Electronic Journal of Sociology (2007)
ISSN: 1198 3655

Racial Differences in Self-Destructive Behavior Related to Depression

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Abstract

This study establishes that the effects of depression on risky behavior and suicide ideation vary significantly between three racial groups in the Cape Fear region of North Carolina. Using binary logistic regression we found that Caucasian respondents who were depressed didn't believe that their depression interfered with their daily lives, while depressed African-American and Latino respondents were more likely to recognize that depression interfered with their daily life. Interestingly, Caucasian respondents exhibited higher levels of suicide ideation, substance abuse and risky behavior than either African Americans or Latinos, despite stating their belief that their depression didn't affect them adversely.

A wealth of existing research has shown that risky behavior and suicide are related to depression or depressive symptoms. Studies have found that depression, or symptoms associated with depression, increase the incidence of suicide (American Psychiatric Association 2003), suicide ideation (Payne and Range 1996), various types of risky behavior (Theodore and Koegel 2002; Malta 2004; Ruangkanchanasetr et al. 2005), and self harm (Fagan and Western 2003; Muehlenkamp and Gutierrez 2004).

Additionally, existing research has shown that depression and its effects on the individual, can vary by racial and ethnic group in both nationally representative samples (Riolo et al. 2005), and in samples representing smaller or local populations (Finkelstein et al. 2001; Guiao and Thompson 2004; Arce 2005).

As depression and the behaviors of those with indications of depression have been shown to vary by race, and self-destructive and risky behavior has been shown to be associated with depression and depressive symptoms, this study explores if risky and self-destructive behavior varies between respondents exhibiting depressive symptoms in three racial groups from one geographical region. Before beginning the analysis however, it is important to first establish that there exists a sound base in published

research to build the previously stated hypothesis upon.

The idea that depression is associated with suicide ideation and risky behavior is well explored. The American Psychiatric Association (2003) cited a Harris and Barraclough (1997) review of 249 published studies on suicide dating from 1966 to 1993 that found extensive linkages in existing research on the relationship between suicide and depression. It has been shown that depressed individuals commit suicide and hold suicidal ideation at a rate higher than individuals without depressed symptoms. However, not all research agrees with the direct link between the two as McLaughlin et al. (1996) contend that it is hopelessness specifically, rather than depression in general, that is the most useful predictor of suicidal intent.

Risky behavior, manifested in different ways, has also been shown to be related to feelings associated with depression. Theodore and Koegel (2002) found that a group of HIV-negative gay men had elevations in mood and less anxiety (both inversely related to the degree of depression) and a higher commitment to safer sexual practices after a series of supportive peer counseling sessions. Deykin et al. (1987) also found a relationship between risky behavior and depression in their study of college students where alcohol and substance abuse were higher in individuals with depressive symptoms. Further, the alcohol and substance abuse followed the onset of depressive symptoms, suggesting that the depression was a cause of the substance abuse, rather than a correlate. Additionally, Diego et al. (2003) found in their study of a group of high school seniors that depression was one of the factors associated with higher incidents of smoking and use of drugs and alcohol, and Wang and Patten (2001) conclude that women with depressive symptoms are more likely to become frequent heavy drinkers than women without those symptoms, and do so possibly as a self-medicating tool. Depression per se isn't the only recognized contributor to risky behavior. Some of the indications of depression (National Mental Health Association), such as sadness, hopelessness, irritability, low self-esteem, and withdrawal from previous friendships have been found to result in similar risky behaviors. Ruangkanchanasetr et al. (2005) identified poor self-esteem and loneliness as two of the contributors to risky behavior such as driving drunk, infrequent seat-belt use, drug and alcohol abuse, and suicide ideation in a study of 2,311 adolescents in Bangkok, Thailand. Malta (2004) also found in studying aggressive driving in young adults that depression and anxiety were two of the predictors found to be reliable indicators of aggressive and risky driving. In this snapshot of studies relating to depression and risky-behavior one can easily see that the common elements are behaviors that put the individual in a situation where direct harm could be expected, and the relationship of that behavior to depression or depressive symptoms.

