 in university bookstore gift cards plus extra credit from their CJUS instructor for participating. The sample (N = 248) was predominately female (59.9%), white (59.7%), CJUS majors (77.4%), Juniors, or Seniors (43.1 and 52.4%, respectively), and was on average 22.74 years old (SD = 4.93). Descriptive information for each of the study’s primary variables of interest is provided in Appendix A.

**Materials**

Students expressing interest in participating in the study were sent an email with a hyperlink to the first of two online surveys. The email explained that the first study explored students’ interest in having online CJUS classes at the university, as well as their perceptions of potential problems associated with such courses. Students were informed they would earn a $5.00 gift card to the university bookstore for their participation in the first study, and that they could either terminate their participation at that time or continue with the second study.

Students were led to believe the second study focused on test anxiety in an online environment. They were told that they would be given a 10-item multiple-choice criminal justice trivia test followed by several questions asking how they felt while taking the test. Students were informed that if they answered at least 8 out of the 10 trivia questions correctly, then they would be rewarded with extra credit offered by their instructor plus an additional $5.00 gift card. However, they were also told that if they failed to score at least 80% on the trivia test, then they would forfeit the $5.00 gift card from the first survey.

Online survey #1: The first survey began by asking participants for their name and email address so that they could be contacted regarding their gift card. Other background questions were included (e.g., age, sex, race, and GPA), along with a lengthy series of distractor questions designed to make students believe the survey was examining their interest in taking online courses and their opinion of possible problems associated with online instruction. In actuality, the primary focus of the survey was students’ intentions to cheat on a hypothetical online exam for which they were unprepared. Included in the survey was the following scenario:

> You have enrolled in an online CJUS class, and it is time to complete your first exam in the course. You log onto the course’s website and open the exam file. It is a ‘closed book, closed notes’ test, so referring to any outside material or asking others for help on the exam is strictly prohibited.

> As you begin working, you realize that you are not adequately prepared for the exam and that you are not going to do well on it. You’ve put in a fair amount of work into the class thus far, but now you face the possibility of having...
nothing to show for all your time and effort. While there will be other exams in the course later in the semester, getting a good grade here would be a real bonus.

Note that immediately prior to the presentation of this scenario, a randomly selected subgroup of participants was reminded of the university’s honor code.

After reading the scenario, participants were instructed to imagine themselves in the hypothetical situation and to self-report their intentions to cheat on the test. Cheating intentions were measured in two ways. First, participants were asked a dichotomous Yes/No question: In this situation, would you use prohibited material (use books/notes, ask others for help, etc) to help you get a better grade on the test? In a separate question immediately afterward, participants were asked to self-report their likelihood of cheating on the exam using a 0% (No Chance) to 100% (Definitely Would) scale. Results based on the latter measure were virtually identical to those based on the former. Therefore, for simplicity, the analyses presented here are based on the dichotomous measure unless otherwise stated. Results based on the continuous measure are available upon request.

Next, participants were asked to rate how immoral the act of cheating would be and how much fun it would be using a 0 (Not at all) to 100 (Very) scale. They were then instructed to assume they had cheated on the test and to rate the certainty and severity of feeling ashamed, losing the respect of their peers, and getting caught by the professor. All measures of certainty were based on a 0–100% scale, and all measures of severity were based on a 0 (Not a problem) to 100 (An extremely large problem) scale. Prior to analysis, composite certainty × severity scores for feeling ashamed, losing respect from peers, and getting caught by the professor were calculated as the product of the corresponding certainty and severity ratings for these three costs. The resulting composite scores, which could range from 0 to 10,000, were then reduced to a 0 to 10 scale in order to avoid having regression coefficients with many leading zeros.

Elsewhere in the survey, participants completed Bolin’s (2004) four-item Attitude Toward Academic Dishonesty scale ($\alpha = .75$). They also reported if they had ever engaged in cheating while at the university. To measure participants’ levels of self-control, an abbreviated version of Grasmick et al.’s (1993) scale was used. A total of six items were selected for inclusion, and were the items that had the strongest loading on each of the six scale factors as reported by Grasmick et al. Item scores were summed to create a total scale score ranging from 6 to 24, with higher scores corresponding to lower levels of self-control ($\alpha = .72$). Based on the work of Nagin and Pogarsky (2003), participants were asked if they would prefer to experience a pending hypothetical sanction (i.e., driver’s license suspension) immediately or at some point in the future. Participants’ responses served as a measure of their preference for delay. Additionally, executive cognitive functioning was measured by way of the ball-and-bat logic question used by Nagin and Pogarsky (2003). Those who answered the question correctly were classified as having higher executive functioning.

