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The Road Rage and Aggressive Driving Dichotomy: Personality and Attribution Factors in Driver Aggression

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THE ROAD RAGE AND AGGRESSIVE DRIVING DICHOTOMY:
PERSONALITY AND ATTRIBUTION FACTORS IN DRIVER AGGRESSION

by

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A thesis submitted in partial fulfillment of the requirements
for Honors in the Major Program in Psychology
in the College of Sciences
and in the Burnett Honors College
at the University of Central Florida
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Abstract

Aggressive driving is not clearly and consistently defined in the literature, neither in terms of the specific behaviors chosen for inclusion nor the degree to which the emotional state of the driver is taken into account. Principally, the aim of this current research is to determine the extent to which aggressive driving and road rage overlap. This will be accomplished primarily by applying two well-supported dichotomies in aggression research: hostile/instrumental and impulsive/premeditated. Relevant personality traits will also be measured to help discern the aggressive driving- road rage overlap and to explore secondary areas of interest, such as sex and age differences in driver aggression.

Acknowledgments

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Table of Contents

Introduction.....	8
Literature Review.....	9
Why Anger Contributes to Dangerous Driving	9
Defining Road Rage and Aggressive Driving.....	10
Personality Determinants of Driving Behavior.....	12
The Instrumental & Hostile Aggression Dichotomy.....	15
The Impulsive & Premeditated Aggression Dichotomy	17
Road Rage & the Role of Hostile Attribution Bias.....	19
Profiling the Aggressive Driver	21
Age & Sex Differences in Driving Behavior: The “Macho” Aggressive Driver	23
Research Questions.....	26
Method.....	29
Participants.....	29
Materials	29
The Risky Driving Subscale of the Dula Dangerous Driving Index (Dula & Ballard, 2003).....	29
Propensity for Angry Driving Scale (Depasquale et al., 2001).....	30
Scenario Driver Attributions.....	30
Ambiguous Intention Hostility Questionnaire (Combs, Penn, Wicher, & Waldheter, 2007).....	30
Reactive-Proactive Questionnaire (Raine et al., 2006).....	31
Impulsive/Premeditated Aggression Scale (IPAS) (Stanford et al., 2003)	31
Personality Attributes Questionnaire Short Form (PAQ) (Spence, Helmreich & Stapp, 1973;.....	31
Results.....	33
Discussion.....	39
Implications & Limitations	42
APPENDIX A: IRB Approval Letter.....	44
APPENDIX B: Informed Consent	46
APPENDIX C: Dula Dangerous Driving Index Risky Driving Subscale.....	49
APPENDIX D: Propensity for Angry Driving Scale.....	52
APPENDIX E: Scenario Driver Attributions.....	58
APPENDIX F: Ambiguous Intention Hostility Questionnaire	61
APPENDIX G: Reactive-Proactive Questionnaire	74
APPENDIX H: Impulsive/Premeditated Aggression Questionnaire	77
APPENDIX I: Personality Attributes Questionnaire	81

References..... 83

List of Tables

Table 1: Principle Terminology in Driver Aggression	12
Table 2: Global Hostile Attributions (AIHQ) & Driving-Specific Attributions (PADS)	33
Table 3: Global Hostile Attributions (AIHQ) & Road Rage (PADS)	34
Table 4: Proactive/Reactive (RPQ) & Impulsive/Premeditated Aggression (IPAS)	35
Table 5: Aggression Type (RPQ, IPAS) & Driver Aggression (PADS, DDDI)	35
Table 6: Sex Differences in Driver Aggression (PADS, DDDI-RD) & Masculinity/Femininity (PAQ)	38

Table of Figures

Figure 3: Road Rage (PADS) & Aggressive Driving (DDDI - RD).....	36
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Introduction

The Impact of Driver Aggression on Crash Involvement

Human factors - such as driver error, inattention, and aggression – have been the leading cause of motor vehicle accidents (MVAs) in the United States for several decades. Even in 1940 - when safety features for cars were particularly lacking and the MVA fatality rate was over ten times higher than it was in 2012 ([USDOT NHTSA, 2012](#)) - it was estimated that only 10% of motor vehicle accidents were related to mechanical malfunction while the other 90% were caused by human factors, with aggressive maneuvers contributing to a substantial portion of the accidents ([Ross, 1940](#)). Almost 40 years later, a report for the U.S. Department of Transportation found strikingly similar numbers, with 93% of MVAs related to human factors and 13% to vehicle factors ([Treat et al., 1977](#)). More recently, testimony at a hearing of the U.S. Congressional Committee on Transportation and Infrastructure attributed aggressive driving to 50% of MVAs ([Snyder, 1997](#)) and 67% of crash fatalities ([Martinez, 1997](#)). Clearly, identifying contributing factors to aggressive driving and exploring interventions is an interest of public safety on the roadways.

Literature Review

Why Anger Contributes to Dangerous Driving

For incidents in which one driver physical assaults another, the role of anger as a causal factor is rather obvious. That being said, truly violent road rage incidents are exceedingly rare ([Smart & Mann, 2002](#); [Wickens, 2011](#)). Only approximately 2% of drivers admit to harming or attempting to harm other drivers and their vehicles ([Sansone & Sansone, 2010](#)) and fatalities linked to road rage are dwarfed by those caused by MVAs. Between 1990 and 1996, there were 290,105 fatal MVAs ([USDOT NHTSA, 2012](#)) and during that same time period, only 218 reported road rage fatalities ([Mizell, 1997](#)) – and there is reason to believe that this latter statistic may actually be inflated due to methodological issues in how data was collected and interpreted ([Fumento, 1997](#)).

How then does more ordinary driver anger manifest? For one, comparatively mild driver anger is linked to risky driving behaviors. This pattern is evident in both self-report “driving diaries” ([Deffenbacher, et al., 2003](#); [Underwood, Chapman, Wright, & Crundall, 1999](#)) and driving behavior in simulations ([Deffenbacher et al., 2003](#); [Jeon, Walker, & Gable, 2014](#); [Stephens, Trawley, Madigan, Groeger, 2012](#)).

The direct causal link between anger and risky driving has not been as thoroughly investigated, but two recent experiments using driving simulations indicate (perhaps unsurprisingly) that anger actually impairs judgment and perception, as well as impulse control, while driving. [Stephens et al. \(2012\)](#) provoked participants by forcing them to follow slow, frequent lane-changing drivers. Participants in these provocation incidents rated themselves as more angry, paid less visual attention to potential hazards, and took longer to correct their

driving errors - suggesting that anger distracted from the task. [Jeon et al. \(2014\)](#) also found impaired driving performance, but took this causal explanation further by inducing anger in participants before the simulation by having them write about memories which angered them – a step that helped to disentangle workload demands in challenging scenarios from emotion-driven distraction.

Regardless of the primary contributor to crash involvement – whether it be dangerous retaliatory maneuvers or pure emotional distraction – driver anger is clearly an important public safety concern.

Defining Road Rage and Aggressive Driving

Some researchers perceive dangerous, forceful maneuvering and actions specifically intended to harm others on the road as two facets of the same aggressive driving concept, but they are substantially different enough in terms of outcomes, motivation, and driver personality to warrant treatment as related, but separate behaviors ([Hennessy, 2011](#); [Miles & Johnson, 2003](#)). The need for this distinction is especially apparent in terms of how they are classified legally, with aggressive driving as a subset of traffic violations and road rage offenses treated as criminal acts akin to physical assaults ([NHTSA, 2000](#)).

When researchers do distinguish between road rage and aggressive driving, they often do so by emphasizing the perceived severity of the term road rage in their distinction - i.e. to denote more newsworthy actions such as chasing or shooting another driver. For example, [Smart and Mann \(2003\)](#) defined road rage as “an incident where a driver or passenger attempts to kill, injure or intimidate another driver, passenger or pedestrian or to damage their vehicle”

(p. 183). However, [Britt and Garrity \(2003\)](#) argue that this use of the term is too restrictive and that a complete focus on the consequences of violent road rage ignores the emotional and perceptual components that underlie all (even mild and commonplace) road rage responses.

Taking a multifaceted approach, they define road rage as: “the constellation of thoughts (e.g. ‘Why did the person do that?’), feelings (e.g. anger, fear, worry), and behaviors (e.g. shouting, tailgating, flashing lights) that will result when an individual perceives an unjustified provocation while driving” ([p. 55 Britt & Garrety, 2006](#)). A similar definition with a greater focus on observable behavior, as opposed to motivations, is one by [Hennessy and Wiesenthal \(2005\)](#) – the purposeful infliction of harm (physical or psychological, injury, humiliation, or annoyance) on another within the driving environment in direct response to a perceived injustice (Hennessy & Wiesenthal, 2005). With its practical inclusion of much more common driver behaviors, this definition is well-suited to the purpose and scope of this study. Therefore, *road rage* as used in this paper will include all anger-induced retaliatory actions behind the wheel, including unnecessary honking, obscene gestures, etc. *Violent road rage*, on the other hand, will generally refer to incidents that escalate into violent confrontations between drivers following the NHTSA’s formal definition: “an assault with a motor vehicle or other dangerous weapon by the operator or passenger(s) of one motor vehicle on the operator or passenger(s) of another motor vehicle or is caused by an incident that occurred on a roadway” ([NHTSA, 2000, p.2](#)).

