Unmasking the Moving Threat: Reckless Driving, Borderline Personality Disorder, and the Impact on Motor Vehicle Accidents

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Charlene Lam

Wright State University
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Abstract

Background: Motor vehicle accidents (MVAs), a leading cause of mortality in the United States have an enormous impact on public health. Researchers contend that approximately 90% of all MVAs are, to some extent, a result of driver characteristics and behavior (Lewin, 1982). One of the least researched driver characteristics is psychiatric comorbidity, especially borderline personality disorder (BPD), a disorder that is characterized by impulsivity and emotional volatility.

Objective: The purpose of this study is to examine the relationship between BPD and driving citations.

Method: Using two measures for BPD, we surveyed a consecutive sample of patients who were being seen at a primary care setting (N = 419) and examined self-reported histories of being charged with, not necessarily convicted of, 12 moving and 11 non-moving traffic violations as well as automobile/motorcycle accidents, driving while intoxicated, vehicular manslaughter, leaving the scene of an accident, and having ever had one’s driving privileges suspended or been refused a driver’s license in any state.

Results: There were statistically significant correlations between both measures of BPD and the number of moving violations, number of non-moving violations, driving while intoxicated, and ever having had driving privileges suspended. There were no between-group differences with regard to automobile or motorcycle accidents. No participant reported vehicular homicide, and too few endorsed leaving the scene of an accident or having been refused a driver’s license to warrant analyses.
**Conclusions:** Compared to those without BPD, individuals with BPD appear to be at a greater risk for reckless driving, particularly with regard to moving and non-moving violations, driving while intoxicated, and having one’s driving privileges suspended.
Introduction

Motor vehicle accidents (MVAs) are a leading cause of morbidity and mortality in the United States. The impact of these deaths on the years of potential life lost (YPLL) is significant. A recognized risk factor for causing vehicular collisions is reckless and aggressive driving (Asbridge, Smart, & Mann, 2006; Bjorklund, 2008; Mann et al., 2007; Tsuang, Boor, & Fleming, 1985). In these respects, both MVAs and reckless driving are identified as serious public health concerns (Asbridge et al., 2006). Understanding which individuals are disposed to reckless driving may lead to further insight on how to prevent this type of driving behavior as well as MVAs. While a number of characteristics of a reckless driver have been explored, specific psychiatric comorbidities disposing one towards reckless driving have not been fully examined. Borderline Personality Disorder (BPD), an Axis II psychiatric disorder, has been indicated as possibly contributing to reckless driving behavior because of these individuals’ proclivity towards impulsive, reactive, and volatile behavior. However, the prevalence of reckless driving among BPD patients has not been well researched. In order to further examine the scope of these public health concerns, we will explore the impact of MVAs, especially on young adults, and the way that dangerous driving behaviors such as aggressive and reckless driving results in MVAs. Next, we will examine the road as a venue for communication between drivers and how it is especially conducive to poor communication. Miscommunications often lead to anger and irritability, resulting in aggressive or reckless driving. We will further define and clarify the terms of aggressive driving, road rage, and reckless driving. Then, we will review the characteristics of BPD. Finally, by reviewing key recent literature on psychiatric disorders and driving, we will integrate the role of research on BPD and reckless driving in
relationship to understanding mental illness and MVAs. This is important for physicians in terms of counseling patients and facilitating public health interventions.

**Purpose Statement**

The purpose of this study is to determine whether individuals with BPD demonstrate a higher frequency of reckless driving than individuals without this disorder. We will examine this issue through a self-report survey that explores moving and non-moving traffic violations as well as automobile/motorcycle accidents, driving while intoxicated, vehicular manslaughter, leaving the scene of an accident, and having ever had one’s driving privileges suspended or been refused a driver’s license in any state among internal medicine outpatients in a primary care clinic.

**Review of the Literature**

*Motor Vehicle Accidents (MVAs)*

According to the Centers for Disease Control and Prevention (CDC), from 1991 to 2000, transportation accidents were the third leading cause of death in the United States for people under the age of 65. Between those years, there was an annual average of 36,000 mortalities due to transportation accidents. Furthermore, motor vehicle accidents (MVAs) are the leading cause of death in people age 5-29 years (CDC, 2005). The National Highway Traffic Safety Administration (NHTSA) reports that young adult drivers ages 15 to 21 are five times more likely to be in fatal crashes than adults (The State Attorneys General, 2007).

As the leading cause of death for young adults, MVAs are the single, greatest public health threat in that population stratum (Shope & Bingham, 2008). Researchers propose that young drivers are more likely to engage in reckless driving, making them more susceptible to MVAs. However, some contend that younger, novice drivers are involved in MVAs because of
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inexperience in detecting and responding to hazards, controlling the vehicle, and integrating speed, rather than engaging in risky behaviors (Dumais et al., 2005).

Regardless of causative factors, in terms of social and economic implications, deaths in this young population stratum are especially devastating. This can be measured through total years of potential life lost (YPLL), which is a measure of premature mortality. Individuals who die of fatalities from MVAs tend to be younger than those who die because of other causes. Therefore, the total of years of potential life lost is higher among MVAs (CDC, 2003). The high YPLL associated with MVAs demonstrates that MVAs result in the loss of productive, healthy individuals. As a relevant health and safety concern for this population, there has been a public health trend for greater public awareness regarding high-risk behaviors, such as reckless driving, among adolescents and young adults (Wagner, 2001).

The cause of MVAs are complex and can be dissected in multiple ways such as environmental variables, characteristics of drivers, or current stress or life events of drivers while driving (Tsuang et al., 1985). Understanding the traits of drivers who are predisposed to aggressive and reckless driving is important. In support of this view, the American public perceives aggressive and reckless driving as a serious threat to safety (Neuman et al., 2003). In a telephone survey conducted by the NHTSA, more than 60 percent of drivers reported that unsafe driving is a major personal threat to themselves and passengers (NHTSA, 1999). In addition, approximately 75% of drivers believe that it is very important to do something about unsafe driving (NHTSA, 1999).