The survey concluded with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, and Tellegen 1988). Participants were told this scale would be used in conjunction with items from the second survey to help assess test anxiety. After completing the PANAS, participants were reminded of their option to terminate their participation and claim their $5.00 gift card, or to continue with the second survey and have a chance to earn extra credit in their CJUS course plus an additional $5.00 gift card. Of the 253 participants who completed the first survey, 248 also completed the second survey and constitute the current sample.4

Online survey #2: The second survey began by asking participants for their name and email address for the purpose of awarding their gift card and extra credit. Participants were reminded that (1) they would complete a 10-item multiple-choice criminal justice trivia test, (2) they should refrain from using outside material or discussing the test with others as they complete it, and (3) afterward they would complete a series of questions about their mood/anxiety level.

Performance on the trivia test was the primary focus of this survey. More specifically, the focus was on participants’ performance on the final eight questions (see Appendix B for all test questions). The first two questions were designed to be very easy and were included to enhance the perceived legitimacy of the test. Regardless of their ability to answer the first two questions correctly, all participants
needed to answer *at least six of the final eight questions* correctly in order to earn a minimum grade of 80% on the test.

The final eight questions were designed to be so obscure that participants would not know the correct answer; as a result, answering any of these questions correctly (and honestly) would essentially be a random guess. Given that each question had five answer choices, the probability of answering any single question correctly is .2. The probability of answering at least six of the final eight questions correctly by guessing follows a binomial distribution where the probability of success on a given trial is .2 and the number of trials is eight. This corresponding probability is .001. Thus, while we cannot say with absolute certainty that students who answered at least six of the final eight questions correctly cheated on the test, for the purpose of this study, they were presumed to have cheated.5,6

At the conclusion of the trivia test, participants were presented with a second PANAS along with other questions about test anxiety. A text box was also provided so that participants could submit any comments they had about the study. Several participants noted the difficulty of the trivia test, but no one questioned the authenticity of the study’s cover story.

**Procedures**

All students interested in participating in the study were emailed a link to the first online survey. Once participants’ responses to the first survey were submitted, their Internet browsers were automatically redirected to the second survey for completion by those wishing to do so. The surveys remained open for a period of two weeks. At the conclusion of the study, all participants were (partially) debriefed by email and informed that everyone who took part in the study would receive the full $10 in gift cards as well as the extra credit. With full approval of the Institutional Review Board and in order to avoid raising students’ concerns over being accused of cheating for extra credit, participants were never informed of the study’s true purpose or of its method of identifying cheaters. As a result, rather than asking students directly about any suspicions they may have had regarding the purpose of the study, we measured suspicions indirectly and by way of the aforementioned text box included at the end of the trivia test. As previously noted, no suspicions/concerns were reported.

**Results**

**Predictive validity of hypothetical intentions**

In order to determine participants’ hypothetical intentions to cheat, the responses to the dichotomous question regarding cheating intentions were examined. In order to obtain a behavioral measure of cheating, participants’ answers to the final eight trivia questions were reviewed. More than one-third of participants (37.5%) indicated they would cheat to get a better grade on the hypothetical exam, while roughly two-thirds of participants (63.3%) answered at least six of the last eight trivia questions correctly. As can be seen, neither measure of cheating appears plagued by excessive homogeneity.

If intentions to cheat are a good proxy for actual cheating behavior, then there should be a strong and statistically significant relationship between these two measures. To assess this relationship, all participants were categorized into subgroups labeled ‘Honest’ and ‘Cheat’ based on their hypothetical intentions. The data were analyzed using a chi-squared test. The results showed a statistically significant relationship between hypothetical intentions and actual behavior, as indicated by the chi-squared statistic (\( \chi^2 = 0.72 \)).

<table>
<thead>
<tr>
<th>Hypothetical intentions</th>
<th>Actual behavior</th>
<th>Test</th>
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<tbody>
<tr>
<td>Honest (n = 155)</td>
<td>Honest (n = 91)</td>
<td>60</td>
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<td>%</td>
<td>%</td>
<td>38.7</td>
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<td>Cheat (n = 93)</td>
<td>Cheat (n = 157)</td>
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<td>%</td>
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<td>33.3</td>
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**Table 1. Relationship between hypothetical intentions and actual behavior (\( N = 248 \); cell counts and row percentages shown).**
intentions. Separately, participants were categorized into groups labeled ‘Honest’ and ‘Cheat’ based on their performance on the trivia test. Table 1 presents the 2-by-2 cross-tabulation and corresponding chi-square analysis for these group classifications. Note that in order to detect a large effect with power = .80 and $\alpha = .05$ in a chi-square with df = 1, a sample of 26 participants is needed (Cohen 1992). If one were to be more conservative and assume a medium-sized effect, then the minimum sample size would increase to 87. With an $N$ of 248, the analysis in Table 1 has sufficient power to assess the proposed IB relationship.