As for how the term *aggressive driving* will be used in this paper, it will be used to describe behaviors [Hennessy & Wiesenthal \(2005\)](#) term as *assertive driving* – “time-urgent and self-oriented behaviors that can be dangerous, illegal, and warrant concern from other

motorists, but lack harmful intent” (p. 62). Examples include: speeding, frequent lane-changing, passing on the shoulder, purposefully “cutting turns” at four-way stop, and etc. It should also be emphasized that this behavior is *purposeful* and relatively *habitual* so as to exclude drunk driving, which is a separate facet of behavior related more to alcohol and deviance than aggression, frustration, and impatience (Jonah, 1997) – the emotions of interest here. Finally, since this definition overlaps considerably with the majority of risky driving behaviors in the literature, aggressive driving will be used in its place (with the exception, of course, of drunk driving). These terms as used in this paper are listed in Table 1.

Table 1: Principle Terminology in Driver Aggression

Aggressive Driving	“time-urgent and self-oriented behaviors that can be dangerous, illegal, and warrant concern from other motorists, but lack harmful intent” (Hennessy & Wiesenthal, 2005, p. 62)
Road Rage	Purposeful infliction of harm (physical or psychological, injury, humiliation, or annoyance) on another within the driving environment in direct response to a perceived injustice (Hennessy & Wiesenthal, 2005)
Violent Road Rage	“An assault with a motor vehicle or other dangerous weapon by the operator or passenger(s) of one motor vehicle on the operator or passenger(s) of another motor vehicle caused by an incident that occurred on a roadway” (NHTSA, 2000)

Personality Determinants of Driving Behavior

Discerning the precise extent of overlap between aggressive/reckless driving and road rage reactions is important in predicting what individuals will perpetrate each, as the

personalities of the *road-rager* and aggressive driver may differ greatly. One of the first major forays into discerning individual differences in driving behavior was a [1949 study by Tillmann and Hobbes](#). They studied particularly accident-prone drivers and noted striking similarities in their life histories and personalities, ultimately concluding that “a man drives as he lives”. Following their example, researchers have linked several personality traits to driving behavior over the years, including some Big Five Traits ([Dahlen & White, 2006](#); [Lonsdale, 2011](#)), but the most enduring and well-supported of these have been sensation-seeking, aggression, and impulsivity.

The relationship between sensation-seeking and aggressive driving is relatively strong. In a meta-analysis of forty studies across three decades of research, [Jonah \(1995\)](#) found the average reported correlation between sensation-seeking and aggressive driving to be about 30-40%. Explanations as to why this link exists have varied. Perhaps the most obvious and one which [Jonah \(1995\)](#) himself offered is that sensation-seekers may get an adrenaline-fueled rush out of taking fewer precautions and performing dangerous driving maneuvers, an explanation partly supported by the fact that risky driving is most strongly related to scores on the Thrill and Adventure-Seeking subscale of Zuckerman’s Sensation-Seeking Scale (SSS) ([Zuckerman, 1964](#); [Zuckerman, Kolin, Pice, & Zoob 1994](#)).

A more popular explanation emphasizes sensation-seekers’ poor risk evaluation ([Arnett, 1994](#)). After all, so-called “risk compensation” – in which people take greater risks in activities when safety equipment improves - has been observed in the adoption of anti-break-locking (ABS) systems ([Wilde, 1994](#)) and even seat belt usage ([Jansenn, 1994](#)). Therefore, the importance of risk perception in unsafe driving habits cannot be understated. Either way, the

higher predisposition towards sensation-seeking more common among young adults (especially young men) is probably the predominant contributor to their elevated crash risk, above and beyond driving skill and experience ([Hatfield & Fernandes, 2009](#))

Overall, impulsivity and sensation-seeking are considered to be the most predictive of all traffic violations ([Dahlen, Martin, Ragan, & Kuhlman, 2005](#); [Schwebel, Severson, Ball, & Rizzo, 2008](#)). However, this may be in large part due to the rarity of violent road rage responses resulting in physical assault and injury ([Smart & Mann, 2002](#); [Wickens, 2011](#)), making the number of violations an insensitive measure of more ordinary anger behind the wheel - such as rude gestures, tailgating, or shouting obscenities. Other studies using more inclusive definitions of road rage have found both road rage perpetration and victimization to be very common among drivers. For example, [Asbridge, Smart, and Mann \(2003\)](#) found rates of 74.3% and 52.8%, respectively, when they asked drivers about their road rage behaviors and experiences in the past year.

There is also a precedence for classifying drivers into different categories based on their behaviors and attitudes. For instance, [Musselwhite \(2006\)](#) categorized drivers according to their reported risk-taking habits while driving and found three distinct groups of risk-taking drivers: (1) Reactive (to stress, time constraints) , (2) Calculated when road conditions were perceived to be safe enough, and (3) Continuous for those who habitually took risks. This typology scheme indicates that context matters when assessing unsafe driving. People not only have different comfort thresholds for unsafe driving but different reasons for it.

Personality traits – particularly, sensation-seeking, aggression, and impulsivity – are useful for analyzing individual differences in driving behavior. Of these, sensation-seeking is

the most predictive of traffic violations, but the extent to which aggressive behavior contributes to violations and accidents is still unclear, largely because of disagreements between researchers on just what constitutes “aggressive”.

The Instrumental & Hostile Aggression Dichotomy

Many researchers have identified imprecise definitions as the primary source of inconsistencies in the driving behavior literature ([Dula & Geller, 2003](#); [Hennessy & Wiesenthal, 2005](#); [Smart & Mann, 2002](#)), with most of the controversy resting on the motivation behind aggressive driving behaviors and the severity of their consequences. One attempt to disentangle driver motivations is the application of the instrumental/hostile aggression dichotomy ([Miles & Johnson, 2003](#); [Shamoa-Nir and Koslowsky, 2010](#); [Shinar, 1998](#)) wherein aggressive maneuvers are instrumental to “getting ahead” of traffic and hostile aggression consists of anger-fueled retaliatory actions against other drivers.

Hostile aggression refers to impulsive, anger-fueled responses to perceived threats or provocations while instrumental aggression is purposeful, unprovoked, and motivated by some extrinsic reward, such as money or power ([Bushman & Anderson, 2001](#); [Ramírez & Andreu, 2005](#); [Sears, Maccoby, & Levin, 1957](#)). It should be noted here that “hostile” and instrumental aggression are interchangeable with “proactive” and “reactive” aggression, respectively (Ramírez, 2009).

Generally speaking, hostile aggressive tendencies are linked to impulsivity, anxiety, and neuroticism while instrumental aggressive tendencies show a stronger relationship with psychopathy and criminality ([Little et al., 2003](#); [Ramírez, 2009](#)). Therefore, conflicting evidence in the literature for related traits as factors in aggressive driving may stem from the

fact that researchers often fail to differentiate instrumental and hostile aggression, with behaviors like speeding and weaving between lanes grouped indiscriminately with expressions of anger (e.g. laying on the horn, tailgating, rude gestures) ([Hennessy & Wiesenthal, 2005](#)). Traits specific to instrumental-aggressive individuals, in particular, make a strong case for the validity of the dichotomy. First of all, endorsement of pronounced instrumental aggressive tendencies is typically very rare ([Haden, Scarpa, & Stanford, 2008](#); [Stanford et al., 2003](#)), already making instrumental aggression a special case – which may account for why most measures of “aggression” truly only measure the hostile kind. Even in violent offenders, where the proportion of instrumental-aggressive individuals is understandably much higher, the majority are still primarily hostile-aggressive. As mentioned before, instrumental aggression is associated with psychopathy and criminality ([Little et al., 2003](#); [Ramírez, 2009](#)), but – because instrumental and hostile aggression often intercorrelate - the relative strength of this relationship can sometimes be unclear.

For the aforementioned reasons, identifying just what factors and outcomes are related to instrumental aggression but *not* hostile aggression can be helpful for parsing out their differences and illustrating the strength of the link between instrumental aggression, antisocial behavior, criminality, and poor life outcomes. [Raine et al. \(2006\)](#) recorded personality, psychosocial, and family factors for a large sample ($N = 335$) of seven year-old boys and then measured their instrumental and hostile aggression tendencies nine years later. Higher instrumental (but not hostile) aggressive tendencies at age sixteen were related to: parent condoning of antisocial behavior, poor school motivation, low father education and employment, low social class, parental substance abuse, and single-parent household

membership. Higher instrumental aggressive tendencies also showed a stronger relationship with poor relations at age seven and serious delinquency at age sixteen than reactive aggressive tendencies did.

Because instrumental aggression is usually motivated by secondary gain (which, in turn, is more closely associated with criminal behavior), this association between poor socioeconomic background and delinquency is relatively unsurprising. What is notable is the attenuated link between hostile aggression. Instrumental aggression is clearly distinct from hostile aggression both on the face of their definitions and in terms of concrete individual differences in personality, background, and life outcomes.

Although the instrumental and hostile dichotomy is opposed by some researchers, most notably [Bushman & Anderson \(2001\)](#), it continues to be a popular method of categorizing different forms of aggression and receives widespread empirical support ([Barratt et al., 1999](#); [Little et al., 2003](#); [Raine, et al., 2006](#); [Ramírez, 2009](#)), and it has shown promise in categorizing different forms of driver aggression ([Miles & Johnson, 2003](#); [Shamo-Nir and Koslowsky, 2010](#); [Shinar, 1998](#)).

