DISSERTATION

FAKING IT: THE INFLUENCE OF INSURANCE-RELATED CONTINGENCIES ON THE ACCURACY OF SELF-REPORTED DRIVING BEHAVIORS

Submitted by

Phebe Titus

Department of Psychology

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY PHEBE TITUS ENTITLED FAKING IT: THE INFLUENCE OF INSURANCE-RELATED CONTINGENCIES ON THE ACCURACY OF SELF-REPORTED DRIVING BEHAVIORS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

(Please print name under signature)

Susan MacQuiddy

Eric D. Hepsted

Charles Davidshofer

John R. Brouillette

Jerry L. Deffenbacher

Adviser

Co-Adviser

Department Head/Director

ABSTRACT OF DISSERTATION

FAKING IT: THE INFLUENCE OF INSURANCE-RELATED CONTINGENCIES ON THE ACCURACY OF SELF-REPORTED DRIVING BEHAVIORS

The validity of self-reported questionnaires has been debated extensively, particularly when respondents are aware of contingencies associated with their responses. In this study, self-report for potential auto insurance purposes was addressed to determine (a) if individuals altered their responses when aware that contingencies such as higher insurance rates were associated with their self-report, and (b) if tests developed under anonymous conditions were still valid when used in motivated contexts. This study involved self-report of driving anger and driving anger expression, as previous research showed that high anger drivers tend to be more aggressive and risky drivers. Insurance companies could be interested in this information to assess risk.

Three hundred students in an introductory psychology class completed questionnaires on driving anger, driving anger expression, trait anger, impulsivity, and speech anxiety under three conditions. The first was an anonymous self-assessment of these variables. The second asked students to complete the questionnaires as if submitting them to their automobile insurance company, assuming the information would be used to set premium rates. The third resembled the second, but students were informed of the insurance company instructions after describing their driving behaviors, but before describing their anger, anger expression, and impulsivity, (i.e., psychological variables

which cannot be externally validated). These conditions are designed to assess the potential impact of insurance contingencies on both criterion and psychological variables.

Generally, no condition effect was found, as only three of the analyses involved conditions. The insurance later respondents reported less driving anger and fewer major accidents than those in other conditions. Also, condition interacted with gender to predict differing patterns of self-report of speaking anxiety. While men's anxiety increased over insurance conditions, women's decreased.

Potential differences in correlations as a function of condition were tested by comparing the strengths of independent correlations. No meaningful differences in correlations between variables were found as a function of condition. Data were collapsed across conditions. Correlations among driving anger, driving anger expression and trait anger reflected previous research.

Potential reasons for lack of finding include actual lack of condition impact, possible lack of understanding of the impact of increased insurance rates, and lack of understanding of instructions.

Phebe Titus
Psychology Department
Colorado State University
Fort Collins, CO 80523
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INTRODUCTION

A psychological test is a measurement of a sample of behavior, obtained under standardized conditions, which is designed to predict behavior in other contexts. Examples include intelligence tests, special aptitude and achievement tests, personality tests and neuropsychological tests. Although Kroger and Wood (1993) note what they call the "reification" of abstract personality constructs into measurable concepts, psychological testing has been determined to be useful to the degree that test performance corresponds to behavior in other, real world situations, i.e., criterion validity (Anastasi & Urbina, 1988; Gregory, 1992). Many such tests involve self-reports. That is, the respondent reports something about himself or herself. Since this study explores a specific example of the validity of self-report, factors that influence this validity of self-report are important and will be reviewed briefly.

A significant amount of research has been done on the accuracy of self-report and its relationship to actual behavior. Pryor, Gibbons, Wicklund, Fazio and Hood (1977) describe La Piere's 1934 classic study of prejudice, which found actual behaviors differed considerably from self-reported behaviors. While almost all of the restaurant managers mailed a questionnaire about serving a Chinese couple indicated they would not do so, when the couple actually presented to eat, in fact, all but one seated them. The authors describe several other studies (e.g., Harthorne & May, 1930; Rischel & Wicker, 1969) addressing a variety of behavioral domains, for example, beliefs about cheating, that have found self-reports to have poor predictive validity. Similarly, Manfredo and Shelby (2001) also report studies (e.g., Cannell & Fowler, 1967; Goddard, Broder &

Wenar, 1961; Warshaw, Calantone & Joyce, 1986) in areas including hospitalization stays, report of children's developmental milestones, and reports of blood donation, which indicate poor correlation between self-reported and actual behaviors.

This predictive value of self-report could be compromised by both external factors (e.g., physical condition of testing administration, attitude of the test administrator) and internal factors of the individual test-taker (e.g., physical health, motivation level), which would influence self-report. To minimize variation resulting from external factors, people collecting self-reports attempt to address external variables through standardization, ensuring that individuals making self-reports do so under essentially similar conditions. Internal factors such as individual motivation levels can be problematic, however, because whenever people respond to variables other than item content, the predictive value of the information gained is potentially compromised (Murphy & Davidshofer, 1991). Self-report inventories may be particularly vulnerable to this type of responding, called response sets (Barrick & Mount, 1996; Dicken, 1960; Furnham & Craig, 1987; Thornton & Gierasch, 1980).

These response sets, i.e., response patterns that are not in response to specific item content, include acquiescence (the tendency to either respond all "yes" or all "no" to questions), extreme responses (the tendency to avoid any middle-of-the-road options and only give extreme responses), middle-of-the-road responses (the pattern of responding in which an individual avoids all extreme responses and only endorses response options in the middle), deviation (an individual's propensity to give unusual or uncommon responses) and social desirability (the tendency of test takers to respond in styles they believe to be socially desirable).

This last variable, i.e., social desirability, has been described as including both self-deception (respondents who actually believe their responses to be accurate, thus their distorted responses are due to lack of self knowledge) and impression management (respondents who intentionally distort their responses to reflect a particular image) (Ellingson, Sackett & Hough, 1999; Paulhus, 1991; Paulhus & Levitt, 1987; Paulhus & Reid, 1991). In either case, response distortion clearly could influence the predictive value of self-report.

Regarding motives, Kroger and Wood (1993) offer a discussion of the term "faking," pointing out that it is misleading because it implies that there is a "true" response that could be independently assessed. They suggest the term be replaced by "strategic action" that more accurately defines the respondents' assessment of the testing context and process of self-portrayal.

However, in this paper we are primarily concerned with the idea of impression management, where respondents do make a conscious effort to portray a particular image of themselves in a particular domain. Faking has been described as any time "an individual consciously distorts answers to be viewed favorably" (McFarland & Ryan, 2000, p. 813), or when test-takers "adopt a response set strategically contrived to impart a particular image" (Christiansen, Goffin, Johnston & Rothstein, 1994, p. 847). For the purposes of this study, therefore, we will use the terms "response distortion," "socially desirable responding" and "faking" interchangeably to indicate this pattern of intentional distortion.

Thus, we know the purpose of self-report measures is to predict later behavior. An individual's response bias, i.e., a tendency to respond to items based on elements

other than item content, can influence the predictive validity of self-report instruments. Although individuals may distort their responses for many reasons, in this paper we are concerned about distortion for specific purposes, i.e., faking.

Laing (1986) in her paper addressing the value of self-report as an assessment technique, outlines four criteria necessary for the use of self-report. First, respondents must clearly understand what information is being requested. They must understand the concept in question and the time period referenced. Second, the information requested must be available to the respondents. Third, the examiners must be able to interpret the response accurately. Fourth, the respondent must be willing to provide the information. It is this last criterion that is the focus of this paper.

The Possibility of Response Distortion in Self-Report

The first question to be addressed is whether or not people do intentionally distort their responses if they perceive some benefit or stake in the outcome. Anastasi and Urbina (1988) point out that most items on self-report inventories have at least one response that appears more socially acceptable than the others, thus enabling test-takers to present themselves in either a more or less favorable light, assuming they were motivated to do so. Summarizing several studies indicating the ease with which respondents can intentionally distort their responses on personality inventories (Jacobs & Baron, 1968; Radcliffe, 1966; Stricker, 1969), Anastasi and Urbina (1988) point out that "the results of such studies clearly demonstrate the facility with which the desired impression can be deliberately created on such inventories" (p. 549).

Research in the area of self-report (Dunnete, Koun, & Barber, 1981; Furnham & Craig, 1987; Thornton & Gierasch, 1980) indicates that not only is it possible for people to distort their responses, it is likely they will do so if they perceive some benefit.

Several domains have been studied to assess this further. These areas include the report of illegal behaviors or those carrying legal sanctions, i.e., reporting drinking while on probation (Lapham et al., 1994; Lapham, C' de Baca, Chang, Hunt & Berger, 2002), report of health conditions to which a benefit is attached, i. e., reporting symptoms of a condition for which there is compensation (Tearnan, 2003), report of medication compliance (Wagner & Miller, 2004), self-report of socially undesirable attitudes (Teachman & Brownell, 2001), and self-report of skills and attitudes on employment selection questionnaires (Barrick & Mount, 1996; Donovan, Dwight & Hurtz, 2003; Ellingson, Sackett & Hough, 1999; Hogan, Hogan & Roberts, 1996; Hough, Dunnette, Eaton, Kamp & McCloy, 1990; Jackson, Wroblewski & Ashton, 2000; Mueller-Hanson, Heggestad & Thornton, 2003; Ones, Viswesvaran & Reiss, 1996; Rosse, Levin & Nowicki, 1999; Thumin & Barclay, 1993).

Looking at the validity of self-reports of adolescent smokers, Murray, O'Connell, Schmid and Perry (1987) found support for the pipeline effect; students were more willing to disclose a socially undesirable behavior if they believed there was an independent and valid means of confirming the behavior. The authors created conditions under which respondents were asked to self-report their smoking frequency, and then asked an experimental group to self-report their smoking frequency with the knowledge that all students would have their carbon monoxide levels tested (pipeline condition).