Of the 155 students who expressed honest intentions, 38.7% completed the trivia test honestly while 61.3% cheated. Of the 93 students who expressed intentions to cheat, 33.3% remained honest while 66.7% cheated. Given that the percentage of cheaters was roughly the same regardless of intentions, it is not surprising that the relationship between hypothetical intentions and cheating behavior was very weak ($\phi = .05$) and not statistically significant ($\chi^2 = .72, p = .40$). Additionally, the results from the continuous (0–100%) measure of hypothetical intentions indicate that intention scores for those who completed the trivia test honestly ($M = 35.27, SD = 35.13$) were not significantly different from those who cheated ($M = 37.32, SD = 34.61; t = .45, p = .66$).

Finally, note in Table 1 that there were 60 cases in which those who intended to be honest actually remained honest, and 62 cases in which those who intended to cheat actually cheated. This means that cheating intentions were able to accurately predict cheating behavior in just 49% of the cases (i.e., $(60 + 62)/248$). Thus, hypothetical intentions to cheat were no better than a coin-flip in predicting real-world cheating behavior.

**Correlates of hypothetical and actual cheating**

Given that the hypothetical and actual cheating measures were unrelated, one might expect the two measures to have different correlates. To examine this issue, a series of $t$-test and chi-square analyses were performed using the correlates of cheating identified from the literature. Table 2 summarizes these bivariate results.

As seen in the table, several of the study variables predicted hypothetical cheating intentions. Stronger intentions to cheat were reported by students who: viewed the act as less immoral, viewed the act as more fun, perceived a lower certainty and severity of feeling ashamed, perceived a lower certainty and severity of losing peer respect, perceived a lower certainty of getting caught, had a more favorable attitude toward academic dishonesty, had cheated in the past, had lower levels of self-control, and were younger. Furthermore, those who were randomized to see the university honor code prior to the scenario were less likely to express cheating intentions ($p < .05$, one-tailed test). Despite several non-significant results (some of which may be attributed to a small cell sizes – e.g., Greek affiliation), the findings for hypothetical intentions are largely consistent with the cheating literature. All totaled, 12 of the 20 variables in Table 2 were significantly related to hypothetical intentions and in the expected direction.

When turning to actual cheating behavior, a very different set of results emerge. None of the 20 variables were significantly related to cheating on the trivia test. Clearly, students who remain honest in the face of receiving no extra credit or gift cards are somehow different from those who cheat; yet, the factors that differentiate these two groups on their cheating behaviors do not appear to be among the variables in Table 2 that differentiate them according to their cheating intentions.

**Multivariate models of cheating**

Given that hypothetical intentions are commonly used to shed light on real-world decision-making processes, a set of logistic regressions was conducted that modeled participants’ intentions to cheat. For purposes of comparison, identical regressions were conducted that modeled participants’ actual cheating behavior. In this way, we sought to examine the potential consequences of modeling participants’ dishonest intentions rather than their dishonest behaviors.
Initially, a simple model of decision-making was examined using rational choice variables such as participants’ perceptions of the immorality of cheating and their perceptions of how much fun cheating would be. Composite measures for the certainty × severity of losing peer respect and getting caught by the professor were also included in the model. The composite measure for feeling ashamed was omitted from the analysis because of multicollinearity issues between it and the immorality ratings. (Note that the general conclusions remain the same when the composite measure for losing peer respect is omitted and the measure of feeling ashamed is included.) Prior cheating behavior (1 = prior cheater), age, sex (1 = male), and a dummy variable for race (1 = non-white) were used as control variables. See Table 3 for a summary of how all of the variables used in our multivariate models are related at the bivariate level.
Table 3. Bivariate (Pearson r) correlations among study variables (N = 248)*.