As was stated earlier, research has shown that responses to depression, and indicators of depression, vary by race. Young Latinas were found in one study (Guiao and Thompson 2004) to be at a higher risk for depression than Euro-Americans in the same group, and tended to use alcohol more than Asian- and African-American young women. Additionally, Bromberger et al. (2004) studied middle-aged women and found that Hispanic and African-American women were more likely to exhibit higher scores on a depression scale than were Japanese and Chinese women. However, the authors attribute part of the cause of these findings to socioeconomic status, which resulted in

differences in health practices and psychosocial factors in respondents. Finally, Sen (2004) found in a sample of 9,000 children in grades 6-10 that all racial minority groups were at a higher risk for depressed mood than were non-Hispanic whites, though African-Americans were at a lower risk for self-injury than were non-Hispanic whites. Sen points out that observed differences in suicide rates among racial groups could be related to the finding that asking for help with mood problems also varies by race.

Given that there is evidence to support the statement that depression varies by race, and that suicide ideation and risky behavior are related to depression and feelings associated with depression, there is solid base on which to build our investigation of how indicators of depression affect racial groups differently with respect to suicide ideation and risky behavior.

Method

The data for this study was gathered with a 56-item self administered survey. The survey was developed with questions from the Center for Disease Control's 2004 National Health Interview Survey and was administered to residents in the Cape Fear region of North Carolina after passing an Institutional Review Board.

The Cape Fear region consists of 11 counties in southeastern North Carolina, along the state border of South Carolina and the Atlantic coastline. The area has experienced recent changes in the racial makeup of the population, including a significant increase in the percentage of Latinos (North Carolina State Data Center 2001), and this study seeks to explore if there are racial disparities in how indicators of depression affect risky behavior and suicide ideation.

Respondents were chosen randomly from local telephone directories using systematic random sampling. A random starting point was selected using a random number generating software program, and every *n*th case was selected from each sampling frame, starting at the random point. Respondents who were identified were called on the telephone and asked to participate in the study by filling out the survey anonymously and returning the instrument in a provided self-addressed stamped envelope.

Although home-telephones are generally seen as a reliable means for gathering information with surveys, additional sampling was done across the region to ensure that any bias against those population members without telephones wouldn't occur. During the same time respondents were being contacted by telephone, other interviewers were sent out to various public locations throughout the 11-county region to invite adults over the age of 18 to participate in the study by filling out a survey on their own and then returning it anonymously to a collection box. Additionally, surveys were available to respondents in Spanish to prevent bias against non-English speaking respondents, who represent the second highest language group in that region of the country (US Census Bureau 2003).

As this study deals directly with the issue of race, it is useful to consider the distribution of race in respondents. Recall that this study deals with exploring possible

differences between groups, rather than attempting to identify characteristics about the larger population, which would include all races, from which the sample was drawn.

Table 1: Distribution of race in the sample

Race	Frequency	Percent
White/Caucasian	108	33.5
African-American	79	24.5
Latino	112	34.8
Native American	14	4.3
Biracial/Multiracial	3	.9
Other	6	1.9
Total	322	100

Depression was measured using indicators from the National Health Interview Study (NHIS) from the Centers for Disease Control. Respondents were asked to indicate how often they felt "Nervous," "Hopeless about life," "That everything is an effort," "So sad that nothing can cheer you up," and "Worthless." Respondents were provided a 4-point scale (coded as 0 to 3) to indicate how often they had these feelings, and were asked to indicate the frequency on a scale of "None of the time," "A little of the time," "Most of the time," and "All of the time." As is done in the standard for depression scales, Beck's BDI (Beck et al. 1961), the five measures/indicators of depression were summed to indicate the overall level of depressed feelings in the respondent. Respondents with a total value of 0-2 were considered "not indicating feelings of depression," values from 3-5 indicated "mild level of feelings associated with depression," 6-9 corresponded to "moderate feelings associated with depression," and 10 and higher was used to indicate "high levels of feelings of depression."