Roads: Breeding Grounds for Miscommunication

Driving provides a unique forum that brings individuals from diverse backgrounds into contact with each other as they attempt to negotiate the road (Roberts & Indermaur, 2008).
Purposeful communication in traffic is limited to drivers’ mutual desire to find their destination, thereby, forcing interaction. Communication between individuals in traffic tends to be ambiguous because individuals are relatively anonymous (Bjorklund, 2008). Interactions are brief and the venue for communication is restricted. These poor conditions for communication breed misunderstanding and misinterpretation among drivers, resulting in irritation and aggressive behavior.

Regardless of how insulated one may feel in their vehicle, his/her actions affect other drivers and passengers, alike. An angry, irritated driver is an impaired driver. These emotions interfere with driving as it affects attention, perception, information processing, judgment, and motor skills, thus contributing to MVAs (Bjorklund, 2008). Studies show that emotional reactions while driving such as anger and fear consume our attention, diverting attention away from the primary task of driving (Britt & Garrity, 2006). Ironically, despite poor communication conditions, body language such as minor expressions of hostility is easily observable and may escalate to a more serious incident. An irritated driver who is more disposed to exhibiting aggressive behavior may also provoke other drivers, causing reactive irritation in them, as well. Like a domino effect, without much effort, there are suddenly two drivers who are angry, with both becoming hazards to others on the road. In support of this, several studies have demonstrated that the emotion of anger while driving is correlated with traffic violations and accidents (Britt & Garrity, 2006; Lajunen, Parker, & Stradling, 1998; Lawton, Parker, Manstead, & Stradling, 1997; Parker, Lajunen, & Stradling, 1998; Wells-Parker et al., 2002).

Typically, attention has been attributed to the perpetrators of aggressive driving. However, the victims of aggressive driving are equally at risk for collisions. Mann and colleagues suggest that both victims and perpetrators are significant contributors to collisions and
have an increased risk of collisions (Mann et al., 2007). In comparing those who did not report road rage, those who were victimized, and those who perpetrated road rage, the odds of collision involvement is 157% higher overall, 87% higher among those who reported only victimization, and 83% who reported only perpetration (Mann et al., 2007). This demonstrates how aggression and frustration on the road influences all drivers regardless of status as perpetrator or victim.

Aggressive Driving, Road Rage, and Reckless Driving: Dangerous Acts

The terms *aggressive driving*, *road rage*, and *reckless driving* are terms that have been used interchangeably in popular media. According to the NHTSA, *aggressive driving* is situationally defined as “when individuals commit a combination of moving traffic offenses so as to endanger other persons or property” (Mann et al., 2007). Some examples of aggressive driving include exceeding the speed limit, following another vehicle too closely, changing lanes in an erratic or unsafe manner, excessive horn honking, improper signaling of lane changes, and failing to obey traffic control devices (i.e., stop signs, yield signs, traffic signals, railroad grade cross signals). The NHTSA further notes that running red lights is one of the most dangerous forms of aggressive driving (NHTSA, n.d.). As noted previously, other drivers fear aggressive drivers and believe that it is a personal threat (NHTSA, 1999).

*Road rage*, a term popularized by the media since the mid-1990s, refers to a more severe, specific form of aggressive driving behavior (Mann et al., 2007; Roberts & Indermaur, 2008). Smart and Mann define road rage as a form of interpersonal aggression in which “a driver attempts to intimidate, threaten, or injure another driver, pedestrian, or passenger or to damage their vehicle in a traffic incident” (Smart & Mann, 2002, p. 761).

The impact of aggressive driving on MVA morbidity and mortality is comparable to impaired driving due to alcohol use. Traffic safety authorities contend that one-third of all
personal injury MVAs, two-thirds of MVA fatalities, and half of all MVA crashes are due to aggressive driving (Martinez, 1997; Snyder, 1997). Aggressive drivers have also been found to have a higher degree of anxiety, hostility, competitiveness, and anger, especially at slow drivers and traffic obstructions (Galovski & Blanchard, 2002).

The term “reckless driving” is more often used in the context of a moving traffic violation and has a meaning similar to aggressive driving. Reckless driving is commonly defined as “willful or wanton disregard for the safety of persons or property” ("Reckless driving," n.d.). It indicates that any driver who operates a vehicle in a dangerous fashion, without concern, or that may cause an accident, is at risk for a citation. While specific citable actions vary depending on location, some examples include excessive speeding, driving with malfunctioning brakes, driving with obstructed vision, or failing to use proper signals. In the United States, all 50 states have similar statutes that prohibit reckless driving. For example, the state of Ohio does not have a “reckless driving” clause but rather a “willful or wanton operation on street or highway” clause, which essentially covers the same violation ("Operation in willful or wanton disregard of the safety of persons or property").

**Psychiatric Disorders and Driving**

While not completely clear, there appears to be an empirical association between some forms of mental illness and aggressive driving behaviors. For instance, Dumais and colleagues (2005) demonstrated that borderline personality disorder, antisocial personality disorder, and substance abuse are risk factors for young male deaths in MVAs. However, the amount of research on the psychiatric contributors to dangerous driving behaviors is notably limited. Specifically, there is no study that addresses borderline personality disorder (BPD) and hazardous driving.
Malta, Blanchard, and Freidenberg (2005) sampled 88 undergraduate students to compare the prevalence of psychiatric diagnoses and behavior problems in young adult drivers with reported high aggression versus those with low aggression. They hypothesized that aggressive drivers might have a greater prevalence of psychotic diagnosis and behavior problems (Malta, Blanchard, & Freidenberg, 2005). The researchers surveyed and interviewed a young, undergraduate student population who were mostly Caucasian and middle class. With the potential methodological limitations (i.e., small sample size, mean age of 19 years suggesting inexperienced drivers, difficulty in detecting criminal activity or diagnosing personality disorders because of young age), researchers found that aggressive drivers have higher rates of oppositional defiant disorder, alcohol and substance use disorders, and cluster B personality disorders (i.e., borderline, narcissistic, antisocial, histrionic personalities), conduct disorder, attention-deficit/hyperactivity disorder, and intermittent explosive disorder (Malta et al., 2005).