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<tbody>
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<td>1. Intentions to cheat</td>
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<td>2. Actual cheating</td>
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<td>3. How immoral</td>
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<td>4. How much fun</td>
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<td>5. Cert. × Sev. losing respect</td>
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<td>6. Cert. × Sev. getting caught</td>
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<td>7. Attitude toward dishonesty</td>
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<td>−.47</td>
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<td>8. Prior cheating behavior</td>
<td>.29</td>
<td>−.08</td>
<td>−.18</td>
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<td>−.14</td>
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<td>9. Low self-control scale</td>
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<td>.34</td>
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<td>−.25</td>
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<td>−.07</td>
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<td>−.09</td>
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<td>17. Greek affiliation</td>
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<td>−.03</td>
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<td>18. Student athlete</td>
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<td>−.02</td>
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<td>−.11</td>
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</table>

*Correlations ≥|0.13| are statistically significant at p < .05 or lower.
When hypothetical cheating intentions were regressed onto this simple model of decision-making, the model’s overall fit was quite good ($\chi^2 = 69.82$, $p = .000$; see Table 4, Model 1). Consistent with prior research, those who perceived cheating to be more immoral were significantly less likely to express intentions to cheat ($p < .05$, one-tailed test). Furthermore, perceptions of how much fun cheating would be significantly enhanced cheating intentions, while the perceived certainty × severity of getting caught significantly curbed them. Those with a history of cheating were more likely to express cheating intentions, as were females. Overall, the regression results offer a modest amount of support for the rational choice perspective.

Next, the ability of this simple rational choice model to predict real-world cheating was examined. When participants’ cheating behavior was used as the dependent variable, the model’s overall fit was poor and not statistically significant ($\chi^2 = 6.07$, $p = .64$; see Model 2). Given the null results at the bivariate level, the lack of fit for this model at the multivariate level is not surprising. Absent a significant omnibus test of the model, an interpretation of the individual predictor variables is unwarranted.

To better understand the predictors of cheating intentions and cheating behavior, a more comprehensive model of decision-making was developed. In addition to the aforementioned independent variables, this new model also included participants’ attitude toward academic dishonesty scores, low self-control scores, preference for delay scores, GPA, and dummy variables for executive cognitive functioning (1 = higher functioning), Greek membership (1 = yes), student athlete (1 = yes), and whether the participant was randomly assigned to view the University’s honor code (1 = yes).

When hypothetical cheating intentions were regressed onto this model, the overall fit remained quite good ($\chi^2 = 81.17$, $p = .000$; see Model 3). Participants were significantly more likely to endorse hypothetical cheating if they perceived a lower certainty × severity score for getting caught, had a more favorable attitude toward cheating (one-tailed test), had a prior history of cheating, were not reminded of the University honor code (one-tailed test), and were female. When actual cheating was regressed onto this same model, the overall fit was again poor and not statistically significant ($\chi^2 = 12.02$, $p = .74$; see Model 4). As such, the model is incapable of explaining any meaningful variance in real-world cheating.

### Table 4. Logistic regression results predicting hypothetical intentions and actual cheating behavior ($N = 248$).

<table>
<thead>
<tr>
<th></th>
<th>Model 1: Hypothetical intentions</th>
<th>Model 2: Cheating behavior</th>
<th>Model 3: Hypothetical intentions</th>
<th>Model 4: Cheating behavior</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>Exp ($B$)</td>
<td>$B$</td>
<td>Exp ($B$)</td>
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<tr>
<td>How immoral</td>
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<td>0.99</td>
<td>-0.01</td>
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</tr>
<tr>
<td>How much fun</td>
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<td>1.01</td>
<td>-0.001</td>
<td>1.00</td>
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<tr>
<td>Certainty × Severity of:</td>
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<tr>
<td>Losing respect from others</td>
<td>-0.06</td>
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<td>Getting caught by professor</td>
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<td>0.80</td>
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<td>-</td>
</tr>
<tr>
<td>Prior cheating behavior</td>
<td>1.40**</td>
<td>4.05</td>
<td>-0.36</td>
<td>0.70</td>
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<td>Low self-control scale</td>
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<td>Preference for delay</td>
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<td>Executive cognitive functioning</td>
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<td>-</td>
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<td>-0.43</td>
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<td>Non-white</td>
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<tr>
<td>Student athlete</td>
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<tr>
<td>Model $\chi^2$</td>
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<td>81.17***</td>
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<td>Nagelkerke $R^2$</td>
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<td>0.03</td>
<td>0.39</td>
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</table>

*a*Significant at $p < .05$, one-tailed test.

*p < .05; **p < .01; ***p < .001.
Exploratory analysis of affective responses

As we sought to identify possible explanations for the incongruence between cheating intentions and behaviors, we recalled the work of Loewenstein (2000), who argued that when individuals are in a calm state of mind, they are often unable to predict how they would respond to an emotionally charged event. Loewenstein refers to these misjudgments across visceral states as empathy gaps. Although the current study was not designed to test the presence of empathy gaps, the incidental inclusion of the PANAS allowed for an exploratory analysis of the different affective states associated with hypothetical and actual cheating decisions.