They found that twice as many students in the pipeline condition, i.e., knowledge of external validation, admitted to smoking compared to controls.

Similarly, the validity of self-reports regarding illicit drug use (with the potential contingency of incarceration) is also controversial. Assessing screening instruments to determine classification of DWI offenders, Lapham et. al. (1994) found that 7% of their clients self-reported using other drugs of abuse (with no additional form of validation). However, of court-ordered DWI participants, who presumably were having their self-reports confirmed with urinalysis, 22% self-reported using other drugs of abuse. Lapham, C'de Baca, Chang, Hunt and Berger (2002) looked at the self-report of DWI offenders when reporting other drug use and found that "despite a rigorous screening program to identify drug use problems among convicted drunk drivers, there appears to be significant under-identification of drug use disorders among those screened" (p. 247). The authors found that 28% of those offenders not initially diagnosed with a drug problem retrospectively self-reported a diagnosis of drug dependence or abuse.

Morral, McCaffrey, and Iguchi (2000) assessed the accuracy of use-frequency self-reports of methadone maintenance clients and validated these with urinalysis. Although complete denial of use was minimal (i.e., of those cases where participants had at least one urinalysis revealing illicit opiate use, only 12% completely denied use and 34% of cocaine users with at least one positive urinalysis completely denied use), under-reporting was more serious. For example, 36.5% of opiate users and 42.8% of cocaine users reported improbably low drug use frequencies. The authors calculated that use frequencies were actually 34% higher for opiate users and 20% for cocaine users than were self-reported. Ehrman and Robbins (1994) also found about a 15% discrepancy

between methadone users self-report of frequency of illicit drug use and actual results of urinalysis, apparently including both under- and over-reporting use, providing a 30% range in which the use may have occurred.

Medication compliance is another area in which self-report may be influenced by social desirability, i.e., the desire to be perceived as a good patient, as Wagner and Miller (2004) noted in their study of adherence issues in HIV antiretroviral therapy.

Looking at the influence of contingencies on self-report, Tearnan (2003) addressed the treatment of chronic pain patients and the issue of self-report distortions, i.e., malingering and deception, in order to remain off work or to obtain pain medication. Pain is a subjective experience that cannot be verified, and both pain medication and the opportunity to remain out of work can serve as powerful contingencies that may influence the accuracy of patient self-report of pain. For example, he noted that, in order to remain out of work, 17-25% of patients admitted they lied about their level of injury. Bury and Bagby (2002), in a study looking at faking Posttraumatic Stress Disorder (PTSD) symptoms on the Minnesota Multiphase Personality Inventory-2 (MMPI-2) in order to receive some form of compensation, showed that 30% of the personal-injury and worker's compensation claimants faked PTSD symptoms.

Assessing biases of medical professionals towards obese people, Teachman and Brownell (2001) found that explicit measures of bias, i.e., face-valid self-report, differed significantly from measures of implicit biases, which appeared more predictive of biased behavior. Measurements of implicit biases (i.e., automatic or unconscious beliefs) included an Implicit Association Test which measures reaction time when sorting automatic associations and concepts a person has towards a social group. Designed to

address the issue of social desirability, this process occurs without requiring an individual's conscious introspection. The authors concluded that relying exclusively on explicit measures is inadequate, because, first, people may be ignorant of their biases (self-deception), and second, people want to appear tolerant and fair (impression management) and may thus distort their responses.

Another example of the impact of social desirability is self-report of church attendance. For example, Toolin (2001) found that actual church attendance was about half of what people self-reported on telephone surveys, again reflecting peoples' tendency to endorse what they feel is the socially desirable response.

An area clearly involving contingencies which concerns the issue of self-reporting possibly undesirable behaviors or enhancing desirable ones is the area of employment selection. This is an area in which applicants could be motivated to alter their responses to attain a job and thus influence the predictive value of the measure. As with other contexts, the value of self-report instruments or other testing for employment selection lies with the instrument's ability to predict future job performance and work-related behavior. Personality tests, involving self-reports, are frequently used, as it is believed that people's personalities predict their general behavior (Hogan, Hogan & Roberts, 1996). Thus, variables that compromise this predictive ability of self-report clearly impact the usefulness of employment testing. Jackson, Wroblewski and Ashton (2000) in their review of the effect of forced-choice test design on faking on employment tests, cited several studies (e.g., Dunnette, McCartney, Carlson & Krichner, 1962; Furnham, 1986, 1990) indicting that people have been shown to have the ability to fake good, "if the situation motivates them to give a favorable impression" (p. 372). Hough, Dunnette,

Eaton, Kamp and McCloy (1990) also note that, "the possibility of response distortion is often cited as the main argument against the use of personality measures to aid in selection decisions" (p. 581). Donovan, Dwight and Hurtz (2003), evaluating the impact of a random response technique to guarantee individual anonymity, assessed faking behavior in current college student job applicants. They found rightly 50% of respondents reported exaggerating qualities of dependability and reliability and said they tried to portray themselves as more agreeable than they really were. Further, 60% reported minimizing negative traits, and over one third of respondents reported providing completely fabricated responses.

Thus, from a variety of domains, research has indicated that people can and do distort their responses, especially if there is an incentive or motivation to do so. The second question addressed concerns the impact of such distortion.

Impact of Socially Desirable Responding

The impact of socially desirable responding has been assessed particularly in the areas of medication compliance and employment. For example, Wagner and Miller (2004) report that adherence is vital to success of treatment, as accurate reporting informs optimal treatment planning, and that misrepresentation, even if stemming from memory deficits, can negatively influence treatment.

In the area of employment, Barrick and Mount (1996) found that while "respondents can and do distort their responses on personality inventories, this distortion does not influence the predictive validity of personality constructs" (p. 269). Similarly, Ones, Viswesvaran and Reiss (1996) found that "social desirability is not a response bias

that attenuates criterion-related validity" (p. 670) and that "it does not contribute to the prediction of job performance" (p. 669).

The issue of impact may revolve around whether one looks at the aggregate or individual level. Ellingson et al. (1999) pointed out that, at the aggregate level, correcting for social desirability does not generate "honest scores" as such correction assumes all respondents' demonstrate a similar socially desirable responding bias. However, on an individual level, "honest individuals holding top ranks are displaced when other individuals fake" (p. 163). Thumin and Barclay (1993) note that, comparing student test-takers to job applicants, the job applicants had smaller standard deviations than the student group on the Self-Perception Test (SPT), suggesting that "some individuals are willing to describe themselves quite unfavorably in noncompetitive situations (e.g., where the results are used only for self-analysis) - but they improve their profiles (i.e., "fake good") when motivated by the prospect of employment. The result is a substantial reduction in the most unfavorable values, thereby tightening the distribution and reducing dispersion to some degree" (p. 14).

Mueller-Hanson, Heggestad and Thornton (2003) described the more specific impact of response distortion on the upper-end of the predictor-criterion distribution. The actual correlation coefficient may remain constant but, as Ellingson et al. (1999) determined, the rank order of individuals in the upper section of the same distribution might change as faking increases. As fakers, i.e., those who are not really high on the characteristic being measured but who have faked to get a higher score, are more likely to be in this upper section of the distribution, the prediction error for this section is higher, and the criterion-related validity for people in the upper end is lower. Mueller-Hanson et

al. thus concluded that "faking is a problem; it affects validity at the high end of the predictor distribution and can lead to hiring people whose performance is below what we would expect on the basis of their test scores" (p. 354). They go on to note several studies (e.g., Nguyen & McDaniel, 2000; Rosse et al., 1998; Weinver & Gibson, 2000) that illustrated the significant impact even modest faking has on selection decisions. As also noted by Donovan, Dwight and Hurtz (2003), particularly when selection ratios are small, fakers, who presumably score higher on tests than non-fakers, are more likely to be hired. Given that the work performance of fakers would be expected to be poorer than honest respondents, the utility of the self-reports could be severely compromised.

Rosse, Levin and Nowicki (1999) also support this finding. They address whether or not faking impacts job performance and determine that faking poses three distinct risks to employers. They note first that higher levels of faking do occur among those who move to the top of the applicant pool. Second, they point out that faking can and does lead to employers selecting lower performing employees, and finally, that faking can lead to employers selecting applicants who will demonstrate more negative behaviors after being hired.

Thus, factors such as social desirability and the influence of contexts and situations in which test takers are aware of contingencies associated with their responses (e.g., employment, incarceration, treatment) may significantly influence the predictive value of the self-reported the information. It is because of this propensity that many self-report instruments have developed validity scales, although there is significant disagreement about whether or not correcting for this tendency actually leads to more accurate scores (Ellingson, Sackett & Hough, 1999).

Influence of Auto Insurance Rates on Self-Report of Driving-Related Characteristics

Another area in which the accuracy of self-reports could be compromised due to individual motivation involves auto insurance applications. In order to accurately assess the risk a particular driver poses, companies attempt to evaluate prior driving history and any additional factors (e.g., school performance) that may predict driving behavior. Generally the information used to make risk assessments is confirmed by checking public records (e.g., accident reports, speeding tickets) or by obtaining school transcripts (e.g., good student discounts). However, the literature suggests that several self-reported personality, emotional and/or behavioral characteristics may predict important driving-related behaviors (e.g., aggression on the road, risky behavior) or conditions (e.g., moving violations).