Galovski, Blanchard, and Veazey (2002) examined intermittent explosive disorder (IED) and other psychiatric morbidities in convicted aggressive drivers. They sampled 30 treatment seeking aggressive drivers (20 court-mandated and 10 self-referred) and 30 age- and gender-matched controls to assess the psychiatric problems in identified aggressive drivers. They found that aggressive drivers have a greater prevalence of intermittent explosive disorder, alcohol and substance abuse (past and current), cluster B personality disorders (especially antisocial, borderline, and narcissistic personality disorders), and mood and anxiety disorders (Galovski & Blanchard, 2002). The limitations of this study included the lack of concealment of the status as an “aggressive driver” (i.e., clinical interviewers were aware of the status of the participant). In addition, this sample may reflect an extreme population because they were either convicted of aggressive driving or they believed that their driving was a problem, prompting self-referral.
Therefore, the sample characteristics make generalization to other types of populations problematic.

A 1994 study observed women incarcerated for drunk driving, who were receiving treatment at an alcoholism treatment facility (Lex, Goldberg, Mendelson, Lawler, & Bower, 1994). The participants were interviewed for alcohol and substance abuse, somatoform disorders, and borderline and antisocial personality disorders, using the Structured Clinical Interview for the DSM-III. When excluding behaviors while intoxicated, they found that only 1 of the 33 women met the criteria for antisocial personality disorder. However, seven women met the criteria of antisocial personality disorder when including behavior while drinking. Furthermore, women with antisocial personality disorder and history of conduct disorder tended to have a higher rate of BPD compared to those with only antisocial personality disorder. At the end of the study, the researchers concluded that the relationship between antisocial personality disorder, prodromal behaviors, and substance abuse was more complicated than expected. The limitations of this study include the small sample size and limited ability to generalize findings.

In a 2005 study, Dumais and colleagues conducted a case-control study that compared the psychopathology of 61 young males involved in fatal MVAs to living males matched for age. Their hypotheses were two-fold. First, younger men would be more likely to be involved in MVAs due to inexperience in detecting and responding to hazards, controlling the vehicle, and integrating speed rather than risky behaviors. Secondly, drivers aged 25 to 34 would be more likely to have a higher prevalence of substance abuse/dependence and cluster B personality disorders compared to their younger counterparts (Dumais et al., 2005). The results demonstrated that cluster B personality disorders (borderline and antisocial personality disorders)
and substance abuse disorders were indeed more prevalent among those older than 26 years of age in MVAs fatalities. The limitations in the study include the small sample size, limited ability to generalize findings, and the recruitment of controls. Due to the criteria of matching cases to their controls, the small sample size possibly limited the power needed for more precise univariate analysis by age. Furthermore with such small sample size, there may be some unknown difference in psychopathology between accident and control subjects. The low participation rate (55.4%) also limits the generalizability. The control subjects were also originally collected for suicide research thus the driving status is not available for this group. The control subjects were matched for suicide research, which may lead to reduction in power, by the increased likelihood of higher levels of psychopathology than in a general public (Dumais et al., 2005).

In a 2001 study, Fong and colleagues examined the relationship between road rage and four groups of patients recruited from a primary care setting: perpetrators of road rage ($n = 16$), victims of road rage ($n = 38$), both perpetrators and victims of road rage ($n = 14$), and controls ($n = 63$). With regard to borderline, histrionic, avoidant, and dependent personality disorders (i.e., the personality disorders under investigation), there were no between-group differences (Fong, Frost, & Stansfeld, 2001).

To summarize, note that four out of five of the previous empirical endeavors suggest a possible association between BPD and hazardous driving, with the one exception being a study based on low statistical power (Dumais et al., 2005). However, these past studies have been limited in a number of ways. First, sample sizes have been consistently small (30-131 participants in the various samples). Also, the unique characteristics of several samples make the generalization of findings questionable (e.g., women incarcerated for drunken driving, court-
referred individuals, males involved in motor vehicle fatalities, college students taking psychology classes). Similarly, one study limited participants to males only (Dumais et al., 2005) and one to females only (Lex et al., 1994). In addition, all past studies have operationalized reckless driving into one variable for study, such as convictions or road rage. Finally, one study did not tease out the specific Axis II disorders, but affirmed cluster B relationships in general. While all of these studies seem to suggest there may be a higher prevalence of reckless driving among patients with BPD, it is necessary to understand the entity of BPD and the potential explanations behind the link between BPD and reckless driving.

**Borderline Personality Disorder and Reckless Driving**

BPD is a complex personality dysfunction that is classified in the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR)* as a cluster B disorder (American Psychiatric Association, 2000). As a group, cluster B disorders are typified by dramatic, erratic, and emotional characteristics. As noted previously, other cluster B disorders include antisocial, narcissistic, and histrionic personality disorders (American Psychiatric Association, 2000).

The prevalence of BPD in the general population is approximately 2% to 10% (American Psychiatric Association, 2000; Stone, 1986). Many mental health professionals believe that this disorder is actually increasing in prevalence (Sansone & Sansone, 2007). The *DSM-IV-TR* states that women are more often diagnosed with BPD than men (American Psychiatric Association, 2000). However, some researchers contend that this is due to sampling bias and that there are distinct symptom presentations based on gender (Sansone & Sansone, 2007; Skodol & Bender, 2003). With all personality disorders, there is no psychiatric treatment that provides an absolute cure. Therefore, symptoms tend to emerge in young adulthood and continue to persist into older
adulthood (Sansone & Sansone, 2007). However, the way the disorder manifests may differ depending on age. For example, Stevenson, Meares, and Comerford (2003) suggest less impulsivity is seen in elder BPD patients.

As for clinical features, BPD is characterized by a transient intact social façade, chronic emotionally lability, impulsivity, unstable interpersonal relationships, and repetitive self-harm behavior. Indeed, the *DSM-IV-TR* (American Psychiatric Association, 2000) defines BPD as “a pervasive pattern of instability of interpersonal relationships, self-image and affects, as well as marked impulsivity, beginning by early adulthood and present in a variety of contexts.” The diagnostic criteria involves any five of the nine criteria present for a significant amount of time: (1) frantic efforts to avoid real or imagined abandonment, (2) a pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation, (3) identity disturbance: markedly and persistently unstable self-image or sense of self, (4) impulsivity in at least two areas that are potentially self-damaging (e.g., promiscuous sex, eating disorders, binge eating, substance abuse, *reckless driving*), (5) recurrent suicidal behavior, gestures, threats, or self-mutilating behavior such as cutting and interfering with the healing of scars, (6) affective instability due to a marked reactivity of mood, (7) chronic feelings of emptiness, worthlessness, (8) inappropriate anger or difficulty controlling anger, (9) transient, stress-related paranoid ideation, delusions or severe dissociative symptoms (American Psychiatric Association, 2000).