The Impulsive & Premeditated Aggression Dichotomy

Another popular classification scheme for aggressive behavior is the impulsive/premeditated aggression dichotomy ([Ramírez, 2009](#); [Teten-Tharp et al., 2011](#)). Impulsive aggression refers to “unplanned aggressive acts which are spontaneous in nature, are either provoked or out of proportion to the provocation and occur among persons who are often characterized as ‘having a short fuse.’ Perpetrators often report regret after the act.”

[\(Barratt et al., 1999, p. 164\)](#). Conversely, premeditated aggression is planned and lacks the emotional charge of impulsive aggression ([Barratt et al., 1999](#); [Ramírez, 2009](#))

At first glance, this distinction appears almost identical to the one made by the hostile/instrumental aggression dichotomy, but they actually represent distinct aspects of aggressive behavior. After all, one can easily imagine seemingly-contradictory hybrids of the two classifications – e.g. an aggressive act performed on a whim for secondary gain (impulsive/instrumental) such as a random mugging of a high-end expensive purse. For example, the Impulsive Premeditated Aggression Scale (IPAS) and the Proactive-Reactive Questionnaire were found to agree only 38% of the time and six aggression sub-types using different combinations of low/high, premeditated/impulsive, and proactive/reactive were derived ([Teten-Tharp et al., 2011](#)).

A literature review revealed no studies that applied the impulsive/premeditated dichotomy to the description of driver aggression, though many have examined generalized impulsivity or have used the hostile/instrumental dichotomy ([Berdoulat, Vavassori, & Sastre, 2013](#); [Miles & Johnson, 2003](#); [Shamoa-Nir and Koslowsky, 2010](#); [Shinar, 1998](#)), as detailed previously. Depasquale (2001) found a significant, but small, relationship between impulsivity and road rage. Given that aggressive driving has often been linked with impulsivity and sensation-seeking ([Jonah, 1997](#)), impulsive aggression may be higher in individuals with aggressive driving tendencies and could, therefore, serve as a useful metric for differentiating aggressive drivers from road rage-ers.

Road Rage & the Role of Hostile Attribution Bias

Another potential route for distinguishing aggressive driving from road rage is to examine a key mechanism in hostile aggression – hostile attribution bias, a term first coined by [Dodge & Newman \(1981\)](#). [Matthews & Norris \(2002\)](#) define hostile attribution bias (HAB) as “atendency to interpret the intent of others as hostile, despite the fact that environmental cues fail to indicate clear intent” (p.5). HAB is particularly relevant because road rage is, by definition, a reactionary response ([Mizell, 1997](#)) and because HAB is especially applicable when someone assesses the intentionality of ambiguous actions ([Tremblay & Belchevski, 2004](#)), which comprise most conflicts on the road due to typically-limited communication between drivers ([Mizell, 1997](#)). Below in **Error! Reference source not found.** is a simple visualization of reactive aggression in terms of attributions.

Dispositional (reactive) aggression is the principal personality trait associated with HAB ([De Castro, Veerman, Koops, Bosch, & Monshouwer, 2002](#); [Dodge, 2006](#)). In a previous study, [Schafer, Sanders, & Hancock \(2014\)](#) found evidence for the role of HAB in road rage propensity. As expected, individuals with high dispositional aggression made more negative attributions of drivers depicted in the written scenarios of the Propensity for Angry Driving Scale (PADS) ([Depasquale, Geller, Clark, & Littleton, 2001](#)) and likewise answered with more severe road rage responses.

Impulsivity is also positively correlated with scores on the PADS, though to a lesser extent than dispositional aggression and hostility ([Depasquale et al., 2001](#)). It is not clear from this finding whether impulsivity is most influential in the attribution process (the impetus

for road rage emotions) or in hastily responding out of anger (the road rage response itself) because the PADS only measures hostile responses, not thought processes. Still, most telling is the personality trait found to not correlate at all with PADS scores – sensation-seeking. [Depasquale et al. \(2001\)](#) interpreted this finding as discriminant validity for the PADS –which they did not intend to assess aggressive driving – but it also underscores the necessity of differentiating between aggressive driving (more strongly linked with sensation-seeking) and road rage. One study lending some support for the pivotal role of attributions in road rage framed the attribution process in terms of *thought confidence* – the degree of certainty in one’s perceptions or evaluations ([Blankenship, Nesbit, and Murray, 2013](#)) – which was found, just like HAB, to be linked with greater anger and harsher retaliations in response to provocations from other drivers. It remains to be seen whether certainty (thought confidence) in hostile attributions can be usefully distinguished from the propensity to generate hostile attributions (HAB), however.

Instead of focusing solely on interpretations of *intent*, some researchers have evaluated road rage in terms of larger attribution theories. [Britt & Garrity \(2003\)](#), for example, modeled their attribution questions after [Fincham & Bradbury \(1992\)](#) by assessing attributions about behavior in terms of: Locus of Control (external/situational or internal/dispositional), Stability (likelihood of change), and Globality (the underlying cause affects other areas of life). Of these three, only Stability was a significant predictor of anger and aggression. [Wickens et al. \(2011\)](#) used [Weiner’s \(1995\)](#) attribution model of social conduct, which adds Controllability (preventability) and Intentionality (purposefulness) to the three aforementioned dimensions modeled by [Fincham & Bradbury \(1992\)](#). Like [Britt & Garrity \(2003\)](#), [Wickens et al. \(2011\)](#)

did not find attribution Globality to be a significant causal component of anger and aggression, but did find support for applying the other four dimensions of [Weiner's \(1995\)](#) model to driver aggression and recommended their inclusion in future research.

Attribution processes are fundamental components of hostile aggressive and, likewise, road rage. Individuals prone to making more hostile attributions ([Schafer, Sanders, & Hancock, 2014](#)) and to attributing the actions of others as stable and internal ([Britt & Garrity, 2003](#); [Wickens, 2011](#)) are more likely to experience anger in response to other drivers and to retaliate against them.

Profiling the Aggressive Driver

One likely reason why the aggressive driving-road rage distinction has been ignored is that the typical profiles of the angry and aggressive driver are one in the same – young men, who are thought to be more likely to both take unnecessary risks while driving and to react aggressively to perceived provocations from other drivers ([Asbridge et al., 2003](#); [Constantinou et al., 2011](#); [Hennessy & Wiesenthal, 2005](#)).

Just as the discrepancy between instrumental and hostile aggression is sometimes tenuous, there also exists a well-established behavioral and demographic overlap between victims and offenders of violent crime ([Jennings et al., 2010](#); [Posick, 2013](#)). In 2013, for example, 76% of Milwaukee homicide and nonfatal shooting victims had prior citations or arrests and 88% had their first arrest by age 21. These are lower but roughly comparable to the same numbers for suspects - 92% and 93%, respectively (Milwaukee Homicide Review Commission, 2013).

A similar victim-offender overlap is a developing trend in the road rage literature ([Asbridge et al., 2003](#); [Roberts & Indermaur, 2008](#)). In either context, victims and offenders are predominantly young men with low socioeconomic status ([Lauritsen & Laub](#); [Roberts & Indermaur, 2008](#)), suggesting that the overlap is largely an issue of demographics. However, several behavioral explanations for the victim-offender overlap also show support, including an emphasis on risky routine behaviors/lifestyle ([Taylor et al., 2008](#)), subculture of violence/“cycle of violence” approaches (Singer, 1981; [Anderson, 1999](#); [Nofziger & Kurtz, 2005](#)), and low self- control theory ([Pratt & Cullen, 2000](#)).

However, aggressive driving and road rage research also has some inconsistencies with the general criminological literature in terms of the overlap’s size and the extent to which young males are the most prominent victim-offenders. Findings in agreement with the predominant victim-offender paradigm include those by [Roberts and Indermaur \(2008\)](#), who found that a full two-thirds of violent road rage perpetrators also report being road rage victims and that these perpetrators are predominantly young males from low socioeconomic backgrounds who have poor control over their tempers. [Asbridge et al. \(2003\)](#) also found a substantial victim-offender overlap, but a few of their findings conflict with the traditional victim-offender narrative and are less clear-cut, including a relatively high prevalence of road rage behavior among older men and on-par female victimization. To explain this latter finding, [Asbridge et al. \(2003\)](#) proposed that the relative anonymity provided by cars may prevent identification of groups one would normally avoid attacking (i.e. women, elderly), and would generally support deindividuation. This “cover of darkness” explanation, has been demonstrated experimentally by [Ellison-Potter, Bell, and](#)

[Deffenbacher \(2001\)](#), who successfully increased participants' aggressive driving behavior inside a simulation simply by manipulating the perceived anonymity of their vehicle (describing the participant's vehicle as a convertible with its top up vs down).

The most notable difference in aggressive driving/road rage research is the size of the overlap between road rage perpetrators and their victims, which appears to be smaller compared to violent criminal offenses. [Asbridge et al. \(2003\)](#) found that only 75% of road rage victims reported being road rage offenders and that only 50% of road rage offenders reported being victims. This finding is surprisingly low in light of the fact that the road rage behaviors studied by [Asbridge et al. \(2003\)](#) contained a full spectrum of road rage behaviors, including a great proportion of less violent offenses.