An area of behavior not currently assessed by these companies but which appears predictive of driving risk is an individual's level of driving anger and forms of driving anger expression. Novaco (1994) describes anger as a "subjective emotional state, entailing the presence of physiological arousal and cognitions of antagonism, and is a causal determinant of aggression" (p. 32). Considering the risk angry, aggressive drivers pose to themselves and other drivers, information on an individual's driving anger may be of significant interest to an insurance company in order to determine insurance rates, and a self-report questionnaire may be the most expedient means of obtaining this information.

The connection between driving anger and risky and aggressive driving practices has a building literature. High-anger drivers report becoming more intensely angry, more often than low-anger drivers and indicate they are angered by a wider range of driving

events (Deffenbacher, Deffenbacher, Lynch & Richards, 2003; Deffenbacher, Filetti, Richards, Lynch & Oetting, 2003; Deffenbacher, Huff, Lynch, Oetting & Salvatore, 2000; Deffenbacher, Richards & Lynch, in press). High anger drivers, in a research context, report being more aggressive drivers, admitting they commit approximately 3.5 to 4.0 times more aggression on the road (Deffenbacher, 2003; Deffenbacher, Deffenbacher et al., 2003; Deffenbacher et al., in press). Also, high anger drivers appear to be higher risk drivers (e.g., drive faster and more erratically, drive with greater variability of speed, use their seat belt less often, have shorter time and distances to collisions) than low anger drivers (Deffenbacher, Deffenbacher et al., 2003; Deffenbacher et. al., in press; Deffenbacher, Lynch, Oetting & Yingling, 2001) and, in driving simulations involving impedance, have crash rates roughly two times as great as low anger drivers (Deffenbacher, Deffenbacher et al., 2003). In fact, they have a higher lifetime prevalence of accidents and near accidents and higher rates of minor accidents than do low anger drivers (Deffenbacher, Deffenbacher et al., 2003; Underwood, Chapman, Wright & Crundall, 1999) and report more frequent loss of concentration and vehicular control over the past three months than do low anger drivers. As Deffenbacher, Huff et al. (2000) summarize, the actual difference between high and low anger drivers is significant. Extrapolating from their study, they report:

> Assuming an average of 300 driving days per year, low-anger drivers would experience 210 anger episodes, 142 aggressive behaviors, and 492 risky behaviors, whereas high-anger drivers would experience 678 anger episodes, 604 aggressive behaviors, and 1,164 risky behaviors that expose them, and potentially others, to greater occurrence of more emotional upset, aggression, and risky, potentially accident-engendering behavior (p. 11).

Given the risk factors summarized above, auto insurance companies might be interested in assessing the anger level of insurance applicants, and may therefore request this information from the applicants. A critical question would concern the accuracy and validity of this self-reported information, as it seems reasonable to assume applicants might under-report, given their knowledge of specific contingencies associated with reporting, i.e., their insurance rates. Would previous research on social desirability and the accuracy of self-reports in motivated contexts generalize to this specific purpose? Also, would the levels of variables and relationships among variables generalize from the anonymous, non-contingent research in which risk-factor relationships have been established?

Goals of This Study

The focus of this research reflects two areas related to the collection of driving anger data. The first concerns the accuracy of self-report of socially undesirable behaviors in a motivated context (i.e., when respondents are aware of contingencies associated with their self-report, will they alter their responses accordingly?). Similar to the study of Murray et. al. (1987), we want to know whether knowledge of contingencies associated with the information provided influences responses, as it appears to in other contexts. Specifically, does knowledge of the contingencies (i.e., insurability and insurance rates) based on self-reported information with little external possible validation significantly influence responses?

To address this question, respondents will be assessed in three different conditions: (a) an anonymous self-assessment of their anger level, anger expression, impulsivity, and driving behaviors which parallels how the original risk-factor

relationships were established; (b) a condition under which participants are informed from the outset that their insurance company will be using their responses to influence their insurance rates; and (c) a condition under which they are only informed of the insurance company involvement after completing a survey of their driving behaviors but before completing the survey of their anger, anger expression, and impulsivity, (i.e., the psychological variables which cannot be externally validated).

In the latter condition, respondents are informed of the insurance contingency only after they have reported aggression and risky behavior and accident-related conditions. If there is a simple contingency effect, it should influence only data collected after this contingency. However, if the effect were very powerful, then respondents might retrospectively alter the data collected earlier. Comparisons between conditions (c) and (a) will also allow an assessment of this possibility. These conditions are designed to assess the potential impact of contingencies on both criterion and psychological variables. Our hypothesis is that the external contingency of use for insurance purposes will lower reported aggression, risky behavior, and crash-conditions as well as other psychological variables (e.g., driving anger, driving anger expression and impulsiveness) in response to the contingency. At no time are applicants instructed to "fake" or in any way alter their responses. Smith and Ellingson (2002) note that research instructing applicants to fake their responses may reduce any natural deterrents to response distortion and thus may artificially mask the effects of any alternative traits. By posing a "real world" scenario and providing no other instructions to applicants, we are hoping to allow the naturally occurring response pattern to surface.

The second focus of this research concerns the validity of the self-report data when used in a motivated context such as this. As the normative data for many self-report instruments, including the ones used here, are gathered under standardized, anonymous conditions where no contingencies exist to influence responses, we are interested in determining whether or not these questionnaires are still valid when used under such motivated conditions as created here, and whether or not the relationships between the variables remain consistent. The latter issue will be explored by comparing the strengths of correlation among variables within the three different conditions noted above.

METHOD

Participants

Participants were 300 (150 female and 150 male) introductory psychology students (M age = 19.06, SD = 2.56) at Colorado State University. Of these, 65% were freshmen, 23% were sophomores, and 12% were juniors, seniors or others; 87.3% were White non-Hispanic, 8.3% Hispanic, 3.0% Asian American, 1.7% African American, 1.3% Native American, and 2.3% other or mixed ethnic background. Students were randomly assigned from each gender grouping to one of the conditions: (1) standard noncontingent instructions, (2) insurance institutions for all measures, and (3) insurance instructions after reports of aggression, risky behavior, and crash-related conditions. This resulted in 50 males and 50 females per condition. Students received one of four research credits for participating in this study.

Instruments

Demographic information. Age, gender, year in school (freshman, sophomore, junior, senior or other), and ethnicity (white non-Hispanic, Hispanic, Asian American, African American, Native American, and other or mixed background) were reported prior to other information

Driving Anger Scale (DAS). The DAS (Deffenbacher et. al., 1994) was administered to assess participants' general level of driving anger. It is a 14-item, paper-and-pencil test measuring the self-reported propensity to become angry while driving (i.e., trait driving anger). Respondents indicated the level of anger they experience when encountering specific driving conditions described by the item. Ratings are on a 5-point

Likert scale (1 = not at all, 5 = very much), and there are no reversed scored items. The score is the sum of the item scores. This 14-item DAS is a short version of the 33-item DAS and has a correlation of .95 with the long-form. It has at least one question from each of the following subscales from the 33-item version: (1) Hostile Gestures, (e.g., someone makes an obscene gesture, honks or yells at you about your driving); (2) Illegal Driving, (e.g., another driver breaks a traffic law); (3) Police Presence, (e.g., you are pulled over or are aware of police in your vicinity); (4) Slow Driving, (e.g., someone on foot or another vehicle impedes traffic), (5) Discourtesy, (e.g., an approaching driver doesn't dim his/her headlights, or drives up on your back bumper); and (6) Traffic Obstructions, (e.g., you are stuck in traffic or encounter road construction). The α reliabilities for the short form of the DAS range from .80 to .92, and the 10-week test-retest reliability is .84 (Deffenbacher, 2000; Deffenbacher et al., 1994). The DAS correlates positively with state anger during visualizations of provocative driving situations or during driving simulations, with greater frequency and intensity of anger during daily driving situations, with higher frequencies of aggressive and risky behavior while driving, and also with some crash-related outcomes in both clinical and general samples (Deffenbacher et al., 2000, in press; Deffenbacher, Deffenbacher et al., 2003; Deffenbacher, Lynch, Deffenbacher, et al., 2001; Deffenbacher, Lynch, Oetting, et al., 2001). The DAS also correlates positively with general trait anger, verbal aggressive expression of driving anger, with personal physical expression of driving anger, and with using the vehicle to express anger, and correlates negatively with adaptive, constructive coping responses to driving anger (Deffenbacher et al., 2002; Deffenbacher, Lynch, Deffenbacher et al., 2001). The DAS forms positive correlations with measures of

driving-related judgmental and disbelieving thinking, revenge and retaliatory thinking, physically aggressive thinking, pejorative labeling and verbally aggressive thinking, and correlates negatively with coping self-instruction (Deffenbacher, Petrilli, et al., 2003; Deffenbacher et al., 2004). Finally, higher anger drivers report more anxiety and greater trait anger (Deffenbacher et. al., 2000; Deffenbacher et. al., in press).