In diagnostic support of the *DSM* sub-criterion of reckless driving, there are a number of other measures for BPD that includes this behavioral item. However, reckless driving is typically positioned in the midst of a general inquiry about other types of impulsivity (e.g., binge eating, sexual impulsivity). For example, the Diagnostic Interview for Personality Disorders
(Zanarini, 1983) contains the item, “[Have you] driven far too fast or while you were under the influence of alcohol or drugs?” This item is also present in the Zanarini Rating Scale for Borderline Personality Disorder (Zanarini & Frankenburg, 2001). The borderline personality scale of the Personality Disorder Examination queries, “Have you ever been stopped by the police for speeding or reckless driving (when you were not intoxicated with alcohol or drugs)?” (Loranger, 1988). The Diagnostic Interview for Borderlines-Revised asks respondents, “[Have you]…driven far too fast? How about while you were under the influence of alcohol or drugs?” (Zanarini, Gunderson, & Frankenburg, 1989). The borderline personality scale of the Personality Diagnostic Questionnaire-4 (PDQ-4) contains the item, “I have done things on impulse that can get me into trouble…such as…reckless driving” (Hyler, 1994). The Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II) asks, “How about driven recklessly?” (First, Spitzer, & Gibbon, 1995). Finally, the Self-Harm Inventory (SHI) contains the item, “Have you ever intentionally, or on purpose, driven recklessly?” (Sansone, Wiederman, & Sansone, 1998). These ubiquitous and consistent diagnostic queries strongly suggest that reckless driving is a potentially relevant clinical feature of BPD.

While the DSM-IV-TR states that BPD patients may manifest their impulsivity difficulties through reckless driving (American Psychiatric Association, 2000), no study has precisely evaluated BPD and its relationship with reckless driving. The purpose of the following study is to examine the relationship between MVAs, reckless driving, and BPD.

**Method**

**Participants**

Participants were males and females, between the ages of 18 and 65 years, who were being seen at an outpatient primary care clinic for non-emergent medical care. The outpatient
clinic is staffed by both faculty and residents in the department of internal medicine, and is located in a mid-sized, mid-western city. We excluded participants who were unable to complete a brief survey—i.e., those with compromising medical (e.g., dementia, pain), intellectual (e.g., mental retardation), or psychoses.

Procedure

During afternoon clinic hours, the author positioned herself in the lobby of the outpatient clinic. She approached incoming patients and informally assessed exclusion criteria (see above). With potential candidates, she then reviewed the focus of the project and invited each to participate. Each participant was asked to complete a 4-page survey, which took about 10 minutes. Participants were then asked to place the completed surveys into sealed envelopes and then to place them into a collection box in the lobby.

Study survey. The survey consisted of 3 sections (see Appendix A). The first section was a demographic query, in which we asked participants about their sex, age, marital status, racial/ethnic origin, and educational level.

The second section contained an author-developed (R.A.S.) Driving Questionnaire, which consists of a series of legal citations related to driving (charges, not convictions). With yes/no response options, this questionnaire explores 12 moving violations (e.g., speeding, reckless driving, going through a stop sign) and 11 non-moving violations (e.g., expired registration, violating a muffler law, lack of proof of insurance). We also asked participants if they had ever been cited for: (1) an automobile/motorcycle accident; (2) driving while intoxicated; (3) vehicular manslaughter; and (4) leaving the scene of an accident. Finally, with yes/no response options, we inquired if participants had ever had their driving privileges suspended or been refused a driver’s license in any state.
The third section of the survey contained two measures for BPD. The first was the borderline personality scale of the PDQ-4 (Hyler, 1994). This subscale of the PDQ-4 is a 9-item, true/false, self-report measure that consists of the diagnostic criteria for BPD that are listed in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (American Psychiatric Association, 2000). A score of 5 or higher is highly suggestive of the diagnosis of BPD. Previous versions of the PDQ have been found to be useful screening tools for BPD in both clinical (Dubro, Wetzler, & Kahn, 1988; Hyler et al., 1990) and nonclinical samples (Johnson & Bornstein, 1992), including the use of the freestanding borderline personality scale (Patrick, Links, Van Reekum, & Mitton, 1995). The second BPD measure was the SHI (Sansone et al., 1998), which is a 22-item, yes/no, self-report inventory that explores participants’ histories of self-harm behavior. Each item in the inventory is preceded by the statement, “Have you ever intentionally, or on purpose,…” Individual items include, “overdosed, cut yourself on purpose, burned yourself on purpose,” and “hit yourself.” Each endorsement is in the pathological direction. The SHI total score is the summation of “yes” responses. SHI total scores of 5 or higher are highly suggestive of the diagnosis of BPD (Sansone et al., 1998). Indeed, in comparison with the Diagnostic Interview for Borderlines (Kolb & Gunderson, 1980), a benchmark measure for the diagnosis of BPD in research settings, the SHI demonstrated an accuracy in diagnosis of 84%.

These data were collected during April of 2009. This project was approved by the institutional review boards of both the affiliated community hospital as well as the university (see Appendix B). Completion of the survey was assumed to be implied consent.

*Statistical analyses.* Linear associations between two continuous variables were assessed with Pearson’s Correlation Coefficient. Differences between two groups for scores on the SHI
and PDQ-4 were analyzed by One-Way Analysis of Variance (ANOVA). Data analyses were performed by PASW™ (ver. 17.0 for Windows).

Results

Characteristics of Sample

A total of 492 people were invited to participate in this study; 419 agreed, for a response rate of 85.2%. Of the 419 respondents, 130 were male, 287 were female, and 2 failed to indicate sex. Respondents ranged in age from 18 to 65 years ($M = 49.48, SD = 15.26$). Most (358) participants were White/Caucasian (85.4%); 35 participants were African American, 8 Native American, 2 Hispanic, 4 Asian, 11 “other,” and 1 failed to indicate race/ethnicity. With regard to educational attainment, most (92.1%) had at least graduated high school, with 159 (37.9%) having attended some college and 110 (26.3%) having earned at least a 4-year college degree.