[Asbridge et al. \(2003\)](#) also qualify the extent of the overlap by speculating that many road rage incidents may in fact consist of retaliation against road rage behaviors. That is, such responses would not necessarily arise from frustration with traffic or consternation with some slight, but in retaliation against more serious personal attacks or threats. Individuals in this case, then, may require a higher threshold of perceived personal injury in order to engage in violence, separating them from more frequent and typical "road rage-ers" who need less provocation to get angry and violent.

Age & Sex Differences in Driving Behavior: The "Macho" Aggressive Driver

[Asbridge et al. \(2003\)](#) directly challenge the extent to which young males can be assumed to comprise the majority of aggressive drivers. In addition, other studies have failed to

find significant differences in driver anger ([Deffenbacher, Deffenbacher, Lynch, & Richards, 2003](#))

or aggressive driving tendencies ([Wickens et al., 2012](#)) between the sexes. Potential mediators in the rather inconsistent relationship between age, sex, and driver aggression are individual differences in traditional “masculine” and “feminine” traits. For instance, “macho” personality ([Krahé & Fenske, 2002](#)) and masculinity ([Özkan & Lajunen, 2005](#)) have been linked with increased risky and aggressive driving tendencies while femininity has been linked with the opposite effect ([Krahé & Fenske, 2005](#); [Özkan & Lajunen, 2005](#)).

Therefore, men and women who do not closely adhere to their traditional gender roles may upset the otherwise straightforward male-aggressive driving link, and such deviance from gender norms may be a function of age.

Even almost twenty years ago, [Twenge \(1997\)](#) observed that adherence to traditional sex roles, as measured by the Bem Sex Role Inventory ([Bem, 1974](#)), had markedly decreased over time, mostly due to increased female endorsement of traditionally-masculine traits. Such a trend may then explain why some aggressive driving studies found sex differences while others did not. If sex differences in [Twenge's \(1997\)](#) interpretation holds true, then one could expect that studies using convenience samples of young undergraduates to show reduced sex differences relative to samples with more diverse age groups. This can be observed in the positive results of [Asbridge et al. \(2003\)](#), who used a large community sample of drivers aged 18-65+, relative to the negative results of [Deffenbacher, et al. \(2003\)](#), who used an undergraduate sample.

However, more research is needed to test this idea, as [Wickens et al. \(2012\)](#), for example, found no large sex differences and used a large, diverse community sample like [Asbridge et al. \(2003\)](#).

Research Questions

The primary goal of this research was to determine the overlap between road rage (angry emotional reactions to perceived provocations on the road) and aggressive driving (e.g. speeding, passing on the shoulder), which were mainly accomplished by comparing scores on the Propensity for Angry Driving Scale (PADS) ([Depasquale, 2001](#)) and the Dula Dangerous Driving Index (DDDI) ([Dula & Ballard, 2003](#)).

Three other issues relevant to the aggressive driving/road rage dichotomy and driver aggression were also studied:: 1) the accuracy of the instrumental/hostile and impulsive/premeditated aggression dichotomies in describing aggressive driving and road rage, 2) the role of attributions in road rage, and 3) the demographics of aggressive drivers and road rage-ers (principally, in terms of age and biological sex).

While the instrumental/hostile aggression dichotomy has been proposed as a theoretical framework in aggressive driving research ([Miles & Johnson, 2003](#); [Shamo-Nir and Koslowsky, 2010](#); [Shinar, 1998](#)), no attempts had been made before this study to see how well existing measures of instrumental and hostile aggression correlate with aggressive driving and road rage, which they are theorized to describe. Additionally, the related dichotomy of impulsive and premeditated aggression has not yet been applied at all to the study of driving behavior. It was of interest here to see whether it would actually be a better descriptive model of aggressive driving and road rage than the instrumental/hostile dichotomy or whether both models are useful for explaining different aspects of driver aggression. I hypothesized that greater road rage scores on the Propensity for Angry Driving Scale (PADS) (Depasquale, 2001) would positively correlate with hostile scores on the Reactive-Proactive Questionnaire

(RPQ) (Raine et al., 2006) and impulsive scores on the Impulsive/Premeditated Aggression Scale (IPAS) (Stanford et al., 2003).

Further, as it was assumed that road rage is clearly distinguishable from aggressive driving as consisting primarily of retaliatory (hostile) aggression – it was also be expected that hostile attributions would play a greater role in road rage than in aggressive driving. Because aggressive driving involves unprovoked instrumental aggression, coupling measures of hostile attributions with questions on aggressive driving behavior is not feasible. For this reason – and to assess the degree to which hostile attribution bias is a stable tendency – a measure of hostile attribution bias outside the driving context was used: the AIHQ. Finally, continuing previous research ([Schafer, Sanders, & Hancock, 2014](#)) and following the recommendations of [Wickens et al. \(2011\)](#), four questions following each written scenario of the PADS measured attribution Locus of Control, Stability, Controllability, and Intentionality. I hypothesized that all four causal dimensions would be positively correlated with PADS scores such that retaliatory behavior will be greater when an internal Locus of Control is reported, the underlying cause for the other driver's behavior is perceived to be Stable, the other driver's actions are perceive to be Controllable, and when it is perceived that the other driver Intended for their actions to be aggressive.

A secondary aim of this study was to test a possible explanation for inconsistent findings regarding the apparent gender gap in driver aggression: that individual differences in sex role adherence modulate the effect, especially in younger samples. Because this study only used an undergraduate sample, the latter portion of this explanation regarding age will not be directly assessed unless an unexpectedly large number of older undergraduates participate. In-

line with previous research supporting the gender gap ([Asbridge et al., 2003](#); [Hennessy & Wiesenthal, 2005](#); [Roberts & Indermaur, 2008](#)) the role of masculinity ([Krahé & Fenske, 2002](#); [Özkan & Lajunen, 2005](#)) and higher endorsement of masculine traits is expected to positively correlated with aggressive driving and road rage tendencies. Therefore, I hypothesize that greater scores on the Instrumental (masculine) and lower scores on the Expressive (feminine) scale of the Personal Attributes Questionnaire (PAQ) will positively correlate with scores on the PADS and DDDI.

Method

Participants

Three hundred fourteen undergraduate students (98 male and 216 female) at the University of Central Florida completed this study online through Qualtrics Online Survey Software and, to receive class credit, Sona Research Systems. Two hundred forty (68 male, 172 female) were included in analysis after removing participants ($N = 74$) who failed to answer all control questions correctly. The average age of these 240 participants was approximately 22 years old and the average years of driving experience was approximately five years.

Materials

The Risky Driving Subscale of the Dula Dangerous Driving Index (Dula & Ballard, 2003)

The DDDI is a self-report measure of aggressive driving habits and attitudes, such as “I will illegally pass a car or truck that is going too slowly” and “I feel that most traffic ‘laws’ could be considered as suggestions” along a frequency scale from (1) “Never” to (5) “Always”. Two items on driving while intoxicated will be omitted because it is outside the scope of this study. It was not anticipated that removing those items would interfere with the accuracy of the Risky Driving (RD) subscale, as subsequent exploratory and confirmatory factor analysis by the scale’s author and his colleagues has identified Drunk Driving as a separate factor in the DDDI ([Willemsen, Dula, Declercq, & Verhaeghe, 2008](#)). The RD subscale has good internal consistency ($\alpha = .83$) and was found to be predictive of the number of accidents ($r = .33, p < .001$) and the number of tickets ($r = .37, p < .001$) participants reported in the two preceding years prior to their completion of the survey ([Dula & Ballard,](#)

[2003](#)). In this study, the internal consistency for the DDDI RD subscale was $\alpha = .81$.

Propensity for Angry Driving Scale ([Depasquale et al., 2001](#))

In a multiple choice format, participants were asked to indicate how they would respond to 19 written scenarios in which another driver engages in an anger-provoking, inconsiderate actions or is openly hostile. The four responses accompanying each question range from doing nothing to retaliating with various levels of severity ranging from horn honking and rude gestures to pursuit of the other driver. The PADS has high internal consistency ($\alpha = .88$) and four-week test-retest reliability ($r = .91$). In this study, the internal consistency for the PADS was $\alpha = .86$.

Scenario Driver Attributions

Accompanying each of the original PADS questions were four additional questions assessing participants' attributions about the other driver. Adapted from [Wickens et al. \(2011\)](#), each assessed attribution Locus of Control, Controllability, Intentionality, and Stability. The internal consistency of the questions: was $\alpha = .83$ for Locus of Control, $\alpha = .92$ for Controllability; $\alpha = .85$ for Intentionality, and $\alpha = .91$ for Stability.

Ambiguous Intention Hostility Questionnaire ([Combs, Penn, Wicher, & Waldheter, 2007](#))

The AIHQ was used to assess hostile attribution tendencies outside the driving context. It consists of 15 1-2 sentence vignettes of negative social interactions with varying degrees of intentionality (intentional, accidental, ambiguous). The internal consistency of the composite blame score is good for the Intentional ($\alpha = .85$), Ambiguous ($\alpha = .86$), and Accidental situations ($\alpha = .84$). ([Combs, Penn, Wicher, & Waldheter, 2007](#)). In this study, the internal consistency for each of the three situation types was: $\alpha = .88$ for Intentional, $\alpha = .86$ for

Ambiguous, and $\alpha = .86$ for Accidental.