Internal consistency of the created scales was measured using Cronbach's alpha on the three groups. The 5 variables for Latino respondents, used to indicate an overall level of depression, produced an alpha score of .854, the combined scale for African-Americans resulted in a score of .741, and the reliability of the created scale for Caucasian/whites was .912, all of which are in the acceptable range for reliability (Carmines and Zeller 1979). With the 5 measures/indicators combined, we now have a single reliable indicator of feelings or moods associated with depression for respondents in each of the three racial groups most common in the geographical area.

The measures of depression created for this study are similar to Beck's BDI (Beck et al. 1961), a measure of depression also based on a 4-point scale. Beck's scale consists of 21 items and the measure of depression is scored based on the cumulative value of

respondent's answers to standardized questions. The BDI's properties (Helm et al. 2002) hold that values of 0-9 can be considered minimal and indicate individuals with little or no indication of depression; 10-16 can be considered mild; 17-29 moderate; and 30-63 would indicate severe depression. Helm et al, in their use of the BDI, found a mean well within the non-depressed range (5.94) and cited 3 other studies that each found their sample mean either right at or under the BDI level for indicating depression. Helm et al's study of 623 college students found that depression scores indicated mild to severe depression 21.8% of the time, and cited Arthur and Hayword's (1997) study of college students who reported 32% of the respondents in the mild to severely depressed range. Our current study's frequency distribution was approximately equal to those ranges. 31.9% of respondents reported depression levels from mild to severely depressed, and the mean value (.4396) was well within the range indicating "not depressed."

Table 2: Distribution of measures of depression

Level of Depression (scale from 0 – 15 points)	**Frequency**	**Percent**
no depression, 0-2	203	68.1
mild depression, 3-5	68	22.8
moderate depression, 6-9	18	6.0
severe depression, 10-15	9	3.0
Total	**298**	**100.0**

Analysis

To explore racial differences in the effects of depression on risky behavior we will run a series of binary logistic regression models where the dependent variable indicates the presence of risky behavior that were found in the literature review to be related to depression.

In this series of models, the regressors were the measures of the severity of depression, created from the indicators of depression described above. The dependent variable in each model was an indicator of risky behavior or suicide ideation. In Suris et al's (2005) study of evaluating risk-taking adolescents, the authors included the use of tobacco, alcohol, cannabis and other illegal drug use, sexual risky behavior, driving while intoxicated, riding with an intoxicated driver, not always using a seatbelt, and not always using a helmet when riding a bike as indicators of risky behavior. As that study dealt with adolescents, and was not attempting to explore possible differences between racial groups related to depression (which could influence the rate of tobacco or alcohol use among members), not each of the measures would be appropriate for

our current study. Risky behavior was indicated here by the following: seat belt use, driving while intoxicated, riding with an intoxicated driver, the use of cocaine, and the use of marijuana.

To identify influences of depression on risky behavior we use a binary logistic regression model. This model is slightly more complex to interpret than the standard least-squares regression model, but the use of a dichotomous dependent variable renders the OLS model unreliable. In these regressions we considered the effects of depression using the exp (b) which is the natural-log raised to the Beta coefficient produced in the regression model. In effect, this is the ratio-change in the odds of the dependent variable for a 1-unit increase in the regressor. In interpreting the exp(b), values that are close to 1 have little or no effect on the dependent variable. Values that are less than 1 have an inverse effect on the dependent variable, which becomes stronger as the value approaches 0. Values greater than 1 have a positive effect on the predicted Y, and the effect, conversely, becomes stronger as the value increases (moves further away from 1, the indicator of "no effect.")