Prevalence of Borderline Personality Disorder in the Sample

Of the 419 respondents, 62 (14.8%) exceeded the clinical cut-off score for BPD according to the PDQ-4, 63 (15.0%) did so according to the SHI, and 89 (21.2%) exceeded the clinical cut-off score on one or both of the measures of BPD. Scores on the PDQ-4 and the SHI were positively correlated ($r = .66, p < .001$). There were no sex differences in scores on either the PDQ-4 [$F(1,415) = .13, p = .73$] or the SHI [$F(1,415) = .007, p = .95$]. However, respondent age was negatively correlated with scores on the PDQ-4 ($r = -.32, p < .001$) as well as the SHI ($r = -.34, p < .001$).

Borderline Personality Disorder and Driving Citations

We noted that speeding was endorsed by two-thirds of participants and deleted this item from the following analyses. With regard to potential relationships between BPD scores and
driving citations, scores on the PDQ-4 were positively correlated with the total number of moving violations \((r = .20, p < .001)\) as well as the total number of non-moving violations \((r = .28, p < .001)\). Similarly, scores on the SHI were positively correlated with the total number of moving violations \((r = .17, p < .002)\) as well as the total number of non-moving violations \((r = .29, p < .001)\). The individual moving and non-moving violations that were statistically significantly related to PDQ-4 scores and SHI scores are presented in Table 1 (only for those violations that at least 12 respondents indicated having committed).

Scores on the PDQ-4 did not differ as a result of having ever had a vehicular accident \([F(1,398) = 2.83, p = .10]\), nor did scores on the SHI \([F(1,398) = 1.70, p = .20]\). However, scores on the PDQ-4 were greater for respondents who had driven while intoxicated \((M = 2.82, SD = 2.67, n = 28)\) compared to those who had not \((M = 1.84, SD = 2.07, n = 367), [F(1,393) = 5.52, p < .02]\). Similarly, scores on the SHI were greater for respondents who had driven while intoxicated \((M = 4.57, SD = 4.77, n = 28)\) compared to those who had not \((M = 1.69, SD = 2.89, n = 367), [F(1,393) = 23.04, p < .001]\). No participant admitted to vehicular homicide. In addition, too few participants reported leaving the scene of an accident \((n = 8)\) to warrant analyses. Scores on the PDQ-4 were greater for respondents who had ever had their driving privileges suspended \((M = 2.83, SD = 2.69, n = 72)\) compared to those who had not \((M = 1.72, SD = 1.93, n = 330), [F(1,400) = 17.06, p < .001]\). Likewise, scores on the SHI were greater for respondents who had ever had their driving privileges suspended \((M = 3.54, SD = 4.07, n = 72)\) compared to those who had not \((M = 1.55, SD = 2.79, n = 330), [F(1,400) = 25.21, p < .001]\). Finally, too few participants reported being refused a driver’s license in another state \((n = 7)\) to warrant analyses.
Discussion

Understanding BPD and Reckless Driving

In this study, we found that BPD scores were statistically significantly correlated with both moving and non-moving driving violations, driving while intoxicated, and having ever had one’s driving privileges suspended. These correlations were evident on two independent measures of BPD, each of which has a unique construct (i.e., the PDQ-4 explores more psychological aspects of BPD whereas the SHI explicitly explores lifetime histories of self-harm behavior). These data seem to convincingly indicate that individuals with BPD are more likely than those without BPD to drive recklessly.

A number of BPD features may contribute to undisciplined or reckless driving such as self-regulation difficulties, sensation-seeking behavior, self-harm behavior, mood regulation difficulties, dissociation, and predisposition to alcohol and substance abuse. Examining these possibilities more thoroughly, reckless driving may be a manifestation of the core self-regulation difficulties encountered in these individuals. These self-regulation difficulties likely reflect underlying struggles with impulsivity or the inability to restrain oneself, and may manifest in numerous ways including binge eating, substance abuse, sexual promiscuity, and poor pain regulation.

BPD is also associated with an inner pervasive sense of emptiness (Klonsky, 2008). These feelings may predispose individuals with this disorder to engage in self-stimulating, dangerous acts or sensation-seeking behavior such as reckless driving to fill the void of emptiness. In support of this possibility, susceptibility to boredom, without an association with BPD, is an identified independent personality characteristic associated with higher rates of dangerous driving behaviors and negative driving outcomes (Patil, Shope, Raghunathan, &
Bingham, 2006). This might be akin to sensation-seeking, which is defined as “the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience” (Zuckerman, 1979). Wagner (2001) also reports that those with high sensation-seeking personalities are more likely to engage in risk-taking behaviors such as substance abuse, risky sexual behavior, reckless driving, and theft, and vandalism. The combination of sensation-seeking behavior and the sense of emptiness may be especially trying for patients with self-regulation difficulties.

Another contributory factor to the association between BPD and reckless driving may be the psychodynamic of intentional self-harm and recurrent suicidal behavior. To explain this, reckless driving may potentially be similar to other types of self-injury behaviors like cutting (i.e., it may function as a self-injury equivalent). Self-harm is defined as deliberately injuring oneself through methods such as superficial cutting or attempting to hang and poison (Skeg, 2005). Given this psychodynamic, drivers can speed excessively with the attitude that “something might happen” or attempt suicide via “traffic accidents.” Selzer and Payne argue that, “the automobile constitutes an ideal self-injurious or self-destructive instrument, particularly for persons intent upon camouflaging their suicidal motivation from others–and themselves” (Selzer & Payne, 1962). They further note that there may be degrees of unconscious and self-destructive impulsivity that play a role in automobile accidents. However, one may argue that the converse is true in relation to BPD (i.e., they have no reason to camouflage their self-injurious behaviors). Although not always the case, many individuals with BPD tend to exhibit suicidal gestures or engage in acts of low mortality as a plea for help or attention (Martiniuk et al., 2009). MVAs tend to have high mortality and morbidity rates;
therefore, a motor vehicle collision may not be a preferred gesture. On the other hand, a MVA may provide the drama and attention BPD patients’ desire.