Recall that participants’ first PANAS scores were recorded shortly after they completed the hypothetical scenario. Scores from the positive affect and negative affect subscales were compared across those expressing intentions to cheat and those intending to remain honest. Similarly, subscale scores from the second PANAS (completed after the trivia test) were compared across cheaters and non-cheaters. The results are summarized in Figure 1.

Moments after the hypothetical scenario, there were significant differences in affect. Those who expressed intentions to cheat reported significantly lower positive affect than those who intended to remain honest \((t = −3.10, p = .002)\), and significantly higher negative affect \((t = 2.84, p = .01)\). A test of means on the 20 individual PANAS items further illustrated these differences. As if they were disappointed in themselves, the hypothetical cheaters reported significantly higher levels of guilt, irritability, and shame, with significantly lower levels of excitement, strength, enthusiasm, alertness, inspiration, determination, attentiveness, and activity (all \(p s < .05\)).

When examining participants’ affective states after completing the trivia test, the pattern of results was reversed. Those who cheated on the test reported significantly higher positive affect than those who remained honest \((t = 2.46, p = .02)\), and significantly lower negative affect \((t = −3.82, p = .000)\). Seemingly pleased with themselves, the real-world cheaters reported significantly higher levels of interest, pride, inspiration, determination, and attentiveness, with significantly lower levels of distress, upset, fear, hostility, irritability, and shame (all \(p s < .05\)). These findings suggest that cheating in a hypothetical environment does not elicit the same emotional response as cheating in the real world. This, in turn, may explain why participants’ predictions of how they would respond to a hypothetical cheating opportunity were poor predictors of their actual cheating behavior.
Discussion

Although hypothetical scenarios provide researchers with an ethical and versatile way to study criminal decision-making, the method is useful only to the degree to which it can shed light on real world offending. With this in mind, we sought to examine the question: Do hypothetical intentions to offend predict actual offending behavior? The results from this study suggest the answer is No. In fact, hypothetical intentions to cheat were no better than a coin-flip at predicting actual test cheating. While such a finding is at odds with research in psychology that reports a positive and significant correlation between individuals' prosocial intentions and behaviors (Armitage and Conner 2001; Randall and Wolff 1994), these results are generally consistent with research by Exum, Turner, and Hartman (2012) and Exum, Bailey, and Wright (2014), who found that participants' deviant intentions had limited predictive validity.

The current study also sought to examine the ramifications of using hypothetical intentions in lieu of actual behavior as the dependent variable in statistical models of criminal decision-making. Although several factors were found to be significantly related to hypothetical offending, none of the variables under study were related to real-world offending. Perhaps most surprising is the failure of the past cheating measure to predict current (trivia test) cheating. This may be a function of at least two factors. First, recall that approximately 18% of participants admitted they had previously cheated while in college. This self-reported value seems suspiciously low, given that prevalence estimates of cheating among college students commonly range between 50 and 80% (Coston and Jenks 1998; Lambert and Hogan 2004; McCabe, Butterfield, and Trevino 2012; Whitley 1998), which is also consistent with the approximately 63% of participants in the current study who cheated on our trivia test. If participants under-reported their past cheating activities, then this may help explain the measure's non-significant correlation with current cheating behavior. Second, although individuals who have cheated in the past may indeed be more likely to cheat at some point in the future, this does not necessarily mean they will cheat at every future opportunity. In other words, prior cheating may be predictive of subsequent cheating in the long run, but not of any particular, isolated event.

Overall, the findings from this study suggest that by focusing on hypothetical intentions to offend instead of real-world behavior, researchers may run an increased risk for uncovering Type I errors. In other words, researchers may be rejecting the null hypothesis (when studying intentions) when in fact the null hypothesis is true (when studying behavior). Given that the current study examined just one type of dishonest behavior, more research is needed to see if these findings can be replicated across other types of deviance. If these results can be confirmed, then the effects could be far-reaching. Not only are hypothetical scenarios commonly used to understand decision-making among potential offenders, they are also used to study the decisional processes of the police (Phillips and Varano 2008), court prosecutors (Wilson et al. 2011), judges (Freiburger 2010), jurors (Mitchell et al. 2005), and probation/parole officers (Krebs, Jones, and Jolley 2009). Thus, the predictive validity of hypothetical intentions is central to a wide band of research in criminology and criminal justice.

Limitations and future research

The current study has certain limitations. For example, the study utilized a sample comprised entirely of undergraduate criminal justice students; as a result, the generalizability of the findings may be limited. However, undergraduate samples – even those comprised solely of criminal justice students – are not uncommon in studies of criminal decision-making (Bouffard 2002; Loewenstein, Nagin, and Paternoster 1997; Nagin and Paternoster 1993), and there is no evidence to suggest that criminal justice students are any better or worse than anyone else at predicting their future behavior. If criminal justice students are just as (in)capable as the rest of society when it comes to forecasting how they would respond to a real-world deviant opportunity, then the results from the current study should be reasonably robust.