The measures of the reliability of the model itself are similar to those used in OLS, but must be useful on models where linearity can't be assumed. The Nagelkerke R^2 is interpreted in the same way that R^2 in OLS regression is interpreted, with .000 indicating that 0% of the movement of the dependent variable can be explained by movements of the independent variable, to 1 which indicates that 100% of the movement of Y is explained by the included X's. Finally, the model test of significance tests the null hypothesis that the coefficients are not useful in explaining the dependent variable. Values lower than .05 allow us to reject that hypothesis in favor of the alternative hypothesis which holds that the coefficients are of use in explaining the dependent variable, and thus the model itself is reliable.

Table 3: Binary Logistic Regression Models

	Logistic Regression X_1=Degree of Depression in White Respondents	Logistic Regression X_2=Degree of Depression in African-American Respondents	Logistic Regression X_3=Degree of Depression in Latino Respondents
Y= Perception that feelings of depression interfere with daily life	Model Sig .000** Nagelkerke R^2 .679 Exp(B) .000 (Sig 1.000)	Model Sig .001** Nagelkerke R^2 .223 Exp(B) 3.817 (Sig .006)**	Model Sig .001** Nagelkerke R^2 .177 Exp(B) 3.910 (Sig .006)**
Y=Suicide ideation in past 12 months	Model Sig .000** Nagelkerke R^2 .552 Exp(B) 8.496 (Sig .000)**	Model Sig .005** Nagelkerke R^2 .289 Exp(B) 4.863 (Sig .010)**	Model Sig .000** Nagelkerke R^2 .318 Exp(B) 5.861 (Sig .001)**
Y= Cocaine use	Model Sig .011* Nagelkerke R^2 .129 Exp(B) 2.358 (Sig .009) **	Model Sig .354 Nagelkerke R^2 .040 Exp(B) 1.858 (Sig .327)	Model Sig .603 Nagelkerke R^2 .015 Exp(B) 1.665 (Sig .567)
Y= Marijuana use	Model Sig .008** Nagelkerke R^2 .102 Exp(B) 2.047 (Sig .008)**	Model Sig .698 Nagelkerke R^2 .003 Exp(B) 1.156 (Sig .695)	Model Sig .058 Nagelkerke R^2 .128 Exp(B) 3.030 (Sig .042)*
Y= Drove while intoxicated more than twice in past month	Model Sig .001** Nagelkerke R^2 .300 Exp(B) 3.951 (Sig .001)**	Model Sig .637 Nagelkerke R^2 .007 Exp(B) 1.295 (Sig .626)	Model Sig .105 Nagelkerke R^2 .113 Exp(B) 2.919 (Sig .077)
Y= Rode in the car with an intoxicated driver more than twice in past month	Model Sig .008** Nagelkerke R^2 .132 Exp(B) 2.360 (Sig .007)**	Model Sig .316 Nagelkerke R^2 .032 Exp(B) 1.679 (Sig .293)	Model Sig .031* Nagelkerke R^2 .105 Exp(B) 2.624 (Sig .024)*
Y= Regular use of seatbelts	Model Sig .027* Nagelkerke R^2 .099 Exp(B) .474 (Sig .021)*	Model Sig .358 Nagelkerke R^2 .022 Exp(B) 1.684 (Sig .397)	Model Sig .373 Nagelkerke R^2 .015 Exp(B) .685 (Sig .354)

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

From the above table, we can see how respondents differ according to race in their belief about how depression interferes with their daily life. In this model, it appears that African-American and Latino respondents reported higher levels of feelings of interference with daily life related to higher levels of depression (indicated by exp(b) values of 3.817 and 3.910, respectively). Caucasian respondents however indicated no effect on feelings of interference in their daily lives related to levels of depression, evidenced by the statistically insignificant regressor. To state it more clearly, when levels of depression increased in African-American and Latino respondents, they reported higher levels of interference in their daily life attributed to feelings of depression. However, Caucasian respondents with higher levels of depression reported that their daily lives were not affected by the presence of feelings associated with depression. This difference will play an important role as we continue to explore how depression affects risky-behavior in the three racial groups.