A fourth possibility may lie in the context of reckless driving in relation to mood. Individuals with BPD are characterized by their difficulties with mood regulation as well as exquisite emotional over-reactivity, particularly in an interpersonal context. It may be that some reckless driving behaviors are in the context of relational difficulties and are the outgrowth of reflexive anger responses. As a result, the emotional lability of these individuals tends to lead to exponential miscommunications while driving. As discussed previously, driving can be stressful and even people with no psychiatric comorbidities may act out. Patients with BPD can be especially vulnerable to these situations.

Individuals with BPD may also, under stress, experience quasi-psychotic experiences that are often times characterized by dissociation. The resulting dissociation may impair the ability to focus and concentrate on driving. Examples of dissociative experiences may include intense depersonalization and/or derealization as well as bona fide dissociation.

Finally, to further augment the tendencies of impulsivity, emptiness, boredom, and self-injurious behaviors, BPD patients tend to have higher-than-average problems with alcohol and substances. In support of this impression, according to these data, there was a statistically significant correlation between BPD and being likely to drive while intoxicated. Intoxicants could certainly contribute to impaired judgment and thus driving citations. The combination of these personality traits makes BPD patients extremely susceptible to acts of dangerous driving and potentially life-threatening MVAs.

One way to conceptualize the preceding proposed contributory variables to reckless driving in BPD is to view them within the context of a risk model. In other words, each possible
factor heightens the risk for driving citations, but perhaps not equally (e.g., in individual cases, a particular risk factor may display a higher loading than the others, such as substance abuse). Only further research will delineate the underlying causal factors for reckless driving in those suffering from BPD.

At this juncture, it is important to emphasize that a single citation does not necessarily indicate psychiatric pathology. For example, although the speeding assessment was removed from the analysis, it does not affect the conclusion from the findings of the study as the goal was to examine reckless driving as a whole. The next germane question for follow-up studies would be to explore the total number of tickets an individual have received during their driving history. This could indicate the frequency of risky behavior. Perhaps, the more pertinent question within this survey is ever having one’s driving privileges suspended (i.e., the likely accumulation of driving offenses), which was statistically significantly correlated with BPD scores. This finding indicates that either the subject committed a violation that was so severe that it resulted in the suspension of a license, or there were multiple repeated offenses that culminated in license suspension.

Limitations and Implications

This study has a number of limitations including a retrospective study; the use of self-report data and the inherent limitations associated with this type of methodology; the use of a non-validated author-developed questionnaire for the assessment of driving citations, which was necessary because of the lack of a pre-existing measure; and the use of self-report measures for the assessment of BPD, which are known to be over-inclusive (i.e., risk of false positives). A retrospective approach in combination with the mean age of the population ($M = 49.48$, $SD = 15.26$) provides an especially unique situation for this study. With regard to age, it has been
suggested that elderly patients with BPD tend to be less impulsive compared to younger individuals (Stevenson, Meares, & Comerford, 2003). Given our setting of an outpatient clinic, where an older population will naturally be gathered, this is meaningful because older patients tend to be less impulsive and therefore less likely to engage in reckless driving behaviors. If they had these behaviors previously, it may have been years prior and it may affect their ability to recall certain events. On the other hand, since the questionnaire was worded “Have you ever been charged…?,” it takes into account an individual’s entire driving history, rather than some specified time such as the past year.

Although MVAs is the leading cause of death among young adults, it is still the third leading cause of death for those under 65. The purpose for surveying a wider range in age of participants is to take into account this population as well. Furthermore as noted previously, the questionnaire considers the entire history of drivers including their young adult years.

In addition to the preceding potential limitations, the author-developed driving questionnaire was created in an effort to be inclusive and yet reader friendly for the participants. As noted earlier, the state of Ohio, where the study was conducted, does not have a “reckless driving” clause. However, we chose to ask, “Have you ever been charged with reckless driving?” because we felt it was more self-explanatory. It would be interesting to see how the results may have differed if we used the query, “Have you ever been charged with willful or wanton operation on a street or highway?” which means reckless driving. Though being more technically accurate for Ohio, it may have obscured reckless driving citations in other states or been more confusing to participants.

Despite the noted potential limitations, to date, this is the largest sample of participants in this field of study; the second study to utilize a primary care sample; and the only study to
explore a wide array of impaired driving behaviors (i.e., previous studies have typically examined only one facet of impaired driving such as drunken driving, road rage, aggressive driving, or accidents). Indeed, according to these data, individuals suffering from BPD appear to be at a greater risk for reckless driving, including both moving and non-moving offenses, thus supporting this poorly researched sub-criterion that is so often encountered in assessments for BPD.

Public Health Impact

With its high associated morbidity and mortality and public view as a personal threat, MVAs and reckless driving will continue to be a public health concern. It is important to note that, unlike environmental variables, aggressive and reckless driving are preventable risk factors for MVAs. While the absolute numbers of reported citations in this study are relatively low and the consequences of aggressive driving are unpredictable, it appears that, indeed, reducing reckless driving could improve the overall driving experience for all those involved. The unique situation of traffic, the way it is unconducive to communication, and the impact of road rage on victims suggests that eliminating even one angry driver could prevent irritation and frustration in another driver. The results of this study suggest three possible modalities to address MVAs, aggressive driving, and BPD. The first modality is to increased awareness of the link between BPD and reckless driving among physicians. Next, this study suggests a ready-made sample for intervention. Finally, it demonstrates the significance in addressing psychiatric and behavior problems in driving programs.

In an effort to reduce motor vehicle crashes, D’Angelo and Halpern-Felsher (2008) suggest the development of a new national awareness — a proposal that gives health care providers a unique opportunity to counsel patients. Explicitly, the results of this study
demonstrate a role for physicians to counsel their BPD patients on reckless driving. They argue, “… in contrast to more indirect messages delivered via mass media efforts, healthcare providers have the opportunity, through the provision of direct and personal interventions, to interpret and reinterpret important public health information in a way that may be more meaningful…” (D'Angelo & Halpern-Felsher, 2008, p. S305). Increasing awareness among physicians of the self-regulation difficulties in patients with BPD could help with counseling and education. It is important to note, although there are no cures for personality disorders, there are therapeutic approaches that can relieve symptoms and help affected individuals’ deal with specific feelings and emotions.

In road rage prevention, Asbridge, Smart, and Mann (2006) contend it is first important to focus on the small group involved in serious road rage cases. Furthermore, programs tailored for high-risk groups can be most effective (Asbridge et al., 2006). This study potentially identifies a group of individuals predisposed to reckless driving that could benefit from additional research and program development.