Some readers may be concerned that because Survey #1 (with the hypothetical scenario) was not anonymous, students may have under-reported their true intentions to cheat, thereby contributing to the incongruence between intentions and behaviors. While this is possible, we believe that
non-anonymous measures of hypothetical and behavioral cheating were necessary. In the real world, academic cheating is not done anonymously, which adds an element of risk. To mirror that real-world risk, we asked students to report their name before completing the online trivia test (Survey #2). Then, in order to make the hypothetical scenario conditions mirror those of the trivia test, we asked students to report their name at the beginning of Survey #1. Arguably, the lack of anonymity may have influenced how students responded to the hypothetical scenario; however, had we collected anonymous intentions and non-anonymous behaviors and still found no statistical relationship between the two, the interpretation of this null finding would have been confounded. In the end, we felt it was far better to provide participants with a realistic and risky (i.e., non-anonymous) cheating opportunity and reproduce that lack of anonymity in our hypothetical scenario than to remove all elements of risk from the study (making it less realistic) and/or introduce a confound.

Finally, some readers may view the incentive structure for the trivia test as a limitation. In particular, readers may feel that because of an endowment effect and/or loss aversion (Kahneman and Tversky 1979; Morewedge et al. 2009; Thaler 1980), participants succumbed to cheating not for the purpose of securing additional benefits but to avoid losing the gift card they had already earned by completing Survey #1. While we recognize this possibility, we have reason to believe that participants who cheated on the trivia test did so primarily to earn extra course credit. At the conclusion of the study, we sent many emails to participants over a period of several months reminding them to claim their $10.00 in bookstore gift cards. Despite our efforts, less than half of the participants claimed their cards. Participants did not need to stray far from their daily routines to pick up their cards; they merely needed to stop by an office in the Criminal Justice department, just a few feet away from where many of their classes are taught on a daily basis. The fact that so many participants did not stop by suggests that the gift cards were not participants’ primary motivation for participating – or cheating – in the study. As long as students received their extra credit (and all of them did), they were generally satisfied with the outcome.

These potential limitations notwithstanding, perhaps the best explanation for the incongruence between the two cheating measures is also the most intuitive: whereas the hypothetical scenario was an imaginary situation, the trivia test was a real event. When individuals are confronted with a real-life opportunity, they may experience an emotional response that is not evoked during a hypothetical exercise and, as a result, they behave in a manner that they would not have predicted. There is tentative evidence to support this argument. Compared to those who intended to remain honest, hypothetical cheaters felt less positive and more negative affect following the exam scenario, whereas actual cheaters felt more positive and less negative affect after the trivia test than those who completed the test honestly. Such differences suggest that hypothetical and real-world opportunities for deviance come with unique emotional undercurrents. This may not only help explain the incongruence between cheating intentions and behaviors uncovered in the current study, but also the differences in their respective correlates.

Based on the results of this study, three recommendations for future research seem warranted. First, whereas the current study examined the predictive validity of the test cheating on a sample of undergraduate students, future research should examine the validity of hypothetical intentions using other types of deviant behavior and in other types of samples. If such research confirms the current study’s findings, then the utility of the hypothetical scenario as a tool for studying criminal decision-making will be a matter for larger debate.

Second, future research using hypothetical scenarios should seek to make the exercise more genuine by inducing an associated emotional/visceral state within the participants. This would presumably allow participants to make decisions in the laboratory in much the same way they would in the real world. Currently, there is a small body of research that has sought to do this. For example, some studies have manipulated participants’ levels of sexual arousal by randomly assigning them to view pornographic images before administering a sexual assault scenario (Bouffard 2002, 2014; Exum and Zachowicz 2014; Loewenstein, Nagin, and Paternoster 1997), while others have manipulated participants’ blood alcohol levels and feelings of anger immediately prior to administering a bar fight scenario (Exum 2002). The general findings from this line of research suggest that participants make different decisions under hot
and cold states of mind; yet, more research is needed to better understand how emotionally charged situations impact the underlying decisional processes.