Reactive-Proactive Questionnaire ([Raine et al., 2006](#))

Respondents indicate how often they have committed 23 aggressive behaviors in different contexts on a scale of (0) “Never” to (2) “Often”. Internal consistency was good for the Total aggression score ($\alpha = .89$) and for the Reactive ($\alpha = .81$) Proactive ($\alpha = .84$) scales. While originally tested with adolescent boys aged sixteen, the RPQ has also been used successfully with a college sample comprised of both sexes ([Teten-Tharp et al., 2011](#)).

Impulsive/Premeditated Aggression Scale (IPAS) ([Stanford et al., 2003](#))

On a scale from (1) “Strongly Disagree” to (5) “Strongly Agree”, respondents rate how well thirty statements characterize their aggressive behavior over the last six months. Ten of the statements pertain to Impulsive Aggression (IA) and eight to Premeditated Aggression (PA) while twelve are unscored. Internal consistency for the PA scale is good ($\alpha = .82$) and acceptable for the IA scale ($\alpha = .77$). The two scales were found to not significantly intercorrelate ($r = -.02$) and the percentage of respondents endorsing IA relative to PM tendencies was in-line with previous research (90% and 10%, respectively). Though the IPAS was originally tested with data from known physically-aggressive men, (referred from clinics, self-referred from radio advertisement), it has been validated for use with both sexes in a college sample ([Haden, Scarpa, & Stanford, 2008](#)). In this study, the internal consistency for the PA scale was $\alpha = .75$ and $\alpha = .82$ for the IA scale.

Personality Attributes Questionnaire Short Form (PAQ) ([Spence, Helmreich & Stapp, 1973](#);

[Spence, 1986](#))

Along with the Bem Sex Role Inventory, the PAQ is one of the most commonly used instruments for measuring femininity and masculinity. The Instrumentality/Masculinity subscale consists of adjectives more commonly ascribed to men (e.g. competitive, self-confident) while the Expressiveness/Femininity subscale consists of adjectives more commonly ascribed to women (e.g. emotional, gentle). The third subscale, originally intended to measure Androgyny, is composed of both expressive and instrumental adjectives. The 24-item short form is more reliable ([Spence, 1986](#)), so it was used here. It has α coefficients of .85, .82, and .78 for the M, F, and M-F subscales, respectively. In this study, the internal consistency was $\alpha = .57$ for the M scale and $\alpha = .81$ for the F scale.

Results

Multiple correlation analyses were conducted in SPSS to assess the relationships between hostile attribution bias, aggression type, road rage, and aggressive driving.

The first correlation conducted was between the AIHQ's measure of global hostile attribution bias and the attribution questions added to the PADS in order to test the underlying assumption that global hostile attribution bias would reflect in a greater number of hostile attributions in the driving context.

Table 2: Global Hostile Attributions (AIHQ) & Driving-Specific Attributions (PADS)

AIHQ	PADS Attribution Questions			
	Locus	Controllability	Intentionality	Stability
Intentional	.14**	.11	.29**	.17**
Ambiguous	.06	.02	.22**	.03
Accidental	.06	.03	.28**	.02

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

As can be seen in Table 2, attributions for Controllability in the PADS were not significantly correlated with hostile attributions in any one of the AIHQ scenario types and only weak significant correlations were found for the other three attribution questions. Intentionality attributions were the most strongly correlated with the AIHQ: $r = .29, p < .0001$ for Intentional, $r = .22, p < .0001$ for Ambiguous, and $r = .28, p < .0001$ for Accidental. Both Locus ($r = .14, p < .0001$) and Stability ($r = .17, p < .0001$) attributions were correlated with attributions made for Intentional AIHQ scenarios, but only weakly.

Next, the PADS attribution questions and PADS scores were correlated to test whether

negative attributions made in each written PADS scenario were related to more aggressive responses. Only perceived Intentionality was significantly correlated with PADS scores ($r = .20, p < .0001$).

However, when global hostile attribution bias (AIHQ) was correlated with PADS scores, significant correlations were obtained in all three AIHQ categories. (See Table 3).

Table 3: Global Hostile Attributions (AIHQ) & Road Rage (PADS)

	AIHQ		
	Intentional	Ambiguous	Accidental
PADS	.31**	.29**	.32**
DDDI	.12	.16*	.21**

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

When the same correlation was conducted with DDDI scores instead, significant correlations also emerged (See Table 3), though there was no significant relationship with Intentional AIHQ scores ($r = .12, p = .07$) and the correlation with Ambiguous AIHQ scores was at a weaker significance level ($r = .16, p < .05$).

The next set of tests surrounded the role of aggression type (e.g. proactive/reactive) on driver aggression, beginning with an assessment of the overlap between proactive/reactive aggression as measured by the RPQ and the premeditated/impulsive aggression IPAS to see if they perhaps measure the same underlying tendencies in spite of their theoretical distinction (See Table 4).

Table 4: Proactive/Reactive (RPQ) & Impulsive/Premeditated Aggression (IPAS)

IPAS		RPQ	
		Proactive	Reactive
	Premeditated	.17*	.30**
	Impulsive	.24*	.38**

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

Significant correlations were found for all four comparisons, all of them positive. The strongest was between the two most theoretically similar constructs – impulsive and reactive aggression ($r = .38, p < .0001$). Interestingly, the subscales of both the RPQ ($r = .57, p < .0001$) and IPAS ($r = .36, p < .0001$) were both positively intercorrelated, despite purportedly measuring distinct constructs.

Then, the relationships between these four aggression types and driver aggression were tested (See Table 5).

Table 5: Aggression Type (RPQ, IPAS) & Driver Aggression (PADS, DDDI)

	RPQ		IPAS	
	Proactive	Reactive	Impulsive	Premeditated
Road Rage (PADS)	.24**	.37**	.21**	.24**
Aggressive Driving (DDDI)	.27**	.41**	.14*	.20**

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

Significant positive correlations were found for every comparison. Both the Proactive ($r = .24, p < .0001$) and Reactive ($r = .37, p < .0001$) subscales of the RPQ were positively

correlated with road rage as measured by the PADS, as well as aggressive driving measured by the DDDI ($r = .27, p < .0001$; $r = .27, p < .0001$); and both the Impulsive ($r = -.21, p < .0001$) and Premeditated ($r = .20, p < .0001$) subscales were positively correlated with road rage as measured by the PADS, as well as aggressive driving measured by the DDDI ($r = -.14, p < .05$; $r = -.20, p < .0001$).

To directly test the central hypothesis that road rage and aggressive driving are distinct behaviors, a correlation was run between the PADS and DDDI, yielding the strongest positive correlation found in this study ($r = .49, p < .0001$) between two separate scales (See Figure 1).

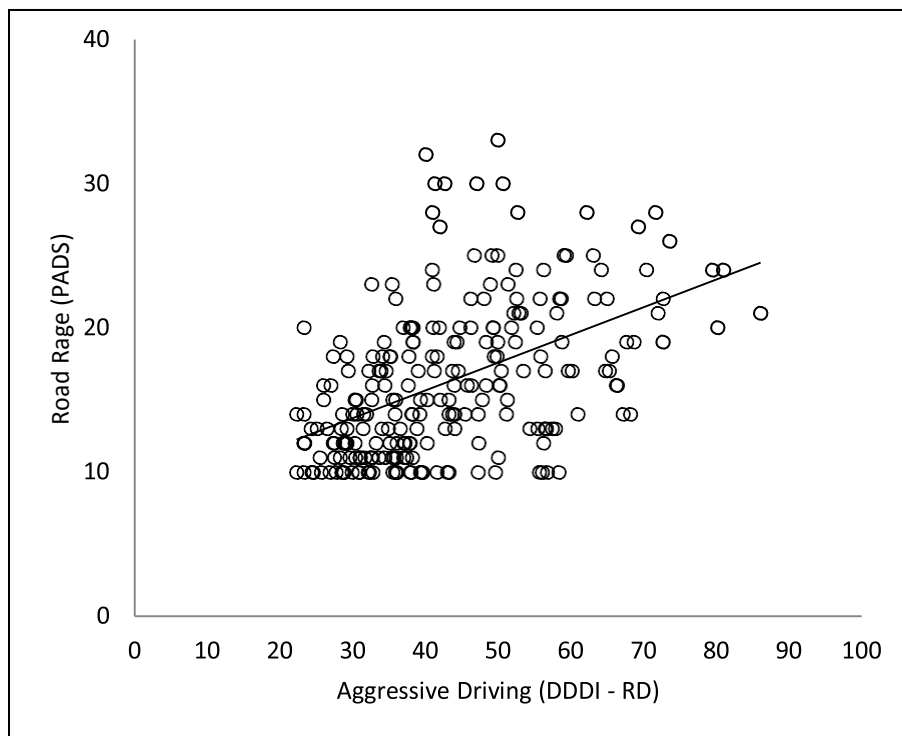


Figure 1: Road Rage (PADS) & Aggressive Driving (DDDI - RD)

To identify the single best predictors of road rage tendencies as measured by the PADS, a backward stepwise regression analysis was conducted. Because earlier correlation analyses of the RPQ and IPAS contradicted their hypothesized relationship with road rage (See Table 4), all four subscales were included in the analysis. Likewise, the Intentional and Accidental subscales of the AIHQ were included for the same reason (See Table 3). The DDDI was also included.