Finally, the implications of this study indicate that it may be necessary to address psychiatric and behavioral problems in prevention and interventions programs designed to reduce aggressive driving. However, more empirical evidence on the psychiatric aspects of individuals involved in MVAs is required before prevention and intervention programs can be designed. Additionally, it is critical to acknowledge specific mental illnesses such as BPD that predisposed individuals towards reckless driving, may complicate safe driving interventions or prevention tools. A more comprehensive examination of the interaction between BPD patients, their characteristics, and how these manifest through dangerous driving could possibly provide solutions to reducing the number of MVAs seen in this country.
References


Operation in willful or wanton disregard of the safety of persons or property, ORC 4411.20 C.F.R.


Table 1

*Scores on the PDQ-4 and the SHI as a Function of Specific Driving Violations*

<table>
<thead>
<tr>
<th>Did Not Indicate</th>
<th>Indicated This</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Driving Violation</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Reckless Driving</td>
<td>1.82 (2.07)</td>
</tr>
<tr>
<td>Expired Registration</td>
<td>1.80 (2.02)</td>
</tr>
<tr>
<td>Lights Required on a Vehicle</td>
<td>1.83 (2.09)</td>
</tr>
<tr>
<td>License Not on Person</td>
<td>1.84 (2.08)</td>
</tr>
<tr>
<td>Failure to Renew License</td>
<td>1.83 (2.08)</td>
</tr>
<tr>
<td>Lack of Proof of Insurance</td>
<td>1.77 (2.03)</td>
</tr>
<tr>
<td>Expired Temporary Tag</td>
<td>1.82 (2.07)</td>
</tr>
</tbody>
</table>

*Scores on the SHI*

| Reckless Driving  | 1.77 (2.97) | 3.52 (4.05) | 9.79 | .002 |
| Lights Required on a Vehicle | 1.78 (3.02) | 3.29 (3.92) | 5.45 | .03  |
| License Not on Person | 1.79 (3.01) | 4.26 (4.62) | 11.54 | .001 |
| Failure to Renew License | 1.79 (3.08) | 3.95 (3.89) | 9.05 | .003 |
| Lack of Proof of Insurance | 1.74 (2.97) | 4.21 (4.43) | 17.08 | .001 |
| Expired Temporary Tag | 1.75 (2.95) | 5.35 (5.16) | 22.48 | .001 |
A. Driving Survey

Driving Study

Our names are Charlene Lam, and Randy Sansone, MD, and we are studying driving citations and the relationship, if any, to emotional symptoms. We would appreciate your participation in this research project, which involves the completion of the attached 5-page survey (it should take you about 10 minutes). Participation in this research project is completely voluntary. You do not have to participate if you do not want to. Your decision to participate (or not) will not affect your care at Sycamore Primary Care Center.

Please note that your responses are confidential. Do not write your name on the survey. After completing the survey, please place it in the accompanying envelope, seal the envelope, and give it to Ms. Lam, a staff member, or the receptionist. It will then be placed with other completed surveys for processing. Your doctor here at Sycamore Primary Care Center will not have access to your personal survey results. Only group results will be reported in publications, not individual results.

While completing the survey, you may have some mild anxiety because of the types of questions asked. If you feel very anxious, you may stop at any time with no consequences to you. However, please try to answer all questions on the survey to enable us to compare your answers with others. We are not able to pay you for participating in this research project, but our findings may help doctors to better understand the role of emotional symptoms in patients with driving citations.

If you have any questions or concerns about this research project, you may contact Randy Sansone, MD, at 937-384-6850. If you have any questions about your rights as a research subject, please contact Stephen McDonald, MD, through the Kettering Medical Center Institutional Review Board at 937-298-3399, extension 55109.

If you would like to receive a copy of the group results, please leave your name and address with your doctor or nurse—results should be available in about one year. We sincerely thank you for your willingness to complete the survey. You may keep this cover page.
Background Information

Your age ___

Sex: ___ Male ___ Female

Race: ___ White ___ African-American ___ Native American ___ Asian ___ Hispanic ___ Other (_______________________)

Marital Status: ___ Married ___ Separated ___ Divorced ___ Never Married ___ Widowed

Highest completed education:
___ Less than high school ___ Some college, no degree ___ Graduate degree/higher ___ High school ___ 4-year college degree

Who was/were your primary caretakers or parents when you were growing up (please check all that apply)?

___ Biological mother ___ Foster parents ___ Biological father ___ Grandparents ___ Step-mother ___ Other blood relatives

(describe:_______________________)

___ Step-father ___ Other ___

(describe:_______________________)

How many different caretakers did you have while growing up (up to age 18; please
circle one)?

1 2 3 4 5 6 7 8 9 10 10-

How would you rate the overall quality of care you received as a child?

___Excellent ___Good ___Fair ___Not very good ___Terrible

When you were growing up, were you ever a victim of bullying? ___Yes ___No

If yes, for how many years (please circle one)?

<1 1 2 3 4 5 6 7 8 9 10 11 12

If yes, how many individual bullies?

1 2 3 4 5 5+

Have you ever had any rage reactions? ___Yes ___No

Have you ever had any real problems with excessive spending? ___Yes ___No

Have you ever had any problems with alcohol abuse? ___Yes ___No

Have you ever had any problems with substance abuse? ___Yes ___No

Have you ever had any problems with binge eating? ___Yes ___No

How many sexual partners have you had in your lifetime? ___Yes ___No

Have you ever been seen by a psychiatrist? ___Yes ___No

Have you ever been hospitalized in a psychiatric hospital? ___Yes ___No

Have you ever been in counseling? ___Yes ___No
Have you ever been on medication for your nerves?  ___ Yes  ___ No
Driving Questionnaire

Have you ever been formally charged (not convicted) by the police with any of the following traffic violations?