As the chart shows in the second row, suicide ideation increased for all three groups with higher levels of depression, but it should be noted that the effect on Caucasian respondents showed a significantly higher Nagelkerke R^2 value (.552) and value for exp(b) (8.496) than the other two racial groups. This suggests that feelings associated with depression are much more useful for predicting suicide ideation in Caucasian respondents than for African-American or Latino respondents. The results clearly indicate that all three groups have obvious effects of depression on suicide ideation, but the effect on Caucasians is nearly twice as strong as the effect in African-Americans and Latinos in this sample.

The next two rows, the amount of use of cocaine and marijuana will be looked at simultaneously as they are both indicative of substance abuse. For both variables, Caucasian respondents who indicated higher levels of depression reported a greater frequency in the use of cocaine and marijuana. Both R^2s for Caucasian respondents are relatively low (.129 for cocaine use and .102 for marijuana), but the models were statistically significant and the natural-log raised to the beta coefficient showed a statistically significant and positive relationship between depression and the use of the two drugs. Neither model was statistically significant for African-American respondents, which suggests that depression and substance abuse are unrelated in this group. The regressions that explored the effect of depression on Latinos' use of the drugs were also statistically insignificant, though the regressor indicating marijuana use was statistically significant. However, given that the overall model itself was statistically insignificant, any reliable statement of a relationship between Latino respondents' level of depression and marijuana use can't be made.

Driving while intoxicated was found to occur at a higher level in Caucasian respondents who scored higher on the depression scale. The Nagelkerke R^2 value of .300 and the exp(b) value of 3.951 indicate that depression is a useful indicator of the frequency of driving while intoxicated in this sample. The same effect could not be established for African-American and Latino respondents as the models and the coefficients were statistically insignificant.

The pattern of the past 5 groups of regression models stops when we consider the effect of depression on riding in a car with an intoxicated driver. For African-American respondents, there was no increase in the log-odds ratio, or chance, of riding with an

intoxicated driver as the respondent reported increasing levels of depression. Latino and Caucasian respondents did, however, have a greater chance of riding with intoxicated drivers when their level of depression was higher.

The final series of binary regressions explores how higher levels of depression affect the use of seatbelts. As in most of the previous models, Caucasian respondents were more likely to exhibit risky behavior when higher levels of depression were indicated. In this model, the Nagelkerke R^2 is low at .099, but the coefficient of .474 has a negative effect (recall that when the natural-log is raised to the beta coefficient, the change in the odds of the log-ratio results in numbers less than 1 indicating negative effects). Again, responses from African-American and Latino's didn't indicate changes in the effects of depression on the occurrence of regular seatbelt use.

Discussion

We clearly see a significant difference between Caucasian, African-American, and Latino respondents with respect to the effects of indicators of depression on risky behavior and suicide ideation, which generally supports existing research. Rarely did the effects among the three racial groups converge. In only one series of regressions did the three groups have similar general effects, and that was on the incidence of suicide ideation related to depression levels.

Supporting existing research, we found that all 3 groups saw statistically significant increases in the chances of suicide ideation with increasing levels of depression, but the effect of depression on Caucasian respondents was noticeably higher than the effect on the other two groups.

Latino and Caucasian respondents also had similar increases in the chances of frequently riding with intoxicated drivers, though depression in African-American respondents displayed no statistically significant effect. Other than in these two groups of models, Caucasian respondents significantly differed from African-American and Latino respondents with respect to the odds of engaging in risky behavior related to measures of depression.