Driving Anger Expression Inventory (DAX). The DAX, which was included to determine the manner in which driving anger is expressed, is a 49-item instrument which assesses a respondent's self-reported propensity to express driving anger in the behavior described by the item (Deffenbacher, Lynch, et. al., 2002). Respondents rated the likelihood of responding in these ways on a 4-point scale (1 = almost never, 4 = almost always). The DAX includes four general forms for expressing driving anger: (1) Verbal Aggressive Expression, a 12-item scale (α = .90) which assesses the expression of driving anger in verbally aggressive ways (e.g., I call the other driver names out loud or I yell at the other driver); (2) Personal Physical Aggressiveness Expression, an 11-item scale (α = .80) which assesses the use of one's physical presence to express anger aggressively (e.g., I give the other driver the finger); (3) Use of the Vehicle to Express Anger, an 11-item scale (α = .88) which assesses use of the vehicle to express anger (e.g., I bump the other driver's bumper with mine or I leave my brights on in the other driver's rear view mirror); and (4) Adaptive/Constructive Expression, a 15-item scale (α = .90) which measures the expression of anger by constructive means (e.g., I pay even closer attention to being a safe driver or I think about things that distract me from the frustration of the road). Small negative correlations were found between Adaptive/Constructive Expression and measures of driving anger, while aggressive forms of expression formed

larger, positive correlations with driving anger, and aggression and risky behavior on the road (Deffenbacher et al., 2002; Deffenbacher, Lynch, Deffenbacher et al., 2001). Also, positive correlations were found between general trait anger and aggressive forms of expression (i.e., Verbal Aggressive Expression, Personal Physical Aggressive Expression and Use of the Vehicle to Express Anger). The three aggressive forms of driving anger (i.e., verbal aggressive expression, personal physical aggressive expression and use of vehicle to express anger) correlate positively with driving-related angry thinking patterns. For example, verbally aggressive anger expression is associated with pejorative labeling/verbally aggressive thinking, as well as with judgmental/disbelieving and revengeful/retaliatory thinking. Both personal physical aggressive expression and use of the vehicle to express anger are associated with revengeful/retaliatory thinking. Adaptive/constructive anger expression is positively associated with coping self-instruction and judgmental/disbelieving thinking, and negatively associated with revengeful/retaliatory, pejorative labeling/verbally aggressive and physically aggressive thinking (Deffenbacher et al., 2004; Deffenbacher, Petrilli, et al., 2003)

Driving Survey. Portions of the Driving Survey (Deffenbacher, Lynch, et al., 2001) were employed to assess risky and aggressive behavior and crash-related outcomes. Respondents self-report the number of times on a 0-5+ scale the number of times in which they engaged in these behaviors or experienced the condition. The 13-item measure of aggression, (e.g., flashed your headlights in anger or yelled at another driver or pedestrian) (α = .88), and the 15-item measure of risky driving, (e.g., driven without your seatbelt or changed lanes unsafely) (α = .86) are reliable measures, and are assessed over the past three months. The survey includes six items that measure the frequency (0-

5+) of accident-related outcomes. More frequent occurrences (e.g., losing concentration) are assessed over a three-month period, whereas less frequent events (e.g., having a major accident) were assessed over a respondent's lifetime. Crash-related items (αs = .41 to .45) do not form reliable scales (Deffenbacher et. al., 2004) and are therefore analyzed individually. On the Driving Survey, more aggression, risky behavior and some crash-related outcomes are reported by high anger drivers than low anger drivers (Deffenbacher et al., 2000, in press; Deffenbacher, Deffenbacher et al., 2003; Deffenbacher, Filetti et al., 2003). Aggressive driving on the road in the past three months correlated positively with scores on the three aggressive anger expression scales, and negatively with scores on the Adaptive/Constructive Expression scale. This same trend was reflected in reports of risky driving behavior; the three aggressive anger expression scales correlated positively with reports of risky driving behavior, and the Adaptive/Constructive scale correlated negatively with reports of risky driving (Deffenbacher et al., 2002, 2004). Aggressive and risky behaviors also correlate positively (Deffenbacher et al., 2002, 2004).

State-Trait Anger Expression Inventory. General anger and anger expression were measured by the 10-item Trait Anger, and the 8-item Anger-In, Anger-Out and Anger-Control scales from the State-Trait Anger Expression Inventory (Speilberger, 1988). All items were rated on a four-point scale (1 = almost never, 4 = almost always). The Trait-Anger subscale (αs = .82 to .84) measures the respondents' general feelings of anger. The Anger-In subscale (αs = .73 to .76) assesses the frequency with which the individual suppresses his or her anger, the Anger-Out subscale (αs = .73 to .78) looks at the frequency with which people express their anger toward the source of their anger, and the Anger-Control subscale (αs = .81 to .84) assesses how people control or lower their

anger. Anger-In is generally uncorrelated with either Anger-Out or Anger-Control, and Anger-Out and Anger-Control are inversely related (Deffenbacher et al., 2000). These three scales have very different patterns of correlation with measures of state and trait anger, anxiety and anger-provoking situations but do correlate highly with other measures of hostility (e.g., the Buss-Durkee Hostility Inventory, the MMPI Hostility Scale) (Speilberger, 1988).

Barrett Impulsivity Scale (11th Edition). This 30-item self-report scale assesses general impulsiveness in individuals (Patton, Stanford & Barratt, 1995). Test-takers respond with a frequency scale of 1 (rarely/never) through 4 (almost always/always) depending on how accurately the item defines their behavioral, motor or cognitive impulsiveness. Eleven items are reverse scored. Greater impulsiveness is indicated by higher scores. The total scale, which has three factors (Motor Impulsiveness, Attentional Impulsiveness and Nonplanning Impulsiveness), has reported reliabilities ranging from .79 to .83 (Patton et al, 1995). A measure of impulsiveness was included because impulsive behavior is logically related to risky and aggressive behavior, and this scale correlates positively with measures of risk-taking behavior, such as aggression, drug use, drunk driving and seatbelt use (Stanford, Greve, Boudreaux, Mathias & Brumbelow, 1996) and driving anger (Deffenbacher, Filetti et al., 2003).

Personal Report of Confidence as a Speaker. This self-report measure (Paul, 1966) consists of 30 items that evaluate public-speaking-related anxiety. The test is in a true/false format, with scores ranging from 0, which indicates no fear at all, to 30, which indicates extreme fear. Cronbach's α reliability is .91 (Daly, 1978). This measure also correlates positively with 12 other measures of speech and social anxiety (Daly, 1978),

including those that measure performance anxiety, communication anxiety and social anxiety with rs ranging from .52 to .97. This measure of speech anxiety was included to assess the breadth of effect of the instructions. Presumably, the speech anxiety variable would be the least affected by reporting conditions, as it appears unrelated to driving anger. Thus, if reporting instructions did impact scores on this scale, which measures an unverifiable emotional variable, it would indicate people significantly distort their responses in response to known contingencies.

Procedure

Students became aware of the study by checking the Department web site that described available studies in which to participate. Those who were interested in this study signed up online. The study was described as dealing with emotions and their expression, particularly anger, and other psychological variables and how they relate to driving. Instructions also indicated where and when they were to show up to participate. Students were informed that only licensed drivers were eligible to participate, and that they would receive one credit for participation.

Upon arriving in groups of 10 to 20, in a large university classroom of 150-200 seats, students were given two informed consent forms. The study was briefly described, and questions answered. Students completed both consent forms and returned one, keeping the other for their records. They then randomly received and completed one of three different packets of questionnaires. Each packet contained, in order, demographic information, the Survey, the DAS, the DAX, the TAS, the AX, Barratt's Impulsivity Scale, and the Personal Report of Confidence as a Speaker.

The packets differed in terms of instructions. One packet included standard instructions:

> Please complete the following questionnaires according to the instructions for each one.

The second packet included the addition of insurance instructions, at the beginning of packet:

> For the next set of questionnaires, we want you to do something special. We want you to pretend that you are renewing your auto insurance policy. Your agent informs you that the company has implemented a new procedure and that you will have to fill out these questionnaires before your policy will be renewed. You are assuming that information from the questionnaires will be used in making decisions about reissuing your policy and your insurance rate.

Finally, the third packet included the insurance instructions but included them after the Driving Survey, asking about aggression, risky behavior and accident-related conditions but before questionnaires measuring psychological variables.

Students completed the packets anonymously, turned them in, and were debriefed. They then received one research credit for their participation.

RESULTS

Data were analyzed by 2 (Gender) x 3 (Insurance condition) MANOVAs on clusters of measures from a specific form of assessment. MANOVAs employed the Wilks λ statistic, and significant univariate condition effects and interactions were explored by Tukey post hoc tests ($p < .05$). Single variables were analyzed by 2 x 3 ANOVAs. Minor differences in the df in some analyses resulted from dropping participants for missing or unusable data. Effect sizes are reported in terms of η^2 and are interpreted within Cohen's (1988) criteria, where η^2 of 0.01 to 0.04 is considered small, 0.04 to 0.14 moderate, and greater than 0.14 large. Effect sizes for correlations were also interpreted by Cohen's (1988) criteria wherein rs from .10 to .30 are considered small, .30 to .50 moderate, and greater than .50 large.

Variables as a Function of Gender and Insurance Condition

Ratings of self as a driver (Table 1) revealed a significant multivariate effect for gender, $F(4, 291) = 4.33$, $p < .01$, $\eta^2 = 0.056$, but not for condition or the interaction, $Fs(8, 587) = 0.63$ and 0.98. Univariate analyses demonstrated significant gender effects on ratings of self as aggressive and risk-taking drivers, $Fs(1, 294) = 21.33$ and 9.72, $ps < .001$ and .05, $\eta^2 s = 0.036$ and 0.020, but not for ratings as angry or safe drivers, $Fs(1, 294) = 0.16$ and 0.33. Males rated themselves as more aggressive ($M = 4.14$) and risky ($M = 3.47$) drivers than did females ($Ms = 3.61$ and 3.11).

An univariate ANOVA on the DAS (Table 2) revealed a significant effect for condition, $F(2, 294) = 8.40$, $p < .001$, $\eta^2 = 0.054$, but not for gender, $F(1, 294) = 1.39$, or the interaction, $F(2, 294) = 1.00$. Participants in the insurance later condition reported significantly less anger while driving ($M = 38.69$) than did participants receiving the insurance condition at the beginning ($M = 43.42$) or no insurance instructions ($M = 43.21$). The latter two groups did not differ from one another.