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. In Step 1, 13 factors were entered [IPAS (2), RPQ (2), AIHQ (3), scenario attribution questions (4), self-rated driver skill (1), and the DDDI (1)] explaining 37% of the variance, $F(13, 225) = 10.10, p < .0001$. Variables with the smallest β coefficients were removed in each step until all model variables were significant. In the final model, only 5 variables remained: Intentional AIHQ, DDDI, Accidental AIHQ, RPQ reactive, and Control Attribution questions. The DDDI had the highest β value ($\beta = .38, p < .0001$). The final model as a whole explained 35% of the variance, $F(5, 234) = 25.35, p < .0001$.

Finally, the secondary hypotheses surrounding the effects of age and sex on driver aggression were assessed. No significant relationship between age and either aggressive driving (DDDI) or road rage (PADS) were found ($r = -.09, p = .19$). In an independent samples t-test to compare the PADS and DDI scores for males and females, there was no significant difference in scores for males ($M = 44.59, SD = 15.44$) and females ($M = 42.31, SD = 12.46$) on PADS scores; $t(240) = 1.19, p = .24$ (two-tailed). The magnitude of the differences in the

means (mean difference = 2.28, 95% CI: -1.49 to 6.05) was also very small ($\eta = .006$).

Likewise, there was no significant difference in scores for males ($M = 16.40$, $SD = 5.53$) and females ($M = 16.15$, $SD = 5.17$) on DDDI-RD scores; $t(240) = .33$, $p = .74$ (two-tailed). The magnitude of the differences in the means (mean difference = .25, 95% CI: -1.24 to 1.74) was also extremely small ($\eta = .0005$).

When a second t-test was then conducted to compare Personality Attributes Questionnaire (PAQ) between the sexes, however, a significant difference in scores was found between males ($M = 29.60$, $SD = 5.19$) and females ($M = 33.40$, $SD = 33.40$) on the Expressive (feminine) subscale of the PAQ; $t(240) = -5.91$, $p < .0001$ (two-tailed). The magnitude of the differences in means (mean difference = -3.80, 95% CI: -5.06 to -2.53) was moderate ($\eta = .13$).

Table 6: Sex Differences in Driver Aggression (PADS, DDDI-RD) & Masculinity/Femininity (PAQ)

	PADS (Road Rage)	DDDI-RD (Aggressive Driving)	PAQ :Instrumental (Masculinity)	PAQ: Expressive (Femininity)
Males	44.59	16.40	29.01	29.60**
Females	42.31	16.15	28.96	33.40**

**t-test is significant at the .01 (two-tailed) level

It was also found that Femininity as measured by the PAQ's Expressivity subscale was negatively correlated with both the DDDI-RD ($r = -.14$, $p = .03$) and the PADS ($r = -.16$, $p = .01$).

Discussion

The results of this study only provided weak support or outright violated several of the theoretical assumptions I made based on my review of the current literature and appear to contradict my central hypothesis – that road rage and aggressive driving deserve a more strict distinction because of individual differences. I will address these results in the order in which I described them in the Results section.

A basic assumption not explicitly elaborated upon was that hostile attribution bias (HAB) is a function of individual differences – primarily in trait aggression, its strongest correlate (Dodge, 2006) – and that its expression would be reflected in more driver aggression. The results of this study only provide weak support for this assumption (See *Table 2*). Higher negative attributions in the various AIHQ scenarios were positively correlated with some attributions made in the PADS driving scenarios, but the relationships were unexpectedly weak.

In other words, HAB tendencies detected by the AIHQ do not appear to have had a large effect on the negative attributions made in the written driving scenarios of the PADS, potentially undermining the usefulness of HAB in predicting road rage entirely - though this is entirely inconsistent with results from a previous study (Schafer, Sanders, & Hancock, 2014). Also unexpected was the failure of the Ambiguous AIHQ scores to make it into the final model arrived at in the multiple regression, since ambiguous intentionality is where HAB exerts its effects most powerfully (Dodge, 2006).

Support for the idea that HAB and negative attributions can be used to differentiate

between aggressive driving and road rage was mixed. If aggressive driving is entirely proactively aggressive, one would not expect to see negative attributions correlated with aggressive driving at all or, at the very least, to a much lesser extent than they would with road rage. Data from the AIHQ and the PADS attribution questions directly contradict each other on this question. As can be seen in Table 2, negative attributions as measured by the AIHQ failed to reasonably differ between aggressive driving (DDDI) and road rage (PADS). The PADS attribution question data, however, behaved as expected - yielding no positive correlations with the DDDI.

As can be seen in Table 4, the effects of the different aggression subtypes on road rage and aggressive driving were relatively even, and the directions and size of the correlations found sometimes contradicted what was hypothesized. For example, reactive aggression as measured by the RPQ was more highly correlated with aggressive driving (DDDI) than road rage (PADS), and premeditated aggression as measured by the IPAS was more highly correlated with road rage than aggressive driving. Therefore, nothing can be said definitely on this question of whether aggressive driving is better characterized as proactive/premeditated and road as reactive/impulsive. Instead, the data only support that overall aggressive tendencies are indeed linked to driver aggression in both instances – a thoroughly unsurprising find.

As for the influence of age and sex on driving behavior, no significant effects for either variable were found. However, the undergraduate participant sample used in this study was not diverse in age range ($M = 22.22$, $SD = 5.59$) and females ($N = 172$) outnumbered males ($N = 68$) by almost 3:1. Furthermore, although it was found that Femininity as measured by the

PAQ's Expressivity subscale was negatively correlated with both aggressive driving and road rage (See Table 5) and that Femininity scores differed between the sexes (see Table 4), the effect of Femininity on driver aggression was small.

Furthermore, a greater number of older participants would be needed to see if Femininity and Masculinity differed as a function of age – a central premise of my hypothesis that younger women adhere less to traditional roles than other women, and that this has perhaps made them more aggressive than older female cohorts. As it is, the present results only support that Feminine qualities included in the PAQ, such as empathy and caring, are negatively correlated with driver aggression.

Finally, the multiple regression analysis indicated that the DDDI surpassed all other variables in predicting PADS scores, which is in direct contradiction to my central hypothesis that they are distinct constructs.

Implications & Limitations

Overall, this study did not support the idea that aggressive driving and road rage are distinct constructs, at least when it comes to the role of hostile attribution bias and aggression subtype in each. This is consistent with the more traditional view in the driver aggression literature that both are products of the tension and hostility underlying all aggression subtypes, rather than different motivations (e.g. instrumental vs hostile) or thought processes (i.e. hostile attributions). There is also no support for age and sex differences in driver aggression and only a weak negative effect for Femininity was found.

In both cases, the data would probably have been helped by a much more diverse sample. The inclusion of noted problem drivers (i.e. from tickets and citations) or anger management patients could reasonably be expected to push the ceiling on the aggression scores for the RPQ up, which could have increased the study's power. While the IPAS asks about aggressive behaviors one has exhibited first and then asks respondents to characterize those incidents, the RPQ uses incident frequency – a more direct measure of aggressive tendencies.

While the inclusion of more aggressive participants would have been helpful to assess the primary hypotheses, the convenience undergraduate sample was more straightforwardly unsuitable for studying the interaction of age, sex, and gender roles due to the homogeneity in age for this undergraduate sample ($M = 22.22$ years old, $SD = 5.59$ years). Despite this failure to adequately address my hypothesized interaction, it should be noted that this is yet another study to find little to no sex differences in aggression. Whether this apparent trend is a function of increased aggression and assertiveness in younger women due to changing social norms or

due to something about the driving context specifically (e.g. anonymity, leveled physical playing field) has yet to be seen. Either way though, the prototypical aggressive driver or road rage-er as a young male is challenged by the results of this study. Unless driving is some special context in which women behave more aggressively, research into sex differences in driver aggression could have far-reaching implications for how we understand aggression, gender roles, biological sex, and the interaction between them.

In addition, aside from a larger, more diverse sample - which arguably benefits all studies - the Big Five personality traits should continue to be explored as another avenue for characterizing aggressive drivers and road rage-ers.

Appendix A: IRB Approval Letter



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board
#1 FWA00000351, IRB00001138**

To: **Peter A. Hancock** and Co-PI: **Kathryn E. Schafer**

Date: **March 17, 2015**

Dear Researcher:

On 03/17/2015, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: The Road Rage and Aggressive Driving Dichotomy: Personality and Attribution Factors in Driver Aggression
Investigator: Peter A Hancock
IRB Number: SBE-15-11142
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

A handwritten signature in black ink that reads "Joanne Muratori".

Signature applied by Joanne Muratori on 03/17/2015 04:27:58 PM EDT

IRB Coordinator

Page 1 of 1

Appendix B: Informed Consent



EXPLANATION OF RESEARCH

Title of Project: Hostile Attribution Bias in Road Rage

Principal Investigator: Peter Hancock, Ph.D

Other Investigators: K. Elizabeth Schafer, Tracy Sanders, B.A.

Faculty Supervisor: Peter Hancock, Ph.D

You are being invited to take part in a research study. Whether you take part is up to you.