Yes  No

___  ___  Speeding
___  ___  Reckless driving
___  ___  Careless driving
___  ___  Going through a stop sign
___  ___  Driving in a restricted traffic lane
___  ___  Driving in an HOV lane
___  ___  Running a traffic light
___  ___  Passing a school bus
___  ___  Following too closely
___  ___  Failure to move over
___  ___  Traffic control device (police detector)
___  ___  Failure to yield

Yes  No

___  ___  Required registration
___  ___  Certificate of registration not in vehicle
___  ___  Unlawful use of a license plate
___  ___  Driving an unregistered vehicle
___  ___  Lights required on vehicle
Violating a muffler law

Driver's license not on person

Driver's license without new change of address

Unrenewed driver's license

Lack of proof of insurance

Expired temporary tag

Have you ever been cited for:

Yes   No

An automobile/motorcycle accident?

Driving while intoxicated?

Vehicular manslaughter?

Leaving the scene of an accident?

Have you ever had your driving privileges suspended?   Yes   No

Have you ever been refused a driver's license in any state?   Yes   No
**Personality Diagnostic Questionnaire—4**

*Instructions:* The purpose of this questionnaire is for you to describe the kind of person you are. When answering the questions, think about how you have tended to feel, think, and act *over the past several years.* To remind you of this, you will find the statement, “Over the past several years…”

T (True) means that the statement is generally true for you.

F (False) means that the statement is generally false for you.

Even if you are not entirely sure about the answer, indicate “T” or “F” (circle one) for every question. There are no correct answers. You may take as much time as you wish.

*Over the past several years…*


- **T** F I’ll go to extremes to prevent those who I love from ever leaving me.
- **T** F I either love someone or hate them, with nothing in between.
- **T** F I often wonder who I really am.
- **T** F I have tried to hurt or kill myself.
- **T** F I am a very moody person.
- **T** F I feel that my life is dull and meaningless.
- **T** F I have difficulty controlling my anger or temper.
T F When stressed, things happen. Like I get paranoid or just "black out."

T F I have done things on impulse (such as those below) that can get me into trouble.

Check all that apply to you: __ Spending more money than I have
__ Having sex with people I hardly know
__ Drinking too much
__ Taking drugs
__ Eating binges
__ Reckless driving
**Self-Harm Inventory**

*Instructions:* Please answer the following questions by checking either, “Yes”, or “No.” Check “yes” only to those items that you have done intentionally, or on purpose, to hurt yourself.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Have you ever intentionally, or on purpose, ...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Overdosed?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Cut yourself on purpose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Burned yourself on purpose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Hit yourself?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Banged your head on purpose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Abused alcohol?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Driven recklessly on purpose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Scratched yourself on purpose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Prevented wounds from healing?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Made medical situations worse, on purpose (e.g., skipped medication)?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Been promiscuous (i.e., had many sexual partners)?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Set yourself up in a relationship to be rejected?</td>
</tr>
</tbody>
</table>
13. Abused prescription medication?

14. Distanced yourself from God as punishment?

15. Engaged in emotionally abusive relationships?

16. Engaged in sexually abusive relationships?

17. Lost a job on purpose?

18. Attempted suicide?

19. Exercised an injury on purpose?

20. Tortured yourself with self-defeating thoughts?

21. Starved yourself to hurt yourself?

22. Abused laxatives to hurt yourself?
B. IRB approval

February 17, 2009

Randy Sansone, M.D.
Sycamore Primary Care Group
2116 Leiser Rd.
Miamisburg, Ohio 45342-3608

RE: Request for Approval of Research dated: 1/29/2009
09-005: Borderline Personality and Driving Study

Dear Dr. Sansone:

I have reviewed your request for expedited approval of the new study listed above. Your study is eligible for expedited review under category 7 OHRP regulations (45 CFR 46.116(b)(1)).

This is to confirm that I have approved your request. The following items have been approved:

- Script: Borderline Personality and Driving Study (dated 1/27/2009)
- Driving Study Cover Sheet/Questionnaire (dated 1/20/2009)

You must obtain informed consent from all subjects; however, signed written consent is not required. The KHN Privacy Board has approved the privacy and confidentiality portion(s) of your protocol and related HIPAA documents.

You are granted permission to conduct your study as described in your request effective immediately. The study is subject to continuing review on or before February 15, 2010, unless closed before that date. If you plan to continue the study, please submit the project for continuing review 60 days before the expiration date.

Federal regulations require any changes to the study must be promptly reported and approved prior to implementation (45 CFR 46.103(b)(4)). Any data collected, or research activities conducted after February 15, 2010 without IRB approval is non-compliance with both institutional and federal regulations.

Please contact Gail Young ((937) 395-8309; fax (937) 395-8168; email: Gail.Young@khnetwork.org) if you have any questions or require further information.

Sincerely,

Douglas Lahr, M.D.
Vice Chairperson, Institutional Review Board

cc: IRB Files, Innovation Center
C. Public Health Competencies

<table>
<thead>
<tr>
<th>Domain</th>
<th>Skills</th>
</tr>
</thead>
</table>
| Analytical Skill Assessment   | - defines a problem  
- determines appropriate uses and limitations of both quantitative and qualitative data  
- recognizes how the data illuminates ethical, political, scientific, economic, and overall public health issues  
- applies ethical principles to the collection, maintenance, use and dissemination of data and information  
- selects and defines variables relevant to the defined public health problems  
- identifies relevant and appropriate data and information sources  
- evaluates the integrity and comparability of data and identifies gaps in data sources  
- obtains and interprets information regarding risks and benefits to the community |
| Policy Development            | - collects, summarizes, and interprets information relevant to an issue                                                                 |
| Communication Skills          | - communicates effectively both in writing and orally, or in other ways  
- solicits input from individuals and organizations  
- effectively presents accurate demographic, statistical, programmatic, and scientific information for professional and lay audiences |
| Cultural Competency           | - utilizes appropriate methods for interacting sensitively, effectively, and professionally with persons from diverse cultural, socioeconomic, educational, racial, ethnic, and professional backgrounds, and persons of all ages and lifestyle preferences |
| Basic Public Health Sciences Skills | - identifies and applies basic research methods used in public health  
- identifies and retrieves current relevant scientific evidence  
- identifies the limitations of research and the importance of observations and interrelationships  
- develops a lifelong commitment to rigorous critical thinking |
| Leadership and Systems Thinking Skills | - helps create key values and shared vision and uses these principles to guide action |

Source: Competencies Project, Council on Linkages, April 2001
http://trainingfinder.org/competencies/background.htm
http://trainingfinder.org/competencies/list_levels.htm