Multivariate analysis of the DAX (Table 2) indicated a significant multivariate effect for gender, $F(4, 291) = 9.32$, $p < .001$, $\eta^2 = 0.114$, but not for condition or the interaction, $Fs(8, 584) = 1.47$ and 0.88. Univariate analysis of gender effects yielded significant gender effects on personal physical aggressive and adaptive/constructive expression, $Fs(1, 294) = 20.08$ and 5.54, $ps < .001$ and .05, $\eta^2s = 0.064$ and 0.018, with men reporting more personal physical aggressive expression of anger ($M = 13.62$) than women ($M = 12.24$), and women reporting greater use of adaptive/constructive driving anger expression ($M = 34.19$) than men ($M = 31.90$).

Aggression and risky behavior (Table 3) revealed no significant multivariate effect for gender, $F(2, 293) = 1.09$, or condition or the interaction, $Fs(4, 586) = 0.72$ and 0.43. Because crash-related conditions (Table 3) did not form a reliable index, they were analyzed by 2 x 3 univariate ANOVAs. Regarding losses of concentration, no significant effects were found for gender, $F(1, 294) = 2.29$, condition, $F(2, 294) = 0.76$, or the interaction, $F(2, 294) = 0.11$. A significant gender effect was found for minor loss of control, $F(1, 294) = 5.42$, $p < .05$, $\eta^2 = 0.018$, although no effect was found for condition or the interaction, $Fs(2, 294) = 0.21$ and 0.01. Females reported more frequent loss of control ($M = 1.48$) than did men ($M = 1.13$). A gender effect was also found for close

Table 1

Ratings of Self as a Driver as Function of Gender and Condition

Measure	Gender	Condition					
		No Insurance		Insurance First		Insurance Later	
		M	SD	M	SD	M	SD
Angry Driver	M	3.36	1.27	3.14	1.14	3.54	1.23
	F	3.42	1.05	3.16	0.98	3.32	0.91
Aggressive Driver	M	4.32	1.39	3.88	1.42	4.22	1.46
	F	3.62	1.38	3.64	1.27	3.56	1.40
Risky Driver	M	3.68	1.29	3.40	1.44	3.34	1.20
	F	3.06	1.22	2.94	1.32	3.34	1.21
Unsafe Driver	M	2.84	1.15	2.70	1.25	2.64	1.16
	F	2.86	1.13	2.62	0.95	2.90	1.11

Note. M = males and F = females.

Table 2

Driving Anger and its Expression as a Function of Gender and Condition

Measure	Gender	Condition					
		No Insurance		Insurance First		Insurance Later	
		M	SD	M	SD	M	SD
Driving Anger Scale	M	41.52	10.26	43.26	9.02	38.66	10.82
	F	44.90	7.99	43.58	8.11	38.72	8.78
VAE	M	25.30	8.25	25.94	8.12	25.84	7.61
	F	27.00	8.02	25.14	7.48	26.74	7.51
PPAE	M	13.70	2.97	13.70	3.82	13.46	3.35
	F	12.52	1.75	11.64	0.96	12.56	2.01
UOV	M	18.44	5.31	18.56	5.40	18.04	6.13
	F	18.46	4.50	17.32	4.63	17.60	4.74
AC	M	29.42	8.70	32.02	8.32	34.28	8.33
	F	32.40	8.62	36.16	7.6	34.02	8.84

Note. M = males, F = females, VAE = Verbally Aggressive Expression, PPAE = Personal Physical Aggressive Expression, UOV = Use of Vehicle to Express Anger, and AC = Adaptive/Constructive Expression.

Table 3

Aggression, Risky Behavior and Crash-Related Conditions as a Function of Gender and Condition

Measure	Gender	Condition					
		No Insurance		Insurance First		Insurance Later	
		M	SD	M	SD	M	SD
Aggressive Behavior	M	13.62	10.08	13.68	11.94	13.44	9.67
	F	13.58	8.67	10.78	8.45	13.74	9.19
Risky Behavior	M	25.06	14.90	25.50	16.48	23.82	14.20
	F	23.36	12.69	22.06	11.09	22.50	11.41
Lost Concentration	M	2.76	1.78	2.56	1.94	2.80	1.76
	F	3.20	1.60	2.82	1.58	3.02	1.84
Loss of Control	M	1.16	1.32	1.08	1.44	1.16	1.35
	F	1.54	1.20	1.40	1.19	1.52	1.37
Close Call	M	1.14	1.18	1.12	1.42	1.20	1.22
	F	1.60	1.16	1.26	1.16	1.58	1.16
Moving Violations	M	1.50	1.43	1.38	1.44	0.94	1.30
	F	0.54	0.97	0.84	1.17	0.70	1.11
Minor Accidents	M	1.36	1.38	1.10	1.18	0.94	1.11
	F	0.74	0.78	0.96	1.05	0.74	0.92
Major Accidents	M	0.38	0.64	0.40	0.64	0.14	0.41
	F	0.22	0.68	0.26	0.53	0.14	0.35

Note. M = males and F = females.

calls, $F(1, 294) = 7.52$, $p < .01$, $\eta^2 = .025$, as women reported more frequent close calls ($M = 1.48$) than did men ($M = 1.09$), but no effects were found for the condition or the interaction, $Fs(2, 294) = 0.55$ and 0.81. Moving violations also reflected a gender effect, $F(1, 294) = 15.96$, $p < .001$, $\eta^2 = 0.051$, although there were no condition or interaction effects, $Fs(2, 294) = 1.40$ and 2.07. In this case, men reported receiving more moving violations ($M = 1.27$) than women ($M = 0.69$). Analyses of minor accidents also yielded a significant gender effect, $F(1, 294) = 6.49$, $p < .05$, $\eta^2 = 0.022$, but no effects for condition or the interaction, $Fs(2, 294) = 1.13$ and 1.45. Men reported more lifetime minor accidents ($M = 1.13$) than women ($M = 0.81$). Major accidents reflected a different pattern. While no effect was found for gender, $F(1, 294) = 2.45$, or for the interaction, $F(2, 294) = 0.62$, a significant condition effect was found, $F(2, 294) = 3.40$, $p < .05$, $\eta^2 = 0.023$. Individuals in the insurance later condition reported significantly fewer major accidents ($M = 0.14$) than did those in the insurance first ($M = 0.33$) or no insurance ($M = 0.30$) conditions, which did not differ.

General anger measures (i.e., Trait Anger Scale and Anger Expression Inventory) (Table 4) yielded a significant multivariate effect for gender, $F(4, 291) = 4.15$, $p < .01$, $\eta^2 = 0.054$, but not for condition or the interaction, $Fs(8, 582) = 1.78$ and 1.02. Only anger-control demonstrated a significant univariate gender effect, $F(1, 293) = 5.34$, $p < .05$, $\eta^2 = 0.018$, due to men ($M = 23.40$) reporting greater anger control than women ($M = 22.10$).

Regarding impulsivity (Table 4), an ANOVA revealed a significant effect for gender, $F(1, 293) = 6.72$, $p < .01$, $\eta^2 = 0.022$, and condition, $F(2, 293) = 3.24$, $p < .05$, $\eta^2 = 0.022$, but not for the interaction, $F(2, 293) = 0.55$. Men reported more impulsive

Table 4

General Anger and Other Measures as a Function of Gender and Conditions

Measure	Gender	Condition					
		No Insurance		Insurance First		Insurance Later	
		M	SD	M	SD	M	SD
Trait Anger Scale	M	18.32	5.30	20.30	5.51	19.44	4.79
	F	18.74	4.11	18.08	4.00	18.42	4.62
Anger-In	M	15.98	4.68	17.66	4.88	16.70	4.96
	F	16.96	3.81	16.88	4.31	16.34	4.37
Anger-Out	M	15.66	3.66	16.30	4.06	15.42	3.28
	F	16.28	3.71	14.50	3.31	15.40	3.55
Anger-Control	M	22.82	4.86	23.60	4.70	23.78	4.64
	F	21.22	5.06	23.26	4.63	21.82	5.29
Impulsivity Scale	M	68.04	8.80	65.67	10.42	65.72	10.25
	F	65.70	8.51	63.98	8.83	61.36	9.01
Confidence As a Speaker	M	11.80	6.77	12.98	7.00	14.18	7.87
	F	15.92	7.90	14.56	8.00	12.88	7.30

Note. M = males and F = females.

behaviors (M = 66.48) than did women (M = 63.69), and those in the insurance later condition reported significantly fewer impulsive behaviors (M = 63.54) than did those in the no insurance condition (M = 66.87). Those in the insurance first condition (M = 64.85) were not significantly different from either of the other groups on impulsivity.

Speech anxiety (Table 4) yielded a significant univariate effect for the interaction, $F(2, 294) = 3.28$, $p < .05$, $\eta^2 = 0.020$, but not for gender, $F(1, 294) = 2.79$, or condition, $F(2, 294) = 0.05$. The mean levels of speech anxiety reported by men did not differ significantly from each other as a function of insurance condition (Table 4), nor did the mean levels of anxiety differ by insurance condition for women (Table 4). However, the level of speech anxiety reported by men in the no insurance condition (M = 11.80) differed significantly from that reported by women in the no insurance condition (M = 15.92). Thus, for men the lowest level of public speaking anxiety was in the no insurance condition and increased nonsignificantly over insurance conditions, whereas the reverse was true for women (i.e., highest in no insurance condition and decreased over insurance conditions).