- The purpose of this study is to investigate driving behavior and related personality factors.
- First, you will be asked to complete a demographics questionnaire followed by questions about your driving habits, two written scenario-based surveys on driving behavior, and three personality questionnaires. You do not have to answer every question or complete every task. You will not lose any benefits if you skip questions or tasks. However, if you skip questions, your data may not be included in the study.
- We expect that you will be in this research study for up to 1 hour and 30 minutes.

You must be 18 years of age or older and have a valid driver's license to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, email Elizabeth Schafer, undergraduate student, at eschafer@knights.ucf.edu or Tracy Sanders, graduate student, at tracy.sanders@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

Appendix C: Dula Dangerous Driving Index Risky Driving Subscale

Please answer each of the following items as honestly as possible. Please read each item carefully and then circle the answer you choose on the form. If one of the choices seems to be

	Never	Rarely	Sometimes	Often	Always
I "drag race" other drivers at stop lights to get out front.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will illegally pass a car/truck that is going too slowly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will race a slow moving train to a railroad crossing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will weave in and out of slower traffic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will cross double yellow lines to see if I can pass a slow moving car/truck.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel it is my right to get where I need to go as quickly as possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will drive in the shoulder lane or median to get around a traffic jam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When passing a car/truck on a 2-lane road, I will barely miss on-coming cars.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

your ideal answer, then select the answer that comes closest. THERE ARE NO RIGHT OR WRONG ANSWERS. Select your answers quickly and do not spend too much time analyzing your answers.

I consider myself to be a risk-taker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that most traffic "laws" could be considered as suggestions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX D: Propensity for Angry Driving Scale

The following survey contains 19 different scenarios one might encounter while driving. Please read each of the scenarios carefully and then decide which of the potential responses most closely match how you would respond in that situation.

1. You are driving your car down a two-lane road. Without warning, another car pulls out in front of you from a parking lot. You had to brake suddenly to avoid hitting it. How do you respond?
 - a) Let out a sigh of relief and drive on.
 - b) Lean out your window and yell at the other driver.
 - c) Honk your horn to let the other driver know they almost caused an accident.
 - d) Follow the other car to its destination so you can give him a piece of your mind.
2. You are driving your car down the interstate in the passing lane. You come up to a car driving much slower than you are in the passing lane. Even though you flash your high beams as a signal for the other car to move over, it does not. How do you respond?
 - a) Make an obscene gesture at the driver as you pass on the right.
 - b) Shrug your shoulders and continue to wait for the other car to move to the side.
 - c) Start driving right on the rear bumper of the other car and lay on your horn.
 - d) Continue flashing your high beams at the car hoping the behavior will cause them to move to the side.
3. You are driving on a single lane road. For no apparent reason the car in front of you is constantly braking and accelerating causing you to drive in the same manner. How do you respond?
 - a) Honk your horn and loudly curse at the driver.
 - b) Honk your horn and make a mean face at the driver causing the disturbance.
 - c) Slow down a little and keep a safe distance.
 - d) Deliberately tailgate the car and occasionally lay on the horn.
4. You are in a full parking lot. You see a driver leaving and you put on your blinker to indicate you intend to take the parking space. As the other driver pulls out, a second driver cuts in front of you from the other side and takes the parking space. How do you respond?
 - a. Glare angrily at the other driver as you move on to find another parking space.
 - b. Shrug your shoulders and look for another space to park.
 - c. Wait for the other driver to get out of the car and then scream out your window at him/her for being an inconsiderate jerk.
 - d. Stop your car, and approach the other car to express your anger to the driver.
5. You are driving your vehicle in a traffic jam in the far right hand lane. Out of nowhere, a car comes up from behind on the shoulder and attempts to squeeze in front of you. How do you respond?
 - a) Nothing, let the car squeeze in.
 - b) Make obscene gestures, or yell ""jerk" at the other driver as you close ranks on the car in front of you to prevent the driver from cutting in front of you.
 - c) Let the car squeeze in but honk your horn to demonstrate your disapproval to the other driver.
 - d) Honk your horn and close ranks on the vehicle in front of you to prevent the car from getting in front of you.
6. You are sitting in your car at a light controlled intersection. A car pulls up next to you with its windows rolled down and the stereo playing music way too loud. How do you

respond?

- a) Yell out your car at the other vehicle occupants asking them to turn the music down.
 - b) Ignore it, the light will change shortly.
 - c) Honk your the horn to get the other driver's attention and then angrily yell at the driver for disturbing the peace.
 - d) Turn your own music up loud so you do not have to listen to the music from the other vehicle.
7. You are driving in the passing lane at 75 mph. The speed limit is 55 mph. A car comes up behind you very quickly. Soon the other vehicle is right on your bumper and the driver flashes his/her headlights and honks the horn. How do you respond?
- a) Stay in the passing lane at your current speed intentionally preventing the other car from passing.
 - b) Give the other driver the finger and purposely slow down to aggravate the driver behind you.
 - c) As soon as possible change lanes and let the other car pass.
 - d) Give the other driver the finger and stay in the passing lane at your current speed.
8. You are driving on the interstate when another vehicle pulls up alongside your car. You look over and see a total stranger making obscene gestures at you. How do you respond?
- a. Ignore the other driver by looking straight ahead and minding your own business.
 - b. Look at the other driver and shake your head in disbelief, then slow down and wait for the other car to drive on.
 - c. Glare back at the driver with a menacing face.
 - d. Make obscene gestures back to the driver in the other vehicle.
9. You have been sitting in your car in a traffic jam for over 20 minutes. Suddenly, a car lightly bumps you from behind. How do you respond?
- a) Step out of your car and yell at the other driver for being a horrible driver and not paying attention.
 - b) Ignore it, the bump was not hard enough to cause any damage.
 - c) Yell out your window at the other driver to pay more attention.
 - d) Yell out loud in your vehicle, but not to the other driver.
10. You are driving on the interstate. One of the cars in front of you keeps switching lanes preventing other cars from passing efficiently. Thus traffic is being slowed. How do you respond?
- a) Yell obscenities in your car and honk your horn numerous times to show your displeasure.
 - b) Pull up next to the other car so that you can honk your horn and scream obscenities at the driver for blocking traffic.
 - c) Let out a sigh and slow down with the rest of the traffic.
 - d) Yell out obscenities in your car.
11. You are driving on a city street. Without warning, a pedestrian suddenly runs in front of your car nearly causing you to hit him/her. How do you respond?
- a) Do nothing except feel grateful no one was injured.
 - b) Actually stop your car and get out to yell at the pedestrian for being careless and stupid.
 - c) Yell at the pedestrian out your window telling them to watch where they are going.
 - d) Curse loudly at the pedestrian out your window telling them next time your not

- going to stop.
12. You are trying to exit off the highway. However, a car coming on to the highway has failed to acknowledge a yield sign and their behavior has caused you to miss the exit. How do you respond?
 - a) Honk your horn at the other driver to demonstrate your displeasure.
 - b) Throw your hands in the air in disbelief and drive to the next exit.
 - c) Tailgate the car for a while then drive up next to the car, honk your horn, and yell obscenities at the other driver.
 - d) Drive up next to the car that cut you off, honk your horn, and give the driver a mean look.
 13. Your off ramp is quickly approaching. The driver next to you is driving in a manner that is preventing you from changing lanes. You may miss your exit. How do you respond?
 - a. Honk your horn and yell out your window at the driver telling them to get out of your way.
 - b. Hit the gas to get in front of the other car, yell obscenities as you pass the other car.
 - c. Cursing under your breath, reduce your speed as necessary to make the lane change.

- d. Follow the car to its destination so you can yell obscenities at the other driver.
14. You are driving on the highway. The driver in the car in front of you throws a cup of coffee out his/her car window. The cup hits your windshield. How do you respond?
 - a) Honk your horn and yell at the other driver from within your car.
 - b) Speed up next to the car and make obscene gestures at the other driver.
 - c) Shake your head in disbelief and turn on your windshield wipers.
 - d) Speed up so that you pass the car and then throw something out your window to hit the other car.
 15. While making a left-hand turn you accidentally cut off another car. In response, the other driver follows you to the next intersection at which point he/she pulls up to your car and proceeds to yell obscenities at you until the light turns green. When the light turns green the other driver takes off in a hurry. How do you respond?
 - a. Follow the car to the next intersection so that you can yell obscenities back.
 - b. Sigh in relief that the whole ordeal is over.
 - c. Get behind the car and tailgate it to the next intersection, then pull up next to the car and yell obscenities back at the other driver.
 - d. Yell back at the other driver telling him to relax because it was an accident.
 16. You have been stuck in a traffic jam for nearly 40 minutes. While not paying attention you accidentally bump the car in front of you. The driver in the car in front of you leans out the window and curses at you very loudly. How do you respond?
 - a) Shrug your shoulders to indicate it was not intentional.
 - b) Intentionally ram the car again.
 - c) Yell back at the other driver telling him to relax because it was unintentional and there is no damage.
 - d) Give the other driver the finger and yell back.
 17. You are driving on the highway in the passing lane. You come up behind another car in the passing lane. You flash your headlights as an indicator for the other car to move over. Instead of moving over, you see the driver in the other car give you the finger and remain in the passing lane. How do you respond?
 - a) Start flashing your lights with greater frequency hoping to influence the driver to move over.
 - b) Get right on the rear bumper of the car, flash your lights, and honk your horn in order to intimidate the other driver into moving over.
 - c) Roll your eyes in disbelief and wait for the car to move over or exit.
 - d) Get right on the rear bumper of the other car and lay on your horn.
 18. You are in the left-hand lane behind another vehicle. When the left turn light is given, the vehicle does not move because the driver is not paying attention. You tap on your horn to get her attention and she gives you the middle finger in her rearview mirror. How do you respond?
 - a) Tap on your horn again.
 - b) Fume inside a bit, but do nothing.
 - c) Lay on your horn.
 - d) Lay on the horn and return the finger gesture.
 19. You are traveling in a single-lane road late at night and the vehicle coming at you in the other lane has on high beams. You flash your lights, but the bright lights of the other vehicle do not change. How do you respond?
 - a) Grit your teeth in frustration and wait for the car to pass so you can see again.
 - b) Put on your high beams and honk your horn.