Finally, rather than relying solely on hypothetical criminal offenses, researchers should also explore opportunities to study real-world deviant acts in controlled environments. While laboratory studies of actual crimes may be ethically out of reach, much can be learned about decision-making through the study of basic acts of dishonesty such as cheating. For example, Nagin and Pogarsky (2003) used a cheating paradigm to study the impact of the certainty of detection and severity of punishment on students’ acts of dishonesty. Mazar, Amir, and Ariely (2008) examined how cheating on a laboratory task may be influenced by the financial benefits of the act, as well as by participants’ recognition of moral codes. Similarly, Mead et al. (2009) examined the impact of low self-control on laboratory cheating. While each of these factors has also been studied by way of hypothetical scenarios, the above research highlights the fact that there are other (possibly more realistic) ways to study the individual and situational forces that influence the decision to offend.

Notes

1. Although academic test cheating is not necessarily a criminal offense, it has often been used to study theoretical and methodological issues related to criminal offending and decision-making (e.g., Bichler-Robertson, Potchak, and Tibbetts 2003; Cochran et al. 1998; Michaels and Miethe 1989; Nagin and Pogarsky 2003; Pogarsky 2004; Tibbetts 1998, 1999; Tibbetts and Herz 1996; Tibbetts and Myers 1999).
2. The instructors of the CJUS courses who agreed to offer extra credit predominately taught upper level classes, which explains the large number of Juniors and Seniors in the sample.
3. When designing the study, we were concerned that those participants who were already performing well in their courses may not find the extra credit opportunity very enticing. We therefore added the opportunity to earn a second $5.00 gift card as an additional incentive.
4. Some readers may be concerned that by allowing participants to choose whether to complete the second survey, risk-averse students will self-select out of the second survey leaving the sample heavily biased toward risk seekers. Given that real-world offenders are inherent risk seekers (Gottfredson and Hirschi 1990), it is essential for researchers who use hypothetical offending scenarios to understand the I/B relationship among these types of individuals. Thus, if the current sample is biased toward risk seekers, then this can be viewed as an asset rather than a limitation.
5. Note that the survey did not monopolize participants’ Internet browsers, thereby allowing them to open a secondary window and conduct an online search for the answers to the trivia questions. Participants could easily find the answers by conducting a basic Internet search on key words included in the questions.
6. To verify that students would not perform well on the trivia test without cheating, paper copies of the test were to administered to a comparable but independent sample of CJUS students at the university (n = 106) a few months after the completion of the current study. Students completed the trivia test without the aid of technology while sitting in a classroom. They were told they would receive extra credit if they received a score of 80% or higher. No student answered six or more of the final eight questions correctly (mean = 1.05, range = 0–3).
7. In an additional examination of the predictive validity of hypothetical intentions to offend, Models 2 and 4 were re-analyzed with hypothetical intentions included as an independent variable. In both analyses, the model fit remained poor and non-significant. In Model 2, the coefficient for hypothetical intentions was .34 (p = .30, Exp (B) = 1.41), while in Model 4, the coefficient was .35 (p = .31, Exp (B) = 1.42).

Disclosure statement

No potential conflict of interest was reported by the authors.

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M. Cristina Layana graduated from the Criminal Justice master’s program at the University of North Carolina at Charlotte in 2014. She is currently a doctoral student in the Department of Criminal Justice and Criminology at the University of Maryland, College Park. Her research interests include criminal decision-making, corporate crime, and terrorism.
References

Appendix A. Descriptive information for the primary study variables.

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<th>N</th>
<th>Reported range</th>
<th>( \bar{x} ) (SD) or %</th>
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<tr>
<td>How much fun is it</td>
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<td>17.70 (29.99)</td>
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<td>Certainty of:</td>
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<td>247</td>
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<td>Losing peer respect</td>
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<tr>
<td>Getting caught</td>
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<td>0–100</td>
<td>38.34 (31.93)</td>
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<tr>
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<td>0–100</td>
<td>77.66 (29.74)</td>
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<td></td>
</tr>
<tr>
<td>Yes (n = 137)</td>
<td>–</td>
<td>–</td>
<td>55.2%</td>
</tr>
<tr>
<td>Age</td>
<td>247</td>
<td>18–52</td>
<td>22.74 (4.93)</td>
</tr>
<tr>
<td>Sex</td>
<td>247</td>
<td>0–1</td>
<td></td>
</tr>
<tr>
<td>Male (n = 99)</td>
<td>–</td>
<td>–</td>
<td>39.3%</td>
</tr>
<tr>
<td>Race</td>
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<td>1–6</td>
<td></td>
</tr>
<tr>
<td>African-American (n = 56)</td>
<td>–</td>
<td>–</td>
<td>22.6%</td>
</tr>
<tr>
<td>American Indian (n = 1)</td>
<td>–</td>
<td>–</td>
<td>0.4%</td>
</tr>
<tr>
<td>Asian (n = 9)</td>
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<td>–</td>
<td>3.6%</td>
</tr>
<tr>
<td>Hispanic (n = 19)</td>
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<td>–</td>
<td>7.7%</td>
</tr>
<tr>
<td>White (n = 148)</td>
<td>–</td>
<td>–</td>
<td>59.7%</td>
</tr>
<tr>
<td>Other (n = 15)</td>
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<td>–</td>
<td>6.0%</td>
</tr>
<tr>
<td>GPA</td>
<td>248</td>
<td>1.87–4.00</td>
<td>3.00 (0.51)</td>
</tr>
<tr>
<td>Greek affiliation</td>
<td>248</td>
<td>0–1</td>
<td></td>
</tr>
<tr>
<td>Yes (n = 23)</td>
<td>–</td>
<td>–</td>
<td>9.3%</td>
</tr>
<tr>
<td>Student athlete</td>
<td>247</td>
<td>0–1</td>
<td></td>
</tr>
<tr>
<td>Yes (n = 12)</td>
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<td>–</td>
<td>4.8%</td>
</tr>
<tr>
<td>Intentions to cheat on hypothetical exam</td>
<td>248</td>
<td>0–1</td>
<td></td>
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<tr>
<td>Yes (n = 93)</td>
<td>–</td>
<td>–</td>
<td>37.5%</td>
</tr>
<tr>
<td>Actually cheated on trivia test</td>
<td>248</td>
<td>0–1</td>
<td></td>
</tr>
<tr>
<td>Yes (n = 91)</td>
<td>–</td>
<td>–</td>
<td>63.3%</td>
</tr>
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</table>