Strengths of Correlations as a Function of Insurance Condition

Correlations of variables within each condition were run (Tables 9, 10, and 11 in Appendix A). Potential differences in correlations as a function of condition were tested by comparing the strengths of independent correlations (Bruning & Kintz, 1997) with α at $p < .05$. Comparisons of correlations in the no insurance condition with the insurance instructions first condition revealed seven of 253 or 2.8% of correlations were statistically significant (see Table 5 for significant differences). Comparison of

Table 5

Significantly Different Correlations for No Insurance with Insurance First Conditions

Comparison	No Insurance r	Insurance First r
VAE with Unsafe Driver	.00	.29
TAS with Angry Driver	.47	.22
TAS with Anger-In	.27	.51
TAS with Anger-Out	.63	.77
TAS with AC	-.08	-.42
Aggression with PPAE	.62	.41
DAS with Lost Concentration	.51	.21

Note. Strengths of correlations were compared by tests of differences in strengths of independent correlations. VAE = Verbal Aggressive Expression, TAS = Trait Anger Scale, PPAE = Personal Physical Aggressive Expression, UV = Use of Vehicle to Express Anger, AC = Adaptive/Constructive Expression, and DAS = Driving Anger Scale.

correlations in the no insurance condition with the insurance later condition yielded 10 of 253 or 4.0% statistically significant differences in strengths of correlations (see Table 6 for significant differences). Finally, the comparison of insurance instructions first with insurance instructions later revealed 15 of 253 or 5.4% statistically significant differences in the correlations (see Table 7 for significant differences). Both within conditions (i.e., 2.8% to 5.4%) or averaged across conditions (i.e., 4.2%), these are essentially chance differences in the number of statistically significant differences. This suggests no meaningful differences in the nature of the correlations between variables as a function of condition.

Correlations among Variables for Total Sample

Since there were no meaningful differences in correlations across conditions, data were collapsed across conditions with correlations summarized in Table 8.

Ratings of self as a driver (Driving Survey) showed that ratings as an angry, aggressive, risky, and unsafe driver formed small, positive correlations with each other, except for ratings of being an unsafe and aggressive driver, which were not correlated. Ratings of oneself as an angry or aggressive driver correlated moderately with driving anger (Driving Anger Scale), whereas ratings as a risky or unsafe driver were not correlated with level of driving anger. Self-ratings correlated positively with three-month reports of aggressive and risky behavior (Driving Survey) and with verbal, personal physical, and vehicular forms of expressing anger behind the wheel (Driving Anger Expression Inventory) and negatively with adaptive/constructive anger expression. Self-ratings as a driver also formed small positive correlations with losses of concentration, loss of control, and close calls. Ratings as a risky and aggressive driver also formed

Table 6

Significantly Different Correlations for No Insurance with Insurance Later Condition

Comparison	No Insurance r	Insurance Later r
Lost concentration with Aggressive Driver	.29	-.00
Lost concentration with VAE	.47	.15
Lost concentration with DAS	.51	.00
Moving Tickets with Angry Driver	-.39	.10
AC with Impulsivity	-.38	-.07
Close calls with DAS	.41	.07
Close calls with VAE	.37	-.11
Aggression with close calls	.43	.12
Risky behavior with DAS	.48	.04
DAS with UV	.59	.22

Note. Strengths of correlations were compared by tests of differences in strengths of independent correlations. VAE = Verbal Aggressive Expression, TAS = Trait Anger Scale; PPAE = Personal Physical Aggressive Expression, UV = Use of Vehicle to Express Anger, AC = Adaptive/Constructive and DAS = Driving Anger Scale.

Table 7

Significantly Different Correlations for Insurance First with Insurance Later Condition

Comparison	Insurance First r	Insurance Later r
Aggressive Driver with Cautious Driver	.54	.11
Lost concentration with aggression	.43	.15
Lost control with VAE	.39	-.12
Aggression with risky behavior	.73	.34
Aggression with VAE	.69	.39
Risky behavior with VAE	.46	.14
Risky behavior with AC	-.34	-.05
Risky behavior with TAS	.36	.09
DAS with VAE	.45	.20
DAS with PPAE	.38	.02
AC with TAS	-.42	-.13
UV with Impulsivity	.43	.15
Close calls with TAS	.42	-.07
TAS with Anger-Out	.77	.61

Note. Strengths of correlations were compared by tests of differences in strengths of independent correlations. VAE = Verbal Aggressive Expression, TAS = Trait Anger Scale, PPAE = Personal Physical Aggressive Expression, and AC = Adaptive/ Constructive Expression, UV = Use of Vehicle to Express Anger, and DAS = Driving Anger Scale.

Table 8

Correlations between Variables for the Collapsed Condition

	Measure	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Angry Driver	.47	.28	-.23	.26	.12	.10	-.06	.01	.00	.43	.21	.33	.44	.34
2	Aggressive Driver		.38	.08	.18	.13	.18	.15	.06	.10	.39	.35	.33	.24	.23
3	Risky Driver			.51	.22	.18	.16	.17	.20	.04	.24	.37	.09	.13	.26
4	Unsafe Driver				.32	.23	.24	-.06	-.08	.08	.19	.30	.05	.14	.17
5	Lost Concentration					.36	.31	.06	.06	-.01	.31	.44	.22	.33	.14
6	Lost Control						.43	.07	.08	.01	.32	.42	.15	.17	.06
7	Close Calls							.05	.09	.02	.38	.34	.21	.22	.14
8	Moving Tickets								.35	.15	.03	.16	.05	-.04	.02
9	Minor Accidents									.22	.04	.08	.01	-.02	.08
10	Major Accidents										.04	.01	.05	-.10	.08
11	Aggression											.58	.34	.57	.48
12	Risky Behavior												.32	.33	.33
13	DAS													.37	.22
14	VAE														.46

$r > .19$, $p < .05$; $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure	16	17	18	19	20	21	22	23
1 Angry Driver	.33	-.31	.32	.17	.31	-.28	.07	.04
2 Aggressive Driver	.39	.27	.27	.05	.28	-.16	.01	.11
3 Risky Driver	.25	-.18	.07	.04	.11	-.08	-.02	.10
4 Unsafe Driver	.17	-.17	-.10	-.01	.06	-.09	-.06	.07
5 Lost Concentration	.20	-.13	.13	.09	.22	-.03	.02	.05
6 Lost Control	.21	-.09	.05	.12	.09	-.00	.05	.07
7 Close calls	.21	-.08	.20	.06	.20	-.06	.01	.12
8 Moving Violations	-.11	-.06	.00	-.05	.01	.11	-.09	.08
9 Minor Accidents	.08	-.04	.07	-.01	.04	-.04	-.02	.08
10 Major Accidents	.08	.08	.08	.02	.02	-.08	-.01	.09
11 Aggression	.59	-.19	.25	.14	.30	-.14	.02	-.31
12 Risky Behavior	.51	-.19	.25	.14	.30	-.14	.02	.31
13 DAS	.39	-.18	.38	.21	.31	-.22	.12	.18
14 VAE	.47	-.17	.48	.32	.52	-.22	.07	.14

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure	16	17	18	19	20	21	22	23
15 PPAE	.55	-.17	.41	.17	.47	-.21	.04	.27
16 UOV		-.27	.43	.19	.42	-.26	.14	.28
17 AC			-.18	.07	-.24	.37	-.06	-.23
18 Trait Anger Scale				.40	.67	-.44	.09	.27
19 Anger-In					.19	-.06	.21	.10
20 Anger-Out						-.42	-.01	.26
21 Anger-Control							-.13	-.19
22 Personal Report of Confidence as a Speaker								.17
23 Impulsiveness Scale								

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$. Note: DAS=Driving Anger Scale; VAE=Verbal Aggressive Expression, PPAE=Personal Physical Aggressive Expression; UOV=Use of the Vehicle; AC=Adaptive/Constructive Expression; TAS=Trait Anger Scale; AEX-In=Anger Expression-In; AEX-Anger Expression-Out; AEX Control=Anger Expression Control

small, positive correlations with moving violations, whereas ratings as an angry and unsafe driver were not correlated with moving violations. No self-rating correlated with major or minor accidents. Ratings of oneself as an angry and aggressive driver tended to correlate positively with trait anger and outward negative expression of anger generally, and negatively with anger control strategies. Ratings as a risky and unsafe driver were uncorrelated with these variables. Additionally, ratings of self as a driver were unrelated to impulsiveness and speech anxiety.

Driving anger correlated positively with verbal, personal physical, and vehicular forms of expressing driving anger, and negatively with adaptive/constructive means of handling anger behind the wheel. Driving anger also correlated positively with aggressive and risky behavior, and with minor losses of concentration, losses of control, and close calls, but did not correlate with moving violations and accidents. Driving anger also correlated positively with general trait anger, anger suppression, outward negative forms of expressing anger generally, impulsiveness, and speech anxiety and negatively with general anger control.

Aggressive forms of driving anger expression (verbal, physical and vehicular) were moderately correlated with each other and formed small negative correlations with adaptive/constructive forms of expressing anger while driving. Aggressive forms of driving anger expression correlated positively with losses of concentration while driving, minor losses of vehicular control, and close calls, except for personal physical expression, which was not correlated with losses of vehicular control. Adaptive/ constructive expression correlated negatively only with losses of concentration. No form of expressing anger while driving was related to moving violations or accidents.

Aggressive forms of expressing driving anger, however, correlated positively with both risky and aggressive behavior, whereas adaptive/constructive expression correlated negatively with risky and aggressive behavior. Aggressive forms of expressing anger behind the wheel correlated positively with trait anger, anger suppression, outward negative expression of anger, and impulsiveness, and negatively with general anger control strategies. Of the aggressive forms of expressing driving anger, only use of the vehicle to express anger correlated positively with speech anxiety. Adaptive/constructive expression correlated negatively with trait anger, outward negative expression of general anger, and impulsiveness, and correlated positively with general anger control, but was unrelated to anger-in and speech anxiety.