Caucasian respondents in this sample reported, ironically when we consider the above findings, that their feelings of low self-worth, nervousness, hopelessness, sadness, and generally negative feelings towards life (taken collectively to indicate the presence of depressive symptoms) had no noticeable effect on their perception that feelings of depression interfere with their daily life, while African-American and Latino respondents report that the feelings we associate with depression are more likely to disrupt their daily lives. This doesn't suggest that Caucasians deal with their depression better than African-Americans or Latinos, it suggests that Caucasian respondents are either not aware of the level of disruption these feelings cause in their daily life, or they are aware of them and deny their existence to others.

Interestingly, the indicators of risky behavior were much more likely to increase in occurrence with increasing levels of the severity of depression in Caucasians than for African-Americans or Latinos. When we combine this with the previous findings where Caucasians reported that feelings of depression, when present, have no effect on their

daily lives, and African-American and Latino respondents reported that these feelings did have an effect on their daily life, we arrive at an interesting conclusion: Caucasian respondents with higher levels of depression exhibited a greater incidence of risky behavior and suicide ideation than African-American and Latino respondents. Ironically, Caucasian respondents, who were more likely to report that feelings of depression had no effect on their daily lives, regularly exhibited behaviors that put them at a heightened risk for personal harm or injury. African-American and Latino respondents, who would appear here to be more aware of how their feelings of depression affect them, tended not to exhibit a higher incidence of risky behavior. An exception to this statement is the occurrence of Latinos and Caucasians both exhibiting a greater chance of riding with an intoxicated driver when they report higher levels of depression, though Latino respondents' with depression were no more likely to drive themselves while intoxicated than were non-depressed Latinos.

One possible cause for these findings is articulated by the American Psychiatric Association's 2003 report on suicide. The report only addresses suicidal ideation and suicide explicitly, but there is evidence to suggest that suicide ideation and other forms of risky behavior are related (Muehlenkamp and Gutierrez 2004; Langhinrichsen-Rohling et al. 2004):

"Thus, knowledge of and sensitivity to common contributors to suicide in different racial and ethnic groups as well as cultural differences in beliefs about death and views of suicide are important when making clinical estimates of suicide risk and implementing plans to address suicide risk" (2003: 15).

This suggests that the underlying causes of suicide ideation, and risky behavior by extension, can vary according to how members of different racial or ethnic groups view the causes of their feelings and consider appropriate responses. The respondent's culture could influence how depression should be dealt with, and Caucasian respondents in this study appeared to ignore the personal disruptions caused by their depression (as evidenced by their belief that depression didn't affect their daily life) which in turn manifested itself as behavior that put the individual directly at risk. Latino and African-American respondents were either more aware of their depression, and would therefore be more inclined to seek help with it, or were more comfortable admitting it on a survey, which suggests that they don't necessarily see depression as a taboo and something that should be dealt with alone. Similarly, Riolo et al. (2005) conclude that observable differences in depression between racial groups could be caused by, among other factors, poverty, education, cultural factors, and differences in the willingness of the respondent to acknowledge their depression. However, Hightower (2005) finds that the presence of symptoms associated with depression, when considering race or ethnicity, could also be related to a bias in diagnosis (the instrument itself in this case) as well as the particular experience unique to the ethnicity of a group.

Sachs-Ericsson et al.'s (2005) study suggests that caution should be taken when considering the relationship between race and depression. In that report, the authors found that both socio-economic status and race needed to be considered together to fully understand the incidence of depression in a sample of older adults.

Clearly there exists the possibility that observed racial differences in depression, in this study and others, might be related not to depression exclusively, but to how the racial or ethnic group understands both the instrument and the point of the study, as well as understanding the very feelings and emotions that the study seeks to measure.

A limitation of this study is that it doesn't explore how the feelings of depression are understood by respondents, which might affect how they understand depression's effect on their behavior. Also, the issue of depression being stigmatized wasn't explored, which might affect how the respondent answers the questions on the survey, nor were there questions exploring possible communal or familial support for the depressed person, which could vary by racial group. These shortcomings could be addressed in a qualitative study using in-depth interviews to explore how respondents in these three racial groups understand depression in their daily lives.

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