- c) Put your high beams on in retaliation.
- d) Turn around and follow the other vehicle with your high beams on.

Appendix E: Scenario Driver Attributions

1. Would you say that the main reason for the other driver's actions was because of...

	1	2	3	4	5	6	7
Something specific to the situation? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Something specific to the driver? (7)							

2. Do you believe the cause of the event was beyond the driver's power?

1	2	3	4	5	6	7
---	---	---	---	---	---	---

	1	2	3	4	5	6	7
Not at all (1)							
Very much so (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very much so (7)							

3. Do you think the other driver's actions were deliberate?

4. Do you think the reason for the driver's behavior will change in the future?

	1	2	3	4	5	6	7
Not at all (1)							
Very much so (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix F: Ambiguous Intention Hostility Questionnaire

Please read each of the situations listed below and imagine the situation happening to you. For each situation, type a brief reason for it. Then, rate whether you think the person acted that way toward you on purpose. You will then be asked to rate how angry that situation makes you feel and how much you blame the other person. Finally, please describe what you would do about that situation. A response of "I don't know" is not acceptable. You need to describe some type of behavioral response. Complete sentences are not necessary.

Someone jumps in front of you on the grocery line and says, "I'm in a rush"

What do you think was the real reason why someone jumped in line in front of you?

Did that person jump in front of you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame that person for jumping in front of you on line?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

A friend of yours slips on the ice, knocking you onto the ground.

What do you think was the real reason why your friend knocked you to the ground?

Did your friend knock you onto the ground on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame your friend for knocking you onto the ground?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You've been at a new job for three weeks. One day, you see one of your new co-workers on the street. You start to walk up to this person and start to say hello, but she/he passes by you without saying hello.

What do you think was the real reason why your coworker passed by you without saying hello?

Do you think your co-worker did this to you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the co-worker for passing by you?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

While walking outside during the rain, a car swerves to avoid hitting a cat, and drives into a puddle, splashing water onto you.

What do you think was the real reason why the car splashed water onto you?

Do you think the driver of the car splashed water onto you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person in the car for splashing water onto you?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You have an appointment with an important person. When you arrive at your appointment, the secretary informs you that the person is not in; they took the day off.

What do you think was the real reason why the person didn't keep your appointment?

Do you think the person did this to you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person for not keeping your appointment?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You are on a bus sitting in an aisle seat. A person gets on the bus at the next stop, begins walking as the bus moves, and steps on your foot.

What do you think was the real reason why the person stepped on your foot?

Do you think the person did this to you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person for stepping on your foot?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

Your neighbors are playing loud music. You knock on the door and ask them to turn it down. Fifteen minutes later, the music is loud again.

What do you think was the real reason why your neighbors played the loud music again?

Do you think your neighbors raised the music on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame them for raising the music again?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You walk past a bunch of teenagers at a mall and your hear them start to laugh.

What do think was the real reason why the teenagers started to laugh after you walked past them?

Do you think the teenagers did this to you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the teenagers for laughing as you walked past them?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

While driving, the person in the car behind you honks their horn and then cuts you off.

What do you think was the real reason why the person cut you off while driving?

Do you think the person cut you off on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the driver of the car for cutting you off on the road?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You are supposed to meet a new friend for lunch at a restaurant but she/he never shows up.

What do you think was the real reason why your new friend didn't show up at the restaurant?

Do you think your new friend did this to you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame your new friend for not showing up at the restaurant?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You've been looking for a parking spot for awhile, when you see one up ahead. You put your signal on, proceed toward the spot, but someone passes your car and takes the parking space.

What do you think was the real reason why the person in the other car took your parking space?

Do you think the person in the other car took your parking space on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person in the other car for taking your parking space?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You're dancing at a club and someone bumps into you from behind.

What do you think was the real reason why the person in the club bumped into you from behind?

Do you think the person bumped into you on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person for bumping into you at the club?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You call a friend and leave a message on their answering machine, asking them to call you back. One week passes and they have not called you back.

What do you think was the real reason your friend didn't call you back?

Do you think your friend didn't call you back on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame your friend for not calling you back?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

You're at a bar watching a football game and having a drink. Suddenly, the home team scores, people begin to cheer, and someone hits your arm, spilling the drink onto your clothes.

What do you think was the real reason why the other person hit your arm?

Did the other person hit your arm on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the person for hitting your arm?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

A day before meeting someone for a date, she/he calls to cancel. This is the third straight time they've done that.

What do you think was the real reason why the other person canceled the date with you?

Did the other person cancel the date on purpose?

- Definitely No (1)
- Probably No (2)
- Maybe No (3)
- Maybe Yes (4)
- Probably Yes (5)
- Definitely Yes (6)

How angry would this make you feel?

- Not at all Angry (1)
- 2
- 3
- 4
- Very Angry (5)

How much would you blame the other person for cancelling your date?

- Not at All (1)
- 2
- 3
- 4
- Very Much (5)

What would you do about it?

Appendix G: Reactive-Proactive Questionnaire

There are times when most of us feel angry, or have done things we should not have done. Rate each of the items below by selecting 0 (never), 1 (sometimes), or 2 (often). Do not spend a lot of time thinking about the items—just give your first response. Make sure you answer all the items (see below). How often have you...

	0 (never)	1 (sometimes)	2 (often)
Yelled at others when they have annoyed you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had fights with others to show who was on top	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reacted angrily when provoked by others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taken things from others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gotten angry when frustrated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vandalized something for fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had temper tantrums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Damaged things because you felt mad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had a gang fight to be cool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hurt others to win a game	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Become angry or mad when you don't get your way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used physical force to get others to do what you want	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gotten angry or mad when you lost a game	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gotten angry when others threatened you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used force to obtain money or things from others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt better after hitting or yelling at someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Threatened and bullied someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made obscene phone calls for fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hit others to defend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

yourself			
Gotten others to gang up on someone else	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carried a weapon to use in a fight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gotten angry or mad or hit others when teased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yelled at others so they would do things for you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix H: Impulsive/Premeditated Aggression Questionnaire

When people become frustrated, angry, or enraged, they express their anger in a variety of ways. Considering your aggressive acts over the last 6 months, please answer the following questions. An aggressive act is defined as striking and/or verbal insulting another person or breaking/throwing objects because you were angry or frustrated. Your possible answers are: Strongly Agree = SA, Agree = A, Neutral = N, Disagree = D, Strongly Disagree = SD

	SA	A	N	D	SD
I planned when and where my anger was expressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt my outbursts were justified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When angry, I reacted without thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I typically felt guilty after the aggressive acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was in control during the aggressive acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel my actions were necessary to get what I wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually can't recall the details of the incidents well	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understood the consequences of the acts before I acted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I lost control of my temper during the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes I purposely delayed the acts until a later time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt pressure from others to commit the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I wanted some of the incidents to occur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel some of the incidents went too far	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think the other person deserved what happened to them during some of the incidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I became agitated or emotionally upset prior to the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The acts led to power over others or improved social status for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was under the influence of alcohol or other drugs during the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I knew most of the person involved in the incidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was concerned for my personal safety during the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some of the acts were attempts at revenge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I acted out aggressively more than the average person over the last six months	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was confused during the acts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Prior to the incidents, I knew an altercation was going to occur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My behavior was too extreme for the level of provocation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My aggressive outbursts were usually directed at a specific person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consider the acts to have been impulsive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was in a bad mood the day of the incident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The acts were a release and I felt better afterwards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am glad some of the incidents occurred	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anything could have set me off prior to the incidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX I: Personality Attributes Questionnaire

The items below consist of a pair of contradictory characteristics--that is, you cannot be both at the same time. You are to choose the point that best describes where you fall on the scale.

	1	2	3	4	5
Not at all independent:Very independent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all emotional:Very emotional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very passive:Very active	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all able to devote self completely to others:Able to devote self completely to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very rough:Very gentle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all helpful to others:Very helpful to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all competitive:Competitive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all kind:Very kind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not all aware of feelings of others:Very aware of feelings of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can make decisions easily:Has difficulty making decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gives up very easily:Never gives up easily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all self-confident:Very self-confident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feels very inferior:Feels very superior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all understanding of others:Very understanding of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very cold in relations with others:Very warm in relations with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Goes to pieces under pressure:Stands up well under pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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