Loss of concentration, loss of control, and close calls were moderately and positively correlated with each other, but unrelated to moving violations or accidents. They were also moderately, positively correlated with reports of aggressive and risky behavior. On the other hand, moving violations and major and minor accidents correlated positively with each other. None of these variables correlated with aggressive behavior, and only moving violations correlated with risky behavior. Crash-related variables tended to be uncorrelated with impulsiveness and speech anxiety. Aggressive and risky behavior, however, correlated strongly and positively with each other.

Trait anger correlated positively with anger suppression and outward negative expression of anger and negatively with anger control. Of the six crash-related conditions, trait anger and anger-out correlated positively only with close calls. Anger-control was unrelated to these variables, and anger-in correlated positively only with minor losses of control. Trait anger, anger suppression, and outward negative expression

of anger generally correlated positively with aggressive and risky behavior, whereas anger-control correlated negatively with these. Trait anger and anger-out were unrelated to speech anxiety, but both correlated positively with impulsiveness. Anger-in, on the other hand, correlated positively with speech anxiety, but not impulsiveness. Anger-control correlated negatively with both speech anxiety and impulsiveness. Finally, impulsiveness formed a small positive correlation with speech anxiety.

DISCUSSION

Condition Effects

No consistent main effect was found for condition, as only three of the analyses reflected significant effects involving condition. Those in the insurance later condition reported significantly less anger while driving and fewer major accidents than those receiving insurance conditions at the beginning or no insurance instructions, and the insurance condition interacted with gender to predict differing patterns of self-report of speaking anxiety. Men reported the lowest levels of speaking anxiety in the no insurance condition, and their anxiety increased over insurance conditions. Women, on the other hand reported the highest level of speaking anxiety in the no insurance condition, and their anxiety decreased over insurance conditions. Thus, there were only two direct effects for condition, where if there were a consistent insurance effect many more significant findings would have been expected for anger expression, risky and aggressive behavior, and other crash-related conditions.

Relationships between variables also appeared unaffected by condition. When the strengths of correlation tests were run, only 4.2% revealed statistically different correlations (see Tables 5-7). This is essentially a chance number of difference and suggests that relationships between variables were also not substantially influenced by the condition participants were in.

Many explanations might account for this lack of condition effect. One explanation is that there are no differences in reporting across conditions. Laing (1988) reports a study by Sawyer, Laing and Houston in which low-achieving students were only slightly less accurate in self-reporting high school grades than high achieving students

when reporting their grades to the American College Testing Program Assessment, even though they were told these grades would be sent to colleges receiving their test scores. It may be that those students are especially high in temperamental factors that act against faking, such as conscientiousness (McFarland & Ryan, 2000).

Alternatively, college students simply may not find the contingency of insurance rate increases meaningful enough to distort their responses. Participants were young college students (mostly freshmen and sophomores). They may not pay their own insurance and thus perhaps were not aware of the consequences of insurance rate increases. To address this, students could either read a short article or hear a brief oral presentation discussing the plans of various auto insurance companies to increase car insurance rates for college students presenting with high-risk qualities such as high anger levels. This might help strengthen the relationship between self-reported driving behaviors and insurance consequences. Alternatively, only students would pay for their own auto insurance could be included in studies of this self-report.

Paulhus and Levitt (1987) address another issue that may have impacted our study. Looking at the impact of affective distractors on socially desirable responding, the authors determined that by enhancing arousal, self-awareness automatically enhances egotism. It may be that the respondents in our study were not sufficiently focused on their anger levels or means of anger expression to reflect this phenomenon in their responses. To address this in future research, students could read a short paragraph outlining psychological and physiological components of anger, and in particular, elements of driving anger, to focus their attention on the target dynamic.

Another explanation involves limitations of the study that might have failed to reveal any real differences. For example, there was no manipulation check to ensure that participants both read and understood the instructions. Thus, one problem may have been that students did not read the instructions and thus failed to vary their answers in response to the instructions. This could be addressed by administering the questionnaires separately by condition, rather than randomly distributing the condition across participants. Instructions could thus be read and described, and, following the completion of the questionnaires, students could complete a manipulation check asking them what they thought the study was about, ensuring that they comprehended the instructions. Additionally, respondents might be asked questions regarding who pays their insurance, the name of their insurance company, how behavior influences rates, etc. to increase the saliency of the instructions

In summary, null findings do not mean that insurance contingencies might not influence levels of variables and/or relationships between variables. All they say is that minimal evidence was found in this study. Possible saliency of instructions and relevance of auto insurance costs to participants may have limited effects in this study. Different effects might be found in different populations and/or under different insurance-related conditions.

Gender Differences

Regarding gender effects, findings generally replicated earlier research (Deffenbacher et al., 2004; Deffenbacher, Deffenbacher, et al., 2000; Deffenbacher, Filetti, et al., 2003; Lajunen & Parker, 2000; Lawton, Parker, Manstead & Stradling, 1997; Weisenthal, Hennessey & Gibson, 2000) as men self-reported as more risky and

aggressive drivers, engaged in more personal physical aggressive anger expression and reported using fewer adaptive/constructive driving anger expression strategies than women. Men also reported more trait anger and moving violations. Interestingly, men and women did not differ on measures of risky and aggressive driving behavior, although women did report more close calls and minor losses of vehicular control. However, no gender differences were found for levels of driving anger or for verbal or vehicular aggressive driving anger expression. These findings are consistent with earlier research (Deffenbacher, Deffenbacher, et al., 2000; Deffenbacher, Filleti, et al., 2003) that the overall impact of gender on driving is small and inconsistent. It appears that while gender may have some relationship to driving behavior, its impact is variable and does not consistently capture differences in aggressive or risky driving behavior, or if there is an effect, it is a small one with men being more aggressive on some measures.

Regarding impulsivity, men reported themselves to be more impulsive than women, a finding generally supported by findings on the BIS itself (Stanford et al., 1996) and in literature on Attention-Deficit Hyperactivity Disorder (Carlson, Tamm & Gaub, 1997; Cote, Tremblay, Nagin, Zoccolillo & Vitaro, 2002; Jentsch & Taylor, 2003; Willcutt & Pennington, 2000).

Relationships between Variables

While correlations between variables did not differ as a function of condition, the relations between the variables did generally replicate earlier research (Deffenbacher et al., 2000; 2004; Deffenbacher, Lynch, et al., 2003), which has also found that driving anger correlates positively with the aggressive forms of driving anger expression, aggression behind the wheel, risky driving, general trait anger, and impulsivity. Further,

verbal, physical and vehicular forms of driving anger expression have tended to correlate positively with each other, with aggressive and risky driving, and with trait anger, anger suppression, outward negative expression of anger and impulsivity, and minimally or negatively with adaptive/constructive forms of expression and anger control strategies.

The aggressive forms of driving anger expression all correlated positively with losses of concentration while driving and close calls, and all except personal physical expression correlated positively with minor losses of control. Adaptive/constructive expression correlated negatively only with losses of concentration. No form of expressing driving anger was related to moving violations or accidents. In their study developing the Driving Anger Expression Inventory, Deffenbacher, Lynch, et al. (2002) found that crash-related variables were not correlated highly with any form of driving anger expression. They hypothesized that many forms of crash-related behaviors are not mediated by anger or aggression, and thus no clear pattern of correlation between those behaviors and forms of driving anger expression were found.

This cluster of findings is generally consistent with previous research (Deffenbacher et. al., 2004; Deffenbacher, Lynch, et al., 2002) that found the three aggressive forms of driving anger expression to correlate positively with each other, with aggressive and risky driving behavior, trait anger and outward expression of anger. As was found here, these measures correlated negatively with adaptive/constructive forms of driving anger expression and with general anger control strategies.

Trait anger positively correlated with anger suppression and outward negative expression of anger and negatively with anger control, replicating earlier research that found that those high in trait anger tended to have less effective anger coping strategies,

and tended to engage in more outward negative expression of anger (Deffenbacher, Huff, et al. 2000; Deffenbacher, Lynch, et al., 2002; Deffenbacher, Oetting et al., 1996). This research supports earlier findings that suggest there is a group of high anger individuals with poor anger and stress management skills that is more likely to express anger in outward, negative, uncontrolled means. This pattern of behavior may, on occasion, translate into impulsive, aggressive and risky driving practices.

In summary, findings in this study generally replicated earlier research on driving anger, driving anger expression, risky and aggressive driving, and trait anger. As previous studies have found, driving anger is positively correlated with the three aggressive forms of driving anger expression, which are all positively correlated with each other, and negatively correlated with use of adaptive/constructive driving anger expression methods. Driving anger correlates positively with both risky and aggressive driving behavior. This addresses the second question posed by our research, namely, would test-taking in a motivated context alter the relationships between variables, as presumably the tests were normed under non-motivated conditions? Context, as manipulated in this study, did not influence the pattern of correlations between conditions.