Appendix B.

1. Complete this sentence: In order to obtain a conviction in a criminal trial, the prosecution must show that the defendant is guilty ____________.
   (a) Beyond all possible doubt
   (b) Beyond a reasonable doubt
   (c) Based on a preponderance of the evidence
   (d) Based on a substantial amount of evidence
   (e) Based on reasonable suspicion

2. Which Amendment of the US Constitution protects the people’s right ‘to keep and bear arms’?
   (a) The 2nd Amendment
   (b) The 8th Amendment
   (c) The 11th Amendment
   (d) The 13th Amendment
   (e) The 27th Amendment
3. The first US state to enact a sex offender registration program was:
   (a) Massachusetts
   (b) Hawaii
   (c) California
   (d) Florida
   (e) New York

4. William Kemmler is known for being the first:
   (a) US juvenile to be sentenced to death
   (b) US death row inmate to be exonerated based on DNA evidence
   (c) US death row inmate executed in the electric chair
   (d) US fugitive to appear on the FBI's 'Ten Most Wanted' list
   (e) US defendant to plead 'Not Guilty by Reason of Insanity'

5. The only US Supreme Court Justice ever to be impeached is:
   (a) William Paterson
   (b) Joseph Story
   (c) Thomas Todd
   (d) James Wilson
   (e) Samuel Chase

6. The landmark Palermo Protocols, which focus (in part) on the prevention and punishment of human trafficking, were finally adopted in the year 2000 by which organization?
   (a) The US Congress
   (b) INTERPOL
   (c) The FBI
   (d) The United Nations
   (e) The US Department of Justice

7. The 'Judicial Conference of the United States,' which oversees the administration of the US courts, was formerly known as:
   (a) The Conference of Judicial Regulation
   (b) The Conference of National Judges
   (c) The Conference of Legal Affairs
   (d) The Conference of Senior Circuit Judges
   (e) The Conference of Magistrates

8. In his groundbreaking book The Criminality of Youth, which American criminologist famously championed for a rehabilitative approach to the problem of juvenile delinquency?
   (a) Thorsten J. Sellin
   (b) Sheldon E. Glueck
   (c) Lloyd E. Ohlin
   (d) Donald R. Cressy
   (e) Albert J. Reiss

9. Alaska P. Davidson is known for being the first:
   (a) Woman to serve as a special agent in the FBI
   (b) Female judge appointed to a US Federal Court
   (c) Known female serial killer in the US
   (d) Person in the US to use 'Battered Women's Syndrome' as a defense for murder
   (e) Woman to serve as chief of police in a major US city
10. In ‘Berghuis v. Thompkins,’ the US Supreme Court ruled:
   (a) Police cannot conduct a warrantless search in a home unless all occupants agree
   (b) The right to remain silent does not exist unless the suspect invokes it
   (c) Life imprisonment without the possibility of parole may not be a mandatory sentence for juvenile offenders
   (d) Juries may convict a defendant without having reached unanimous agreement
   (e) A defendant has the right to a competency evaluation before being executed

[Correct answers are: 1b, 2a, 3c, 4c, 5e, 6d, 7d, 8a, 9a, and 10b]