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APPENDIX

Table 9

Correlations between Variables for the No Insurance Condition

Measure	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Angry Driver	.41	.20	.21	.21	.17	.22	-.38	-.11	-.05	.49	.20	.45	.48	.33
2 Aggressive Driver		.45	.15	.29	.06	.28	.03	.09	.06	.36	.40	.24	.24	.32
3 Risky Driver			.46	.30	.07	.22	.10	.26	-.01	.25	.39	.24	.09	.15
4 Unsafe Drivers				.33	.27	.26	-.03	.06	-.02	.11	.19	.11	.00	.16
5 Lost Concentration					.40	.45	-.032	.10	-.00	.34	.45	.51	.46	.17
6 Lost Control						.44	-.02	.05	-.03	.28	.33	.23	.24	.19
7 Close Calls							-.018	-.02	.05	.43	.44	.41	.39	.29
8 Moving Tickets								.44	.17	-.08	.08	-.12	-.21	-.05
9 Minor Accidents									.23	-.02	.04	-.07	-.09	-.16
10 Major Accidents										.02	-.05	.01	-.02	-.01
11 Aggression											.60	.55	.62	.62
12 Risky Behavior												.48	.37	.32
13 DAS													.51	.33
14 DAX/VAE														.54

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure	16	17	18	19	20	21	22	23
1 Angry Driver	.35	-.33	.47	.23	.40	-.22	-.20	.27
2 Aggressive Driver	.38	-.23	.33	.05	.26	-.09	-.04	.18
3 Risky Driver	.31	-.10	.03	.02	-.03	-.07	.02	.15
4 Unsafe Driver	.08	-.20	-.05	.01	-.08	-.02	-.02	.12
5 Lost Concentration	.32	.05	.21	.23	.25	.06	-.00	-.01
6 Lost Control	.26	-.08	.06	.25	.03	.14	.07	.05
7 Close Calls	.37	.00	.22	.21	.22	-.05	.07	.02
8 Moving Violations	-.00	.09	-.13	-.13	-.21	.22	-.15	-.13
9 Minor Accidents	-.06	.00	-.03	-.18	.01	.11	-.10	.05
10 Major Accidents	-.05	.03	.10	-.02	-.02	-.02	.05	.01
11 Aggression	.61	-.30	.49	.21	.41	.22	.16	.33
12 Risky Behavior	.54	-.17	.29	.29	.20	-.08	.08	.35
13 DAS	.59	-.16	.51	.28	.38	-.28	.13	.24
14 DAX/VAE	.51	-.13	.52	.46	.51	-.16	.14	.18

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$

Measure	16	17	18	19	20	21	22	23
15 DAX/PPAE	.58	-.21	.35	.24	.37	.15	.03	.22
16 DAX/UOV		-.23	.36	.30	.32	-.26	.19	.27
17 DAX/AC			-.04	.18	-.17	.37	-.00	-.38
18 TAS				.28	.63	-.36	.03	.22
19 AEX-In					.14	.01	.19	.09
20 AEX-Out						-.41	.02	.28
21 AEX-Control							-.26	-.25
22 Speaker Confidence								.07
23 Impulsiveness Scale								

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Note: DAS=Driving Anger Scale; VAE=Verbal Aggressive Expression, PPAE=Personal Physical Aggressive Expression; UOV=Use of the Vehicle; AC=Adaptive/Constructive Expression; TAS=Trait Anger Scale; AEX-In=Anger Expression-In; AEX-Anger Expression-Out; AEX Control=Anger Expression Control.

Table 10

Correlations between Variables for the Insurance First Condition

Measure	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Angry Driver	.59	.39	.29	.36	.26	.16	.17	.17	-.02	.38	.25	.40	.35	.22
2 Aggressive Driver		.55	.21	.27	.22	.12	.27	.20	.13	.35	.38	.29	.35	.15
3 Risky Driver			.49	.14	.19	.40	.24	.28	.12	.28	.42	.14	.20	.17
4 Unsafe Driver				.33	.22	.24	.12	.07	.16	.30	.42	.19	.29	.34
5 Lost Concentration					.44	.29	.09	.03	-.07	.43	.46	.21	.39	.08
6 Lost Control						.36	.09	.05	-.04	.49	.52	.26	.38	.08
7 Close Calls							.09	.88	-.06	.55	.44	.18	.35	.14
8 Moving Violations								.33	.16	.20	.25	.10	.11	.16
9 Minor Accidents									.16	.16	.23	.05	.05	-.07
10 Major Accidents										-.00	.06	-.01	-.00	.13
11 Aggression											.73	.44	.69	.41
12 Risky Behavior												.44	.46	.26
13 DAS													.46	.55
14 DAX/VAE														.55

$r > .19$, $p < .05$; $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure	16	17	18	19	20	21	22	23
15 DAX/PPAE	.46	-.18	.49	.25	.50	-.12	.0	.23
16 DAX/UOV		-.30	.48	.24	.46	-.27	.26	.43
17 DAX/AC			-.42	-.05	-.34	.39	-.07	-.19
18 TAS				.51	.77	-.40	.17	.44
19 AEX-In					.24	-.73	.15	.20
20 AEX-Out						-.36	.03	.41
21 AEX-Control							-.05	.14
22 Personal Report of Confidence as a Speaker								.27
23 Impulsiveness Scale								

$\underline{r} > .19$, $p < .05$; $\underline{r} > .25$, $p < .01$; $\underline{r} > .32$, $p < .001$

Measure	16	17	18	19	20	21	22	23
1 Angry Driver	.23	-.26	.22	.16	.16	-.23	.04	-.08
2 Aggressive Driver	.41	-.23	.24	.20	.21	-.22	.01	.17
3 Risky Driver	.20	-.17	.12	.10	.13	.07	.01	.12
4 Unsafe Drivers	.23	-.13	.06	.05	-.13	-.07	-.01	-.01
5 Lost Concentration	.34	-.94	.20	.12	.26	.09	.03	.04
6 Lost control	.20	-.13	.21	.07	.16	-.26	.02	-.16
7 Close Calls	.18	-.13	.42	.15	.36	.07	.02	.29
8 Moving Violations	.20	-.15	.19	.14	.26	-.06	-.12	.26
9 Minor Accidents	.18	-.06	.11	.08	.11	-.13	-.02	.21
10 Major Accidents	.19	-.10	.12	.04	-.03	-.05	.11	.27
11 Aggression	.48	-.31	.51	.17	.51	-.25	.04	.31
12 Risky Behavior	.46	-.34	.36	.16	-.36	-.26	-.07	.31
13 DAS	.46	-.29	.35	.18	.34	-.24	.16	.30
14 DAX/VAE	.55	-.27	.57	.24	.58	-.37	.32	.29

$r > .19$, $p < .05$; $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Note: DAS=Driving Anger Scale; VAE=Verbal Aggressive Expression, PPAE=Personal Physical Aggressive Expression; UOV=Use of the Vehicle; AC=Adaptive/Constructive Expression; TAS=Trait Anger Scale; AEX-In=Anger Expression-In; AEX-Anger Expression-Out; AEX Control=Anger Expression Control.

Table 11
Correlations between Variables for the Insurance Later Condition

Measure	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Angry Driver	.42	.22	.19	.15	-.07	-.11	.10	.02	.17	.43	.19	.24	.50	.47
2 Aggressive Driver		.11	-.09	-.00	.11	.13	.17	-.01	.16	.42	.26	.31	.15	.23
3 Risky Driver			.59	.24	.27	.16	.18	.05	.05	.18	.27	-.09	.07	.20
4 Unsafe Driver				.29	.21	.25	.11	.13	.17	.13	.30	-.12	.12	.18
5 Lost Concentration					.26	.20	.13	.06	.06	.15	.42	.00	.14	.08
6 Lost Control						.46	.15	.16	.14	.19	.41	.02	-.11	-.08
7 Close Calls							.07	.20	.11	.12	.29	.07	-.11	-.01
8 Moving Tickets								.23	.08	-.03	.12	-.01	-.05	.12
9 Minor Accidents									.27	-.01	.04	-.02	.01	-.01
10 Major Accidents										.18	.05	.07	.02	.19
11 Aggression											.39	.09	.38	.44
12 Risky Behavior												.04	.14	.43
13 DAS													.20	.02
14 DAX/VAE														.38

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure		16	17	18	19	20	21	22	23
1	Angry Driver	.39	-.34	.29	16	.40	-.26	.06	-.07
2	Aggressive Driver	.38	-.35	.26	.01	.36	-.16	.04	-.00
3	Risky Driver	.24	.15	.07	.20	.23	-.08	-.10	.01
4	Unsafe Driver	.14	-.15	-.03	-.06	.24	-.15	-.16	.07
5	Lost Concentration	.14	-.21	-.01	.04	.14	-.04	.03	.09
6	Lost Control	.09	.05	-.11	.07	.06	.11	.05	-.01
7	Close Calls	.09	-.09	-.07	-.15	-.01	-.04	-.06	.02
8	Moving Violations	.12	-.11	-.08	-.18	-.04	.14	-.01	.06
9	Minor Accidents	.12	-.30	.13	.06	-.01	-.10	.07	-.05
10	Major Accidents	.12	-.20	.16	.01	.18	-.23	-.06	.07
11	Aggression	.67	-.32	.39	.03	.49	-.30	-.06	.07
12	Risky Behavior	.55	-.05	.09	-.02	.33	-.09	.05	.29
13	DAS	.22	-.08	.31	.18	.22	-.22	.07	-.02
14	DAX/VAE	.37	-.13	.35	.30	.49	-.15	.03	-.04

$r > .19$, $p < .05$: $r > .25$, $p < .01$; $r > .32$, $p < .001$.

Measure	15	16	17	18	19	20	21	22	23
15 DAX/PPAE		.57	-.11	.40	.06	.52	-.33	.01	.34
16 DAX/UOV			-.27	.46	.06	.47	-.32	-.01	.15
17 DAX/AC				-.13	.07	-.20	.34	-.10	.07
18 TAS					.41	.61	-.59	.08	.16
19 AEX-In						.21	-.15	.28	.03
20 AEX-Out	.						-.49	-.09	-.07
21 AEX-Control								-.08	-.16
22 Personal Report of Confidence as a Speaker									.16
23 Impulsiveness Scale									

r > .19, p < .05: r > .25, p < .01; r > .32, p <.001.

Note: DAS=Driving Anger Scale; VAE=Verbal Aggressive Expression, PPAE=Personal Physical Aggressive Expression; UOV=Use of the Vehicle; AC=Adaptive/Constructive Expression; TAS=Trait Anger Scale; AEX-In=Anger Expression-In; AEX-Anger Expression-Out; AEX Control=Anger Expression Control.